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The journal *Annals of Spiru Haret University. Economic Series* was founded in 2000 at the initiative of two professors from Spiru Haret University: Professor Ph.D. Gheorghe Zaman – also corresponding member of the Romanian Academy and Professor Ph.D. Constantin Mecu – one of the University's founders and vice-rector.

Between 2004-2010, the journal is headed by Professor Ph.D. Constantin Mecu, as editor-in-chief, and associate professor Ph.D. Aurelian A. Bondrea, as deputy editor, both vice-rectors of the university.

In 2011, associate professor Ph.D. Aurelian A. Bondrea, rector of the university, takes over the presidency as editor-in-chief and leads the journal until present.

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In 2007, *Annals of Spiru Haret University. Economic Series* obtained the B+ quotation from The National Council of Research in Higher Education in Romania, becoming a publication of real scientific interest.

Starting 2009, the review is indexed in REPEC, SSRN and Google Scholar and beginning with 2016 our Journal is under a process of rebranding, the new team trying to rethink the journal indexing strategy in international databases, suggesting a greater external visibility.

Along the years, in the journal pages, the members of the teaching personnel – professors, associate professors, lecturers and teaching assistants – active in six economics faculties and distinct specialty departments, as well as in the Central Scientific Research Institute, functioning within Spiru Haret University, present the results of their scientific research. The journal also hosts many studies of professors, researchers or Ph.D. students from other universities and research institutes all over the world.

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FOREWORD

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In the article written by Afrodita Cicovschi, entitled: *The world economy is waiting for the great monetary relaxation, after a year under the threat of recession*, published in the *Adevarul.ro* newspaper on 11.12.2023, it is stated that at the beginning of 2023, fears were emerging regarding a possible recession determined by the tightening of monetary policies, with a significant impact on the markets, an aspect also recorded by XTB analysts.

So far, however, the economic slowdown has been limited, and some indicators suggest the worst is over, at least in the US. So, according to XTB's Economic Outlook Report, the year 2024 brings reasons for optimism, although challenges still remain.

First, in Europe, signs of economic slowdown have multiplied. Germany, Romania's important trading partner and the continent's leading economy, faces difficult quarters. On the other hand, the American economy grew beyond expectations. Here, consumption evolves positively, and the moderation of energy prices supports the downward trend in inflation. Nearing the end of the most aggressive rate-tightening cycle in four decades, investors are waiting for the first clear sign of easing from central banks.

Trade indicators show that Europe is in the most difficult situation among the main economic regions. Thus, Europeans have seen a deep decline in manufacturing in response to the post-Covid inventory glut and increased energy prices. Progressive deglobalization, as well as the EU's ambitious climate policies, also contributed to this setback.

Globally, manufacturing companies appear to be slowly reducing inventories. In Europe, however, there were hopes that the economy would be helped by consumers through the services sector, but the opposite appears to be happening. The XTB report recalls that the current interest rate on European Central Bank deposits is 4%, after more than a decade of being negative or close to zero. Therefore, the positive tone is difficult to maintain in terms of consumer demand until the end of 2024.

So, while the US economy seems to be holding up, Europe could be on the brink of some kind of recession, the severity of which will be decided by the global market. The exact extent of the economic slowdown Europe is going through will depend on the length of the restrictive policies imposed by the main central banks, and these policies will in turn be influenced by inflation.

On the positive side, economists expect inflation to ease in both the US and Europe next year, barring an external shock. Across the ocean, the main driver of tempering inflation will be house prices. Real estate rates and rents are at all-time highs, but close to stagnating. This is all the more so as core inflation in the real estate sector reacts to house prices with significant delays, over a year.

Therefore, in 2024 we are almost guaranteed lower inflation from this segment. At the same time, given low fuel prices and relatively limited pressure from services, an acceleration in inflation seems unlikely at this point. In Europe, weak consumer demand and the fading effects of the energy crisis should also reduce core inflation.

As a negative signal, however, part of the inflation could be structural, i.e. long-term. This stems from deglobalization and changes in the labor market, where aging societies and post-Covid changes could put more pressure on wage growth. These factors will not overcome the short-term trends mentioned above, but could mean that a return to very low interest rates may not be possible (except in crisis situations).

Geopolitics requires investors' attention. Outside of day-to-day economic developments, we live in a world where geopolitical tensions have become part of the things an investor needs to watch out for. In 2022 we had the Russian invasion of Ukraine, and in 2023 the crisis in the Middle East. According to XTB analysts, these appear to be just proxies of the great war for global dominance going on between the US and China.

Both countries appear to be on a collision course, regardless of what their leaders say: The US is trying to limit China from developing cutting-edge technologies, especially those that could be used in the military. Beijing, on the other hand, seeks to maintain free trade as long as it takes advantage of it to strengthen its position. It is quite clear that the interests are conflicting, and while an extreme turn of events (such as the invasion of Taiwan) is unlikely to happen next year, we will certainly see more action on the geopolitical stage.

Uncertainties surrounding China are not limited to geopolitics. The economic situation is much worse than expected. When Beijing suddenly lifted its COVID restrictions at the end of 2022, expectations were high. But after a short-lived

recovery, the economy stagnated and failed to pick up steam despite interest rate cuts and stimulus, however limited. It is becoming increasingly apparent that the country is starting to pay the price for fueling the economy through the housing market in recent decades. Now that this source of growth is gone, a slowdown may be inevitable.

The euro-dollar evolution is influenced by central banks. Looking at the EUR-USD pair from a technical point of view, after the price managed to climb above parity again, it maintained an upward trajectory until July 2023. Even so, this development should be interpreted as a correction within a broader downward trend. This instability was determined by the two major forces pulling the tandem in opposite directions: on the one hand we have the relatively weaker European economy, and on the other, market optimism. The favorable fall for the currency pair was a reflection of the lowering of Fed rate expectations in 2024.

The Federal Reserve has the opportunity to cut rates next year, but equally, just as many such cuts could be needed in the eurozone.

It could be argued that the economic situation in Europe could put pressure on the ECB sooner. Even now, if we look at bond yields, they remain relatively flat (markets continue to expect faster cuts on both sides of the Atlantic), thus providing no support for the euro-dollar pair.

If the United States remains resilient or if Europe slips into recession, these differences could become even more unfavorable for the euro. In terms of market sentiment, things look good at the moment, but investors should keep in mind that any deterioration in sentiment is usually negative for the euro.

On the other hand, Wall Street is wondering if the Fed is running the stock markets. In 2023, Wall Street indices recovered much of the losses of the previous year. The gains came despite the Fed raising rates to their highest level since March 2001. The question now appears to be not whether the Fed will cut rates in 2024, but when, exactly, they will begin cutting them.

The general view is that loose monetary policy is good for stock markets and the economy, while aggressive monetary policy is bad. But analysis of the Fed's past three rate-cutting cycles leads to an interesting conclusion: Interest rate moves by the central bank do not influence stock markets on their own and must be examined against the broader economic context.

Thus, the rate cuts that started the 2001 and 2007 cycles failed to boost market sentiment in the following months, and the broad US stock market indices faced declines. On the other hand, the rate cut that started in 2019 was followed by stock

market gains in the following months. What seems to be central to the stock market's performance after these moves is the reason behind them.

The 2001 and 2007 cuts were a response to the crisis, while the 2019 rate cut was a response to weakening inflation. Therefore, the macroeconomic context will matter more to the stock market than Fed policy, as it will set the outlook for the next gains.

The price of gold will most likely increase in the near future, rather than decrease, as previously predicted. Since 2020, gold has fluctuated in a wide range of price consolidation between \$1,600 and \$2,000 per ounce. With the predictable end of the rate hike cycle in the US, the prospect of gold finally breaking out of this upward trend is looming on the horizon. Market expectations suggest that initial rate cuts could occur as early as the first half of 2024.

Statistical data, however, shows that the average advance in the price of gold in the two years after the last interest rate increase is almost 20%. If this pattern were to repeat itself, gold could not only surpass all-time highs, but could reach levels close to \$2,400 an ounce. Additionally, the metal typically experiences gains shortly before and after the first anticipated rate cut in a cycle. But the main risk of this scenario is a potential return to interest rate hikes, which would cause the dollar to strengthen and yields to rise.

Demand for gold has been relatively subdued over the past year. However, a weaker dollar, along with a stronger Chinese yuan and Indian rupee, could change that. These countries are very important from the perspective of physical demand for gold. Additionally, given that gold ETFs have ceased selling activities, potential capital inflows into these funds could spur additional demand for physical gold.

Despite fears of a recession, investors have shown a high level of optimism in 2023, both in the US and in Europe. On the other hand, China's stock market is in a slow decline. Geopolitical challenges have led to a different response, with gains especially for gold, which recently reached a new all-time high. At the same time, they caused oil quotations to fall, after the strong volatility of October 2023.

In 2024, another year of complex global developments awaits us: elections in the US and elsewhere in Europe, plus excitement doubled by some concerns about artificial intelligence. So it is not out of the question that interest in precious metals will remain high. However, volatility is likely to be relatively high for oil, European and US stocks.

In Romania, the competition for capital between the stock market and government bonds can remain high. The economy as a whole will have to face the new fiscal realities, the effects of the German recession and the European

slowdown. One chance could be connecting to major global innovation trends and rapid and efficient public and private investment in new AI-based technologies.

In the current context, the authors found forums for discussions and debates and have written articles for the current issue trying, as far as possible, to look at some solutions for the problems facing the new world state of the economy. Whether or not they succeeded in responding to the challenges, we leave it to you to determine.

In the first paper published in the present issue, entitled “*Impact of Trade Union’ Presence on the Enhancement of Safety Performance of Workers in the Maritime Industry in Lagos State*”, the authors **Pedro Uwadum ADAGBOR, Wilfred Isioma UKPERE** believe that trade unions plays a pivotal role in championing the rights and well-being of workers, including the enhancement of job safety performance. The study investigates the impact of trade unions’ presence in the enhancement of job safety performance of workers in the Maritime industry in Lagos state. Proportionate random sampling technique was employed to select two hundred (200) workers. The data collection instrument consisted of a researcher-designed questionnaire. The data analysis involved pie charts and multiple regression analysis. The findings reveal that trade unions’ presence significantly enhance workers’ adherence to safety regulations and standards to perform their job safely ($R=.783, P<0.05$); trade unions’ presence significantly enhance safety knowledge and skills of workers to perform their job safely ($R=.590, P<0.05$); trade unions’ presence significantly improve the provision of proper safety equipment to enhance workers' job safely ($R=.671, P<0.05$); trade unions’ presence significantly enhance workers with hazard identification and control to perform their job safely ($R=.592, P<0.05$); trade unions’ presence significantly enhance support to workers who experience injuries or accidents to perform their job safely ($R=.671, P<0.05$) in the Maritime industry in Lagos state. Considering the findings, it was therefore suggested that trade unions should continue to actively engage with workers and employers to promote adherence to safety regulations and standards; prioritize the provision of safety knowledge and skills to workers through ongoing training programs; actively support employers in ensuring the provision of appropriate safety equipment to workers; work closely with employers to strengthen hazard identification and control processes in the workplace; focus on establishing support systems for workers who experience injuries or accidents.

Authors **Thiathu MASINDI, Darlington Peter ONOJAEFE, Robertson TENGEH and Wilfred Isioma UKPERE**, in their paper entitled “*Influence of Job Satisfaction and Organisational Commitment on Employee Turnover Intention*

in the Chemical Industry in South Africa” aimed to assess the extent to which work satisfaction and organisational commitment influence employee turnover, both individually and concurrently. The assessment was conducted quantitatively through the utilisation of an online survey methodology to gather data from a sample of 249 respondents who were randomly chosen from the organisation operating in the specialty chemical business. The study discovered a detrimental absence of connection between employees and supervisors, which contributes to a climate of job unhappiness among the participants.

Compared to other characteristics that have an influence, a lack of strong dedication to the organisation (known as affective commitment) resulted in an increased inclination to resign from the company. The study's findings suggest that an increase in job satisfaction and organisational commitment would lead to a decrease in turnover intention. The supervisor's influence and emotional dedication to the organisation are recognised as being more substantial than other aspects. Consequently, research has shown that contentment with a colleague, manager, and client (in descending order) has a beneficial impact on affective commitment. Consequently, heightened levels of work satisfaction and organisational commitment will result in a reduction in turnover intention. The study shows that employees' overall happiness with their supervisors, colleagues, and customers is associated with a decrease in their intention to leave the company, indicating a higher likelihood of retention.

In the article entitled *“The Relationship between Motivation and Job Satisfaction of Administrative Staff at a Selected University in Cape Town”*, the authors **Zintle MNYANI, Darlington ONAJAEFE and Wilfred Isioma UKPERE** investigated the correlation between motivation and job satisfaction. The study conducted a detailed analysis of the intrinsic and extrinsic elements that influence the motivation and job satisfaction of administrative staff. The study employed a quantitative method and utilised correlation for data analysis. Data on the factors that influence employee work satisfaction at a specific university in Cape Town were collected using a five point Likert scale questionnaire. The population consisted of 77 respondents, specifically administrative staff. Out of the 54 responses were received, the response rate was calculated to be 70%. The responses were examined using descriptive and inferential statistics. The findings indicate that there is a strong positive correlation (0.695) between work motivation and job satisfaction, which is statistically significant at a p-value of 0.001 ($p < 0.05$). There is a clear and important connection between work motivation and job satisfaction among the administrative staff at the University. Put simply, there is a

direct correlation between increased work motivation and job satisfaction. Hence, this study has established that there is a statistically significant correlation between employee motivation and job satisfaction.

The authors **Francis Ezieshi MONYEI**, **Augustine Ebuka ARACHIE** and **Wilfred Isioma UKPERE** in their article entitled “*Systems Thinking in Workplace Health and Safety: A Theory and Practice Nexus*” undertake a conceptual overview of system thinking in workplace safety and health with the intent of bridging the gap between theory and practice. It is based on the premise that there has been so much discussed in theory without very little to practice, thus, making the modern workplace more hazardous and challenging. This study relied on existing literature and based on the frame an emerging economy perspective was articulated and discussed. The paper draws from a narrative qualitative approach design. The study concludes that there is more to be done in practice when it comes to workplace health and safety. The reality that modern workplaces evolve from a system view thus demands a holistic approach to viewing workplace safety and health, as it remains foundational to employee retention and effective contribution to the survival of the workplace.

Olawale Olufemi AKINRINDE and **Arnesh TELUKDARIE**, in their paper named “*Policy (In)Consistency and Sustainable Development Goals in Africa: A Systematic Literature Review*” are talking about the fact that the attainment of Sustainable Development Goals hinges on the alignment of SDGs policies. This systematic literature review delves into the intricate relationship between policy inconsistency and sustainable development goals in Africa. Through this study, the authors unveil the challenges, implications, and the potential pathways that emerge at the intersection of policies and the quest for sustainable development in Africa. Their investigation takes a close look at the diverse dimensions of policy coherence, encompassing economic, social, and environmental considerations, and how these dimensions impact the progress of SDGs. Employing a systematic review approach, the authors meticulously filtered through 1745 results from databases, selecting 353 articles for a comprehensive analysis. Their findings underscore the significant role that policy inconsistency plays in impeding the attainment of SDGs in Africa. The authors propose an approach anchored on the alignment of SDGs policies and each goal of SDGS for the attainment of the 2030 SDGs agenda in Africa.

The authors **Ivan Georgiev MALAMOV**, **Vania DIMITROVA**, **Krasimir SLAVYANOV** and **Elena GURGU**, in their article entitled “*Strategic Sustainability Management in Military Operations.: Integrating Social Logistic*”,

are exploring the imperative of integrating strategic sustainability management principles and social logistics into contemporary military operations. Recognizing the multifaceted nature of global challenges and the evolving landscape of warfare, this study delves into the intersection of sustainability, logistics, and social considerations within military strategies. Through a comprehensive examination of existing literature, case studies, and theoretical frameworks, the article elucidates the potential benefits and challenges associated with integrating sustainability and social logistics in military planning and execution.

The research emphasizes the strategic planning phase as a crucial juncture for incorporating sustainability and social considerations, thereby establishing a foundation for ethically sound and socially responsible military operations. It underscores the significance of optimizing logistics and supply chain processes to account for environmental impact, community engagement, and cultural sensitivity. By exploring successful examples and lessons learned from past operations, the article aims to provide practical insights for military leaders, policymakers, and strategists seeking to align military endeavors with sustainable and socially responsible practices.

Furthermore, the article investigates the potential benefits, such as enhanced operational efficiency, strategic advantage through positive community relations, and the long-term stability of regions affected by military interventions. However, it also addresses challenges related to balancing competing priorities, navigating cultural nuances, and managing resource constraints in the pursuit of sustainability goals.

In conclusion, this article advocates for a paradigm shift in military operations, moving beyond traditional approaches to incorporate sustainability and social logistics as integral components of strategic planning and execution. By doing so, military organizations can not only fulfill their primary objectives but also contribute positively to global stability, environmental conservation, and the well-being of affected communities. This research aims to stimulate further discourse and practical implementation of strategic sustainability management principles within the realm of military strategy and operations.

Another interesting paper is the one called “*Sustainability 2.0: The Role of Neuromarketing and Organizational Behaviour*”, written by the authors **Valentin KULETO, Milena ILIC, Marko RANKOVIC, Nevenka POPOVIC-SEVIC and Elena GURGU** who are talking that the accelerating pace of environmental degradation and societal challenges necessitates innovative approaches to sustainability. "Sustainability 2.0" represents a paradigm shift that inter-twines neuromarketing and organizational behaviour, unlocking new avenues for fostering

sustainable practices. This article explores the intricate relationship between these two fields, dissecting how insights from neuroscience and organizational dynamics can steer society towards a more sustainable future. The first dimension of Sustainability 2.0, examined through the lens of neuromarketing, delves into the neuroscience of consumer decision-making. By decoding the neural processes underpinning sustainable choices, businesses gain a nuanced understanding of consumer behaviour, enabling the development of products and communication strategies that resonate authentically with eco-conscious individuals. On the organizational front, the article investigates the role of organizational behaviour as a catalyst for sustainable cultures. Leaders are pivotal in this transformation, driving corporate practices that prioritize environmental stewardship and social responsibility. The integration of sustainability into organizational DNA is explored, emphasizing the role of positive organizational behaviour in shaping a workforce committed to sustainable practices. This article not only charts the current landscape but also navigates the potential trajectory of Sustainability 2.0. Data-driven insights, behavioural economics, and technological advancements emerge as key components shaping this transformative alliance. The exploration of practical applications and ethical considerations provides a comprehensive view of the challenges and opportunities inherent in this convergence. As the global community stands at the intersection of environmental responsibility and market dynamics, Sustainability 2.0 offers a roadmap for individuals, businesses, and policymakers. By inter-twining neuromarketing and organizational behaviour, we aim to illuminate the path towards a future where sustainability is not merely an aspiration but an intrinsic and neurologically resonant aspect of our collective consciousness.

The study called “*Medicinal Herbs and Biodiversity Resources in Nigeria: An Ethnographic Analysis of their Governance Mechanisms and Implications for Sustainable and Economic Development*” written by the authors **Olusegun Fariudeen LIADI, Musediq Olufemi LAWAL and Olawale Olufemi AKINRINDE** examines the present systems for regulating biodiversity resource use, with a specific focus on Osun State, Nigeria. The study undertakes an exploratory research design due to the novelty of the subject matter. For data collection, qualitative research methodologies, specifically in-depth interviews (IDIs) and key informant interviews (KIIs), were purposefully adopted. Herbal medicine sellers were key participants in the in-depth interviews, while key informant interviewees included a diverse group of leaders of herb sellers' associations, traditional healthcare providers, government officials responsible for Forestry Resources Management, practicing ethnobotanists, and knowledgeable

academics with expertise relevant to the subject matter. The study further unfolds a comprehensive analysis of the threats to biodiversity, delving into the underlying causes and far-reaching consequences of biodiversity depletion in Nigeria. The study's findings further shed a discerning light on the regulatory mechanisms governing biodiversity utilisation in Nigeria. Despite the existence of these mechanisms, they have struggled to realise the anticipated positive outcomes. This predicament is largely attributable to a lack of strong political will on the part of the government to ensure compliance among users of Nigeria's rich biodiversity. A critical observation is that the legal and policy frameworks that oversee biodiversity in Nigeria have not undergone periodic reviews, rendering them out of touch with current societal dynamics. Consequently, traditional medicine practitioners and vendors of medicinal herbs, among other biodiversity users, have exploited this policy vacuum to exploit plant, tree, and other biodiversity resources unabated. Of notable concern is the unregulated exploitation of plants for medicinal purposes, particularly the trade in herbs, which has emerged as a significant threat to public health and well-being. This unchecked practice undermines the prospects of Sustainable Development Goal 3 (SDG-3), which prioritises health and well-being. In light of these findings, the study strongly advocates for a two-fold approach to address this pressing issue. First, it underscores the critical importance of fostering robust political will to enforce existing regulations and institute much-needed reforms. Secondly, constant monitoring and oversight of medicinal herb utilisation and other biodiversity resources in Nigeria by government agencies are deemed imperative to safeguard the nation's natural wealth and the health of its citizens.

A very interesting paper is the one of professor **Vanja STANKOVIĆ**, called "*Sustainability Marketing Practices Design for Sustainability*". To analyze and synchronize future sustainable design practices and thinking, it is crucial to interpret and keep design practice with urgent and future oriented goals in this field. Sustainable design practice objectives are human-centered, and also centered towards social, economic and environmental wellbeing, influenced by different design practices, in order to maintain comprehensive integrated value of the marketing practice. By complementing ideation, analysis, validated data and goals of the product design and transition design implemented in effective sustainability marketing practices, it is vital to consider context in which they are positioned. So that product design is perceived as a criterion of design sustainability in terms of the product's life cycle, social context and contemporary user. The participatory role of design serves not only to elevate sustainable goals, but to protect the

environment and to be supporting system, while serving the human. It is vital to develop further and to extend even more design and social practices that can help to adopt and collaborate in future grater sustainable transition and transformation.

A financial approach of the economy is shown in the paper of the author **Adina TRANDAFIR** called “*Sustainable Finance – A Way to Improve Social and Economic Sustainability. The Romanian Experience*”. Sustainable finance is a concept that refers not only to environmental problems, but also to social objectives such as those social goals included in the 2030 Agenda for Sustainable Development. Summarizing, it refers to societal impact. In literature, this term - societal impact – is used with the meaning of social, environmental, medical or cultural impact. The current challenges regarding the future development of the social finance market refer to the opacity of its conceptual bases. For this reason, this article aims, among other things, to clarify the basic concepts and instruments of social finance and their continuously developing market, analyzing the literature in the field. Thus, first of all, the author analyzes the structuration processes that take place in social finance and the institutional actors involved. Also, a conceptual delimitation of social investments and the way in which they are selected is necessary. Last but not least, reviewing the literature, this article addresses to the analysis of the financial instruments (FI) used on the social finance market and their impact, also addressing the issue of the usefulness of tailored finance of a social purpose organization. Regarding the experience on the social finance market in Romania, this article aims a static and dynamic analysis of the financial instruments used, as well as of the entities in the Romanian social economy, proposing solutions to improve public policies in terms of sustainable finance and social economy from this country.

The professor and specialist in reliability **Slavko POKORNI** wrote his paper talking about “*The Role of Reliability and Maintainability in the Circular Economy*”. The goal of this paper is to show that reliability and maintainability play important role in the circular economy. The goals of the circular economy are the creation and production of such products that have an extended lifespan not only through reliability, but also through maintenance, servicing and by recycling. To fulfil such goals, reliability and maintainability must be applied in proper way during the design of a product. The role of reliability, availability, maintainability and artificial intelligence in the circular economy is discussed in this paper.

The financial specialist **Dragoș Mihai UNGUREANU**, in his article entitled “Green Budgeting, ‘A Must’ for Environmental Goals”, is talking about the fact that budgets are a crucial instrument for climate action and the green transition.

Faced with the imminent environmental threats, governments are increasingly deploying or planning to deploy green budgeting to better align their policies with climate and environmental commitments. Green budgeting means using the tools of budgetary policymaking to help achieve climate and environmental goals. These tools are part of a country's annual and multiannual budgetary processes. Budgets can perform a crucial role in improving the consistency of public revenue and expenditure with these goals.

The author **Irina ATANASOVA** in her article called "*Digital Right Management: Safeguarding Copyright in the Cyber Era*", analysed the fact that copyright infringement is commonly perceived as a private economic transgression, typically addressed through private legal actions and remedies. The advent of digitalization, encompassing copyrighted works such as text, music, and video, has enhanced the unauthorized reproduction. The ubiquity of the Internet enables infringers to replicate thousands of copyrighted works at minimal cost. This article outlines the methodologies of digital rights management (DRM), clarifying its protective mechanisms and highlighting the adverse consequences associated with DRM implementation. As a technological framework, DRM is specifically engineered to prevent unauthorized copying of digital content. It assumes a pivotal role in safeguarding content exchanges within the digital landscape, thereby minimizing copyright infringement and plagiarism. The paper further explains potential future trends in copyright protection and the evolving landscape of DRM.

The authors **Laura IACOB, Iuliana PARVU and Claudiu CHIRU** thought of a paper called "*Digital Resilience is the New Normal of Higher Education: Student and Teacher Perceptions from Romania*". This paper aims to emphasize the fact that digital technologies in higher education are a necessity, both teachers and students must develop their ability to adapt and deal with informational technology challenges. Data collection was carried out through the administration of two online questionnaires, addressed both to students and teachers from the Faculty of Law and Economics, Spiru Haret University, in December 2021. The students shared their personal experience regarding distance learning in relation to the classical system (in classroom). Second questionnaire measures the frequency of teaching-learning methods, the ways of organizing the teaching materials existing in the eLearning platform, the media resources, evaluation methods used in teaching activities at distance and perceptions regarding some issues related with eLearning implementation. Based on the results, the authors highlighted that the online education process cannot be achieved through a simple translation of the

didactic activity from the classroom to the virtual environment. The preparation of didactic materials for eLearning system requires more time and digital skills and special protection of intellectual property rights. The sanitary crisis accelerated the digitization of education, so that students are already aware of the advantages of E-Learning, but some disadvantages of this system can only be combated through blended learning.

The authors, professors and couple formed from **Jovan IVKOVIĆ and Jelena LUŽIJA IVKOVIĆ** wrote an interesting paper about “*AI NLP-GPT Models: Challenges and Prospects in Business Decision Realms*”. This paper represents a natural progression in the ongoing investigation into the potentials and challenges associated with the application of AI NLP GPT models for decision support. Building upon the foundation laid by the prior study titled "Conceptual Analysis and Potential Applications of DL NN Transformer and GPT Artificial Intelligence Models for the Transformation and Enhancement of Enterprise Management, EIS/ESS, and Decision Support Integrated Information Systems," the current work serves as a valuable continuum, providing further insights and validation of previous research findings. The study not only reaffirms the robustness of AI models in structured environments but also ventures into exploring their limitations when confronted with unstructured and non-pretrained scenarios inherent in real-world business decision-making. Through an in-depth conceptual analysis, the paper sheds light on the intricacies and potential shortcomings of deploying AI models in such dynamic and complex decision-making contexts. This iterative approach contributes to a more nuanced understanding of the capabilities and constraints of contemporary AI systems, providing valuable guidance for their practical implementation in diverse business scenarios. In essence, this work extends beyond a mere sequel, serving as a critical checkpoint in the continuous evolution of research in this domain. It accentuates the adaptability and real-world relevance of AI models while critically examining their applicability in less controlled decision-making environments.

The authors **Vasile MINEA, Cornel STAN, Gheorghe – Dragoș FLORESCU, Costin LIANU and Cosmin LIANU** wrote a dynamic paper entitled “*Automated (Semantics Driven) Data Retrieval from Fiscal Documents: A Comprehensive Approach*”. The importance of paper documents in regular business flow cannot be underestimated. They are an important part of the business domain increasingly digital landscape, complementing digital solutions by providing a plus of transparency, reliability and security. Making prompt decisions in the business world requires fast access to relevant and up-to-date data, and

working with paper-based documents is very inefficient. Digitization of documents is ubiquitous, and digital document management systems (DMS) play an important role in fields like science, business or health. In the business domain, Enterprise Resource Planning (ERP) systems represent an entire ecosystem of solutions, meant to address every aspect of the business process, in a unified approach. An important aspect of successful ERP implementations is related to the integration of DMS into the ERP. Enabling automated retrieval of data from all kinds of fiscal paper documents into the ERP is the next logical step. In this paper, the authors provided a hands-on approach for the task of automated text retrieval from fiscal documents. The novelty of their work resides in the manner in which they addressed the semantics of the retrieved data, such that the system associates meaning to the retrieved text elements, at the same time easing the processing of future documents. The solution is presented in a generic form, with a thorough discussion of the technological aspects. It is further implemented in the ERP system. They present and discuss experimental results, finally drawing conclusions and providing several ideas to further develop their work.

In the same manner, authors **Lăcrămioara HURLOIU, Bianca RUSU and Iulian HURLOIU** wrote the paper named *“Management of the Organization of Personnel Documents and Accounting Operations Related to Personnel Settlements”*. Lately in Romania it has been noted that there is a concern for establishing ethical rules of the accounting profession to ensure professionalism, confidentiality and objectivity in performing the management work. The accounting theories underlying the management personnel settlements assists the public entity to meet its objectives through a systematic and methodical approach that evaluates and improves the effectiveness of the management system based on risk management, control and management processes.

An exciting paper is written by the author **Luminita IONESCU**, and it is called *“Carbon Accounting In The Circular Economy”*. Carbon accounting in the circular economy became a priority for the professional organisations because climate changes are an important issue on international level and carbon emissions are increasing across the globe. Research on carbon accounting is a new area, but public or private entities must quantify their greenhouse gas emissions in order to reduce operational costs, and to improve operational efficiency. Carbon accounting and professional organisations can provide leadership and explain what needs to change within organisations in order to achieve carbon emission reductions at the pace and scale that is required. IASB (International Accounting Standards Board) is actively seeking to embed carbon accounting into current accounting practice

and to develop standards for reporting on carbon emissions. Professional accountants will play a central role in helping managers to integrate climate and other environmental and social value into traditional reporting. The governments and professional organisations are working together in preparing for and delivering carbon reduction and net zero targets. The European Union has already set targets to reduce greenhouse gas emissions by 2050.

Professors **Luminița IONESCU** and **Maria ANDRONIE** wrote another actual paper named *Sustainability Accounting and Integrated Reporting in the Circular Economy*. Circular economy is a priority for the European Commission and European Parliament. Recently, the European Commission adopted the new circular economy action plan, in order to reduce pressure to natural resources and to provide the necessary conditions for the sustainable economy. Sustainability accounting has attracted the attention of professional accountants, private organizations, public institutions and governments all over the world, in order to implement new methods to the circular economy and to measure the circular economy disclosure. Sustainability accounting and integrating reporting in the circular economy are catalysts for circular business models, very useful to redefine values, measuring the impact and risks in waste management and recycling. Thus, the circular economy is a good opportunity to make European economy more competitive and innovative, associated with financing and accounting for circular business. Contributing to the global economy, sustainability accounting provides opportunities for investors to transform their businesses and increase business profitability.

Romanian professors and specialists in accounting and management, **Bianca-Florentina RUSU**, **Elena GURGU**, **Lăcrămioara-Rodica HURLOIU** and **Ion-Iulian HURLOIU** wrote another interesting paper named “*Economic Reflections on the Risk and Materiality Levels in Internal Audit*”. The risk assessment is an important phase in carrying out the internal audit mission, it is necessary to involve experienced internal auditors, who know well the audited entity and the methodology around risk assessment. In an ever-evolving economic landscape, the role of internal audit is also paramount in ensuring organizational resilience and sustainability. This article, titled "Economic Reflections on the Risk and Materiality Levels in Internal Audit," explores the intricate relationship between economic dynamics and critical components of internal audit practices. Delving into the core concepts of risk and materiality, the article examines how economic conditions shape the risk profile of organizations and influence the assessment of materiality thresholds. Furthermore, it addresses the impact of technological advancements on internal audit methodologies, emphasizing the need for alignment

with broader business objectives. By providing a comprehensive overview of the economic dimensions within internal audit, this article serves as a valuable guide for professionals navigating the complex terrain of risk management and materiality assessment in contemporary business environments.

The article entitled *“Opportunities for Improving Financial Control in Combating and Limiting Tax Evasion in the Context of Romania's Membership in the EU”* written by **Lăcrămioara HURLOIU, Bianca RUSU and Iulian HURLOIU** is talking about the integration of Romania into the European Union who has transformed the domestic fight against tax fraud into a matter of community interest. Following integration, tax fraud no longer affects only the national public budget but also the communal one. European interest in preventing and combating fraudulent practices and tax evasion stems not only from budgetary losses but also from the distortions they can cause in the circulation of capital and competitive conditions, thus affecting the functioning of the common market. Close collaboration between financial administrations within the community, in accordance with common principles and norms, is essential for the efficient prevention and combating of tax fraud and evasion, given that national measures alone are insufficient. The importance of effective money management, rigorous control of tax evasion, and respect for employees' rights are emphasized to achieve a balance between social classes and sustainable economic development. In this context, continuous measures are necessary to optimize the Romanian tax system in line with European Union requirements.

In the introduction of the paper named *“New Product Development (Npd) in Globalized Market”* by authors **Dragan ILIĆ, Dragoljub JOVIĆIĆ and Radivoj PRODANOVIĆ** has been clarified the meaning and content of the term new product development, then analyzed the relationship between globalization and product development, and how one influences the other. Furthermore, was analyzed the importance of the steps of the product development process, without which a company cannot develop new products successfully and efficiently. Example of Nestlé corporation was described in details. Important key concepts and the process of product development were explained and finally was described the way Nestlé develops its products.

Globalisation is a broad concept that has continuously impacted various aspects of human endeavours, as it it emphasized in the article called *“Globalisation and Current Employment Situation in South Africa: An Exploratory Enquiry”*, written by the authors **Zanele L. MPABANGA, Wilfred I. UKPERE and Xavier KNIGHT**. Globalisation has influenced the realignment of business strategies as

well as impacted the availability of jobs in many countries. In modern organisations, managers must understand how current globalisation impacts employment situations. Since the dawn of contemporary globalisation in the early 1990s, several path breaking advances have emerged. These advances have also impacted the ways works are coordinated in the workplace. For instance, recently the use of independent contractors has increased as opposed to permanent appointed employees. As a matter of fact, globalisation has impacted employment situations in several ways. Hence, the current paper is an attempt to explore how globalisation has impacted employment situations in South Africa. The main finding of the paper revealed that there is a rising trend in job insecurity in most organisations owing to advanced sophisticated technologies and the utilisation of more atypical employment pattern in the form of casualisation.

In the paper entitled “*Strategic Total Rewards Accross Generations During Pandemic*”, the authors **Calvin MABASO, Nicolene BARKHUIZEN and Thylanu ANKIAH** are talking about the reward system who is crucial in pulling and preserving highly endowed employees, leading to high-quality performance. Many organisations still value systems where base pay and benefits are the significant components. The research study explored the influence of the Fourth Industrial Revolution (4IR) on total rewards within the pharmaceutical industry, specifically focusing on Middle and Senior Managers as the sample. A dearth of empirical research on the total rewards factors associated with the 4IR and employees’ perceptions of rewards in the pharmaceutical industry have been identified. A qualitative research approach was utilised for the current study using phenomenology to explore the lived experiences of employees in the pharmaceutical industry about total rewards in the Fourth Industrial Revolution. The findings indicated that 4IR and Covid-19 influenced pharmaceutical industry employees’ total rewards preferences. The findings also indicated that total rewards preferences depend on an employee’s age, gender and life roles. An interesting finding was that regardless of age and gender, all employees valued the total reward of well-being above all others, but this reward was the most difficult to attain from their employer. The research findings will assist organisations and managers in determining total reward strategies that are fit for purpose to enable them to attract, retain, and motivate talent in a global 4IR marketplace. The study will inform HR managers in the pharmaceutical industry regarding the total rewards preferences of employees, which could then be used to enhance attraction and retention strategies.

The authors **Mario MANDLAZI** and **Sheilla NYASHA**, in their paper entitled *“An Assessment of the Covid-19 Pandemic in South Africa: From its Impact on the Economy to the Rebuilding Strategy”* are talking about the conventional understanding and the fact that the coronavirus pandemic (Covid-19) has challenged the development of the economies at all levels – global, regional and domestic. The need to assess its damage to the South African economy became imperative if the economy has to be resuscitated in an informed and targeted way. The study therefore aimed at assessing the impact of the Covid-19 Pandemic in South Africa, assessing the effectiveness of the South African government response to Covid-19 and outlining government strategies that have been employed in an effort to rebuild the South African economy. The study utilised the qualitative research approach in which semi-structured interviews were used to collect information on a purposive sample of 12 participants. Through the use of thematic analysis as the data analysis method, the study discovered that the Covid-19 pandemic has both long-term and short-term impacts on the South African economy such as loss of employment, contracting GDP, depressed growth below pre-pandemic projections and lack of organisational performance. In response to Covid-19, the government introduced supporting programmes to businesses, regulations aimed at allowing credit facilities and partnership with various stakeholders. Strategies such as expansionary monetary strategies and the introduction of specific programmes targeting the resuscitation of key economic sectors have been implemented to rebuild the economy. The study, therefore, recommends that the government needs to build a buffer of resources in preparation of devastating pandemics such as Covid-19, such that when the country is hit by the pandemic, there are avenues that can be explored to resuscitate the economy. There is also need to ensure that there is a platform where business organisations can flourish as they can access capital and resources.

In the article named *“The Impact Of Covid-19 Pandemic On The Value Relevance Of Accounting Information”*, the authors **Ani STOYKOVA**, **Lăcrămioara HURLOIU**, **Cristian UȚĂ** and **Raluca ZORZOLIU** are talking about the value relevance who is defined as a statistically significant relationship between the accounting information presented in financial statements and the corresponding stock prices in the capital market. The objective of this study is to examine the effects of the COVID-19 pandemic on the value relevance of accounting information within the Bulgarian capital market. The authors analyze the impact of the COVID-19 pandemic on the value relevance of accounting information using panel unit root tests, descriptive statistics, and panel regression

models. The results obtained indicate that the COVID-19 pandemic has had a positive impact on the value relevance of accounting information in the Bulgarian capital market. The authors proved that the book value per share and the sales revenue per share gain value relevance, and these accounting variables influence stock prices after the spread of COVID-19. The financial accounting indicator, dividend per share (DPS), demonstrates increased value relevance in the period after COVID-19 compared to the period before COVID-19. As a result, the period after COVID-19 is characterized by higher levels of value relevance compared to the period before COVID-19.

The article of the authors **Rut SHIMOOSHILI, Palmela MUTENDA** and **Wilfred Isioma UKPERE**, entitled *“Preliminary Survey of Strategies for Attracting and Retaining Qualified Faculty Members at an Institution of Higher Learning in Namibia”* aims to explore the strategic human resources management (HRM) challenge of attracting and retaining qualified faculty members at an institution of higher learning in Namibia. A mixed-methods research approach was employed, involving interviews with faculty members as well as senior HR officials at the institution, as well as the distribution of questionnaires to gather data on perceptions and experiences related to faculty recruitment and retention from purposively selected top faculty members. Through extensive research and analysis, the study revealed key factors influencing faculty attraction and retention, including competitive compensation, career development opportunities, a supportive work environment, and recognition of faculty contributions. Participants emphasized the importance of effective recruitment strategies, professional growth opportunities, and work-life balance in retaining qualified faculty members. It is recommended that the institution should focus on implementing targeted recruitment efforts, enhancing compensation and benefits packages, providing professional development opportunities, fostering a supportive work culture, and recognizing faculty achievements to attract and retain qualified faculty members effectively.

In the paper entitled *“Effect of Various Inputs When Budget of an Organization Increases: A Profit Maximization Study”*, the authors **Devajit MOHAJAN** and **Haradhan Kumar MOHAJAN** are talking about the profit maximization who is an essential part of an organization. To achieve maximum profit an organization has to operate its inputs efficiently and scientifically. So that sensitivity analysis will be beneficial for it to take wise decision for the future production and to work in a sustainable way. This article tries to discuss sensitivity analysis of inputs of an organization during profit maximization inquiries. In this study “method of

Lagrange multiplier” is used to analyze Cobb-Douglas production function with detail mathematical calculations.

The authors **Francis Ezieshi MONYEI, Wilfred Isioma UKPERE, and Obiageli Chinwe NNABUGWU**, in their paper entitled *”Organisational Intervention and Its Growing Quest in the 4IR Era”* are talking about the fact that organizations rarely function in a stable environment since they must deal with a variety of complexity, novelty, and volatility. To stay afloat, one must possess exceptional dynamism and adaptability to react correctly to these uncertainties. This leads to the adoption of certain policies and plans that facilitate the organization's intervention. Drawing on the theoretical foundations of the Person-Environment Fit Theory, the study explores how the quest for organizational intervention is being interpreted in the context of the fourth industrial revolution in a modern business setting, emphasizing its components, catalysts, categories, and flexibility. Through conceptual a analysis, the findings demonstrated that the 4IR has led to an exponential increase in the need for organizational intervention. It therefore concludes that a shift in the mode of operation is necessary for survival in the modern era, and it suggests that business executives make sure that firm activities and the intervention strategies they intend to implement align to maximize resources before putting any intervention strategies into place.

In their paper entitled *”Green Supply Chain Management: The Role of Sustainable Packaging on Corporate Image and Patronage Intentions”*, the authors **Paul MUKUCHA, Samuel SIXPENCE, Leonard MUZANENHAMO, Never MUSKWE and Wilfred Isioma UKPERE** are talking about the fact that the exponential increase in the amount of single use packaging in Harare is attributed to the careless waste disposal behaviors by restaurant customers. This has the potential of damaging the brand image of most fast-food restaurants, and as a result some fast-food restaurants took formidable steps to practicing green packaging. It therefore follows that there is a need to determine whether the green packaging practices adopted by some fast-food restaurants had led to an improvement in their brand image and subsequently higher levels of patronage intentions. A multiple regression analysis was run to determine whether the green practices of reduce, reuse, and recycle have an impact on brand image. Furthermore, whether brand image emanating from green packaging has a deterministic impact on patronage intention. The results indicated that there were a statistically significant improvement in brand image as a result of adopting reduce, reuse, and recycle strategies, and indirectly there was also an improvement in patronage intentions. The study therefore recommended to restaurant businesses

that are still hesitant to adopt green packaging strategies, to do so since the practice is associated with considerable benefits.

In the paper entitled “*Downsizing and Affective Commitment in the Freight Services Management Industry: A Mixed Method Analysis*”, the authors **Tinashe R. MUSHONGA and Wilfred I. UKPERE** are talking about the fact that downsizing, which is a deliberate and systematic reduction of the workforce, has become a common practice in organizations across industries. Despite its widespread use, the impact of downsizing on employee affective commitment, or emotional attachment to the organization, remains equivocal. This study explores the impact of downsizing on affective commitment in the freight services management industry using a mixed-methods approach. The quantitative phase of the study involved a survey of 250 employees from freight services management organizations in Zimbabwe. The survey measured downsizing and affective commitment. The qualitative phase involved in-depth interviews with 15 employees who had experienced downsizing in freight services management organizations. The quantitative findings revealed that downsizing had a significant negative impact on affective commitment. The qualitative findings provided insights into the mechanisms through which downsizing affects affective commitment. Employees reported feeling insecure, anxious, and betrayed following downsizing. They also expressed concerns about their workload, job security, and career prospects. These negative emotions led to a decline in affective commitment. The study's findings have several implications for organizations considering downsizing. First, organizations should be aware of the potential negative impact of downsizing on employee affective commitment. Second, organizations should take steps to mitigate the negative impact of downsizing on employees, such as providing support and counselling and communicating openly with employees about the downsizing process. Third, organizations should consider alternative strategies to cost-cutting, such as process improvement and efficiency gains.

The authors **Godwin Emmanuel OYEDOKUN and Babatunde ORENUGA** in their article entitled “*Effect of Financial Stability on Nigerian Economic Growth: An Empirical Investigation*”, are talking about the fact that economic growth is one of the most extensively alluded economic indicators. This study focused on the effect of financial stability on economic growth of Nigeria. An ex-post facto research design was adopted for the study. The study adopted secondary data. Annual reports data gathered on Return on assets and non-performing loans of eight (8) banks with international authorization to represent all deposit money banks in Nigeria covering the period of 2002 to 2021. Purposive sampling was

employed to choose data from Nigeria. Annual data covering the entire study period was collected and analyzed using the E-Views 9 statistical package. Findings revealed that Return on asset (ROA) has a negative relationship with Nigerian economic growth and the effect is statistically significant ($\beta = -0.051184$; P-Value = 0.0390). Non-performing loan (NPL) has a negative correlation with Nigerian economic growth and the effect is statistically insignificant ($\beta = -0.016001$; P-Value = 0.4983). The study concluded that financial stability when managed appropriately hold potential to enhancing Nigerian economic growth. Based on the findings, the study recommended that government should establish a steady exchange rate regime capable of encouraging capital inflows into the country and boost Nigeria's financial stability. In addition, the current efforts designed at checkmating loan defaults in the banking system through the application of the global standing instruction (GSI) regulations should be improved upon, sustained, and extended to non-individual customers of financial institutions. Furthermore, the cash reserve requirements (CRR) should be reduced to give room for more resources for lending to investors where banks could also make more profits. The current high lending rates in the banking industry are unfavorable to support the real sector economy and, therefore, incapable of motivating economic growth, therefore, the CBN should reduce monetary policy rate (MPR).

The academic article entitled "*Stress Management for Sustainable Workplaces: Clinical Psychology Strategies in Leadership*", authored by **Luminita Viorica PISTOL, Elena GURGU, Iosif GURGU and Ioana-Andreea GURGU**, explores the intersection of clinical psychology strategies and leadership practices in fostering stress management for sustainable workplaces. In contemporary organizational settings, the escalating demands of the professional environment often led to heightened stress levels among employees, negatively impacting both individual well-being and overall workplace sustainability. Recognizing the imperative role of leadership in mitigating workplace stress, this article delves into the application of clinical psychology techniques by leaders to promote a healthier and more sustainable work environment. The article begins by reviewing the prevailing literature on workplace stress and its detrimental effects on employee performance and organizational success. Subsequently, it examines the theoretical foundations of clinical psychology interventions and their adaptability to leadership contexts. Key strategies such as cognitive-behavioral approaches, mindfulness practices, and resilience-building techniques are explored in detail, emphasizing their efficacy in addressing workplace stressors. Furthermore, the article underscores the importance of leadership awareness and skill development in

implementing these clinical psychology strategies. Leadership qualities such as emotional intelligence, effective communication, and empathetic understanding are identified as critical components in successfully integrating stress management interventions. Case studies and empirical evidence from diverse organizational settings are presented to illustrate the practical application and outcomes of these strategies. In conclusion, this article advocates for a holistic approach to stress management in sustainable workplaces, emphasizing the collaborative efforts of clinical psychology and leadership. By fostering a supportive and psychologically informed leadership culture, organizations can create resilient, engaged, and productive workforces, thereby contributing to long-term sustainability and success. The insights provided in this article serve as a valuable resource for academics, practitioners, and organizational leaders striving to enhance workplace well-being and performance.

The authors **Radostia YULEVA-CHUCHULAYNA, Milena FILIPOVA, Denitsa STEFANOVA-BOGDANSKA, Ana-Maria MIHALI and Raluca Ionela CREȚOIU**, in their article entitled *“The Role of Management for the Sustainability and Efficiency of Enterprises”*, are talking about the fact that in the last two decades, digitization and the sustainability of enterprises have become a major focus in the economy. They received the strongest impetus during the pandemic situation related to Covid-19 and the current military situation between Russia and Ukraine. Sustainable development has various economic, environmental and social aspects that are the basis of prosperity on a global scale, namely the development of enterprises and the social situation of consumers. Talking about sustainable entrepreneurship, it is important to start with the sustainable individual actions of managers. From the choice of vehicles and energy sources to simple, everyday habits such as separate collection of waste and recycling - all this is part of the main goal, namely - the sustainability and efficiency of the business. The main purpose of the paper is to clarify the main role of management for the sustainability and efficiency of enterprises. The research methods used in the development are content analysis, method of analysis and synthesis, systematic and intuitive approach. The following main findings were established in the development: the important role of the manager for the management of the organization towards sustainability and the main characteristics of the modern manager; as well as challenges faced by green businesses.

In their paper entitled *“Development and Sustainability of Specialized Accounting Software Products”*, the authors **Miglena TRENCEVA, Milena FILIPOVA, Denitsa STEFANOVA-BOGDANSKA, Rayna DIMITROVA,**

Mihaela BEBEȘELEA are talking about the fact that the rapid advancement of technology has permeated various sectors of the economy to develop, and the field of accounting is no exception. This study delves into the development and sustainability of specialized accounting software products, providing a comprehensive overview of their evolution, current state, and future prospects. The research emphasizes the critical role of such software in enhancing accuracy, efficiency, and transparency in financial reporting and decision-making processes. The initial part of the study traces the historical development of accounting software, highlighting the transition from manual bookkeeping to automated solutions. It examines the driving forces behind this transformation, including the need for real-time financial data, compliance with complex regulatory requirements, and the pursuit of operational efficiency. The research also explores the integration of emerging technologies such as cloud computing, artificial intelligence, and block chain in accounting software, assessing their impact on functionality, security, and user experience. The sustainability of specialized accounting software products is scrutinized, considering both their economic viability and environmental impact. The study evaluates the business models adopted by software providers, exploring how they balance innovation, customer satisfaction, and profitability. The research also addresses the environmental considerations of software development and deployment, emphasizing the importance of green computing practices in the accounting software industry.

Authors **Dilyana YANEVA**, **Aleksander POPKOCHEV**, **Iuliana Petronela GÂRDAN**, **Mihai ANDRONIE** and **Daniel Adrian GÂRDAN**, in their paper entitled “*The Road to Digital Excellence: Addressing Challenges and Exploring Opportunities in Business*” are telling us that in contemporary circumstances, economic and societal realms encounter a multitude of issues and hurdles. The pivotal instrument for fostering enduring progress in business lies in digital transformation. The exploration of innovative business models, managerial methodologies, and reorganizational strategies amid the age of digitization presents a spectrum of prospects to enhance innovation capabilities, digital competitiveness, and corporate social responsibility. Within this framework, a study delving into the challenges of digital transformation and the potential it affords becomes imperative for strategic management decisions, fostering rapid adaptation to the emergent digital business paradigm. Present paper explores this topic from the perspective of challenges and in the same time opportunities that are encountered related with the digital transformations of business activities. Conclusions are establishing the

complex relationship between the process of digitization and challenges specific for overcoming problems inherent for technology acceptance by certain social groups.

This article of the author **Viktoriya KALAYDZHIEVA**, entitled “*Fostering Sustainable Development: The Crucial Impact of Digital Technologies*” delves into fundamental characteristics of emerging digital technologies and explores their potential applications in both the economic and social realms. A comprehensive understanding of these technologies is deemed essential for making informed decisions concerning effective digitization processes aligned with the strategic goals of a company. The article delineates opportunities for transforming business processes and models through digitalization within the context of sustainable development, circular (green) economy, and additive manufacturing. In addition to cognitive competencies in economics, contemporary management necessitates proficient skills for the successful application of cloud technologies, artificial intelligence (AI), and software designed for large database analysis (big data computing) in the execution of innovative projects. The primary objective of this article is to scrutinize the role of digital technologies and their interplay with sustainable development. Employing content analysis, comparative analysis, and synthesis as research methods, the article derives key findings and conclusions regarding the intricate relationship between digitalization and sustainable development.

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Associate Professor Elena GURGU, Ph.D. in Economics
ASHUES Deputy Chief Editor



ACADEMIA PAPERS

IMPACT OF TRADE UNIONS' PRESENCE ON THE ENHANCEMENT OF SAFETY PERFORMANCE OF WORKERS IN THE MARITIME INDUSTRY IN LAGOS STATE

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Abstract

Trade unions plays a pivotal role in championing the rights and well-being of workers, including the enhancement of job safety performance. The study investigated the impact of trade unions' presence in the enhancement of job safety performance of workers in the Maritime industry in Lagos state. Proportionate random sampling technique was employed to select two hundred (200) workers. The data collection instrument consisted of a researcher-designed questionnaire. The data analysis involved pie charts and multiple regression analysis. The findings reveal that trade unions' presence significantly enhance workers' adherence to safety regulations and standards to perform their job safely ($R=.783$, $P<0.05$); trade unions' presence significantly enhance safety knowledge and skills of workers to perform their job safely ($R=.590$, $P<0.05$); trade unions' presence significantly improve the

provision of proper safety equipment to enhance workers' job safely ($R=.671$, $P<0.05$); trade unions' presence significantly enhance workers with hazard identification and control to perform their job safely ($R=.592$, $P<0.05$); trade unions' presence significantly enhance support to workers who experience injuries or accidents to perform their job safely ($R=.671$, $P<0.05$) in the Maritime industry in Lagos state. Considering the findings, it was therefore suggested that trade unions should continue to actively engage with workers and employers to promote adherence to safety regulations and standards; prioritize the provision of safety knowledge and skills to workers through ongoing training programs; actively support employers in ensuring the provision of appropriate safety equipment to workers; work closely with employers to strengthen hazard identification and control processes in the workplace; focus on establishing support systems for workers who experience injuries or accidents.

Keywords: Job safety, Safety Performance, Social exchange, Trade union

JEL Classification: J5; J51; L8

1. Introduction

Job safety is a critical aspect of ensuring the well-being and productivity of workers in any organization. Employers bear the responsibility of creating a safe and healthy work environment for their employees (Kalatpour and Khavaji, 2016). Job safety performance is a crucial aspect of the overall well-being and satisfaction of workers. When employees feel secure and safe in their workspace, their productivity is likely to increase, engaged, and motivated. On the other hand, a lack of proper safety measures can lead to increased accidents, injuries, and illnesses, resulting in physical and emotional distress for workers. However, the implementation and maintenance of proper safety measures can be challenging without the active involvement of trade unions (Karunaratne and Ajith, 2020). In the maritime space in Lagos today, the following are the different trade unions: Dockworkers' Union of Nigeria, Senior Staff Association of Statutory Corporations and Government Owned Companies (SSASCGOC), Nigeria Union of Seamen and Water Transport Workers, Union of Shipping, Clearing and Forwarding Agencies and Maritime Workers Union of Nigeria (MWUN). Each of which plays pivotal role in representing the needs of their members. Trade unions play a crucial role in advocating for the rights and welfare of workers, including the enhancement of job safety performance (Saeed, Mussawar, Lodhi, Iqbal, Nayab and Yaseen, 2013). In

this article, we will explore the significant contributions of trade unions in promoting job safety and how their involvement can lead to a safer working environment for employees.

However, before delving into the role of trade unionism, it is essential to understand the existing challenges faced by workers regarding job safety. Many industries and sectors often prioritize productivity and profit margins over employee well-being, leading to compromised safety protocols and hazardous working conditions. This disregard for safety can result in accidents, injuries, and even fatalities, significantly impacting workers' lives and families (Agwu, 2012). Moreover, workers may face various barriers when attempting to address job safety concerns individually. Fear of reprisal, lack of knowledge about their rights, or limited access to resources can hinder their ability to voice their concerns effectively. This is where trade unions step in as powerful advocates for workers' rights, providing a collective voice to address these issues (Katsuro, Gadzirayi, Taruwona and Mupararano, 2020). Trade unions possess the expertise, experience, and resources necessary to engage with employers and collaborate on improving job safety measures. They act as mediators between management and workers, negotiating for safer working conditions, enforcing compliance with safety regulations, and ensuring that employees receive the necessary training and tools for safe job performance (Karunarathne and Ajith, 2020).

Furthermore, trade unions actively engage in the advancement and execution of safety policies and procedures. Through engaging with management, they can influence the decision-making process, ensuring that worker safety remains a top priority. Through ongoing discussions and consultations, trade unions can help identify potential hazards, recommend effective control measures, and foster a culture of safety within the organization. They play a pivotal role in educating and empowering workers about their rights and safety regulations. They provide training programs, workshops, and information sessions to help employees understand potential risks in their workplace and the measures in place to mitigate them. This knowledge equips workers with the necessary skills to identify hazards, report unsafe conditions, and take appropriate actions to protect themselves and their colleagues (Florence and Amos, 2017).

Trade unions act as a support system for workers who are victims of accidents or injuries. They ensure that affected employees receive adequate compensation, medical assistance, and support during their recovery process. Trade unions can also advocate for improved rehabilitation programs and initiatives to help injured workers reintegrate into the workforce successfully (Florence and Amos, 2017).

Hence, trade unions play an integral role in enhancing job safety for workers. Their involvement in advocating for safer working conditions, negotiating with employers, and educating employees significantly contributes to creating a culture of safety within organizations. By providing a collective voice for workers, trade unions help to address the challenges and barriers that individuals face in ensuring their own safety. It is imperative that employers recognize, and value the important role trade unions play in safeguarding the interest of workers. Collaboration between trade unions, employers, and regulatory bodies is essential to ensure that job safety remains a priority and that workers can perform their duties in a secure and healthy environment (Gyekye, Salminen and Ojajarvi, 2012).

According to Campbell and Wiernik (2015), trade unions play a significant role in enhancing job safety performance by advocating for the implementation and enforcement of safety regulations and standards. They collaborate closely with employers to establish appropriate safety measures, such as safety regulations and standards, safety knowledge and skills, proper safety equipment, hazard identification and control, and provide support to workers who experience injuries or accidents. Trade unions have a critical role in advocating for the enforcement of safety regulations and standards in the workplace. They work with employers to ensure compliance with local and national safety guidelines, which directly impact job safety performance. They advocate for proper training and education programs to equip workers with the requisite skills and knowledge to perform their jobs safely.

According to Greepherson (2013), trade unions work with employers to ensure that employees receive adequate safety training and understand potential hazards in the workplace. They emphasize the importance of providing workers with proper safety equipment to minimize the risks associated with their job tasks. They negotiate with employers to ensure the availability and proper use of proper safety equipment to enhance job safety performance. They actively participate in identifying potential hazards in the workplace and recommending effective control measures. Kalatpour and Khavaji (2016) further noted that trade unions collaborate with employers to conduct risk assessments, implement safety protocols, and make necessary changes to minimize risks and enhance job safety performance. Trade unions provide support and representation to workers who experience workplace accidents or injuries. They assist workers in accessing appropriate medical care, ensuring fair compensation, and supporting their rehabilitation process, ultimately contributing to job safety performance.

Trade unions also have a crucial role in fostering a culture of safety among workers. Through their communication channels and outreach programs, they raise awareness about safety practices and encourage participation of workers in maintaining a safe workspace. By involving workers in safety committees and providing platforms for feedback and reporting, trade unions empower employees to contribute to the improvement of job safety performance. In addition to their advocacy efforts, trade unions offer support and representation to workers who experience workplace accidents or injuries. They ensure that affected employees receive the necessary medical attention and support, including compensation for any losses or damages suffered (Kaynak, Toklu, Elci and Toklu, 2016). Trade unions also assist workers in navigating the workers' compensation process, ensuring that their rights are protected and that they receive fair treatment and rehabilitation services (Milijic, Mihajlovic, Strbac and Zivkovic, 2013).

Furthermore, trade unions play a critical role in addressing emerging safety issues and staying up to date with advancements in safety practices. They actively participate in research and development activities related to job safety, collaborate with experts and organizations, and advocate for the incorporation of modern days safer technologies and practices to enhance job safety performance. This proactive approach helps to anticipate and mitigate potential risks, ensuring that workers are protected from evolving hazards in their workplaces (Samarasinghe and Karunaratne, 2015). Hence, trade unions are instrumental in enhancing job safety performance of workers. Through their advocacy, collaboration, and support, they contribute to the development and maintenance of safe working environments. Through promoting compliance with safety regulations, fostering a culture of safety, and providing representation for workers. Trade unions play a vital role in safeguarding the well-being and job safety accomplishment of employees. Employers and regulatory bodies must recognize and value the contributions of trade unions and work together to prioritize job safety for the benefit of all workers. Given the background outlined above, this study aims to examine the impact of trade unions on the enhancement of job safety performance of workers in the Maritime industry in Lagos State.

1.2 Problem Statement

Despite the importance of job safety for the well-being and productivity of workers, many organizations struggle to prioritize and maintain adequate safety measures in the workplace. This poses a significant challenge for workers, as they face increased risks of accidents, injuries, and occupational illnesses. While employers bear the primary responsibility for ensuring job safety, the involvement

of trade unions is crucial in enhancing job safety performance. However, there are several issues that hinder the effective collaboration between trade unions and employers in improving job safety. The lack of prioritization and maintenance of safety measures in the workplace poses challenges for workers, leading to increased risks of accidents and injuries. While employers hold the primary responsibility for job safety, trade unions play a crucial role in enhancing job safety performance. However, there are barriers to effective collaboration between trade unions and employers. Workers often lack awareness of safety regulations, hindering their ability to identify hazards and take preventive actions. Insufficient resources, including budgets, training programs, and personal protective equipment, further compromise job safety performance. Fear of reprisal and job insecurity discourages workers from engaging in safety discussions. Inadequate communication channels and collaboration hinder timely hazard identification and control (Dwomoh, Owusu & Addo, 2013). In fact, there can be a disconnection between safety policies and their implementation, leading to inconsistent enforcement. Addressing the issues raised requires bridging the knowledge gap, providing resources, creating a supportive environment, improving communication, and ensuring consistent enforcement. Trade unions have a vital role to play in creating a safer working environment through effective collaboration with employers.

1.3 Research questions

From the problem statement the following research questions are raised to guide the study.

1. Will trade unions' presence significantly enhance workers awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State?
2. Will trade unions' presence significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos State?
3. Will trade unions' presence significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos State?
4. Will trade unions' presence significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos State?

5. Will trade unions' presence significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State?

1.4 Research objectives

The objectives of the study are:

1. To establish whether trade unions' presence significantly enhance workers' awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State.
2. To investigate whether trade unions' presence significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos State.
3. To establish whether trade unions' presence significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos State.
4. To investigate whether trade unions' presence significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos State.
5. To investigate whether trade unions' presence significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State.

1.5 Hypotheses

Based on problem statement, research questions and objectives the following hypotheses have been formulated:

H1₀: Trade unions' presence will not significantly enhance workers' awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State.

H2₀: Trade unions' presence will not significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos State.

H3₀: Trade unions' presence will not significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos State.

H4₀: Trade unions' presence will not significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos State.

H5₀: Trade unions' presence will not significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State.

2. Literature Review

This study is subjected to two (2) theories, namely social exchange theory propounded by George Homans (1961) and agency theory propounded by Michael C. Jensen (1976)

2.1 Social exchange theory

George Homans, an American sociologist, is renowned as a key proponent of social exchange theory, which served as a foundational framework for comprehending social interactions and relationships based on exchanges of resources, rewards, and costs (Homans, 1961). Herein is an overview of the social exchange theory, its assumptions, and its relevance to the present study. Social exchange theory posits that social interactions are based on a rational calculation of rewards and costs. Individuals engage in relationships and exchanges to maximize their benefits and minimize their costs. According to Homans (Homans, 1961), individuals engage in behavior that yields rewards and avoid behavior that results in costs. The theory suggests that individuals form relationships and maintain them based on the expectation of receiving desirable outcomes from these interactions.

Social exchange theory presupposes that individuals act as rational decision-makers, meticulously evaluating the benefits and drawbacks associated with their actions. They weigh the potential benefits against the anticipated risks or costs before engaging in any social exchange (Mitchell, et al., 2012). The theory assumes that individuals' behavior is influenced by their relationships with others. People engage in exchanges to meet their needs and depend on others for resources, information, and support. Social exchange is based on the principle of reciprocity, meaning individuals expect that their actions will be reciprocated by others (Mullins, 2013). If one party provides rewards or benefits, the other party is expected to reciprocate in kind gesture. Individuals have a comparison level, which represents their expectations of what they deserve or what they believe is fair in a particular exchange. They evaluate the outcomes of their interactions based on this standard (Robbins & Judge, 2022).

Social exchange theory is relevant to the study, as the theory helps in understanding the motivations of workers to join trade unions. Workers expect to receive certain benefits and protections from trade unions, including improved job safety. By examining the exchange relationship between trade unions and workers,

the theory can shed light on the factors that drive workers' involvement in advocating for better job safety measures. The theory highlights the reciprocal nature of social exchanges. Trade unions negotiate with employers to improve job safety conditions, and in return, workers contribute to the union's objectives and participate in collective actions (Venter & Levy, 2014; Bendix, 2019). The theory emphasizes the interdependence between trade unions and workers, where both parties benefit from a safer working environment. The theory's concept of a comparison level is relevant to understanding workers' expectations regarding job safety. Workers compare their current job safety conditions with their perceived fair or desired level of safety.

Moreover, trade unions play a vital role in advocating for higher standards of safety, helping workers achieve a comparison level that aligns with their expectations. Social exchange theory posits that individuals engage in judicious decision-making when assessing the rewards and costs of their actions (Mullins, 2013). The theory can help in analyzing the decision-making processes of trade unions and workers concerning job safety. It allows for an examination of the choices made by trade unions to prioritize job safety and the considerations of workers in actively participating in safety-related activities (Leap and Crino, 2014). Hence, social exchange theory provides a framework to understand the motivations, expectations, and reciprocal relationship between trade unions and workers in enhancing job safety performance. By considering the principles of social exchange, the theory helps illuminate the dynamics at play in the relationship between trade unions and job safety, contributing to a deeper understanding of their impact on worker well-being and safety.

2.2 Agency theory

Michael C. Jensen, an economist, is one of the key proponents of the agency theory. His work, along with William H. Meckling, focuses on the relationship between principals (employers) and agents (employees or trade unions) and the challenges that arise due to divergent interests (Jensen, & Meckling, 1976). The agency theory examines the relationship between principals who delegate tasks, and agents who carry out the delegated tasks in organizations. It recognizes that there may be divergent interests and goals between principals and agents, leading to agency problems. According to Jensen (2000), agency relationships are characterized by information asymmetry, risk, and conflicts of interest. The theory focuses on aligning the interests of principals and agents and minimizing the costs associated with these divergent interests.

Agency theory assumes that there is a difference in the information available to principals and agents. Principals may not have complete knowledge of agents' actions, efforts, or intentions, creating a potential for conflicts of interest (Pearce & Robinson, 2014). The theory assumes that individuals act in their self-interest and seek to maximize their own well-being. Agents may prioritize their own goals and objectives, which may not align with the interests of principals. Due to the information asymmetry and the potential for agents to act in their self-interest, principals must implement mechanisms for monitoring and controlling to ensure that agents act in line with the principals' interests (Noe et al, 2015). These mechanisms may include performance evaluations, incentives, contracts, and monitoring systems. Agency theory recognizes the concept of moral hazard, which refers to the risk that agents may engage in opportunistic behavior or shirk their responsibilities once delegated a task. Agents may take advantage of the information asymmetry and act in ways that are detrimental to the principals' interests (Pearce & Robinson, 2014).

The agency theory is relevant to the present study, as it helps to understand the relationship between employers (principals) and workers (agents) in terms of job safety. Employers delegate the responsibility of maintaining job safety to workers, who may have their own goals and interests. Trade unions act as agents representing the interests of workers and aim to align their interests with the principals' goal of ensuring job safety. Agency theory placed emphasis on the necessity of monitoring and control mechanisms to mitigate agency problems (Mullins, 2013; Noe et al, 2015). In the context of job safety, trade unions can be involved in a crucial part in monitoring and guaranteeing compliance with safety regulations and procedures (Olokede & Ukpere, 2023a). They act as a check on employers' actions and advocate for effective safety measures and enforcement (Venter & Levy, 2014). Agency theory provides insights into the challenges of aligning the interests of principals and agents. Trade unions, as representatives of workers, work towards aligning workers' interests in job safety with the overall objectives of employers. They negotiate for safer working conditions, promote the use of proper safety gears, and advocate for improved safety policies (Bendix, 2019). The theory focuses on moral hazard and is relevant to the study of job safety. Trade unions play a role in mitigating moral hazard by ensuring that workers adhere to safety protocols, report hazards, and engage in responsible behavior. They provide support, education, and advocacy to workers to minimize the risk of opportunistic behavior that could compromise job safety (Raamazan, Arzu and Ismail, 2016).

2.3. Empirical Review

In a study conducted by Olatunji, Aliyu, Afolayan, Atolagbe, and Ibrahim (2016), the researchers aimed to empirically examine the relationship between the presence of trade unions in a work organization and the achievement of improved working conditions for employees in Seven-Up Bottling Company, Ilorin. The research adopted a survey design and collected quantitative data through structured questionnaires. The findings indicated a significant relationship between the presence of trade unions in a work organization and the attainment of improved working conditions for employees in the selected company. The study concluded that the existence of trade unions plays a significant role in fostering improved working conditions within a work organization.

Fanso and Ugur (2021) investigated the impact of trade unionism on performance of employee in Cameroon, with a focus on the teachers and drivers' trade unions. The researchers collected both quantitative and qualitative data using questionnaires and structured interviews. The study's outcomes unequivocally illustrate that trade unions in Cameroon play an indispensable role in enhancing employee performance. The research revealed that teachers and drivers in Cameroon predominantly join trade unions to safeguard employees' rights. The principal strategies employed by trade unions encompass organizing, collective bargaining, alliance-building, and taking action. Furthermore, it was discerned that trade unions bear a fundamental responsibility in advocating for the rights and socioeconomic interests of their members. Therefore, it is hereby proposed that, trade unions should prioritize negotiation for collective bargaining rather than confrontations with employers. Additionally, employers should provide opportunities for upskilling and training to augment employee performance (Olokede & Ukpere, 2023b). In conclusion, the trade unions of teachers and drivers in Cameroon should prioritize protecting workers' rights and advancing their socioeconomic interests.

Nkirote and Kiiru (2018) investigated the effect of trade union activities on the performance of universities in the public sector in Kenya. Adopting a census approach, due to few numbers of respondents by using questionnaires as data collection instruments. Their data analysis encompassed both descriptive and inferential statistics. The findings of the study revealed that collective bargaining had an inverse and statistically significant impact on the performance of employees in universities in the public sector. On the other hand, the welfare of employee and code of regulation had a very strong statistically significant effect on performance. However, the code of discipline had an inverse and statistically insignificant effect

on performance. Based on these findings, the study proposes the implementation of a specific time frame after a collective bargaining agreement has been reached to reduce the frequency of negotiations, to mitigate its adverse effects on performance. Furthermore, public universities should prioritize activities that focus on employees' welfare, as this has been found to improve performance.

Osman (2014) examined the influence of union activities on employee performance. The research methodology employed was descriptive in nature. The results of this study align with previous research, affirming that union activities exert an influence on workers' performance in the workplace. This suggests that employers should establish adequate structures to mitigate the occurrence of industrial action. Implementing effective measures to address employee concerns, will reduce workers propensity to resort to strike actions.

Bakokor and Antwi (2020) conducted a study to assess the impact of trade union activities within Ghana's Food and Drugs Authority (FDA) on employee fulfilment. Data were collected from actively involved FDA employees who were members of the trade union. The FDA was deliberately chosen for the survey due to the presence of an active trade union within the organization. The researchers gathered information from selected respondents who were active members of the trade union. The result of the inquiry revealed that the majority of respondents concurred that affiliated unions should be supported in conducting collective bargaining on behalf of workers. They also advocated for the organization of workers under a unified trade union movement. Respondents emphasized the importance of affiliated unions collaborating to advocate for improved wages, reduced working hours, and enhanced working conditions. Moreover, most participants strongly endorsed the notion that the trade union plays an essential role in safeguarding its members from victimization. Effective communication facilitated by the trade union between management and employees was identified as having the most substantial impact on employee performance. Several challenges hindering the effective operation of the trade union were identified. These challenges included unfavorable government interference, lack of cooperation among union members, a high number of nominal union members, and low productivity. The inequitable involvement of employees in management decisions and insufficient efforts to increase membership were identified as the most pressing constraints faced by the trade union.

Karimi and Nyawira (2019) conducted a study to investigate the correlation between trade union campaigns and organizational performance in the health sector of Kiambu County. The findings revealed a lack of consensus among respondents

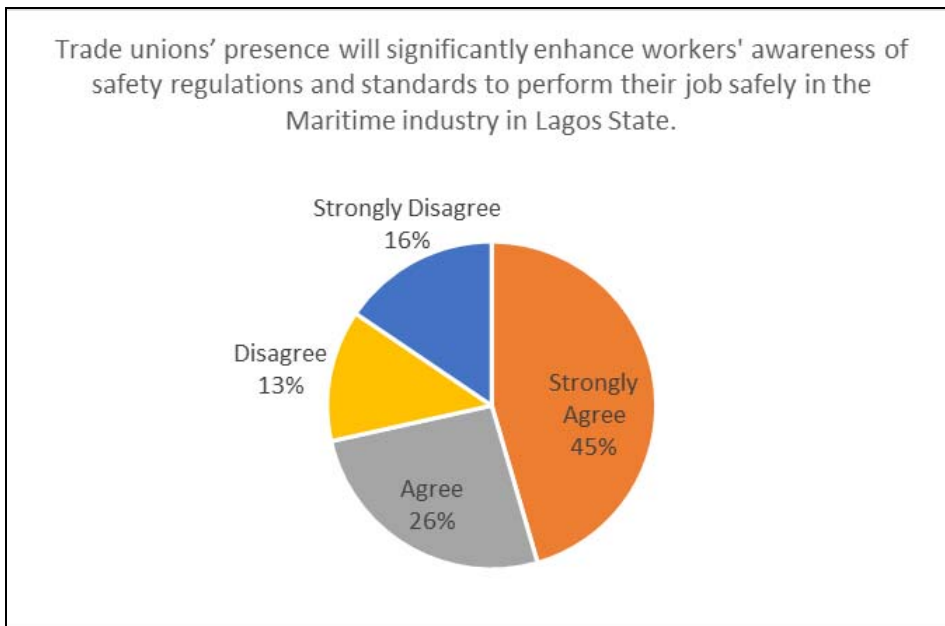
regarding the trade union's use of collective bargaining agreements to negotiate for improved pay and workplace protection. The study also identified subpar working conditions within the organization, with the trade union wielding significant influence over terms and conditions as well as the implementation of occupational health and safety programs, which subsequently affected organizational performance. The results indicated a positive and significant relationship between work stoppages and organizational performance, with strikes negatively impacting the quality of service provided. Furthermore, the study identified the organization's offering of inequitable remuneration and a lack of essential facilities and safety measures. The study also highlighted the absence of organization policies addressing strikes. Concerning dispute resolution, the research revealed that trade unions represented workers in disciplinary and grievance hearings, with conflict management having a positive impact on organizational performance. Mediation emerged as a means to resolve conflicts stemming from personal differences. Wage payment was found to influence labor disputes, and the organization must have conflict management strategies in place.

3. Methodology

The study adopted a descriptive survey research design and utilized a proportionate random sampling technique to select a total of 200 workers from five departments in the Maritime industry in Lagos State. This sampling method aligns with the recommendation by Agbonmiewalent (2007), which suggests appropriate sample sizes based on the population size. In this case, a sample size of 2% or more was used for populations in the few hundred range. A researcher-designed questionnaire was deployed as the data collection instrument, comprising two sections (A and B). Section A collected demographic information, while Section B contained questions pertinent to the study. The questionnaire's validity was assessed by the researcher's supervisor, and its reliability was determined using the test-retest method. The questionnaire was administered twice to 25 employees in 7up Bottling Company, Lagos State, who were not part of the study sample, with a five-day interval. The scores obtained from the instrument were analyzed using Pearson Product Moment Correlation (PPMC), resulting in a reliability coefficient of 0.76. The collected data was then analyzed using pie charts and multiple regression using the Statistical Package for Social Science (SPSS) version 20.

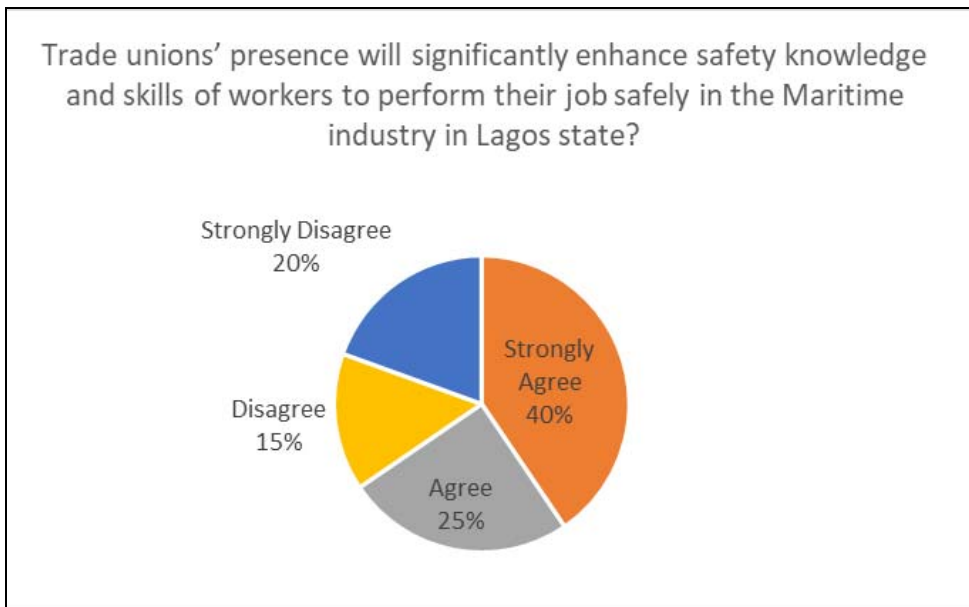
4. Results

Research Question 1: Will trade unions’ presence significantly enhance workers’ awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State?



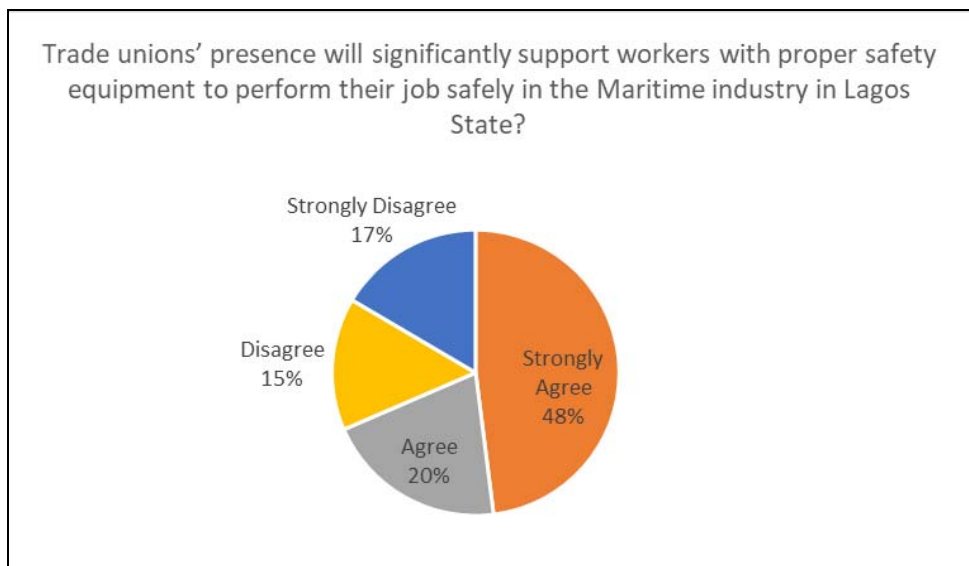
The chart revealed that trade unions’ presence will significantly enhance workers’ awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State. The chart revealed that 91(45.5%) of the respondents strongly agreed and 52(26.0%) agreed that trade unions’ presence significantly enhances workers’ awareness of safety regulations and standards to perform their job safely, while 26(13.0%) of the respondents disagreed and 31(15.50%) strongly disagreed that trade unions’ presence significantly enhance workers’ awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State.

Research Question 2: Will trade unions’ presence significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos State?



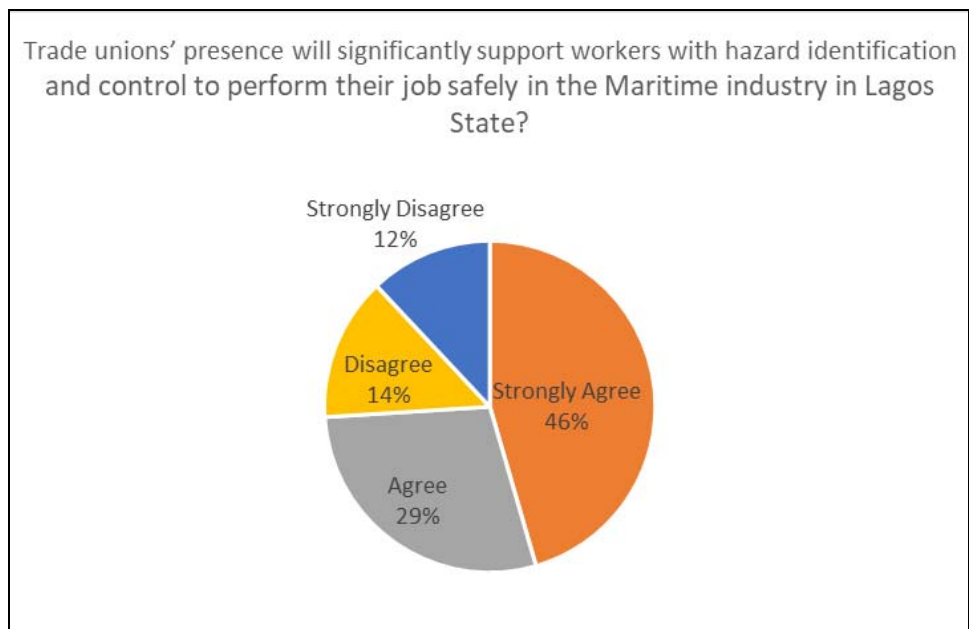
The chart revealed that trade unions’ presence will significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos State. The chart revealed that 81(40.5%) of the respondents strongly agreed and 50(25.0%) agreed that trade unions’ presence significantly enhance safety knowledge and skills of workers to perform their job safely, while 30(15.0%) of the respondents disagreed and 39(19.5%) strongly disagreed that trade unions’ presence significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos State.

Research Question 3: Will trade unions’ presence significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos State?



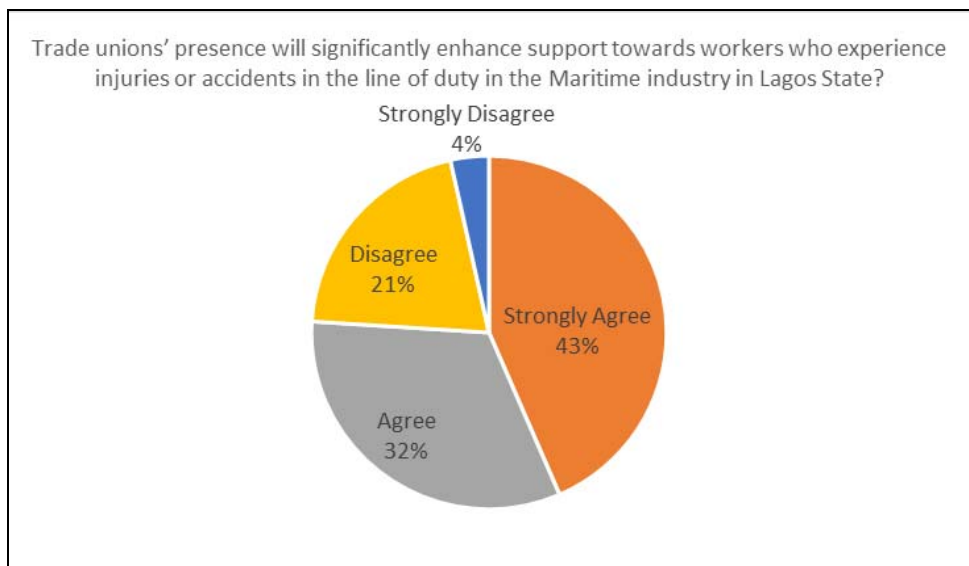
The chart revealed that trade unions’ presence will significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos State. The chart revealed that 96(48.0%) of the respondents strongly agreed and 41(20.5%) agreed that trade unions’ presence significantly support workers with proper safety equipment to perform their job safely while 30(15.0%) of the respondents disagreed and 33(16.5%) strongly disagreed that trade unions’ presence significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos State.

Research Question 4: Will trade unions’ presence significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos State?



The chart revealed that trade unions’ presence will significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos State. The chart revealed that 91(45.5%) of the respondents strongly agreed and 57(28.5%) agreed that trade unions’ presence will significantly support workers with hazard identification and control to perform their job safely, while 28(14.0%) of the respondents disagreed and 24(12.0%) strongly disagreed that trade unions’ presence will significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos State.

Research Question 5: Will trade unions’ presence significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State?



The chart revealed that trade unions’ presence will significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State. The chart revealed that 87(43.5%) of the respondents strongly agreed and 65(32.5%) agreed that trade unions’ presence will significantly enhance support towards workers who experience injuries or accidents in the line of duty, while 41(20.5%) of the respondents disagreed and 7(3.5%) strongly disagreed that trade unions’ presence will significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State.

H1₀: Trade unions’ presence will not significantly enhance workers’ awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State.

Table 1: Regression analysis of research hypothesis one

$R = .783$ $R^2 = .633$ Multiple R^2 (adjusted)=.586 S.E of estimate= .686					
ANOVA					
Model	Sum of square (SS)	Df	Mean square	F	Sig.
Regression	11.586	1	23.317	49.270	.001 ^b
Residual	38.092	198	.470		
Total	5.091	199			

Table 1 illustrates that the independent variable, trade unions’ presence, has a significant positive effect on workers' compliance with safety regulations and standards in the Maritime industry in Lagos state, as evidenced by the values of $R = .783$ and R^2 (adjusted) = .633, with a p-value of .001. These results indicate that trade unions’ presence will significantly enhance workers’ awareness of safety regulations and standards to perform their job safely in the Maritime industry in Lagos State. In that sense, trade unions play a crucial role in enhancing workers' adherence to safety regulations and standards, enabling them to perform their tasks safely with improved safety measures.

H₂₀: Trade unions’ presence will not significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos State.

Table 2: Regression analysis of research question two

$R = .590$ $R^2 = .748$ Multiple R^2 (adjusted)=.616 S.E of estimate= .314					
ANOVA					
Model	Sum of square (SS)	DF	Mean square	F	Sig.
Regression	49.317	1	51.079	10.929	.000 ^b
Residual	8.097	198	.099		
Total	12.414	199			

Table 2 indicates that the independent variable, trade unions’ presence, has a significant positive impact in enhancing the safety knowledge and skills of workers in the Maritime industry in Lagos state, as evidenced by the values of $R = .590$ and R^2 (adjusted) = .748, with a p-value of .000. These results demonstrate that trade unions’ presence significantly contribute to improving workers' knowledge and skills in relation to job safety, equipping them with the necessary tools to perform their tasks safely and effectively.

H3₀: Trade unions’ presence will not significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos State.

Table 3: Regression analysis of research question three

<p>R = .671 $R^2 = .427$ Multiple R^2(adjusted)=.594 S.E of estimate= .523</p>					
ANOVA					
Model	Sum of square (SS)	DF	Mean square	F	Sig.
Regression	50.886	1	27.721	89.942	.001 ^b
Residual	22.447	198	.374		
Total	33.333	199			

Table 3 indicates that the independent variable, trade unions’ presence, has a significant positive effect in supporting workers with access to proper safety equipment in the Maritime industry in Lagos state, as evidenced by the values of $R = .671$ and R^2 (adjusted) = .427, with a p-value of .001. These result highlights the fact that trade unions’ presence significantly contribute towards providing workers with the necessary proper safety equipment to perform their jobs safely, thereby ensuring that they have adequate protective measures in place.

H4₀: Trade unions’ presence will not significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos State.

Table 4: Regression analysis of research question four

R = .592 R ² = .354 Multiple R ² (adjusted) = .236 S.E of estimate = .864					
ANOVA					
Model	Sum of square (SS)	DF	Mean square	F	Sig.
Regression	56.504	1	64.504	9.716	.005 ^b
Residual	35.816	198	.746		
Total	42.320	199			

Table 4 indicates that the independent variable, trade unions’ presence, has a significant positive impact on supporting workers' ability to identify and control hazards in the Maritime industry in Lagos State, as demonstrated by the values of R = .592 and R² (adjusted) = .354, with a p-value of .005. These findings suggest that trade unions’ presence play a crucial role in improving workers' capacity to recognize and manage workplace hazards, thereby creating a safer work environment and enhancing overall job safety performance.

H5₀: Trade unions’ presence will not significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State.

Table 5: Regression analysis of research question five

R = .671 R ² = .451 Multiple R ² (adjusted) = .439 S.E of estimate = .891					
ANOVA					
Model	Sum of square (SS)	DF	Mean square	F	Sig.
Regression	31.260	1	31.260	39.362	.000 ^b
Residual	38.120	198	.794		
Total	69.380	199			

Table 5 indicates that the independent variable, trade unions' presence, has a significant positive impact in enhancing support for workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State, as evidenced by the values of $R = .671$ and R^2 (adjusted) = .451, with a p-value of .000. These findings imply that trade unions play a crucial role in providing substantial support to workers in such situations, facilitating their job safety performance by ensuring timely assistance, resources, and measures for recovery and prevention.

5. Discussion of Findings

The study showed that trade unions' presence will significantly enhance workers with safety regulations and standards to perform their job safely in the Maritime industry in Lagos State. This finding aligns with the study of Kumarasinghe and Dilan (2022) who asserted that trade unions contribute towards enhancing workers' understanding of safety regulations and standards, thereby enabling them to perform their jobs with a greater focus on safety. Through their collective bargaining power and representation of workers' interests, trade unions can advocate for and enforce the implementation of safety regulations and standards in the workplace. This includes ensuring that employers provide adequate safety training, establish safety protocols, and maintain a safe working environment.

The study showed that trade unions' presence will significantly enhance safety knowledge and skills of workers to perform their job safely in the Maritime industry in Lagos state. This finding is consistent with the study of Ogechi and Tamunomiebi (2019) who stated that trade unions often prioritize the provision of training programs and resources that aim to enhance workers' awareness and understanding of occupational hazards and safe practices. Through educational initiatives, workshops, and safety campaigns, trade unions assist workers in acquiring the requisite knowledge and skills to identify potential risks and implement appropriate preventive measures. By equipping workers with safety knowledge and skills, trade unions contribute to creating a safety-conscious workforce, improving job safety performance, and reducing the likelihood of workplace accidents or injuries.

The study showed that trade unions' presence will significantly support workers with proper safety equipment to perform their job safely in the Maritime industry in Lagos state. This finding aligns with the study of Iheanacho and Ebitu (2016), who observed that trade unions actively advocate for the provision of proper safety

equipment by employers, emphasizing the importance of protective gear in mitigating workplace hazards. Through collective bargaining and negotiations, trade unions strive to secure adequate funding and resources for the provision and maintenance of proper safety equipment. By ensuring that workers have access to suitable protective equipment, trade unions enhance their jobs safety performance and reduce the risk of injuries or illnesses resulting from workplace hazards. This finding highlights the vital role that trade unions play in safeguarding workers' well-being and promoting the cultivation of a safety culture in the workplace.

The study showed that trade unions' presence will significantly support workers with hazard identification and control to perform their job safely in the Maritime industry in Lagos state. This finding correlates with the study of Jelimo (2013) who affirmed that trade unions often prioritize the promotion of a safe work environment and advocate for effective hazard identification and control measures. Through regular communication channels, safety committees, and workplace inspections, trade unions actively engage with workers to raise awareness about potential hazards and empower them to identify and report risks. Through their collaboration with employers, trade unions ensure the implementation and maintenance of hazard control measures, including engineering controls, administrative controls, and personal protective equipment. This proactive approach to hazard identification and control equips workers with the necessary knowledge and resources to minimize workplace risks, resulting in enhanced job safety performance and a safer working environment.

The study showed that trade unions' presence will significantly enhance support towards workers who experience injuries or accidents in the line of duty in the Maritime industry in Lagos State. This finding correlates with the study of Kossek, Kalliath and Kalliath (2012) who was of the opinion that trade unions recognize the importance of timely assistance and resources for workers in need, and they actively advocate for measures to support injured workers. Trade unions may negotiate for improved workers' compensation benefits, access to healthcare services, and rehabilitation programs to aid in the recovery and return to work process. Additionally, trade unions provide a platform for workers to voice their concerns, ensuring that their rights are protected and their experiences are taken into account in the development of workplace safety policies and practices. By offering support to workers who experience injuries or accidents, trade unions contribute to a supportive work environment that promotes worker well-being, boosts morale, and ultimately enhances job safety performance.

6. Conclusion and Recommendations

In conclusion, trade unions play significant roles in the enhancement of employees' adherence to safety regulations and standards in the workplace. By actively promoting and advocating for the implementation of safety measures, trade unions contribute to creating a safer work environment. Through training programs, awareness campaigns, and educational initiatives, trade unions empower workers with the necessary information and skills to identify and mitigate potential hazards. By fostering a culture of safety and continuous learning, trade unions contribute to enhancing job safety performance and reducing the risk of workplace accidents and injuries. By advocating for the provision and proper use of proper safety equipment, trade unions contribute to creating a safer work environment and enhancing workers' job safety. Through active involvement in safety committees, workplace inspections, and regular communication channels, trade unions facilitate the identification and reporting of hazards. By collaborating with employers and advocating for effective hazard control measures, trade unions contribute to a safer work environment and improve workers' job safety performance. By advocating for workers' rights and negotiating for improved workers' compensation benefits, access to healthcare services, and rehabilitation programs, trade unions contribute to the overall well-being and job safety of workers. From the above findings and analysis, the following recommendations are worth pondering:

- (i) Trade unions should continue to actively engage with workers and employers to promote safety regulations and standards. This can be achieved through regular training programs, workshops, and awareness campaigns. Trade unions should collaborate with management to develop and implement comprehensive safety policies that address the specific needs of the workers.
- (ii) Trade unions should prioritize the provision of safety knowledge and skills to workers through ongoing training programs. Through offering regular workshops and educational initiatives, trade unions can ensure that workers are equipped with the necessary knowledge to identify hazards, implement safety measures, and respond effectively to workplace incidents. The focus should be on providing comprehensive training that covers various aspects of job safety, including hazard identification, risk assessment, and emergency response.
- (iii) Trade unions should always advocate for employers to provide proper safety equipment to workers. This includes ensuring that proper safety

- equipment is readily available, properly maintained, and meets relevant safety standards. Trade unions should actively engage in negotiations with employers to establish protocols for the regular inspection, replacement, and training on the proper use of proper safety equipment.
- (iv) Trade unions should work closely with employers to strengthen hazard identification and control processes in the workplace. This can be achieved through regular workplace inspections, reporting mechanisms for hazards, and collaborative efforts to implement effective control measures. Trade unions should actively participate in safety committees and encourage workers to report potential hazards promptly.
 - (v) Trade unions should focus on establishing support systems for workers who experience injuries or accidents. This includes advocating for improved workers' compensation benefits, access to healthcare services, and rehabilitation programs. Trade unions should work closely with employers to develop return-to-work programs that ensure that injured workers are provided with necessary accommodations and support during their recovery process.
 - (vi) Trade unions should emphasize the importance of cooperation and effective communication between workers and management to enhance job safety performance. Encouraging open dialogue, regular meetings, and joint problem-solving initiatives can contribute to a positive safety culture and improve overall safety outcomes in the workplace.

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INFLUENCE OF JOB SATISFACTION AND ORGANISATIONAL COMMITMENT ON EMPLOYEE TURNOVER INTENTION IN THE CHEMICAL INDUSTRY IN SOUTH AFRICA

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Abstract: *The study aimed to assess the extent to which work satisfaction and organisational commitment influence employee turnover, both individually and concurrently. The assessment was conducted quantitatively through the utilisation of an online survey methodology to gather data from a sample of 249 respondents who were randomly chosen from the organisation operating in the specialty chemical business. The study discovered a detrimental*

absence of connection between employees and supervisors, which contributes to a climate of job unhappiness among the participants. Compared to other characteristics that have an influence, a lack of strong dedication to the organisation (known as affective commitment) resulted in an increased inclination to resign from the company. The study's findings suggest that an increase in job satisfaction and organisational commitment would lead to a decrease in turnover intention. The supervisor's influence and emotional dedication to the organisation are recognised as being more substantial than other aspects. Consequently, research has shown that contentment with a colleague, manager, and client (in descending order) has a beneficial impact on affective commitment. Consequently, heightened levels of work satisfaction and organisational commitment will result in a reduction in turnover intention. The study shows that employees' overall happiness with their supervisors, colleagues, and customers is associated with a decrease in their intention to leave the company, indicating a higher likelihood of retention.

Keywords: *Job satisfaction, Organisational commitment, Human resource and Turnover intention, Chemical industry, South Africa.*

JEL Classification: J24, J28, L25,L51, M12, M54, O15, F23

1. Introduction

Employee turnover is prevalent in the specialty chemical business due to insufficient job satisfaction and organisational commitment. This phenomenon incurs significant expenses in recruitment and disrupts operational and management operations. Phillips & Connell, 2003: p 1; Wafula, Ondari & Lumumba, (2017, p 30) argued that human resource managers may need to develop and implement a retention strategy that takes into account the impact of job satisfaction and organisational commitment on turnover intention. Such retention strategy if successfully implemented could become crucial for effectively managing employee turnover and promoting employee retention According to Tett and Meyer (1993: 262); Belete (2018: 1) in their examination of noted that job satisfaction and organisational commitment would have an impact on turnover intention. But the extent of such impact is unspecified as they may depend on timing, and context. In this study, a survey of sales representatives in Company X, a speciality chemicals company was conducted to understand the pattern of and the extent to which commitment may have an impact on turnover intention. "Company X" was used to ensure anonymity clause is observed. The current

workforce of this company consists of 426 individuals, with 95 on temporary contracts and 331 in permanent positions. Out of the total workforce of 426 individuals, 259 were specifically sales employees who were directly engaged in selling chemicals for Company X, in the year 201. The sales department comprises 61% of the total employment of this organisation. The participants in this study are individuals employed in sales positions.

2. Literature review

2.1. Turnover and turnover intention

Ahmad, Shahid, Huma & Haider, (2012: 126) stated that when employee decided to resign thus terminate employment relationship can be understood as voluntary or involuntary. In a separate study, Dess and Shaw, (2001: 446); Seung-Ho, (2019: 8). Yücel (2012, p. 45) defines turnover intention as the employee's inclination or attitude that influences their intention to quit the organisation. Measuring respondent turnover is challenging since it pertains to future events. We can only assess current turnover intention and cannot directly measure future turnover. Additionally, once employees have actually left the organisation, they are no longer available to be surveyed. Resignation intentions predominantly shape turnover decisions. An optimal indicator of turnover is to assess a variable that consistently and directly precedes voluntary employee turnover. A reliable indicator of an individual's behaviour is their level of intention to engage in that behaviour. Both theoretical and empirical evidence suggest that the intention to remain or depart from an organisation can be used to predict turnover (Issa, Ahmad & Gelaidan, 2013, p. 526).

The turnover and turnover intention of employees have been a subject of significant interest among scholars and professionals in fields such as organisational behaviour, psychology, HR management, and economics for more than ten years (Koh & Goh, 1995, p. 103). Employee turnover can have both positive and negative effects on a company. On the positive side, it can remove underperforming employees, bring in fresh ideas, and create new opportunities within the company. However, it can also result in the loss of valuable skilled and experienced employees, lower levels of customer service, reduced company profits, and expenses related to training and relocating new employees. The expenses linked to staff turnover might be significant. The aforementioned factors encompass expenses related to training, recruitment, disruption of workflow and efficiency, as well as negative impact on corporate morale and reputation (Heydarian & Abhar, 2011, p. 31). Suzanna, Graham, Scott, and Mary (2019, p. 109) assert that turnover intention can serve as a

measure of the efficacy of human resource development programmes in promoting organisational and leadership effectiveness. Employee turnover has been linked to discontentment with many facets of the job (Ramaseshan, 1997, p. 193).

2.2. Job satisfaction

Herzberg (as stated in Grobler, Wörnich, Carrel, Elbert & Hartfield, 2006: p. 219) defines job satisfaction as the emotional or affective reaction to a job setting that is not directly observable but may be deduced. Job satisfaction can be categorised into two-factor theory, which includes hygiene and motivational theory. Hygiene considerations encompass external elements of a job, including business policy, administration, supervision, relationships with colleagues, working environment, and remuneration. The job inherently includes motivator variables like as growth, progress, the work itself, recognition, and achievement. Job discontent is caused by extrinsic variables, while job happiness is caused by intrinsic elements (Talat, Saif, Muhammad, Ungku, and Ungku, 2016, p. 653). Job satisfaction among employees is determined by evaluating the degree to which the outcome aligns with or surpasses their expectations. This evaluation is based on comparisons with the performance and rewards of their colleagues, as well as the presence of justice in the workplace (Chatzoglou, Vraimaki, Komsiou, Polychrou & Diamantidis, 2011: p. 131).

2.3. Turnover intention and job satisfaction variables

2.3.1 Pay

Compensation and remuneration play a crucial role in determining job happiness. Money has a crucial role in enabling employees to meet their fundamental demands and is highly significant in fulfilling higher-level needs. Generous compensation or remuneration demonstrates the significance that businesses attribute to their personnel and boosts their sense of self-esteem. A survey of 2,000 managers revealed a favourable correlation between salary levels and job satisfaction (Aydogdu & Asikgil, 2011, p. 44).

2.3.2 The actual work

Studies have shown that when workers are given challenging or interesting assignments, they experience a greater sense of accomplishment at work. They will likely feel content, which will reduce the likelihood that they will decide to leave their current position. One's dedication to their employer, on the other hand, is positively correlated with their job satisfaction (Dziuba, Ingaldi, & Zhuravskaya, 2020; Mbah et al., 2012, p. 286).

2.3.3 Director

An employee's dedication rises or falls with their level of contentment with their superior. In the eyes of their subordinates, managers personify the company itself, and as such, they are not seen as separate from the company itself. Employees' perceptions of the company's commitment to them and their confidence in their supervisors' ability to look out for their best interests are strongly influenced by their immediate supervisors. Thus, happiness with managers has a beneficial effect on employees' dedication to the company. It has been found that having an external factor like supervision can be demoralising and cause dissatisfaction (Chughatai & Zafar, 2006, p. 44).

2.3.4. Possibilities for Advancement

Opportunities for advancement and advancement within an organisation are referred to as "promotion prospects." Concerns about advancement opportunities may lead to dissatisfaction in the workplace. According to the most prominent study on the subject (Muliawan et al., 2009, p. 123), there is a negative correlation between levels of promotional irritation and opinions of the company.

2.3.5. Colleagues or other employees

Coworker interaction is a key factor in maintaining workplace satisfaction. Multiple studies have shown that having supportive coworkers can greatly improve one's mood at work. In this area, happiness is measured by how well coworkers get along with one another. When employees have positive relationships with their coworkers, they are more invested in their occupations and less likely to look for other opportunities (Rast & Tourani, 2012, p. 94; Sunaida & See, 2019, p. 110).

2.3.6. Happiness at Work

Employees' subjective and emotional response to their work environment is hard to measure directly but can be inferred. Examining the two-factor theory, they are categorised as hygiene" and motivation (Carrel, Elbert & Hartfield, 2006: 19). (1) Hygiene factors are things like company policies as well as the relationship with colleagues and (2) Motivators talks about promotions that comes with additional responsibilities. Dissatisfaction on the job can be caused by external factors, whereas happiness in one's work might be caused by internal factors. Therefore, it is important to distinguish between a lack of job satisfaction and job dissatisfaction. How well an outcome meets or exceeds employees' expectations is a good indicator of how satisfied they are with their jobs. The fairness of the workplace and the

performance and compensation of coworkers are taken into account (Chatzoglou, Vraimaki, Komsiou, Polychrou, & Diamantidis, 2011, p. 131) in this evaluation.

Various disciplines, including business, education, and industry, have conducted substantial studies on the topic of employee happiness on the job. How well an employee's expectations match the actual outcomes at work is a major factor in job satisfaction. Therefore, the nature of the job and the employee's own expectations for what the job should offer determine whether the employment is rewarding or dissatisfying (Gui, Barriball, & While, 2008, p. 470).

Employee dedication to a company is influenced by factors such as their level of pleasure in their jobs. Employees' emotional reactions to their employer set organisational commitment apart from a simple appreciation for one's work. Employees' positive feelings about their jobs are what we mean when we talk about job satisfaction. The relationship between these two factors is very robust. This shows that an employee's general attitude towards the company may be positive, but that they may be unsatisfied with their role inside the company. Lack of job satisfaction is linked to a lack of organisational dedication and increased intents to leave the company (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002: 159), making it an important consideration.

2.3.7 Organisational dedication

Commitment is important for both employee wellness and performance (Malik, Nawab, Naeem, & Danish, 2010: 18). An employee can be involved in and identification with an organisation while not fully committed (Muliawan et al. 2009)." There must continuous satisfaction to ensure total commitment. In the instance that an employee is fully committed, such commitment should be rewarded in line with policy and reward programme (Mowday et al. 1979: 226). Having a strong conviction in and acceptance of the organization's objectives and principles, being willing to make a considerable effort on behalf of the organisation, and having a strong tendency to uphold membership in the organisation are the three linked factors that constitute organisational loyalty.

Negative outcomes, such as increased tardiness, poor performance, absenteeism, intention to leave, and staff turnover, result from an organization's lack of commitment. Organisational efficacy and efficiency suffer as a result of all of the above (Güteryüz et al., 2008: 1627).

The literature analysis shows that there are serious consequences for businesses when employees aren't committed to their work. Multiple studies have discovered an inverse relationship between employee turnover, employee intention to leave, and organisational commitment. Research also shows that employees with a strong

emotional commitment to the company work harder and produce better results than those with a weaker emotional attachment (Akroyd et al., 2009: 114).

2.4 Resignation, lack of dedication to the company, and other outcomes of unhappiness in the workplace

Job dissatisfaction occur as a results of employee not having reward consistent with performance and policy (Brashear, White & Chelariu, 2012: 181.) Also, employee can be dissatisfied due to low productivity and poor performance due mainly to extraneous circumstance. Low levels of commitment within a company lead to high rates of employee turnover, absences, disengagement, poor output, dwindling consumer confidence, and a lack of loyalty. Employees that are devoted to their work take on more responsibility, demonstrate more self-control, and stay with the company for longer (Kargar, 2012: 5017). An the rising instances of workers churn does not present a good image for both employee and the organisation (Mbah & Ikemefuna, 2012: 277.) Turnover is a significant drain on an organization's resources due to the time and money spent replacing departing employees. The costs associated with replacing an employee include advertising for and interviewing candidates in the open job market, making a final selection from the pool of qualified applicants, orienting the new hire, and training them formally and informally until they reach the same or higher level of proficiency as their predecessor. A company's bottom line may take a hit if turnover isn't managed well.

Theoretical Research Framework

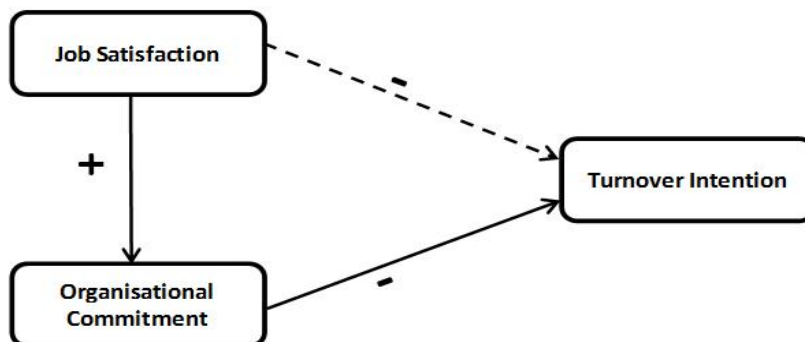


Figure 1: Diagrammatic representation of expected results

According to the literature review, figure 1 displays the anticipated outcomes of this study. Figure 1 indicates that there is an anticipated negative relationship between satisfaction, commitment and turnover intention. Nevertheless, the relationship between satisfaction and turnover intention was seen to have dotted line compared to relationship commitment and turnover intention.

3. Research Method

A brief overview of the research methodology employed is provided below. The quantitative strategy and survey design used for data gathering and analysis influence the scope, which in turn is dependent on the features of the research, the purpose, and the study population. Quantitative information was gathered using a Five-Point Likert Scale questionnaire from a representative sample of the population. There are five possible responses on the Likert scale questionnaire, from one (strongly disagree) to five (strongly agree).

Participants received an email with a link to the survey. With 249 sales staff members, we expected a response rate of 60%, and we got 150. The survey was made with the help of the Thesis Tools online.

Justification for using an online survey is that 1) delays in processing individual surveys were avoided.

- 2) The online survey could be modified easily and collected data quickly.
- 3) Convenience for the people who want to take part.
- 4) It helps you save money.

3.1 How quickly we are getting responses.

Emails with the link and instructions to complete the survey within three months were sent to 249 sales employees. The response rate was extremely low, requiring an extension of almost one month and 24 days. Since a higher response rate means a more accurate depiction, the deadline was extended. A total of 118 surveys were completed after the deadline, for a response rate of 47.4%, well below the targeted 60%. There is a low response rate for self-administered online surveys (Eiselen and Uys, 2005.) SPSS was used to analyse the completed surveys.

3.2 Analysing the Data

Analyses of correlation and regression were used to summarise the data. A statistical method for measuring the strength of a linear relationship between two or more variables, as described by Kumar et al. (2011, page 854). There is a range of 0.91 to 1.00 for the Pearson correlation coefficient in this study. Strong link between the variables as indicated by this correlation. Strong correlation is indicated

by a number between 0.71 and 0.90, whereas moderate correlation is indicated by a value between 0.40 and 0.70. A result between 0.21 and 0.40 shows a moderate but clear connection, whereas a value between 0.0 and 0.20 indicates a very weak one.

4. Results and analysis of data

Descriptive statistics, including means and standard deviations, were used to evaluate levels of job satisfaction, organisational commitment, and intention to leave. Both job fulfilment and dedication to the company were rated on a 5-point Likert scale, with 1 representing strongly disagreeing and 5 representing strongly agreeing.

Table 1: Mean and standard deviation for job satisfaction

Variables	N	Range	Minimum	Maximum	Mean	Std Error	Std. Deviation	Variance
Job Satisfaction: Pay	118	4	1	5	3.47	0.104	1.124	1.264
Job Satisfaction: Fellow Workers	118	4	1	5	4.01	0.079	0.863	0.746
Job Satisfaction: Supervisor	117	4	1	5	3.46	0.094	1.021	1.042
Job Satisfaction: Customer	118	4	1	5	3.59	0.079	0.853	0.727
Job Satisfaction	118	2	2	5	3.64	0.044	0.481	0.21

According to the results, the level of job satisfaction was found to be 3.64 (SD=0.481), which is above the neutral range but below the strongly agreed range. The respondents were most satisfied with fellow workers and least satisfied with supervision. Table 1 indicate that while most sales employees are satisfied with their job, a few are not satisfied as indicated by a standard deviation of 0.481. Satisfaction with pay and supervisor shows the highest standard deviation (SD >1).

Table 2: Mean and standard deviation for organisational commitment

Variables	N	Range	Minimum	Maximum	Mean	Std Error	Std. Deviation	Variance
Affective Commitment	118	4	1	5	3.23	0.076	0.827	0.683
Normative Commitment	118	4	1	5	3.03	0.076	0.822	0.675
Continuance Commitment	118	4	1	5	3.28	0.073	0.792	0.628
Organisational Commitment	118	3	1	5	3.18	0.063	0.689	0.475

The level of organisational commitment was found to be 3.18 (SD=0.689), which is slightly above the neutral range but below the strongly agreed range. Respondents were mostly satisfied with continuance commitment and least satisfied with normative commitment. The variation in sales employees’ responses on organisational commitment, as indicated by a standard deviation of 0.689 is large and suggests that some sales employees are strongly committed to the organisation, while other sales employees are showing no commitment to the organisation. Affective and normative commitment have the highest standard deviation (SD >0.8).

Table 3: Mean and standard deviation for turnover intention

Variables	N	Range	Minimum	Maximum	Mean	Std Error	Std. Deviation	Variance
Turnover Intention	118	4	1	5	2.49	0.109	1.181	1.395

A 5-point Likert scale with responses ranging from (1) no chance to (5) very high was used to measure the levels of turnover intention. The result indicates that the level of turnover intention is 2.49 (SD=1.181), which is below the neutral range, indicating that the sales employees have no intention to leave the organisation. However, a standard deviation of > 1 demonstrates that there is no consensus amongst sales employees regarding turnover intention, while other employees show no intention to leave the organisation; a substantial portion of employees intend to leave the organisation.

Table 4: Correlation results amongst research variables

Variables	Job Satisfaction	Organisational Commitment	Turnover Intention
1. Job Satisfaction	1	.455**	-.520**
2. Organisational Commitment	.455**	1	-.670**
3. Turnover Intention	-.520**	-.670**	1

*Notes: for the table, n = 118. ** Correlation is significant at 0.01 level (2-tailed)*

A Pearson correlation analysis was used to check for a statistically significant partnership between the study's variables. A positive value for the correlation

coefficient indicates a strong relationship, whereas a negative value indicates the opposite. The correlation is regarded to be significant only if it holds at the 0.01 and 0.05 levels. A negative correlation was found between job satisfaction and intention to leave the company, whereas a positive correlation was found between job satisfaction and organisational commitment.

A regression analysis was carried out to delve deeper into the dynamics of employee satisfaction at work and its effect on loyalty to the company. Job satisfaction is shown to explain 62% of the variance in organisational commitment, 31.40% of the variance in turnover intention, and 48.1% of the variance in turnover intention, respectively (using an R-squared value of 0.62, 0.314, and 0.481, respectively). Workers' contentment with their coworkers, supervisors, and customers positively influenced their affective commitment (a subset of organisational commitment), whereas their normative and persistence commitment remained untouched. Among the factors that make up job satisfaction, only being happy with one's boss was found to have a statistically significant negative effect on the risk of quitting one's employment. While the normative and continuity dimensions of organisational commitment had no effect on turnover intentions, the emotive dimension did. Pay satisfaction had a negative effect on all three categories of organisational commitment (emotional, persistent, and normative), but the results of the regression analysis were inconclusive. It's advantageous if workers are content with their pay. This means that the salary satisfaction findings will be disregarded.

Diagrammatic representation of regression analysis results



Figure 2: Summary of Regression Analysis

The summary findings of the regression analysis are shown in Figure 2, which illustrates the negative association between work satisfaction and intention to leave. Furthermore, employee happiness, supervisor satisfaction, and customer satisfaction all have a positive and statistically significant effect on organisational commitment. Affective commitment mediates the relationship between these dimensions of job satisfaction and intentions to look elsewhere for employment. Affective commitment is more important than supervisor satisfaction in predicting whether or not an employee would quit.

Table 4.15: Regression analysis between components of organisational commitment and turnover intention

Model Summary					
R	R Square	Adjusted R Square	Std. Error of the Estimate		
.693 ^a	0.481	0.467	0.862		

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	78.519	3	26.173	35.206	.000 ^b
Residual	84.749	114	0.743		
Total	163.268	117			

Dependent Variable is Turnover Intention

Predictors: Affective, Continuance and Normative Commitment

Model	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6.054	0.384		15.752	0.000
Affective Commitment	-0.737	0.152	-0.516	-4.862	0.000
Normative Commitment	-0.194	0.152	-0.135	-1.281	0.203
Continuance Commitment	-0.181	0.117	-0.121	-1.543	0.126

Dependent Variable is Turnover Intention

The R-squared value was 0.481 as shown in Table 4.15. The results show that the components of commitment account for 48.1% of the variance in turnover

intent. The remaining 51.9% of variability can be attributed to elements beyond the scope of the model's analysis. The regression model does not fit the data well, as shown by the F-ratio of 35.206 with p-value of 0.05. This indicates that the three commitment dimensions (Affective, Normative, and Continuance) are related in a major way. This leads us to conclude that H₀ is false. Turnover intent was negatively affected by affective commitment (B-value = -0.737, t-value = -4.862, p 0.05). Turnover intention was negatively impacted by normative commitment and continuance commitment, but these effects were not statistically significant (B-value for normative commitment = -0.194, t-value of normative commitment = -1.281, p-value >0.05; B-value for continuance commitment = -0.181, t-value for continuance commitment = -1.543, p-value >0.05).

4. Conclusion and annotation

This text discusses the intentions of employees to leave a chemical corporation in Cape Town, the research that examines the impact of workers satisfaction and commitment to organisation. The study outlines the utilisation of quantitative research techniques and survey design to administer the five-point likert scale questionnaire that were administered to selected respondents. The paper's conclusion states that there are statistically significant negative disparities between emotional commitment and supervisor influence, as well as other studied variables like organisation commitment, in terms of their effectiveness. While the majority of respondents expressed satisfaction with their employment in general, but they emphasised that their degree of happiness at work depended on aspects such as the competence of their supervisor, their remuneration, and their working circumstances.

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THE RELATIONSHIP BETWEEN MOTIVATION AND JOB SATISFACTION OF ADMINISTRATIVE STAFF AT A SELECTED UNIVERSITY IN CAPE TOWN

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Abstract

This study investigated the correlation between motivation and job satisfaction. The study conducted a detailed analysis of the intrinsic and extrinsic elements that influence the motivation and job satisfaction of administrative staff. The study employed a quantitative method and utilised correlation for data analysis. Data on the factors that influence employee work satisfaction at a specific university in Cape Town were collected using a five point Likert scale questionnaire. The population consisted of 77 respondents, specifically administrative staff. Out of the 54 responses were received, the response rate was calculated to be 70%. The responses were examined using descriptive and inferential statistics. The findings indicate that there is a strong positive correlation (0.695) between work motivation and job

satisfaction, which is statistically significant at a p-value of 0.001 ($p < 0.05$). There is a clear and important connection between work motivation and job satisfaction among the administrative staff at the University. Put simply, there is a direct correlation between increased work motivation and job satisfaction. Hence, this study has established that there is a statistically significant correlation between employee motivation and job satisfaction.

Keywords: *Work motivation, Job satisfaction, administrative staff, University*

JEL Classification: L2; M1

1. Introduction

The correlation between the motivation of administrative staff employees and their pleasure with work is crucial for the effective execution of the university's teaching, learning, research, and community endeavours. Administrative staff at the university should possess intrinsic motivation, driven by their dedication and the extent to which the work environment fosters employee motivation, to achieve the necessary degree of job satisfaction. The study aims to examine the presence of employee intrinsic and conscious factors to gain a deeper understanding of their relationship with job satisfaction among administrative staff. Amidst the COVID-19 pandemic and the consequences of lockdown measures, maintaining high levels of motivation among administrative staff has become crucial for ensuring the efficiency of educational activities, research endeavours, and community engagement.

Although it is necessary to evaluate the working environment and employment conditions, other factors such as internal motivators and job satisfaction may also contribute to the motivation of administrative staff. Moreover, the selected institution and other general managers in the advanced education industry will carry out a comprehensive inquiry into the correlation between motivation and job satisfaction. Hence, it is imperative for this study to examine the correlation between motivation and job satisfaction among the administrative personnel of the selected university.

1.1 Research Objectives

This study aims to investigate the correlation between motivation and job satisfaction. The study intends to conduct a detailed analysis of the intrinsic and extrinsic elements that influence the motivation and job satisfaction of administrative staff of a selected university.

2. Review of literature of Motivation and Job satisfaction

According to (Zameer, 2014), employee motivation is the way an organization drives workers to fulfil organisation objectives through rewards, promotions, as well as other benefits. Motivation, according to Jain, Gupta, and Bindal (2019), is a linked a set of repetitive and reciprocated emotional, behavioural, and intellectual processes and actions based on a person's goals. Motivation is seen as numerous aspects that improve a character of personal urge and capacity to remain active and self-sufficient while exerting a consistent amount of effort in executing a certain task. Compassion and kindness are a feature of institutional appreciation that efficiently resolves motivation issues, such as monitoring feelings and reacting to everyone else's distresses.

According to Cebeci (2019), employees desire recognition, respect, and fair compensation for their efforts in enhancing the institution's performance and profitability. If organisations fail to fulfil the expectations of their employees, it can result in a hostile work environment. Employees who experience low levels of job happiness demonstrate reduced productivity, whereas employees who experience high levels of job satisfaction exhibit elevated morale and a heightened motivation to perform more effectively towards the organisational goals. As per Badubi (2017), job satisfaction refers to an individual's evaluation of how effectively a job fulfils specified attributes and meets its objectives, or the amount to which its goals are satisfactorily achieved.

Job satisfaction is a noticeable emotional response which could only be presumed independent of the circumstances and situation. Knowing one's degree of job satisfaction, according to the author, is critical for several reasons, and the results of job satisfaction study have an influence on both individuals and businesses. Excellent work satisfaction, in the view of the organization, may contribute to improved performance, which affects the institution's results. Employees are more inclined to engage in behaviour that benefits the company's success when they are focused and committed to the organization, and when their employment gives them a higher sense of fulfilment.

2.1. Theories of motivation

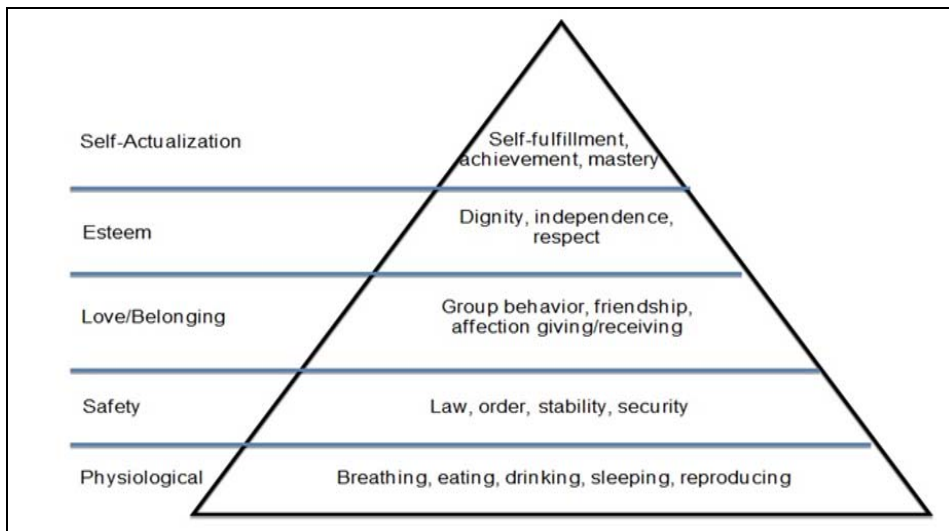
Various motivational theories, such as Maslow's Hierarchy of Needs and Herzberg's Two Factor Theory, are employed to analyse employee motivation and job satisfaction. These theories have been formulated to examine the factors that impact employee motivation in firms. These theories are significant as they elucidate the underlying factors that drive individual motivation. When properly

applied, these ideas have the potential to enhance employee motivation, hence, leading to increased productivity inside businesses (Badubi, 2017).

2.1.1. Maslow's Hierarchy of Needs

The theory of Maslow's hierarchy of needs is widely acknowledged in the field of motivation and is a fundamental basis for the model used in this research. A need refers to a necessary condition that an individual must have, satisfaction occurs when a need is satisfied, and motivation is the drive to satisfy a need. Maslow identified five levels of needs in employees and observed that these needs are arranged in a hierarchical order, with the lowest demands being prioritised above the higher ones. Maslow highlights that no need can be fully gratified and that once a need is adequately fulfilled, it ceases to function as a driving force.

According to Maslow's theory, an employee must satisfy their lower-level desires before becoming motivated by higher-level needs. This concept can be advantageous in ascertaining the categories of incentives that are probable to be efficacious in incentivizing personnel. It is crucial for management to acknowledge that employees' needs and expectations evolve with time and to regard each individual as unique (ALAmrani, 2020). Below is the subsequence of hierarchical stages in Maslow theory of needs:

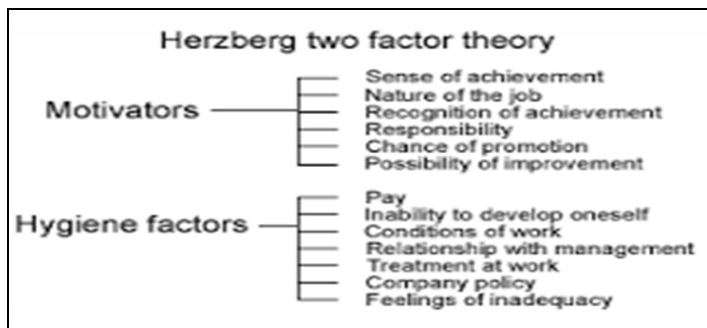


Maslow hierarchy of needs

Source: Buyao and Danyang (2020)

2.1.2. Herzberg’s Dual Factor Theory

Herzberg conducted a study on a sample of experienced professionals and determined that motivators and hygiene aspects had the greatest influence on staff. If hygiene needs are not satisfied, it will lead to job dissatisfaction, including a low-paying organization, which will appear in behaviours such as the bad and insufficient ability to accomplish the job. According to Herzberg, higher-level needs such as belonging, recognition, professional growth, and achievement are more useful in predicting job satisfaction. What separates Herzberg's notion from Maslow's is that, based on empirical data, Herzberg believes that motivational effects are the leading cause of job dissatisfaction. It implies that, in theory, wage increases, and indemnification have no effect on job satisfaction.



Herzberg two factors theory

Source: Tengah (2019)

2.2. Motivational factor

In research based on Herzberg's theory, motivational elements have been found to impact work satisfaction. It is said that motivating factors contribute to high levels of work satisfaction. Some studies believe that increasing the use of intrinsic factors improves staff motivation and work satisfaction; while other studies such as (Chang & Teng, 2017; Putra, Cho, & Liu, 2017) consider that increasing the use of extrinsic incentives factors has a higher influence on enhancing employee motivation and job satisfaction.

2.2.1. Intrinsic

Although intrinsic motivation exists at the confluence of an individual and an activity, some authors interpret it in terms of how appealing the job is, whilst others read it in terms of the advantages gained by intrinsically motivated labour

participation. Employees that are genuinely motivated participate in an activity because it is exciting and fundamentally satisfying to them (Di Domenico & Ryan, 2017). According to the authors, intrinsic drive encourages people to comprehend topical subjects and to separate their concerns, allowing them to form distinct characteristics that give them a sense of sincerity, relevance, and objectivity. This is most likely as they are particular and speak directly to the individual's opinions of their responsibilities and the importance of the obligations assigned to them.

Achievement: The desire to excel in pursuit of certain objectives is commonly known as the motivation for accomplishment (Bande, Fernandez- ferrin, Verlaneira & Otero- neira, 2016). It signifies that achieving success and fulfilling a specific set of goals based on a specific set of standards is necessary. The aspiration for success is a manifestation of an individual's thinking, desires, and determination for personal fulfilment or a feeling of achievement (Green, Finkel, Fitzsimons & Gino, 2017). This is achieved through job engagement, which involves prioritising the completion of tasks and often sacrificing other forms of enjoyment and personal leisure. Employees' success needs are fulfilled when they can accomplish their individual goals independent of and irrespective of others' circumstances.

Acknowledgement: Charano & Harijanto (2015) define acknowledgment as a signal from upper-level management to employees that their contributions in task execution and project involvement are acknowledged. Employees frequently derive greater satisfaction from receiving appreciation for their work rather than solely seeking the external incentives that accompany such recognition. This is a method of conveying appreciation and empathy towards the personnel. Organisations acknowledge their employees to sustain their sense of empowerment and self-worth. Professionals that receive recognition in their respective domains exhibit more motivation and contribute to enhanced overall results.

Career Advancement: The existence of a promotion opportunity indicates that the employee's achievement has been recognised. Promotion is closely linked to movement, professional development, and competency (Bhardwaj, 2019). Training is mostly oriented towards immediate development, while progression is primarily oriented towards long-term progress. The employees' perception of the profession's requirements, as well as its level of excitement and difficulty, are closely linked to the actual tasks performed. Employment primarily revolves around employment prerequisites and designated responsibilities.

2.2.2. Extrinsic

Legault (2016) defines extrinsic motivation as "the conduct of a behaviour that is substantially contingent on the accomplishment of an objective that is separate from the action itself." Extrinsically driven behaviour is described as an action performed in order to get monetary or social benefits or to avoid negative consequences. The behaviour is carried out for the sake of the results rather than for its own pleasure. Extrinsic motivation is described as the need to perform a task or engage in a certain action in order to achieve a specific goal.

Work itself: Previous studies, according to our findings, have not placed a significant emphasis on the nature of the work and the impact this feature has on job satisfaction. According to Ali (2016), work is what an individual can perform, and it also has to do with the workers' workplace environment and their perspectives of the task for which they are responsible. Herzberg's works in 1959 related to the concept that improving job satisfaction would entail a shift in the work itself. Additionally, as stated by the author, employees are also content with characteristics such as growth, ownership, achievement, improvement, acknowledgment, and the work itself, which are all essential to the job.

Promotion: According to Abu, Hassan, Asaari, Desa, & Subramaniam (2019), the basis for promotion may influence employee job satisfaction. Additionally, the author claims that those who think they have a greater possibility of getting promoted due to their talents to complete their responsibilities are more likely to be satisfied with their jobs. The options for growth and advancement in the institution provide possibilities for side advancement, and development undoubtedly enhances job satisfaction inside the workplace.

Working conditions: Working circumstances, according to Tengah (2019), are the extent in which the total workplace contributes to fulfilment. According to Herzberg, Mausner, & Synderman (1959), physical working conditions include the number of workers and accessibility of supplies and equipment, workstations, and conditioning systems. Employees' working conditions can have a positive or unfavourable influence on the workplace, affecting their motivation and job fulfilment.

Pay: Several researchers have identified pay as an important element to consider in the research of job satisfaction. Pay, according to Shah, Burgoyne, Nazri, & Salleh (2017), is a cash compensation offered for job accomplished as well as the degree to which it is viewed as equal in comparison to other individuals in like situations. Job satisfaction decreases when there is a gap between the employee's perception of what they expect to be paid and their actual base income.

This already educates employers in a variety of professions that pay should be equitable and fair, as uneven pay can lead to union involvement.

Job security: According to Holmeberg et al. (2017), if an employee feels they will be recognized for exceptional work and that their job is secure, overall performance will automatically rise. Similarly, Van Der Kolk (2019) discovered that employment security offers employees trust in their future careers and drives them to work hard in order to achieve the organization's goals. Consequently, we may infer that job satisfaction is the most potent motivator since it relieves psychological pain and inspires employees to give their best to the organization, ultimately leading towards profitability and success.

3. Research method and design

The quantitative research approach was chosen given that it will assist the researcher in producing data that can be presented effectively using statistics and figures. The survey research design of correlation type was used in the investigation. According to (Dias & Temido, 2020), a correlation study design comprises the examination of two or more relevant variables as well as the evaluation of the relationship between those variables. Correlational study would offer information on the strength of the relationship between numerous related variables.

The purposive sampling approach was chosen by the researchers for this research. This sampling approach is useful when you require to quickly obtain the desired sample or when sampling for proportion is not a primary concern (Crossman, 2020). Samples obtained using this approach are valid and deemed to be representative of the population. For this investigation, a sample size of 74 people was used. The participants in the study were chosen based on their suitability to provide information on the study's topic. The administrative personnel of a University in Cape town were the target population for this investigation. It mostly engaged administrative employees from several administrative divisions of the University.

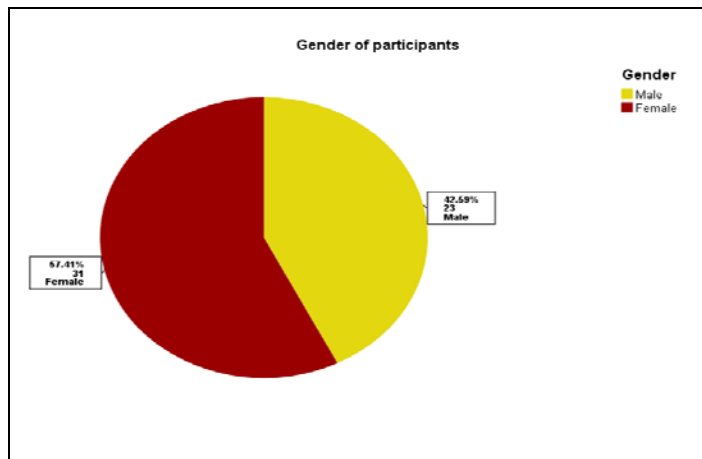
The Statistical Package for the Social Sciences (SPSS) was used to analyse the data of the current study. According to Arkkelin (2014), the advantage of this application is that it is not only user-responsive but also highly adaptable to any form of quantitative study. Furthermore, he states that SPSS handles all step of the analytical process, from data processing and administration through analysis and reporting of data. Descriptive statistics are used to organize information and offer a brief overview by highlighting the relationship among variables in a sample or population. Data collection was done by administering closed ended questionnaires

online via email link to respondents (Canals, 2017). Measurement variables were classified and linked to participant demographics, as well as the motivation and work satisfaction measure, were developed to be answered on a five-point Likert scale. The first phase collected information such as age, gender, and length of employment. The second section evaluated a motivating factor that influences motivation and job satisfaction (intrinsic and extrinsic).

4. Research Results and discussion

The study included more females (57.41%) than males (42.59%), as seen in Figure 3. Gender has always been a significant component in studies on motivation and work satisfaction. Several studies have been conducted to investigate the link between gender, motivation, and work satisfaction. Abun, Ubasa, Magallanes, Encarnacion & Ranay (2021) revealed that there is no gender difference in motivation or job satisfaction in previous research. Azim, Haque & Chowdhury (2013) they all came to the same conclusion. They conducted a study on the association between gender, marital status, and workplace satisfaction among employees, and their findings show that there is no statistically significant evidence to imply that men and women have different levels of job satisfaction.

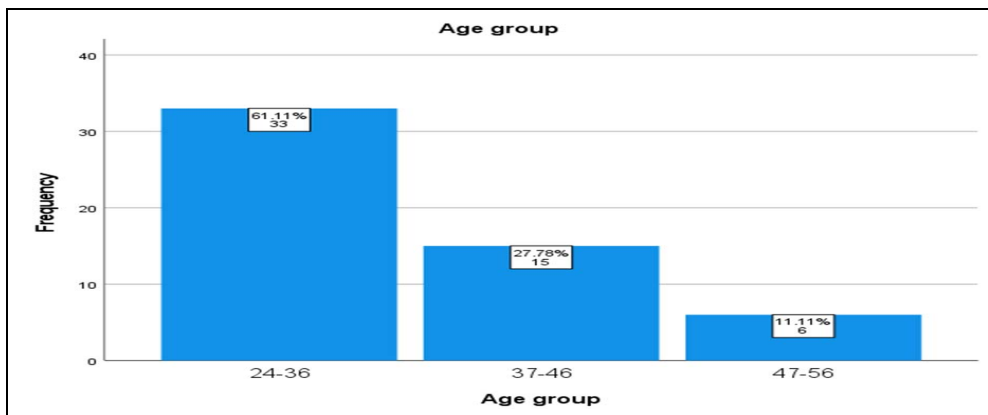
Figure 1: Gender of participants



a. Age of participants

Another demographic component studied was the respondents' age group. As indicated in Figure 2, the majority (61.11%) of respondents were between the ages of 24 and 36, the fewest (11.11%) were between the ages of 47 and 56, and 27.78% were between the ages of 37 and 46. Several studies, according to Sengupta (2011:103), indicate a positive association between work satisfaction and age.

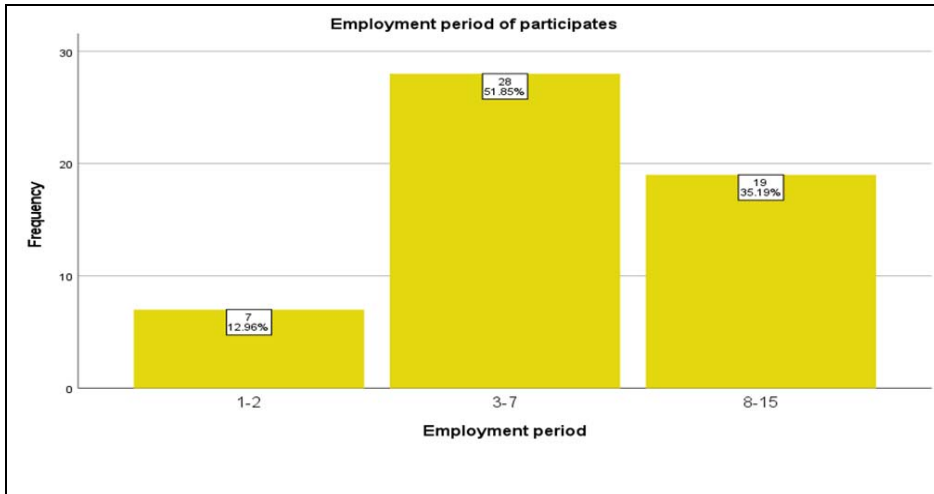
Figure 2: Age group participants



b. Employment period of participants

Figure 3, depicts how workers are classified based on their term of service with the firm. According to the graph below, the majority of 51(83%) of the administrative employees had worked at the university administrative department for 3 and 7 years (n=28). While 35% of the workers had been in the institution's administrative departments for 8 and 15 years (n=19), Furthermore, 96% of the remaining 12 (n=7) had been working for 1 and 2 years.

Figure 3: Participants period of employment



c. Descriptive statistics

Descriptive statistics refer to concise descriptive measures that are employed to summarise a dataset, representing either the full population or a sample (Sharma, 2019). The interval scale consists of a 5-point Likert scale. The scale ranges from 1 to 5, with 1 representing strong disagreement, 2 representing disagreement, 3 representing neutrality, 4 representing agreements, and 5 representing strong agreement. The mean was interpreted using the following range.

Table 1: Likert scale (answer range)

Range	Agreement	Classification
4.21 – 5.00	Strongly Agree	Positive
3.41 – 4.20	Agree	
2.61 – 3.40	Neutral	Neutral
1.81 – 2.60	Disagree	Negative
1.00 – 1.80	Strongly Disagree	

Source: Sözen and Güven (2019)



	N	Minimum	Maximum	Mean	Std. Deviation
I am happy to go to work every day	54	1	5	3.69	1.179
I have the resources I need to work effectively	54	1	5	3.78	1.058
I am allowed to use my initiatives on the job	54	1	5	3.80	.919
Negative attitude shown by most students affects my productivity	54	1	5	3.07	1.426
Poor management has a negative effect on my productivity	54	1	5	3.61	1.280
My manager is interested in my career advancement	54	1	5	3.44	1.093
My manager recommends me for promotion regularly	54	1	5	3.19	1.100
Positive recognition	54	1	5	3.54	1.209
I have an opportunity to use my ability	54	1	5	3.87	1.010
I have a sense of achievement	54	1	5	3.80	1.035
My job skills enhances my satisfaction	54	1	5	3.54	1.128
My opinions on work issues are respected	54	1	5	3.57	1.143
Payment of reasonable salaries and wage	54	1	5	3.26	1.152
My office is conducive for working	54	1	5	3.83	.966
Peaceful work environment	54	1	5	3.56	1.269
My promotion boots the level of my job satisfaction/performance	54	1	5	3.57	1.354
Job security	54	1	5	3.69	.886
Training and career development	54	1	5	3.24	1.132
Career advancement/ development opportunities are limited	54	1	5	3.61	1.188
The benefits offered to me in relation to my work are satisfying	54	1	5	2.94	1.265
Valid N (listwise)	54				

Descriptive statistic is given Table 2.

Participants were questioned about whether they found their office to be conducive for work activities. The results show that most respondents were satisfied with their workplace, with a mean (of 3.83), implying that a favorable workplace has a significant relationship with job satisfaction. Agbozo, Owusa, Mabel, and Atakorah (2017) found a relationship between a favourable work environment and job satisfaction.

According to the findings, promotion ($M=3.19$) and benefits ($M=2.94$) are among the least satisfying and motivating factors. Benefits contributed the least to motivating and satisfying of all the characteristics examined. As a result, it appears that most administrative staff members are dissatisfied with the advantages associated with their work. The conclusions of the current study are supported by other studies by (Bogicevic-Milikic & Dosenovic, 2020). According to their research, there is a slight but significant association between job satisfaction and benefit satisfaction.

Payment of a suitable salary ($M=3.26$) to university administrators are neutral with the fact that their pay is enough. Mabaso & Dlamini (2017) investigated the effect of incentives and compensation on work satisfaction and organizational commitment among academic staff at a specific University of Technology. The study revealed that compensation had no effect on work satisfaction or organizational commitment. This study's findings contradicted those of Suresh Dahake (2018), who discovered that remuneration had minimal impact on employees' motivation and job satisfaction.

The conducive working environment ($M=3.83$) is recognized as one amongst most satisfying factors. Based on the results, administrative staff are content with their work. This implies that for administrative staff, a perception of job security leads to work satisfaction. This finding is also consistent with previous studies, such as those of Kuwaiti, Bicak, and Wahass (2019), who investigated faculty job satisfaction at higher education institutions. They discovered a significant and favourable association between academic faculty job satisfaction and work conditions. Akintola & Chikoko (2016) found that employment stability was the most important factor driving motivation and work satisfaction in different research. People will rest in their thoughts and focus on their duties, although they are considering shifting employment.

The findings show that administrative staff employees are motivated and happy since they can put their abilities to use. As indicated by the fact that the mean

(3.87) value of utilizing ability is bigger than all other factors, the opportunity to use ability is one of the most crucial factors that makes administrative staff more satisfied and motivated with their work. Jasiyah (2018) identified a direct association between ability utilization and employee work satisfaction and motivation in a previous study. The current study's findings, which reveal that skills have a direct influence on job satisfaction and willingness to work, are validated by Palumbo, (2013) in his previous research.

d. Motivation and Job Satisfaction Reliability (questionnaire)

Cronbach's Alpha is a statistic that is used to assess the internal consistency or reliability of a set of scales (Taber, 2018). Cronbach's Alpha is one method for determining the degree of coherence. Furthermore, the consistency of any dimension is related to the degree to which it is a trustworthy degree of a notion. Alpha is reported to have acceptable values of 0.7 or 0.6 for positive results (Griethuijsen, Haske, Brok, Skinner and Mansour, 2014).

Table 3: Scale of Cronbach's alpha

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

e. Pearson Correlation analysis

A correlation analysis was conducted to determine the association between motivation and job satisfaction. The findings are displayed in Table 4. The correlation coefficient demonstrates the magnitude of the presumed linear relationship between the relevant variables. A correlation coefficient of 0 indicates the absence of a linear association between the two variables, while a value of -1 or +1 signifies a perfect linear relationship.

H0: There exists a significant statistical correlation between the level of employee motivation and work satisfaction among administrative staff.

H1: There is no significant correlation between employee motivation and work satisfaction among administrative staff.

The findings presented in table 4 indicate a statistically significant positive correlation between motivation and job satisfaction. The link between individuals and products is statistically significant ($r=0.695$, $p<0.001$). This confirms the hypothesis (H0). Empirical evidence has firmly established a significant correlation between motivation and job satisfaction.

Table 4: Correlation between work motivation and job satisfaction

		WorkMotivation	JobSatisfaction
WorkMotivation	Pearson Correlation	1	.695**
	Sig. (2-tailed)		<.001
	N	54	54
JobSatisfaction	Pearson Correlation	.695**	1
	Sig. (2-tailed)	<.001	
	N	54	54

** . Correlation is significant at the 0.01 level (2-tailed).

5. Conclusion

The study's findings indicate a strong and significant correlation between work motivation and job satisfaction among the administrative staff at the University. Heightened motivation correlates with heightened job satisfaction. The positive correlation elucidates the nature of the relationship between job satisfaction and motivation. Hence, it is logical to infer that when employees are driven, their level of job satisfaction increases.

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SYSTEMS THINKING IN WORKPLACE HEALTH AND SAFETY: A THEORY AND PRACTICE NEXUS

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Abstract: *This paper undertakes a conceptual overview of system thinking in workplace safety and health with the intent of bridging the gap between theory and practice. It is based on the premise that there has been so much discussed in theory without very little to practice, thus, making the modern workplace more hazardous and challenging. This study relied on existing literature and based on the frame an emerging economy perspective was articulated and discussed. The paper draws from a narrative qualitative approach design. The study concludes that there is more to be done in practice when it comes to workplace health and safety. The reality that modern workplaces evolve from a system view thus demands a holistic approach to viewing workplace safety and health, as it remains foundational to employee retention and effective contribution to the survival of the workplace.*

Keywords: *System thinking, Dynamics, Health and Safety, Theory, Workplace*
Jel Classification: I10, I18, J28, L51, M12, M54, O15

Introduction

In the past, concerns have been raised about the best ways for legislation to impact occupational health and safety (OHS) in the workplace, the relationship between OHS and other administrative functions, whether incident investigation findings contribute to incident prevention, and how or why human behaviour can deviate from norms in organisational operations. Vijaya and Ganesh (2020) claim that the complex systems that constantly emerge in our environment are growing at an unstoppable rate. Stressing that globalisation is creating new, complex ways for our social systems to grow as nations become more interconnected. System after system is created by technological innovation, and as time goes on, these systems become more and more dependent on one another (Internet, GPS, power grid, software APIs). Nations are connected by strong economic feedback loops created by international trade. Changes in one country's policies always have an impact on another. As we speed towards a globalised future, systems, if they were ever isolated, are unavoidably gravitating towards interconnection (Vijaya & Ganesh, 2020). These systems all interact with one another to produce incredibly intricate and unpredictable results. The phrase "systems thinking" is credited to Barry Richmond, a renowned pioneer in the fields of systems dynamics and systems thinking, in 1987. In 1991, he claimed that we need to acquire new learning strategies as our interdependence grows. Merely increasing our level of knowledge about our specific "bit of the rock" is insufficient (Vijaya & Ganesh, 2020, Boulding, 1956). However, to share our specialised knowledge, skills, and experience with "local specialists" from around the globe, we need to establish a common language and structure. Esperanto is required for such a system. Then and only then will we be capable of acting morally. In summary, systems thinking is necessary for interdependency, and without it, the evolutionary path that has led to our emergence from the primordial soup will become less and less feasible.

Recently, the concept of systems has been a valuable tool in the development of responses to these inquiries (Gunnigham & Johnstone, 1999). Maintaining a system's purpose and making sure it adapts to change calls for deliberate effort. Some examples of this include responding to changes in administrative staff, job patterns, or working hours. Systems consist of both constituents and dynamics (between and within the constituents). By employing a set of abilities known as systems thinking, people may be able to get a deeper comprehension of the fundamental causes of these intricate behaviours, which will help them make better

predictions and, in the end, modify their results. The demand for systems thinkers to address these challenging issues is developing as a result of the exponential rise of systems in our environment. This requirement encompasses all facets of life and extends well beyond the fields of science and engineering. More than ever, we need systems thinkers to get ready for a future where everything will have global repercussions and is a more sophisticated, globalised system of systems. This logic makes a compelling case for the idea that everyone who makes decisions ought to be well-versed in systems thinking. According to Hermanus (2007), stakeholder groups, OHS committees, policies, procedures, standards, auditing and monitoring protocols, and performance parameters are typical system components for occupational health and safety. The actions and interactions of these components—which include scheduling, fast incident response, leadership engagement and commitment, consultations and interactions with regulators, and taking action based on audit findings—highlight the dynamics of the systems. A competitive advantage can be gained from well-developed system units, but poor and ineffective system performance is likely to occur in the absence of positive dynamics (such as commitment, involvement, feedback, or responsiveness) (Gunnigham & Johnstone, 1999). Richmond's ideas regarding the critical role that systems thinking will play in addressing the complexity of the twenty-first century are shared by a large number of researchers and systems science experts (Bales, 2017). Over time, it has been increasingly clear that entities and people need to increase their capacity to comprehend complicated systems. There is a growing number of educators who feel that systems thinking is a response to this challenge and that it is more important than ever for the general people to be able to comprehend complexity and systems. There are a great deal more claims similar to this one in the literature. If these experts and leaders in the field are to be trusted, systems thinking is going to be critical to our future.

Systems thinking has recently been demonstrated by OHS laws, workplace initiatives, risk assessments, and accident investigations. According to law enforcement risk management expert Graham (2015), companies need to have sufficient procedures in place to identify and address concerns of the utmost priority. Systems for navigating risk and safety throughout the company are part of this. According to Graham (2015), effective system development and accurate system execution/implementation are necessary for both operational and organisational risk management. He went on to say that almost all organisations that are still in operation are those that are dedicated to their systems. It has been shown that there is still a significant gap between theory and practice, even though

the majority of organisations now see the benefits of using a system thinking approach within their own business. The prevalence of poor workplace health and safety remains high across the nation, particularly in business companies (Graham, 2015). This study is motivated by the tendency and the necessity to bridge the gap in the observed literature that has created a chasm between theory and reality in contemporary organisations.

Objective

illustrate the nexus between system thinking and workplace health and safety management

Review of Related Literature

Theoretical Foundation

The normal accident theory and the Swiss cheese theory serve as the fundamental lenses that are used to evaluate this research. As the foundation that the study benchmarked, this theory offers the study's fundamental basis.

Normal Accident Theory

According to Perrow (1980), accidents are inevitable and should be anticipated in any system that has intimate coupling between its constituent parts and interaction complexity. The hypothesis is predicated on the idea that accidents result from little events that spiral out of control and that individuals make mistakes. According to the normal accident theory, an organization's objective should be to reduce mistakes and errors rather than to entirely prevent them because not all incidents can be predicted, particularly in high-risk industries like security and defence where there are a lot of unknowns. Developing a complete understanding of the causes and effects of accidents and implementing policies and programmes to address them is the key to enhancing safety and minimising injuries, (ibid). This is akin to the risk assessment procedure that law enforcement professionals understand as the detection of potential issues (Graham, 2015). Due to a significant shift, zero-injury goals are now a crucial component of workplace safety policies in many organisations. Instead of creating a supportive environment where workers can get important insights from near-misses and mistakes, zero-injury goals instil dread and worry in them (Merilatt, 2015). As a result, implementing a zero-injury tolerance policy hinders the growth of good safety practices and has unfavourable effects, such as making employees reluctant to report safety concerns for fear of facing disciplinary action. Given the

uncontrollable nature of events, the inherent dangers of a profession, and the possibility of injury from a variety of threats, the Normal Accident Theory offers a framework for management to take into consideration. Improving the safety culture in the workplace requires realising that mishaps, injuries, and fatalities can occur, learning from errors and near misses, and creating policies and programmes that assist in identifying and lowering risks.

The Swiss Cheese Theory

The Normal Accident Theory from the literature is strongly related to the Swiss Cheese theory. It is said or seen that defensive leakage(s) is/are the cause of mishaps. According to Reason's (1990) Swiss Cheese Theory, these leaks happen as a result of impending failures or possible threats that go unnoticed. A police officer who disobeys a mandatory directive, such as wearing a seatbelt or bulletproof vest, or who drives over the speed limit while responding to an emergency call, is considered to have committed an exemplary failure. While management's actions, policies, and procedures create potential risks within an organisational system. A security agency's vehicle operations policy that does not impose penalties or limitations on its employees' inappropriate driving behaviours is an example of a prospective or latent danger condition. Until they combine with an impending breakdown that causes an accident, these potential risks are frequently dormant or passive. When something like this happens, the company investigates the individual as well as the system to determine the source, how to mitigate it, and how to prevent it in the future. According to Graham (2015), there are two reasons why accidents happen: a direct cause and an impending issue that is waiting to happen. He notes that frequently, the organisation tries to place the blame on specific events or actions that happen right before the accident—a process known as proximate cause. An example would be a soldier hurting their knee during defensive tactics training. Additionally, situations in the workplace that employees knew about or should have known about but ignored could be the cause of problems that lie in wait. These conditions are thought to be predictable and predictive. In this instance, training was taking place on a hard area devoid of protective matting when the soldier was hurt. Thus, the occurrence results from a confluence of the immediate cause (soldier sustains knee injury during training) and issues that were lying in wait (inadequate training equipment). The only way to prevent an incident from happening again is to implement efficient control measures, such as procedures and/or policies that deal with the issues that are just waiting to happen and stop them from happening again (ibid).

Conceptual Clarifications

System Thinking (ST)

To successfully create and implement a workplace safety programme, it's critical to comprehend the causes of accidents from both an individual and a process perspective. Understanding the causes and effects of risky workplace behaviours is essential for developing an effective safety management system and culture (Hirsch, 2004). It's critical to comprehend what makes up a system to comprehend the newly popular idea of systems thinking. A system is described by the Merriam-Webster Dictionary as an assembly or collection of related parts that move or function as a unit; closely related, interdependent parts that come together to form a single, cohesive whole. In contrast, the Oxford Dictionary saw it as a collection of interconnected parts that made up a whole. An assembly of connected parts serving a common goal is referred to as a "system." Policies, norms, organisations, people, and machinery are examples of components. However, one crucial feature of systems is their dynamic nature, which means that they alter in response to changes in their constituent parts. The renowned pioneer in the subject of systems dynamics, Barry Richmond, used the phrase "systems thinking" for the first time in 1987. The study and design of the whole as opposed to the components are the main foci of systems thinking. Long-term planning, feedback loops between different components, and collaborative planning or execution of all organisational aspects are characteristics of systems thinking (Graham, 2015). When it comes to complicated difficulties, such as those arising from inefficient coordination among parties involved or occurrences that depend on the actions of others, systems thinking is thought to be most effective. By analysing the interrelationships between the various system components, a systems approach to understanding why incidents occur allows for a full and in-depth investigation of incident causation. According to Marais, Dulac, and Leveson (2004), a systems approach to safety acknowledges that safety is a feature of the system overall rather than a characteristic of its parts. They went on to say that a systems approach examines the organization's problems from a wider angle to understand what went wrong and contributed to the occurrence. Systems thinking differs from classical analysis, which investigates systems by disassembling them into their parts, as noted by Aronson (1999). Instead of the traditional approach of addressing safety in terms of personnel behaviour and a singular focus on specific high-risk areas, this opinion suggests that law enforcement organisations should change the way and manner in which they address safety problems by taking a broader and systematic view of organisational safety. There is no denying the significant social and economic

effects that occupational illnesses and injuries have on workers, their families, and society as a whole. The direct and indirect costs incurred by society as a whole represent the economic effects. A range of 1 to 3 per cent of GDP has been calculated as the total costs of workplace diseases and accidents in different nations (Rikhardsson, 2004; Leigh, Markowitz, Fahs, Bernstein & Landrigan, 1992). Costs for compensation, damages, and work disruption are all considered direct expenditures. The costs of missed livelihoods, dependents' income, and the expenses incurred by families and society as a whole when providing care are all considered indirect expenditures. Although external indirect costs are disproportionately felt by distressed communities, organisations may also experience reputational damage and a decline in capital investment. A safe and healthy workplace is one of the basic expectations for sustainability, as seen from a larger viewpoint of sustainable development; this is the expectation that workplace hazards won't rob workers of their means of subsistence or their level of living. Incidents at work and health risks can have an impact on the environment or public health and safety. These circumstances or elements connect the larger societal agenda for development sustainability with measures to limit occupational health and safety (Hermanus, 2007).

Workplace Processes as Inputs for the Creation of a System Thinking

ST cannot be generated with only resource inputs. This is because resources—whether they be financial, human, technological, or social—never generate capabilities unless they are employed towards a certain goal. Take an accounting firm as an example of a professional service organisation. If its goal is to recognise each employee's unique contribution, it needs to create work environments that inspire and motivate each worker. Talent management as an ST may result from this being made possible by a clearly defined set of goals, planning, and staff incentives (Azadegan, Bush, & Dooley, 2008; Helfat & Peteraf, 2015). Another illustration would be high-tech manufacturing businesses. They rely heavily on ongoing technological advancements, which are critical to their survival. However, to connect them through new routines and cohesively coordinate engineering tasks, their technological resource investments require an integration procedure. In this situation, coordination and integration procedures become crucial. Therefore, in addition to resources, workplace procedures are needed to produce ST. Stated differently, workplace procedures serve as rigid routines that provide resource direction. Furthermore, because workplace procedures allow for systemic resource binding, they hinder competitor replication (Eisenhardt & Martin, 2000). It can be

difficult to implement systemic changes in the workplace and across inter-organizational links when replicating or mimicking processes (Teece & Pisano, 1994). Furthermore, sensing, seizing, and transforming are fundamental workplace learning activities on which ST is by definition based. Therefore, when we talk about processes, we're talking about how things work in the company, or what you could call its routines or patterns of current practice in terms of giving the direction and purpose of the resource. Workplace processes are determined by a firm's resource positions and evolutionary routes, which help to explain the core of the competitive advantage that ST could provide. Workplace procedures therefore act as an input aspect in the development of the ST (Teece & Pisano, 1994).

Environmental Dynamics as Input for the Creation of a System Thinking

How to match a firm's internal resources, procedures, and competencies to the external environment is a crucial problem in the field of strategic management (Li & Liu, 2014). A company's environment is the totality of physical and social elements that are taken into consideration in the decision-making behaviour of individuals in the organisation. The inherent uncertainty brought on by different environmental conditions is known as environmental dynamics. Environmental dynamics are influenced by several actors, including suppliers, competitors, customers, regulators, and new entrants. Wijnbenga and Van Witteloostuijn (2007), for instance, define environmental dynamics as the pace at which customer preferences and organisational products evolve. It is suggested that ST actively combat environmental change, implying that environmental dynamism plays a pivotal role. An ST is a company's capacity for methodically resolving issues, which is shaped by its inclination to recognise possibilities and dangers and to make prompt, market-driven decisions (Barreto, 2010). It is noted that company transformation is a reflection of being responsive to external contexts in an empirical study done among specific enterprises in the United Kingdom. Haier's expansion in China serves as another excellent illustration of how to enable ST to react to various environmental changes. As a result, an ST is developed in businesses in response to a specific change demand that results from environmental dynamics. Theorising environmental dynamics as an input component to an ST makes sense as a result. This reasoning, however, is only applicable in extremely erratic markets when environmental dynamics are important. ST most likely does not form in a comparatively steady environment. Because of the maintenance costs involved, the establishment of ST could be costly or even disastrous in these situations (Schreyögg & Kliesch-Eberl, 2007).

Influence of Environmental Factors/Dynamics on System Thinking

Through adjustments to its heterogeneous structures and in response to changes in the environment, a firm's ST should allow it to adapt to its surroundings and achieve a strategic fit (Teece, 2011). (Schilke, 2014). To adapt to changes in the environment and achieve a state of equilibrium where they can completely respond to environmental dynamics, firms employ a variety of interactions amongst ST. This phenomenon is known as "equifinality" in the literature on systems thinking, where a given end state can be attained via a multitude of possible ways. Equifinality is demonstrated via open systems. Managers of companies, for example, utilise different STs to start responding to external dynamics from different beginning points and follow distinct courses. However, the ST permits equifinality since the objective is to provide a competitive advantage (Eisenhardt & Martin, 2000). A corporation that follows this approach will reach an equilibrium where it will fully understand its economic rationality in markets. Here, "equilibrium" refers to the state of being in balance with the changes in the environment, or fully responding to them. In dynamic markets, however, this equilibrium will only be a transient phenomenon. By reintroducing environmental dynamics, several environmental factors (such as changing consumer demands, governmental regulations, new competitors, and shifting competitor positions) upset the equilibrium (Uotila, 2018). Numerous internal (endogenous) and external (exogenous) elements affect the system's thinking during this process. The system is typically brought into a "far-from-equilibrium" condition by these causes.

Management of Health and Safety System

To get deeper into the details of this discussion, we will examine the notion of a management system. A management system, according to Haight, Yorio, Rost, and Willmer (2014), is a collection of connected parts that are used to create goals and policies as well as how they are to be achieved. Organisational structure, planning duties, practises, procedures, processes, and resources are all included in the management system. According to some, it's a framework and collection of rules, guidelines, regulations, and/or practises that a company uses to carry out tasks effectively and methodically or to accomplish its declared goals. To handle revenue and debt, for example, an organisation may employ accounting and financial management systems. These systems integrate staff, software, and interdependent processes to identify, record, and track revenue/income, issue invoices, and guarantee that the company's debts are paid. Together, the investment, tax, and debt management components of this management system guarantee that the

organization's financial objectives are met. One could contend that a systems thinking approach to management can be categorised according to a shared goal and strategic interdependence, as well as the framework required to guarantee their overall efficacy (Plummer, Strahlendorf & Holliday, 2000). According to Haight et al. (2014), an organization's health, safety, and management system (OHSMS) is considered a component of the management system used by the organisation to create and carry out its occupational health and safety (OH&S) policy and manage risks. Because occupational safety and health hazards involve a complex physical, cognitive, and/or behavioural phenomenon that is evident in both natural and artificial environments, an OHSMS may be direct, precise, and targeted (Plummer et al., 2000). Therefore, a proactive management system that can handle such complexities would be a key component of a targeted and successful mitigation plan. The activities that go into a typical safety and health programme, including behavioural safety observations, safety training, and other safety-based non-conformance activities, can be used as a conceptualization or image of an OHSMS (The US Centres for Disease Control, 2013).

Prevention System

The idea that there is also a prevention system is typically what springs to mind when one hears the term or concept of "health system." The OHS unit in organisations plays a part in educating employees about the components of the workplace preventive system and assisting in the development of better ways to connect the many components to achieve more effective, efficient, and fair health outcomes. According to the US Centres for Disease Control (2013), the public health system is made up of all governmental, corporate, and nonprofit organisations that support the supply and delivery of necessary healthcare services in a community. Similar to this, the Australian public health system is described as consisting of networks, organisations, or groups whose main responsibility is to organise, coordinate, and carry out public health initiatives or schemes (The Australian Prevention Partnership Centre (TAPPC), 2014).

Systems Approach to Prevention

In recent years, a wide range of publications, including books, websites, journal articles, and scholarly articles, have progressively focused on systems thinking. It's also typical to use language informally without consulting definitions. The various ways that academics, professionals, and researchers seem to apply system concepts to prevention are captured in the following.

(1) Applying methodical preventive measures

The process of turning a periodic or one-time programme and investment in public health infrastructure into a continuous pattern of service delivery is implied by this facet of "Being systematic about prevention" (Milat, King, Bauman and Redman, 2012). Changes in fund-raising practice, hiring and assigning of staff, responsibility and reporting standards, and the acquisition of information and data for decision-making could all be part of this. This feature aims to improve accountability, efficiency, and dependability.

(2) Realising that the environments in which preventive action is implemented—such as companies, communities, and schools—are environmental systems

According to Tseng and Seidman (2007), this aspect of the systems approach sees communities, workplaces, and schools as environmental systems unto themselves. By better comprehending the systemic nature of these settings—that is, their interactions and dynamic complexity—safety health prevention practises can be made more effective.

When it comes to health sensitization, environmental practises typically go beyond just acting on several levels. This is because they entail comprehending the general dynamics of the system, figuring out how its constituent parts interact, and speculating on how an intervention can lead to a change at the systems level. Research in this field thus aims to ascertain how an intervention functions in conjunction with the local system (e.g., how it integrates into local customs and discourse), reversing roles and relationships, sharing resources, and replacing previous activities. This is a step up from earlier working approaches that saw workplaces, schools, and communities solely as spaces where individuals might engage and receive prevention intervention techniques. Stated differently, the approach used by Baron, Beard, Davis, Delp, Forst, Kidd-Taylor, and Welch (2014) is that environmental systems thinking aims to fully utilise the power present in the system to create and maintain change processes.

(3) Explicit application of systems ideas and methods to the analysis and enhancement of preventative measures

This expands on the prior classification by incorporating techniques and concepts that were not originally applied in the field of public health. Although ecological or environmental systems thinking has long been important in the field of health promotion, preventionists have only lately begun to develop more

advanced systems techniques. Techniques and approaches from systems thinking have been applied to:

1. Use theory/model approaches to conceptualise the emergence and propagation of public health concerns, viewing them as the result of dynamic interactions between the components of a larger, complex system. Identifying systemic forces that might either enhance or reduce expected benefits is another way to increase the efficacy of a new or existing programme.

2. Plan for both expected and unexpected outcomes so that they can be included in evaluation designs that explain the environments in which policies and programmes are developed. Additionally, methods that illustrate how the dynamics of the local setting may support or contradict the intervention (The Australian Prevention Partnership Centre (TAPPC), 2014).

The Theory and Practice Nexus (An Integration of Academic and Workplace Learning)

Learning from experiences in a real-world context is not the same as learning from experiences in a classroom. For example, the majority of the skills learned during off-campus deployments and placements are behavioural or human relations skills including time management, proper work ethics, interpersonal communication, and the growth of a professional sense (Fleming, Zinn, & Ferkins, 2008). It is generally agreed upon that exposure to both academic and professional environments is optimal for the development of strong professional knowledge, abilities, and attitudes because each has advantages and disadvantages and can even be considered complementary. Despite the abundance of literature on learning in the workplace, there is a lack of research on how to explicitly combine learning from the workplace with learning from academic settings. Examples of such connecting activities are especially hard to come by. This raises the possibility that, in many real-world situations, chances to expand and change the knowledge gained from both contexts are missed. According to proponents of social learning theory, social interaction is essential to learning (Brockbank & McGill, 2007). According to the majority of reflective learning theories, transformative learning requires reflective discourse (Mezirow, 1991). Employees had the chance to consider what they had learned in the learning environment, draw clear connections to the curriculum, evaluate each other's work through semi-structured discussions, and compare and contrast experiences. The seminar changed the students' opinions on the worth of chiropractic practice and reinforced course concepts. Research has indicated that participation in many forms of debate can help people gain a deeper

comprehension of ideas (Back, Arnold, Tulskey, Baile, & Fryer-Edwards, 2003). A deeper comprehension of learning experiences might be attained via group reflections as opposed to solitary contemplation (Johns, 2000). In this instance, talking with coworkers could have helped the employee grasp more ideas about evidence-based practice and the importance of communication in client interaction. The post-placement seminars offered students a highly appropriate platform to contemplate their acquired knowledge and experiences. Additionally, they had the opportunity to exchange ideas and experiences with one another, which was seen as a very beneficial experience—especially by the students who chose not to take part in the abroad placement. The additional knowledge that staff members get from the seminars can be applied to their year-long placement, as well as their community service postings. Therefore, the post-placement seminar consolidates for these workers the process of learning about chiropractic that started in the workplace and was further reinforced during placement. The high proportion of staff seminar engagement provides compelling evidence for the study. However, the results cannot be applied to workers in other organisations because the study only included a small group of people from one particular company. Survey responses regarding how the seminar influenced their thoughts and how chiropractic aligned with their values or interests. Demonstrating the occurrence of certain ideas, practises, and dispositional learning, but not being supported by an objective measurement such as a formal assessment.

Findings

Based on the ethnographic outcome of this study, it is revealed that there exists a nexus between system thinking and the health and safety of workplaces. Furtherance of this result indicates the existence of two links between workplace processes through a thorough analysis of the literature. First, the study conducted by Capaldo (2014), and Saenz, Revilla, and Knoppen (2014) documented procedures that use personnel, facilities, and equipment to conduct a workplace's daily operations. According to Teece (2011), they are operational procedures that assist in transforming workplace resources into desired outputs. Second, because ST is based on behavioural theory, workplace learning and management decision-making processes serve as its foundations (Helfat et al., 2009). This suggests that behavioural processes are input components that help construct workplace safety through ST. Examples of behavioural processes that serve as input elements in the construction of the ST system are presented in recent works by Helfat and Peteraf (2015). A review of the literature reveals several exogenous and endogenous

variables that affect system thinking. According to studies by Bingham et al., 2015; Fainshmidt and Frazier, 2017; and Martin, 2011, endogenous factors include health and safety, workplace culture, firm size, and managerial styles. According to studies by Girod & Whittington (2017), and Li, Wu, & Holsapple (2015), exogenous factors include the influence of competitors, influence from suppliers and customers, market influence, and social, economic, regulatory, and legal factors. Furthermore, a firm's positions, procedures, and trajectories are impacted by these influencing elements (Teece et al. 1997). Firms advance on their ST once again to gain a balance with the new environment as a response to this new stage of environmental dynamics (Newey & Zahra, 2009).

Conclusion

Organisational Health and Safety Management Systems (OHSMS) are gaining traction due to industry-wide initiatives and a substantial legislative consensus. Structures, integration, and a single goal that were constrained by the conventional approach are established by an OHSMS. Agbaeze, Monyei, and Agu (2017) assert that an effective organization's culture should integrate personnel into its system thinking, meaning that any OHSMS's performance is primarily dependent on maintaining a constant organisational culture. This entails robust administrative and managerial backing, along with proactive staff involvement. To be fair, though, none of these are simple to establish, measure, or maintain. After conducting a comparative analysis, it has been determined that an organisation can depend on certain intervention events that utilise pre-existing safety initiatives as the foundation for implementing an OHSMS. It has been discovered that the level of effort put into implementing OHSMS elements can be accurately measured by looking at the percentage of available work hours that are assigned to this task. Furthermore, it has been shown that fluctuations in the level or extent of effort can also affect incident rates (Oyewole, 2009). Measurable intervention activities are those that are part of an OHSMS and also aim to prevent incidents. The importance of OHSMS activity quality measurements for the performance variables has been highlighted by more recent research. Scores on safety training tests, the rate at which inspection non-conformance results are corrected, and the results of perception surveys regarding the status of the organisational culture and its suitability for safer modes of operation are examples of quality metrics to take into account. Whatever method an organisation uses to determine the effectiveness of its OHSMS, it must evaluate those aspects over time to spot trends and create accurate documentation for each OHSMS component and intervention's long-term

consequences. Finally, statistical analysis of these metrics and their impact on incidence rates will be required for validation. Following measure validation, the organisation will be able to forecast injury prevention performance based on OHSMS changes to the allocated or discontinued amounts with demonstrated levels of accuracy of roughly 68% to 70%. Preventing occupational injuries is the primary goal of every safety and health method or plan, and thus much is still evident. Thus, even if experts in Safety, Health, and Environment are currently investigating methods to prove that what practitioners are doing is truly effective, efforts to keep staff safe are worthwhile.

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POLICY (IN)CONSISTENCY AND SUSTAINABLE DEVELOPMENT GOALS IN AFRICA: A SYSTEMATIC LITERATURE REVIEW

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Abstract

The attainment of Sustainable Development Goals hinges on the alignment of SDGs policies. This systematic literature review delves into the intricate relationship between policy inconsistency and sustainable development goals in Africa. Through this study, we unveil the challenges, implications, and the potential pathways that emerge at the intersection of policies and the quest for sustainable development in Africa. Our investigation takes a close look at the diverse dimensions of policy coherence, encompassing economic, social, and environmental considerations, and how these dimensions impact the progress of SDGs. Employing a systematic review approach, we meticulously filtered through 1745 results from databases, selecting 353 articles for a comprehensive analysis. Our findings underscore the significant role that policy inconsistency plays in impeding the attainment of SDGs in Africa. We propose an approach anchored on the alignment of SDGs policies and each goal of SDGs for the attainment of the 2030 SDGs agenda in Africa.

Keywords: *Policy (In)Consistency, Sustainable Development Goals, Institutional Capacity, Stakeholders' Engagements, Africa*

JEL Classification: D70; D72; I30; I38; J18; J38; Q01

Introduction

Sustainable development (SD) is a global priority, and African nations have committed to achieving the SDGs. However, policy inconsistency poses a significant challenge to the efforts geared towards the SDGs. Historically, the need to assess the successes and shortcomings of the Millennium Development Goals billed to formally wind up in 2015 eventually triggered the convening of the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012. The 2012 Rio de Janeiro conference eventually birthed the processes that informed the invention of the SDGs (Mukarram, 2020). The intent, in the aftermath of the conference, was to initiate a set of universal goals that meet the current environmental, economic, political and social needs of the world without compromising the capacity of future generations to meet their own needs. Hence, as a creation of the United Nations General Assembly, the Sustainable Development Goals framework was created, among other things, to provide a global template for the efforts geared towards SD. Since its adoption in 2015, several countries of the world, including African countries, have elected to adopt and domesticate the SDGs, and leverage it as a development policy framework that can catalyze the much-needed development that has eroded their respective domains. Countries such as South Africa, Nigeria, Ghana, Tunisia, Morocco, among others, have, since 2015 shown considerable commitment and drive in the domestication process of the SDGs framework. For instance, within the Nigerian context, SDGs have been included into the Nigerian government's national development goals and programs. The "Economic Recovery and Growth Plan (ERGP) 2017-2020" and its follow-up "Medium-Term National Development Plan 2021-2025" have expressly incorporated the SDGs' concepts, aims, and targets into the Nigeria's strategic development priorities. This is coupled with the creation of the office of the Senior Special Assistant to the President on SDGs (OSSAP-SDGs) that was intended to serve as the coordinating body responsible for mainstreaming, implementing, and monitoring the SDGs across various sectors of the economy. Similarly, within the South African context, the South African government has made extensive efforts to internalize and incorporate the SDGs into its national development framework, through policy alignment, stakeholder engagement, data collection, and public awareness. Specifically, the National Development Plan

(NDP) 2030 initiated by the South African government, which serves as the country's long-term development blueprint, aligns with several SDGs. The NDP-20230 prioritizes poverty reduction, inequality reduction, and sustainable economic growth, closely mirroring the objectives of the SDGs (Mukarram, 2020). This is in addition to the integration of the SDGs into various sectoral policies and strategies. For instance, the National Climate Change Response Policy and the National Biodiversity Strategy and Action Plan adequately align with SDG-13 (Climate Action) and SDG-15 (Life on Land), respectively. Within the Tunisian and Moroccan national domains, it is of similar experiences with regards to intentional efforts from the governments in internalizing the SDGs framework. It is on records that Tunisia has taken a number of steps to incorporate the Sustainable Development Goals (SDGs) into its national development agenda. These initiatives illustrate Tunisia's commitment to solving diverse societal and sustainability issues while adhering to the global framework for sustainable development. For instance, Tunisia has adequately integrated the SDGs into its national development plans, notably the Development Plan 2016-2020 and the Development Plan 2021-2025. Tunisia's development goals are aligned with the SDGs' aims and targets in these programs. Similarly, the adopted National Strategy for Sustainable Development (SNDD) in Tunisia further reflects Tunisia's commitment to the SDGs (Mukarram, 2020).

Further to the aforementioned scenarios of African states' commitment to the ideals of the SDGs, most African states have either individually or within the framework of the African Union supported and advanced the cause of the SDGs from 2015 till. Chief among these commitments to the SDGs was the African Union's Agenda 2063. While being distinct from the SDGs, Agenda 2063 has many of the same ideas and objectives as the SDGs. This agenda has been utilized by African governments to advocate for sustainable development, poverty reduction, gender equality, and infrastructure development, thereby contributing to both continental and global SDGs initiatives. Coupled with Agenda 2063, African countries have considerably taken an active role in the Voluntary National Review (VNR) process, which entails reporting to the United Nations High-Level Political Forum on Sustainable Development on their progress toward SDG implementation. These assessment frameworks allow African countries to share their experiences, difficulties, and best practices, proving their commitment to global collaboration.

Related to the aforementioned, African governments have also developed continental partnerships and cooperation to jointly pursue the SDGs. The African Peer Review Mechanism (APRM), for example, is an AU program that emboldens

African countries to examine each other's progress on governance, socioeconomic development, and other sustainability areas, as a result, contributing to SDG-related goals (Assuad, 2020). They have taken an active role in global climate change accords such as the Paris Agreement. Given how vulnerable they are to climate impacts, several African countries have campaigned for more climate action, adaptation, and resources to address climate-related concerns, in line with SDG 13 (Climate Action). They have facilitated peace and security as a vital component of sustainable development whilst engaging global platforms and peacekeeping missions to address African conflicts and stabilize the regions, thereby contributing to the achievement of SDG 16 (Peace, Justice, and Strong Institutions). These and many others are a handful of how Africa has facilitated and continues to promote the advancement of the SDGs continentally and globally.

In recent times, however, there have been empirical studies of policy inconsistencies within the larger spectrum of policy spaces aimed at actualizing the SDGs in most African countries. It is a given that policy and whatever happens within the policy space would have implications for the actualization of SDGs. Expectedly, studies have accounted for how policy consistency and inconsistency had affected the quest for SDGs. For instance, the contradiction between fossil fuel-based energy strategies adopted by several African countries vis a vis the SDG of climate action remains a global concern. Notwithstanding the international accords like the Paris Agreement, many African countries (Nigeria, South Africa, Angola, among others) continue to significantly subsidize fossil fuels, which contributes to carbon emissions. This discrepancy continues to jeopardize efforts to combat climate change and attain SDG 13 (Climate Action). Similarly, trade regulations that favor short-term economic advantages above fair development have the potential to worsen global disparities. Subsidies that favor developed-country agriculture, for example, can harm developing-country agriculture, undermining SDGs 1 (No Poverty) and 2 (Zero Hunger). Again, most deeply rooted social conventions and societal attitudes have led to inconsistent legislative approaches to gender equality. Some nations may have progressive gender legislation on paper, but experience implementation issues owing to cultural opposition, putting SDG 5 (Gender Equality) at risk.

Despite the desire and willingness of many African states to actualize the ideals of sustainable development, many of their policies have suggested the contrary, with several policies proving to be inconsistent with the quest for sustainable development goals. With abundant signposts and outcomes of several policies inconsistencies geared towards SDGs hitting the rock, there is yet no study that has

attempted to apply SLR in interrogating the nexus between policy inconsistency in Africa and the drive for the SDGs. This study attempts to fill the gap by employing SLR technique to synthesize findings of existing extant studies on the nexus between policy (in)consistency and the drive for SDGs in Africa. Thus, this study focuses on answering the following research questions:

What is the state of extant studies on the relationship between policy (in)consistency and SDGs in Africa?

Which Goals of the SDGs have been investigated within the broader spectrum of policy (in)consistency in Africa, and what is the frequency of these studies in literature, if any?

To what extent has policy inconsistencies affected the quest for SDGs in Africa based on literature as identified by Vosviewer?

What are the research methods in the published empirical studies on policy inconsistency and SDGs in Africa?

Literature Review

One of the first and comprehensive attempts to understudy how policy inconsistency had affected Africa's quest for SDGs was Armah and Baek's "Can the SDGs Promote Structural Transformation in Africa? An Empirical Analysis" in 2015 (Armah & Baek, 2015). For Armah and Baek (2015), SDGs including Structural transformation can only be optimized in Africa when policy interventions adopt an integrated approach to sustainable development that takes into account all of its dimensions. What this signposts, is the primacy of consistent policy direction on the quest for the actualization of SDGs in Africa. In this context, the failures of most African states to provide integrated policy direction and ensure consistent policy framework and direction within the pursuit of SDGs in Africa has been the most fatal albatross of the quest for SDGs. Corroborating Armah and Baeke's position, Jaiyesimi (2016) underscored the importance of consistent policy direction within the frame of concerted efforts and actions geared towards actualizing the SDGs in Africa. Specifically, Rotimi Jaiyesimi highlights that during the MDG period, separate UN agencies and states around the world, particularly African states, assumed ownership of specific objectives and implemented them with little concern for other targets. Some of the often mentioned problems to MDG implementation were a lack of clear advice on policy changes and how the objectives should be reached. The absence of direction led in various viewpoints, disregard for environmental objectives, interpretations, and an avenue for cynicism, particularly in low-resource nations. The lack of clear

guidance resulted in diverse opinions, disdain for environmental objectives, various interpretations, and room for skepticism, particularly in resource-constrained states in Africa (Jaiyesimi, 2016). For Jaiyesimi, achieving the SDGs from goal one to goal sixteen is not as important as how they are achieved (Jaiyesimi, 2016). This therefore brings to fore the place of policy direction which foregrounds the essence of SDG – 17. Through integrated and consistent policy framework harmonization at the level of state's policy formulation and global partnerships as contained in SDG – 17, the actualization of the SDGS would be more sustainable. In his words: the defining challenge of our era is to accelerate development that is economically sound, socially inclusive and environmentally sustainable. The Sustainable Development Goals embody nothing less and represent the best possible opportunity of all the complexities of economic development that we face today. The looming challenges in Africa are wide and deep and will require innovative responses that are embedded in partnerships and rooted in our shared values of justice, fairness, equity and solidarity. The time is now to ensure that Africa is not left behind in achieving the SDGs and the beneficiaries of this will be Africans and the people of the world at large. The measure of our success in implementing the sustainable development goals in Africa will be the attainment of the components of the 17 goals by 2030. It can be done, provided the key factors important for successful implementation of SDGs, high level of political support, ownership by the countries, institutional and human capacity development, inclusive of development process, mutual accountability, and policy reform are established and sustained. The success of the sustainable development goals in Africa will hinge on a credible means of implementation (Jaiyesimi, 2016: 16).

In the same vein, Giovanni Valensisi and Stephen Karingi have both investigated the necessity for a context-specific approach to achieving the SDGs in Africa. For these scholars, the lack of consistency between global goals and regional realities, as well as policy inconsistencies in general, has hampered SDGs implementation in Africa (Valensisi and Karingi, 2017). It's no surprise that they call for regionally customized policy measures that take into account Africa's distinct social, economic, and environmental situations into the mainstream of SDG implementation and policy direction in Africa. Thus, for them, the continent may better handle its growth difficulties and maximize the effect of SDG activities by using a more targeted approach (Valensisi and Karingi, 2017).

Similarly, situating the challenges of SDGs in Ghana within the frame of policy inconsistency, Abane (2018) posits that poverty continues to persist in Ghana and indeed, in Sub-Saharan Africa due to the failure of the African government in

ensuring consistency in the SDGs policy direction. While Ghana, like other African nations, in her view, had made significant progress toward the Sustainable Development Goals, the country's development results have been marked by significant discrepancies in policies relating to diverse natural zones: forest, coastal, and dry savanna sectors. The forest zone, for instance, which has a high agricultural potential, has lower poverty rates, whereas the dry savanna zone, which has poor agricultural output, has concentrated poverty. This was most likely due to government failings caused by policy inconsistencies (Abena, 2018).

Interrogating the relationship between policy inconsistency and SDGs, Ajulor (2018) highlights the difficulties that African countries, notably Nigeria, have in adopting policies to achieve the Sustainable Development Goals (SDGs). Economic recession, crime, corruption, and poor leadership are all challenges that contribute to national insecurity, poverty and lac of SDGs in the African continent. He underlined the need of working together, especially with regards to policy direction and harmonization with a view to addressing the numerous SDGs difficulties in the continent. Ajulor (2018) further examined the challenges related with policy implementation and SDGs in Africa, with a particular focus on Nigeria. He achieved this by leveraging questionnaire survey was and hypotheses testing. The acquired data was analyzed using the Statistical Packages for Social Sciences (SPSS), and key informant interviews were employed as well. Further to his findings, Ajulor (2018), argued that Nigeria and many other African countries are now facing economic downturns as a result of policy implementation and consistency issues. These obstacles, for him, include unrealistic target establishment, political bias, neglecting policy receivers, and failing to account for the policy's surrounding environment, among others. According to this study, Africa should create achievable policy objectives. African nations must begin to rethink the Sustainable Development Goals (SDGs) in order to successfully include policy consistency in all spheres of the SDGs (Ajulor, 2018). Corruption, that has been the bane of policy consistency in Africa, must be given higher priority throughout Africa. Policies developed for execution by African states should ensure policy components and consistency at the state, municipal and other governance levels.

Mohamed Farah and Alvedi Sabani further offer an analysis of the current literature on African SDGs and governance issues in their seminal work entitled "Towards Sustainable Development Goals: A Literature Review and a Conceptual Framework of Governance Issues in Africa". The fundamental goal of their study was to evaluate governance and policy issues within the context of SDGs

implementation and state in Africa. Their study contributed to the corpus of multidisciplinary knowledge on SDGs and policy governance. By incorporating lessons from many multidisciplinary sources, their findings demonstrated the possibility of activating successful SDGs actualization and governance when there is policy consistency. In light of their findings, Farah and Sabani (2019) proposed a functional understanding of governance and policy consistency as a continuous and long-term policy direction that acts as a diverse steering mechanism for the attainment of the SDGs. And, from a practical point of view, their study provides a conceptual framework intended to improve the understanding of how important concerns and impediments affect African governments' ability to coordinate governance-related decision-making.

In another seminal work on SDGs and the primacy of policy consistency, Davies, Nwankwo, Olofinnade & Michaels (2019) further highlight the importance of SDGs in national growth and improving people's lives. X-raying the Nigerian experience, they implicated not just lack of policy inconsistency in the quest for SDGs in Nigeria but also the prevalence of poor infrastructure, weak accountability, insufficient water and electricity supply, limited human capital development, inadequate transportation and communication, illiteracy, and environmental degradation as impediments towards SDG actualization in Nigeria. For Davies et. al. (2019), electricity is quite pivotal in achieving Nigeria's SDGs. Progress toward the various SDG targets is heavily dependent on boosting power access across the country. The SDGs have been approved by UN member nations, including Nigeria, to eradicate poverty, protect the environment, and promote general prosperity via sustainable development. Each objective, which includes topics such as healthcare, clean water, education, innovation, and infrastructure, has targets for the next 15 years. However, power is an essential prerequisite for all 17 SDGs. High energy consumption has always been associated with affluent cultures, and a country's economic viability is dependent on the quality of its electrical supply (Cheng, Liu, Wang, Cui, Li, 2021). For them, despite the fact that they are not mandated, SDGs in Nigeria and most African countries have lacked specific implementation requirements in terms of policy direction and consistency. In Nigeria, successful SDG implementation would therefore be dependent on the government's commitment to ensure policy consistency in finance, fiscal prudence, stable governance, effective policies, and functional infrastructure. This would translate to sustainable benefits that may include increased corporate growth, more employment, educational possibilities, environmental friendliness, and higher financial returns. Beyond the realm of policy, addressing electricity issue, for

Davies et al. (2019), is of paramount necessity given the role electricity plays in economic empowerment and activities of the people. Communication, and adequate rural accessibility are critical in the drive towards SDGs.

While multiple studies have used diverse techniques to investigate the policy inconsistency within the context of SDGs in Africa, Systematic Literature Reviews (SLRs) are rather sparse in this area.[TK1] Hence, this study attempts to extend the frontiers of knowledge on SDGs and policy through the agency of SLR.

Empirical Gap

While extant literature on SDGs and policy in Africa from 2015 to 2022 have focused more on the relationship between SDGs and policy, an apparent gap continues to exist in the body of knowledge with regards to how policy inconsistency, in another concept, contradiction has affected the quest for SDGs in Africa since 2015. In specific, there is a large absence of any systematic review of these policy inconsistencies and contradictions within the context of each goal of the Sustainable Development Goals as enunciated by the United Nations in 2015. This study therefore presents a systematic review of these policy contradictions in Africa within the context of each goal of the SDGs from 2015 to 2022.

Research Methodology

An (SLR) enables the identification, selection, and critical appraisal of research to address clearly formulated research questions, based on a clearly defined protocol. On the other hand, bibliometric analysis is a scientific computer-assisted review methodology that identifies core research themes, and interrelationships between these themes, using publications related to a given topic or field, as data sources. Based on these merits, by leveraging the combined endeavors of bibliometric analysis and SLR, this research seeks to unearth essential research insight on the aforementioned empirical gap - policy contradictions in Africa within the context of the SDGs. The sequential steps of the methodology protocol illustrated in figure 1, are inspired by the strategy by Kılıç Depren *et al.*, 2022. These steps are research scope determination, keywords identification, data collection, bibliometric analysis and knowledge synthesis, and are outlined as shall be illustrated.



Figure 1: Sequential steps of the research methodology protocol

Scope determination

The initial step of an SLR is scope determination of the research area of concern, with an aim to acquire the background context of the research area (Kılıç Depren *et al.*, 2022). Accordingly, given the multidisciplinary manner of this research study as informed by the empirical gap, the scope is thus delineated to: policy inconsistency in Africa and Africa’s drive for the SDGs. This scope thus informs the data collection and analysis steps which are outlined as shall be illustrated.

Identification of keywords.

Upon scope determination, there is need to identify keywords, which facilitate the data collection step (Araujo *et al.*, 2017). A preliminary literature review is thus performed using peer-reviewed articles, to acquire background knowledge on the aforementioned scope, and identify keywords with the highest occurrence. At this stage of preliminary information gathering, publications are not screened for relevance. Accordingly, the identified keywords are *policy, policy inconsistency, SDGs, SDG 1, SDG 2, and SDG 3 to 17*”. Upon identification of the keywords, the keywords are in turn used to develop a keyword search string, which is used for data collection in the form of an advanced SLR, as shall be illustrated. The keywords search string is as follows: TITLE-ABS-KEY (“policy” OR “policy inconsistency” AND “SDGs” OR “SDG 1” OR “SDG 2” OR “SDG 3 to 17”).

Data collection via the advanced SLR

Upon generating the keywords search string, there is need to conduct an advanced SLR for purposes of data collection (Kılıç Depren *et al.*, 2022). The data collected is in the form of peer-reviewed publications, whereby these publications are searched and downloaded from research databases using the keyword search string. The search is limited to journals, conference, and book chapters in the

SDGs, and written in the English language. The databases which are queried as data collection sources, using the keyword search string include Scopus, Science Direct, and Google Scholar. Further, these databases are chosen due to their extensive filtering options, which include author name, publication year, topic area, document type, source title, publishing stage, keyword, affiliation, funding sponsor, source type, and language. Upon querying the databases and obtaining research publications, the PRISMA protocol is adopted to eliminate publications and retain the most relevant ones. This is done via deduplication of the publications using Zotero software, followed by elimination of publications based on title or abstract relevance by the authors of this study. Upon eliminating the publications using PRISMA, the remaining publications are thus utilised for bibliometric analysis as shall be illustrated.

Bibliometric analysis

After obtaining the relevant publications via the SLR, bibliometric analysis is then done to identify the trends and themes in the publications pertaining to the research scope, using VOSviewer analysis software package. Bibliometric analysis is chosen based on its merits of leveraging various statistical and quantitative studies so as to assess bibliometric data. This is done through the assessment of qualitative data from the downloaded research publications, converting it into quantitative data, and thus developing a network diagram of all the related themes of the research scope presented as nodes. Because bibliometric analysis has been successfully applied as a quantitative review methodology in research fields such as the humanities, using data sourced from diverse citation indexes, this justifies its purposeful usage for this study.

Synthesis of results

Informed by the key essential themes generated from the bibliometric analysis, the key trends on the research area are identified via reviewing the publications.

Results

Preliminary literature review informed the keywords for utilisation as a search string in the SLR using Scopus, ScienceDirect, and Google Scholar, as sources of data. The keyword search string of TITLE-ABS-KEY ("policy" OR "policy inconsistency" AND "SDGs" OR "SDG 1" OR "SDG 2" OR "SDG 3 to 17") was obtained using a combination of the keywords with the highest occurrence during preliminary literature review, as aforementioned. Upon querying the databases using this keyword search string, the following was obtained:

- Querying of the databases and exclusion of ineligible publications based on the 2015 - 2023-year range resulted in an initial 1915 publications as follows: 1099 from Scopus, 806 from ScienceDirect and 10 from Google Scholar.
- The combined publications above were imported into Zotero software for de-duplication and retention of versions with more metadata, resulting in 1745 publications.
- Parallel screening based on relevance of the title of the article resulted in 800 publications.
- Parallel screening based on the relevance of the abstract was done by the authors, thus retaining 353 publications for full text review and analysis with VOSviewer.

The summary of this information is as displayed in table 1.

Table 1: Summary of data collected, and data collection sources

Item	Number
Downloaded articles downloaded Scopus	1099
Downloaded articles from ScienceDirect	806
Downloaded articles from Google Scholar	10
Total articles	1915
Total articles after de-duplication via Zotero software	1745
Total articles after exclusion based on article relevance of article title	800
Total articles after exclusion based on relevance of article abstract	353

The 353 articles were imported into VOSviewer software for bibliometric analysis, resulted in the extraction of 121 research themes, densified around 6 colour-coded clusters illustrated in Fig. 1.

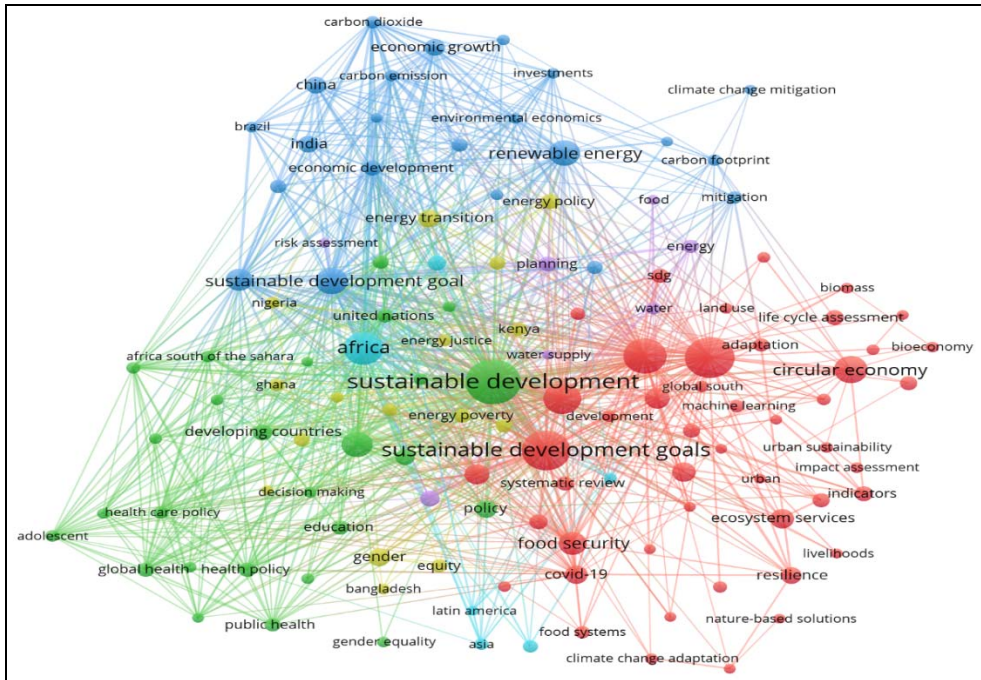


Figure 2

Based on the VOSviewer analysis, the 121 research themes are arranged in hierarchical order premised on the parameter of total link strength, which is a quantitative measure that shows the strength of each of the research themes. Of these 121 research themes, the first 26 are extracted for illustration purposes in table 2. Sustainable development is the strongest research theme, followed by sustainable development goal, sustainable development goals, climate change, sustainability, and the rest of the themes in that order (table 2). This ranking of the 121 elements in hierarchical order based on total nodal strength as enabled by the bibliometric analysis, illustrates the feasibility of adopting a quantitative means of prioritising these elements for modelling purposes of the ecosystem of policy and SDGs. This quantitative manner portrays a true representation of the visibility or presence of these elements, thus providing entry point insight for their capture during the modelling of the holistic ecosystem of SDGs and policy.

Table 2: Top 26 elements of the policy inconsistency and SDGs ecosystem

	Element	Cluster	Total link strength	Occurrences
1	sustainable development	2	1008	303
2	sustainable development goal	3	588	107
3	Sustainable development goals	3	560	119
4	climate change	1	452	188
5	sustainability	1	413	250
6	sdgs	1	357	146
7	sub-saharan africa	2	313	100
8	renewable energy	3	248	103
9	economic development	3	244	34
10	food security	1	241	83
11	planning	5	216	37
12	health policy	2	205	33
13	economic growth	3	196	45
14	poverty	1	188	64
15	health care policy	2	184	25
16	carbon dioxide	3	183	24
17	united nations	2	179	26
18	economics	2	172	28
19	carbon emission	3	171	22
20	policy making	2	163	21
21	global health	2	154	32
22	agriculture	1	148	65
23	energy policy	4	138	37
24	developing countries	2	137	41
25	policy	2	136	47
26	environmental economics	3	136	17

Whilst it is essential to portray the visibility of the elements that constitute the ecosystem of SDGs and policy, it is further essential to portray the interdependencies between these elements. Table 3 illustrates an nxn Adjacency Matrix which maps the elemental pairs via the parameter nodal-to-nodal link strength. This parameter illustrates the extent of the interdependencies between all the elements as per the bibliometric analysis. Only a portion of the entire nxn matrix has been extracted for illustration purposes. For example, the nodal-to-nodal link strength of 45 between sustainable development and sustainable development goals illustrates a strong correlation between these two elements of the model. This strong correlation agrees with the knowledge by Abdulqadir (2023) who mentions the need by global regions to optimise sustainable development policies, in pursuit of sustainable development. The strong correlation of 20 between *sustainable development goal* and *sustainable development goals* attests to the urgent need for a paradigm shift and gravitate towards holistic policy analysis in favour of siloed policy analysis. This is based on the interrelationships between sustainable goals, and thus looking at them in silo underestimates the interrelationships in-between. Overall, the mapping of the elements in the model based on nodal-to-nodal link strength thus provides entry point insight towards the accurate capture and representation of the interdependencies between these elements for modelling purposes.



Table 3: nxn Adjacency Matrix

		Elements																			
Elements		planning	policy	policy making	poverty	poverty alleviation	public health	public policy	remote sensing	renewable energy	resilience	risk assessment	sanitation	sdg	sustainability	sustainability assessment	sustainable consumption	sustainable development	sustainable development goal	sustainable development goals	
	planning	0	5	3	1	1	1	5	2	3	1	2	1	1	2	0	1	28	11	12	
	policy		0	1	1	2	3	2	1	1	2	0	1	1	4	0	0	8	4	7	
	policy making			0	1	0	3	3	1	2	0	1	2	0	2	0	0	16	9	5	
	poverty				0	3	0	2	1	2	0	0	3	1	2	0	0	14	10	9	
	poverty alleviation					0	1	1	0	0	0	0	1	0	1	0	0	5	4	1	
	public health						0	1	0	0	1	0	2	0	2	0	0	11	6	7	
	public policy							0	0	0	0	0	1	1	0	0	0	13	5	5	
	remote sensing								0	0	0	0	0	0	0	0	0	6	2	2	
	renewable energy									0	0	0	0	2	9	1	0	17	10	6	
	resilience										0	0	0	1	7	0	0	4	1	2	
	risk assessment											0	0	1	1	0	0	2	4	1	
	sanitation												0	0	5	0	0	9	5	4	
	sdg													0	5	0	0	5	2	1	
	sustainability														0	3	0	21	11	13	
	sustainability assessment															0	0	6	3	3	
	sustainable consumption																0	2	1	0	
	sustainable development																	0	38	45	
	sustainable development goal																			0	20
	sustainable development goals																				0

Based on the themes illustrated from the VOSviewer analysis, it is essential to synthesise the key research trends and patterns, as informed by the densification of the research themes from the VOSviewer analysis. This synthesis is discussed as shall be illustrated in no particular order.

Thematic Discussion of Findings

Poverty and Hunger

A synthetization of the findings of studies reviewed from 2015 to 2023 from Scopus, Science-direct and Google scholar demonstrates a common position on the severity of poverty and hunger in Africa. Having occurred about sixty-fourth times in the VOSviewer's analysis and of the reviewed studies from 2015 to 2023, it further underlines and demonstrates the import and excruciating effects of poverty and hunger as SDGs 1 and 2 in Africa, most especially, in the sub-Saharan Africa, than any other region (Asongu & Eita, 2023). Although, considerable strides have been made in reducing extreme poverty and hunger, but a large portion of the population still lives below the poverty line as captured in most of the studies (Aiyar & Ebeke, 2020). Challenges implicated in these studies include high inequality, lack of access to quality education, healthcare, and nutritious food (Uzoma & Onor, 2019; Aiyar & Onor). Similarly, as pointed out by Uzoma and Onor (2019), the SDGs, which were intended to be a worldwide endeavor to relieve poverty, achieve a global average performance and bring about overall achievement across countries fell short of the broader goal of eradicating poverty for all, especially in Africa. Arising from this findings, a pertinent question that needs to be asked is: with the SDGs being over eight years old already as of 2023, can poverty and hunger as represented by SDG 1 & 2 initiative succeed across Africa, in the face of burgeoning policy contradictions and inconsistencies in the policy, political, economic, environmental leadership space in Africa? The answer is in the affirmative. With several examples abounding, there is absolutely no doubt that the current drive of African states' drives towards SDGs one and two is headed for the rocks (Koff, 2021, Asongu & Eita, 2023). One of the many instances of policy contradictions within the framework for the actualization of SDGs one and two revealed in the findings was the recent fuel subsidy removal in Nigeria (Asongu & Eita, 2023; Asongu & Nting, 2022). With over 80 percent of the Nigerian population still dependent on the fossil fuel as a source of energy for their economic pursuits, transport needs, among others, the removal of a government subsidy on a basic commodity as fuel on the grounds of corruption in the implementation of the subsidy policy is only bound to result in a predetermined

outcome: the further impoverishment of the poor masses in Nigeria with attendant high cost of living. Little wonder why since the removal of the fuel subsidy, inflation has skyrocketed (See Table 3 below). Corroborating the findings from the SLR, further records have shown that Nigeria's annual inflation rate has increased for the sixth straight month in July 2023, hitting 24.08%, its highest level since September 2005, above expectations of 23.7%. The primary cause of this rise was the growing cost of food and non-alcoholic drinks and other categories such as oil and fats, bread and cereals, fish, potatoes, yam and other tubers, fruits, meat, vegetables, milk, cheese, and eggs. The Consumer Price Index (CPI) also increased by 2.9% month on month, following a 2.1% increase in June. Furthermore, core inflation, which excludes volatile goods, increased somewhat in July, hitting 20.8% from 20.3% in June (Trading Economics, 2023).

Table 3

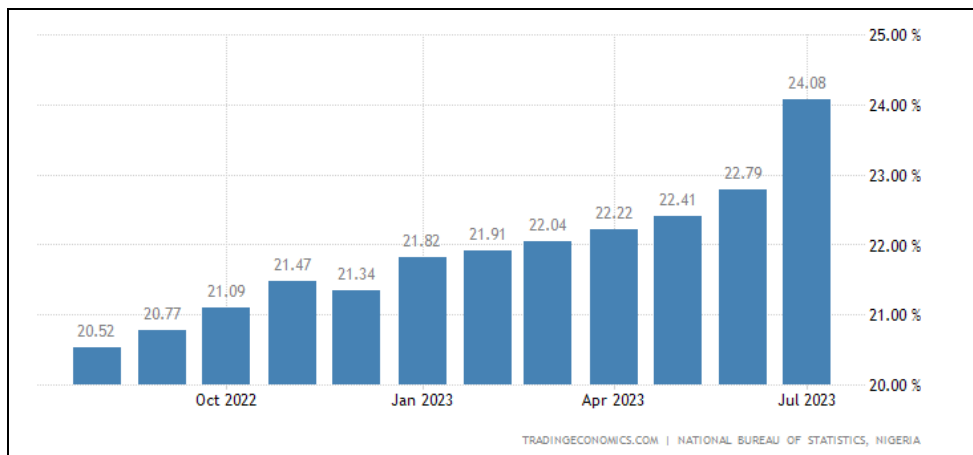


Table 3 further demonstrates the upward rise in inflationary numbers in Nigeria in the month of July, 2023, when the fuel subsidy was sharply removed. Goods that were hither to within the purchasing powers of the masses especially, have become not-for-the-poor goods. As a result of the increment in transportation, majority of the masses in Nigeria are faced the challenge of unaffordable and exorbitant transport fare in Nigeria. The implication of this, put together, is the negative impact the policy contradiction is having on the drive of SDGs one and two. In a nutshell, the more such of these policy paralyses continue to be entertained within

the SDGs framework in Africa, the slimmer the chances for the actualization of SDGs one and two become. Another policy contradiction and inconsistency revealed arising from the synthetization of the findings is in the quest for SDGs, most especially in the area of states pardon of criminal politicians. The relationship between corruption and underdevelopment in Africa is a settled debate in the literature (Asongu & Nting. 2022; Akinrinde and Oyetunbi, 2021). It has therefore become worrisome that despite the latent and manifest declarations and commitment of most African governments towards the actualization of SDGs in Africa, they are still very enmeshed in the heinous act of extending to criminal politicians that have been guilty of corruption related offices by a competent law court state pardon. The state pardon usually accords the convicted criminal immunity from serving jail terms or being liable to other legal consequences of their offences. A case relevant here is the state pardon extended to convicted criminal cum former state governors Joshua Dariye and Jolly Nyame of Plateau and Taraba state in Nigeria (Premium Times, April 14, 2022). One punchy implication of this is the psychological endorsement that usually greets such a reality. Aside the stolen money which would ultimately translate to reduced resources for public service and developmental projects, many public and political servants are eventually emboldened by the possibility of state pardon in the event of court's conviction upon being found guilty. Hence, in its entirety, state pardon amounts to nothing other policy inconsistency on the part of most African governments in their drive for SDGs one and two. By and large, the general consensus from this SLR is the realization that No Poverty and Zero Hunger as represented by SDG 1 and 2 are still very much far away from being a reality. This, therefore, is not unconnected to the history of consistent misplaced policy action in the drive for SDGs in Africa as evidenced by instances of how policy paralysis and inconsistencies has interfered negatively in the wheels of SDGs.

Health and Well-being

One of the dominant themes from the output of the analysis of VOXviewer is Health and Well-being, SDG - 3. Basically, the state of health and the well-being of most African people, as contextualized and revealed by findings of the reviewed studies, have been somewhat unpalatable over time, especially from the beginning from 2015, the year of the commencement of the adoption of the SDGs world over. From child mortality to maternal health and to doctor-patient ratio, the health and well-being status of many African states leave much to be desired. This perhaps accounts for the high rate of studies that have been conducted on health and

wellbeing and the high presence of both health and wellbeing in the VOXviewer's analysis. It further underscores why Adeyeye, Adebayo-Oyetoro, and Tiamiyu (2017) reveal in their studies that several African countries still struggle with high disease burdens, inadequate healthcare infrastructure, and limited access to essential medicines and affordable healthcare system. While in their bid to achieve health and wellbeing among their citizenry - SDG 3, several African governments have identified with the global imperativeness to put in place functional and affordable healthcare system which is the hallmark of SDGs three. For instance, in order to achieve comprehensive vaccination coverage, the Nigerian government has been participating in a number of health immunization initiatives (Mahajan, 2019). The National Program on Immunization (NPI), for example, strives to raise immunization rates for preventable illnesses including polio, measles, Covid-19 and others. In addition, Nigeria has implemented measures to reduce maternal and child mortality. The "Saving One Million Lives" program, for example, focuses on delivering basic medical services to pregnant women and children under the age of five. This is coupled with the intention to revitalize the primary healthcare and other health system through the National Health Insurance Scheme (NHIS). The National Primary Healthcare Development Agency (NPHCDA) also continues to seek to promote community access to basic healthcare services. Also, within the South African context, South Africa has one of the world's highest rates of HIV/AIDS prevalence. To manage the disease and limit its spread, the South African government has undertaken extensive HIV/AIDS awareness programs and offers anti-retroviral medication to those living with HIV at no cost. Despite these commitments and policy directions, the quest for good health and wellbeing - SDG 3 in Africa continues to be implicated by a number of policy inconsistencies and contradictions (Mahajan, 2019). A point of convergence in the reviewed studies through SLR further demonstrates that prominent among these policy contradictions is the issue of continued policy drive of most African political and public servants in patronizing medical tourism away from their home states. For instance, in Nigeria, former president Muhammadu Buhari had earlier, before leaving office, spent 225 days abroad, visiting over 40 countries for medical checkups and tourism (Punch, 4th December, 2022). This absurd policy inconsistency and paralysis is not peculiar to Nigeria. Majority of African policy and political leaders, especially in Sub-Saharan Africa continue to run away from health systems they have provided for the general masses. This therefore suggests that most African policy and political leaders have either paid or continue to pay lip

service to the quest for SDG 3 or constrained, in whatever guise, to see to the actualization of SDG 3 in Africa.

Education

A systematic synthetization of the findings of the reviewed papers here clearly reveal that in many African nations, access to decent education has continued to remain a difficult, elusive and herculean task, particularly for girls and children from underprivileged and underrepresented areas (Santos & Pekkola, 2023; Silva & Oliveira, 2021; Sultana, 2019). While education as SDG 4 has featured in several studies and as captured by the VOXviewer's analysis in this study, in terms of policy, education continues to take the backseat in most African countries. Although, enrollment numbers have increased minimally, challenges such as high school-dropout rates and poor educational quality in almost African countries. For instance, within the Nigerian context, the Nigerian government, in order to guarantee that every child has access to basic education, developed the Universal Basic Education initiative. This policy was to make education free and obligatory for the first nine years of schooling. Coupled with this, the Almajiri Education was also created by the Nigerian government to address the challenges of illiteracy among children in Northern Nigeria whom have been abandoned. It was designed to integrate traditional Islamic education with formal education to improve the children's overall learning experience. Similarly, the South African government has put in place a few policy measures and directions in the drive for SDG 4. Chief among these policies is the Early Childhood Development Policy initiated by the South African government to provide quality early learning experiences to young South African children (Fosu, 2015). This policy has aided in the enrolment of several South African children into early childhood schools, among others. Further to the aforementioned, the government has provided bursaries and scholarships to financially disadvantaged South African students in order for them to pursue higher education. Similarly, Tunisia in the North African region, the Tunisian has encouraged scientific research and innovation in higher education institutions, comprehensively fostering a culture of knowledge creation and dissemination (Fosu, 2015).

However, while the governments of many African states recognize the value of education and have committed to spending a considerable share of the national budget to it, actual funding distribution has continued to frequently fall short of the UNESCO-recommended 25 percent threshold (Asongu & Eita, 2023). This SLR, agreeing with existing studies, believes that with the continued variability and

policy inconsistency in most African states' educational drive, SDG 4, and national educational budget continually falling below the UNESCO-recommended 25%, excellent education programs and SDG 4. With its connection to others themes, education continues to be one of the dominant themes in SDGs both in extant literature and policy framework.

Gender Equality

Gender inequality remains a big concern in Africa, with limited access to economic opportunities, political representation, and education, most especially among women and girls. Although, majority of the reviewed papers pointed out that several African countries have keyed into the ideals of SDG 5 by legislating laws and bringing up policies that can facilitate the prompt actualization of the SDG 5, gender equality within the governance, social, policy, political, economic and environmental space in Africa has remained elusive (Asongu & Eita, 2023). This in part explains why it occurred twenty-five times in the VOSviewer's analysis. In Nigeria, for instance, the Nigerian government has passed legislation and policies to combat violence against women, and notably among these policies, is the Violence Against Persons (Prohibition) Act, which aims to prevent and respond to different types of gender-based violence. Coupled with this, the government has provided enabling environment for civil society in the realm of gender equality advocacy and campaign against Gender-based Violence (GBV) to thrive. Initiatives such as the National Women Empowerment Fund and the intervention programs of the Central Bank of Nigeria strive to give financial assistance and resources to women entrepreneurs and small company owners. This is in addition to the National Gender Policy on women's political representation in political positions which aims to bring about at least 35% representation of women in government positions (Asongu & Eita, 2023). Similarly, in South Africa, the Broad-Based Black Economic Empowerment (B-BBEE) and the National Council on Gender-Based Violence initiatives, for example, contain measures to enhance gender equality by encouraging women's involvement in economic activities and company ownership. In Tunisia and other North African countries, the reality is quite different. Despite the decision of these countries to key into SDG 5 and domesticate it internally, policies that deprive the women the opportunity of participating in politics and other legitimate areas remain in place. For instance, despite the enactment of laws like the Violence Against Persons (Prohibition) Act and the Child Rights Act in African countries, there are inconsistencies in enforcement, and some cultural practices that discriminate against women continue

to persist as alluded to by Ruwanpura (2016). This explains why customary practices that allow for early marriage and restricted educational possibilities for females can contrast laws that create a legal minimum age for marriage and encourage education for girls. In addition, while the right of the women over their body is undeniable, in countries such as Nigeria, a woman is liable to jail term if she engages in abortion, prostitution and others. This contradicts the posture of the African government to SDG 5 and underline many of the contradictions in the drive for SDG 5, as revealed by the synthetization of findings from the reviewed papers (Ruwanpura, 2016; Asongu & Eita, 2023).

Clean Water and Sanitation

Another recurring theme as depicted from the Voxviewer's analysis is the issue of Clean Water and Sanitation. Apparently, its importance extends to all the other SDGs. This is premised on the reality that without clean water and proper sanitation system, life itself becomes hellish and inhabitable for humans. Hence, the recurrence and attention commanded in the Voxviewer's analysis by the theme clean water and sanitation.

Furthermore, access to clean water and sanitation system remains a significant challenge in many African countries, particularly in the sub-Saharan areas. Lack of proper sanitation facilities contributes to health issues. In order to facilitate the drive for SDG 6, many African countries have been initiating policies. As an instance, in South Africa, Operation Phakisa was initiated as a government initiative aimed at fast-tracking the delivery of key services, including water and sanitation (Asongu & Eita, 2023). The policy focuses on addressing infrastructure challenges and accelerating water-related projects in Africa. However, while policies emphasize equitable access to clean water and sanitation for all, disparities persist between urban and rural areas, with urban areas having better access to water and sanitation services (Merry, 2019). Water services have, thus, become costly for most areas in rural African communities while policies aimed at ensuring cheap water services continue to oppose by uneven price structures. Thus, buttressing the existing findings from existing studies.

Renewable Energy

Prominent and highly recurrent in the analytical output of Voxviewer is the theme of renewable energy. This is surprising given the level of indispensability and importance it has assumed in recent times and studies having occurred in the VOSviewer's analysis about one hundred and three times. The challenge of affordable, clean and renewable energy not only in developing regions such as

Africa but also in the western world. Many African countries continue to face energy poverty, with limited access to reliable and clean energy sources (Abdulqadir, 2023). Most studies reveal that efforts to expand energy access and transition to renewable energy are still very low and slow in Africa (Salahuddin, Ali., Sc, Vink & Gow, 2019; Salahuddin, Gow, Ali, Hossain, Al-Azami, Akbar & Gedikli, 2019b). Despite legislation encouraging the use of renewable energy, South Africa's energy system remains strongly reliant on coal, contradicting attempts to create cleaner and more sustainable energy generation (Koff, 2021). Currently, several homes in South Africa are being faced with the load-shedding of electricity power even with the current government policy on affordable, clean and sustainable energy. Similarly, While South Africa has produced an Integrated Resource Plan (IRP) to guide energy development, mismatches between IRP goals and actual investment decisions might stymie clean energy aspirations. In the same vein, the state-owned electrical utility in South Africa, Eskom, has suffered financial challenges in recent times, limiting its capacity to invest in renewable energy infrastructure, which is incompatible with the country's clean energy policy (Buyana, 2020). In Nigeria, the same reality continues to manifest. Despite measures aimed at providing affordable energy with a view to achieving SDG 7, Nigeria has, in contradiction to its commitment to SDG 7, implemented a removal policy on the fuel subsidies which is currently resulting into skewed energy pricing, wasteful energy consumption, and a stifling of investments in energy sources.

Economic Growth and Employment

Supporting one of the dominant themes within the context of SDGs and policy in Africa, the VOSviewer's analysis conducted reveal the primacy of the issue of economic growth and employment. The synthetization of findings of studies in this study further reveal the prevalence of stunted economic growth and high unemployment rate in sub-Saharan Africa (Asongu & Eita, 2023; Rai, (Brown & Ruwanpura, 2019). While policies exist to assist the growth of Small and Medium Enterprises in Africa, uneven access to funding, limited infrastructure, and regulatory impediments have been implicated as impediments towards economic growth and employment in Africa. Again, minimum wage policies in Africa was again identified as another impediment to sustainable economic growth and high employment rate (Asongu & Eita, 2023). An instance projected in Asongu and Eita' study were the minimum wages in South Africa and Nigeria pegged at R25,42 per hour and #33,000 per month respectively (Asongu & Eita, 2023). The

implication of this is that the drive for SDG 8, which is decent work and economic growth, is, figuratively, headed for the south. Hence, no economic growth and sustainable employment can be achieved when the people are not considered worthy of being paid a sustainable living wage.

Industry, Innovation, and Infrastructure

Although recurrent, the state of industry, innovation and infrastructure across Africa remains one of the poorest across the world. Despite being critical for Africa's long-term development and sustainable prosperity, the general consensus in existing studies is the continued lack and absence of adequate industrial capacity and infrastructure in Africa (Abdulqadir, 2023; Muza & Debnath, 2021). Hence, in order to promote economic growth, and strengthen Africa's industrial capacity, investments in technology and transportation networks are required. Similarly, discrepancies in energy supply, since frequent power outages and limited access to electricity hinder industrial progress, aligning with existing studies must be fixed.

Sustainable Cities and Communities

Rapid urbanization in Africa presents challenges related to infrastructure, housing, and environmental sustainability, as revealed by literature (Abdulqadir, 2023; Asongu & Eita, 2023). Informal settlements and inadequate urban planning were implicated by existing studies as common issues facing the realization of SDG 12.

Further, strategies aimed at strengthening transportation systems may be undermined by insufficient investments in public transit, resulting in traffic congestion and air pollution in cities (Tiep, Huan & Hong, 2021). Policies aimed also at safeguarding cultural heritage may be undermined by urban development initiatives that fail to prioritize cultural preservation in Africa, resulting in the loss of historical places and cultural identity.

Climate Change/Action

Africa is particularly vulnerable to the impacts of climate change. Adaptation and mitigation strategies are crucial for building resilience and minimizing environmental risks as revealed by the study of Rosati & Faria (2019). Notwithstanding climate action agreements of African governments, the continuation of fossil fuel subsidies runs counter to attempts to cut greenhouse gas emissions and shift to renewable energy sources. Inconsistent planning of land uses, which encourages urban sprawl and the conversion of green spaces for development, has led to increased carbon emissions and decreased climate

resilience into the environment (McNeill, 2019). Discrepancies between climate policy and those in other sectors such as energy, agriculture, and transportation might stymie a comprehensive strategy to tackling climate change. As revealed by the VOXviewer's analysis, climate change has over time been one of the central and fundamental theme in the parlance of SDGs. This is further buttressed by the over seven hundred linkages between climate change and other important elements of sustainable development. While it has featured in most studies and extant literature, its connection with policy inconsistency has rather been sparsely explored. Rosati & Faria (2019), Abdulqadir (2023) and Asongu & Eita (2023) attempted in their study to look at climate change and action holistically. However, its nexus with policy consistency or inconsistency and vice versa remain yet an underexplored research terrain.

Life Below Water and Life on Land

Although, this was less recurrent in existing studies and from the VOXviewer's analysis, life below water and on land is a very critical and vital element of the United Nations SDGs. Biodiversity loss, deforestation, and unsustainable land use are pressing concerns that have been implicated in existing studies as some of the challenges of actualizing the goal of life below water and on land. (McNeill, 2019). Conservation efforts and sustainable land management practices are important for safeguarding ecosystems and wildlife. Coastal development strategies have affected efforts to maintain marine ecosystems, resulting in habitat destruction, pollution, and biodiversity loss (McNeill, 2019).

Conclusion

This study has underscored the urgent need to address policy inconsistency in Africa in order to ensure the effective realization of the SDGs. It further emphasizes the importance of policy coherence, coordinated governance, and evidence-based decision-making for sustainable development in the quest for SDGs in Africa. By addressing policy inconsistency, African countries can pave the way for a more coherent and integrated approach to achieving the SDGs. Having extended the frontiers of existing literature on SDGs and policy in Africa through the employment of the SLR technique in interrogating the current state of nexus between the two phenomena in Africa, this study has further offered an alternative the empirical research-dominated literature by offering a systematic review and synthetization of the findings of existing empirical studies on SDGs and policy in Africa.

Suggestion for further Studies

This SLR has been able to explore the current state of knowledge on the SDGs and policy in Africa. While the extant literature, as revealed by the SLR, is in no short supply of studies on SDGs and policy from a generic point of view, only a few studies had attempted an exploration of the nexus between SDGs and policy (in)consistency in Africa, especially studies that SLR. This SLR has attempted to fill this gap by employing SLR in exploring the nexus between SDGs and policy (in)consistency. Hence, future studies may consider an empirical research and/or SLR in exploring each goals of the SDGs and policy (in)consistency using either qualitative or computational methods or both.

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STRATEGIC SUSTAINABILITY MANAGEMENT IN MILITARY OPERATIONS: INTEGRATING SOCIAL LOGISTIC

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Abstract:

This academic article explores the imperative of integrating strategic sustainability management principles and social logistics into contemporary military operations. Recognizing the multifaceted nature of global challenges and the evolving landscape of warfare, this study delves into the intersection of sustainability, logistics, and social considerations within military strategies. Through a comprehensive examination of existing literature, case studies, and theoretical frameworks, the article elucidates the potential benefits and challenges associated with integrating sustainability and social logistics in military planning and execution.

The research emphasizes the strategic planning phase as a crucial juncture for incorporating sustainability and social considerations, thereby establishing a foundation for ethically sound and socially responsible military operations.

It underscores the significance of optimizing logistics and supply chain processes to account for environmental impact, community engagement, and cultural sensitivity. By exploring successful examples and lessons learned from past operations, the article aims to provide practical insights for military leaders, policymakers, and strategists seeking to align military endeavors with sustainable and socially responsible practices.

Furthermore, the article investigates the potential benefits, such as enhanced operational efficiency, strategic advantage through positive community relations, and the long-term stability of regions affected by military interventions. However, it also addresses challenges related to balancing competing priorities, navigating cultural nuances, and managing resource constraints in the pursuit of sustainability goals.

In conclusion, this article advocates for a paradigm shift in military operations, moving beyond traditional approaches to incorporate sustainability and social logistics as integral components of strategic planning and execution. By doing so, military organizations can not only fulfill their primary objectives but also contribute positively to global stability, environmental conservation, and the well-being of affected communities. This research aims to stimulate further discourse and practical implementation of strategic sustainability management principles within the realm of military strategy and operations.

Keywords: *strategic sustainability management, military operations, social logistics, integration, environmental considerations, social responsibility, strategic planning, logistics and supply chain, community engagement, cultural sensitivity, operational efficiency, resource constraints, sustainable practices, long-term stability, ethical decision-making, global challenges, positive community relations, military strategies, paradigm shift*

JEL Classification: *Q01, Q50, Q55, Q56, Q58, M00, M15, M21, M38, H56*

Introduction

In an era marked by complex geopolitical challenges, the role of the military extends beyond traditional notions of defense and offense. Contemporary military operations demand a comprehensive reevaluation, one that goes beyond strategic prowess to encompass sustainability and social responsibility. This article delves into the evolving landscape of military strategies, advocating for the integration of

strategic sustainability management and social logistics as integral components of modern military operations (Nilsson, N., & Weissmann, M., 2023).

The imperative to address environmental, social, and economic considerations within military endeavors has never been more pressing. The dynamic interplay between military actions and their broader impact on local and global ecosystems necessitates a paradigm shift in strategic thinking. Our exploration into the realms of sustainability management and social logistics seeks to unravel the potential synergies, challenges, and transformative impacts of integrating these principles into military planning and execution (Boychenko, S., Kuchma, T., & Karamushka, V., 2023).

Traditionally, military strategies have been crafted around geopolitical considerations, force structures, and technological advancements. However, the evolving nature of global challenges demands a broader perspective. By redefining military strategy to include strategic sustainability management, we acknowledge the interconnectedness of military operations with the well-being of ecosystems and communities affected by these operations (Qureshi, A. B., Awan, S. H., Bakhsh, K. S., & Khan, A., 2023).

This article proposes an examination of the intersection between strategic sustainability management and social logistics within military operations. While sustainability management focuses on minimizing environmental impact and resource utilization, social logistics expands the purview to include community engagement, cultural sensitivity, and ethical considerations in the logistical and supply chain processes. Together, they form a cohesive framework that not only addresses the ecological footprint of military activities but also fosters positive relationships with local populations (Shan, S., Mirza, N., Umar, M., & Hasnaoui, A., 2023).

Military operations often unfold in diverse and challenging environments, presenting a unique set of obstacles to the integration of sustainability and social logistics. Balancing the immediate demands of strategic objectives with the long-term consequences on the environment and local communities requires careful consideration. This article aims to elucidate these challenges and explore practical strategies for navigating them successfully (de Bruin, A., Roy, M. J., Grant, S., & Lewis, K. V., 2023).

Our primary objective is to provide a comprehensive understanding of the theoretical foundations and practical implications of integrating strategic sustainability management and social logistics into military operations. Through an exploration of relevant literature, case studies, and strategic frameworks, we aim to

equip military leaders, policymakers, and scholars with the knowledge and insights necessary to implement sustainable and socially responsible practices within military endeavors.

As we embark on this exploration, we invite readers to reconsider the conventional boundaries of military strategy and envision a future where military operations not only achieve strategic objectives but also contribute positively to global sustainability, environmental conservation, and the well-being of affected communities.

1. Theoretical foundations of integrating strategic sustainability management and social logistics into military operations

The theoretical foundations of integrating strategic sustainability management and social logistics into military operations draw from diverse disciplines, ranging from environmental studies and logistics to strategic management and social sciences. This comprehensive understanding involves an exploration of key concepts and frameworks that underpin the integration of sustainability and social considerations into the military domain (Saritas, O., & Burmaoglu, S., 2016).

Systems Thinking and Holistic Approaches involves viewing military operations as interconnected systems with environmental, social, and economic components. Drawing from systems theory, this approach recognizes that actions in one part of the military system can have ripple effects throughout the entire ecosystem (SSI, U., 2023).

Triple Bottom Line (TBL) Accounting evaluates military operations based on three dimensions: economic, social, and environmental performance. Rooted in corporate sustainability, TBL provides a theoretical framework for assessing the overall impact of military actions beyond traditional metrics (Amah, O. E., & Ogah, M., 2023).

Corporate Social Responsibility (CSR) principles involve businesses acting responsibly in relation to society and the environment. Applying CSR to military operations extends the responsibility of armed forces to consider the broader societal and environmental implications of their actions (Oleshko, A., Novikov, D., & Petrivskiy, O., 2023).

Environmental Security theory posits that environmental factors can impact national security. Recognizing that environmental degradation and resource scarcity can be sources of conflict, this theory emphasizes the need for sustainable military practices (Gavenciaková, L., 2023).

Just War Theory provides ethical criteria for the justification of war and the conduct of armed conflict. Integrating just war principles with sustainability management involves considering the ethical and moral dimensions of military actions, including their impact on civilian populations and the environment (Smytsnyuk, P., 2023).

Social Capital and Community Resilience refers to the networks, relationships, and trust within a community. Recognizing the importance of positive relationships with local communities, this theory emphasizes the role of military operations in building social capital and contributing to community resilience (Ravlinko, Z., Shliakhetko, V., Motorniuk, U., Petrukha, N., & Pawera, R., 2023).

Stakeholder Theory asserts that organizations should consider the interests of all stakeholders, not just shareholders. Applied to military operations, this theory emphasizes the importance of considering the interests of various stakeholders, including local communities and the environment (Mahajan, R., Lim, W. M., Sareen, M., Kumar, S., & Panwar, R., 2023).

Sustainable Supply Chain Management involves integrating environmental and social considerations into the procurement and logistics processes. Adapting supply chain sustainability principles to military logistics ensures responsible sourcing, reduced environmental impact, and positive community engagement (Agrawal, V., Mohanty, R. P., Agarwal, S., Dixit, J. K., & Agrawal, A. M., 2023).

Ecological Modernization theory posits that societies can address environmental challenges through technological innovation and social change. Applied to the military, this theory encourages the adoption of sustainable technologies and practices to modernize military operations while minimizing environmental impact (Yu, C., Moslehpour, M., Tran, T. K., Trung, L. M., Ou, J. P., & Tien, N. H., 2023).

Ethical Decision-Making Models provide structured approaches for evaluating the ethical implications of decisions. Integrating ethical decision-making models into military planning ensures a systematic consideration of the ethical dimensions of actions and their consequences.

By exploring these theoretical foundations, military leaders and policymakers can develop a nuanced understanding of how sustainability and social considerations can be woven into the fabric of military operations (Garb, M., 2023).

This comprehensive approach aims to not only enhance the ethical conduct of military activities but also contribute to global sustainability and the well-being of communities affected by armed conflicts.

2. Practical implications of integrating strategic sustainability management and social logistics into military operations

The integration of strategic sustainability management and social logistics into military operations carries a range of practical implications, affecting planning, execution, and the broader impact of military endeavors (Rustad, T. D., 2023). Here are several practical implications that highlight the transformative nature of incorporating sustainability and social considerations into military strategies.

Strategic Planning and Policy Development: Strategic sustainability and social logistics considerations become integral components of military planning and policy development. Military leaders incorporate sustainability goals and community engagement strategies into the development of overarching military strategies (Becker, J., Duda, M., & Lute, D., 2022).

Environmental Impact Assessment: Comprehensive environmental impact assessments are conducted before, during, and after military operations. Military planners integrate environmental experts to assess the potential ecological consequences of military activities and devise strategies to minimize harm (Margulies, P., 2023).

Ethical Rules of Engagement: Ethical considerations are embedded in rules of engagement, guiding military personnel in their conduct during operations. Training programs emphasize ethical decision-making, cultural sensitivity, and respect for human rights as fundamental components of military professionalism (Otieno, G. A. O., & Wanyama, C. O. W., 2023).

Logistics and Supply Chain Practices: Sustainable sourcing, reduced resource consumption, and ethical supply chain practices are prioritized. Military logistics incorporate eco-friendly technologies, ethical procurement practices, and social responsibility criteria in the selection of suppliers.

Community Engagement and Cultural Sensitivity: Proactive community engagement and cultural sensitivity become key elements in military operations. Military units establish channels for communication with local communities, seeking to understand and address their needs and concerns (Bajracharya, R., Shrestha, R., Hassan, S. A., Jung, H., & Shin, H., 2023).

Humanitarian Assistance and Development Programs: Military operations include a focus on humanitarian assistance and development to contribute positively to local communities. Armed forces collaborate with NGOs and international organizations to deliver aid, support infrastructure projects, and

facilitate long-term community development (Koch, E. J., Lopachin, T., Fayos, Z., Lynch, T., Korduba, A., & Barry, M., 2023).

Technology and Innovation for Sustainability: Embracing sustainable technologies becomes a priority for military research and development. Investments are made in green energy solutions, eco-friendly weaponry, and technologies that reduce the environmental footprint of military activities (Reverberi, A. P., Meshalkin, V. P., Butusov, O. B., Chistyakova, T. B., Ferretti, M., Cardinale, A. M., & Fabiano, B., 2023).

Post-Conflict Environmental Rehabilitation: Post-conflict operations include environmental rehabilitation efforts. Military units, in collaboration with environmental organizations, engage in activities such as reforestation, landmine removal, and cleanup of hazardous materials to restore ecosystems (Cooke, S. J., Piczak, M. L., Vermaire, J. C., & Kirkwood, A. E., 2023).

Metrics for Sustainability Performance: Metrics for evaluating the sustainability performance of military operations are established. Key performance indicators (KPIs) include measures of environmental impact, community satisfaction, and the successful integration of sustainability principles. (Fagarasan, C., Cristea, C., Cristea, M., Popa, O., & Pisla, A., 2023).

International Collaboration for Sustainable Peacekeeping: International collaboration on sustainable peacekeeping initiatives is prioritized. Military alliances work collectively to develop and implement best practices for sustainability and social responsibility in peacekeeping operations (Oksamytna, K., 2023).

Training and Education for Sustainable Practices: Military personnel receive training on sustainability and social logistics as part of their professional development. Educational programs incorporate modules on environmental stewardship, cultural awareness, and ethical decision-making into military training academies (Kamilov, F., 2023).

Adaptation to Climate Change in Military Planning: Military strategies account for the impacts of climate change on security. Military planners factor in climate-related risks and vulnerabilities, adapting infrastructure and operations to changing environmental conditions (Omar, M., 2023).

These practical implications underscore the holistic transformation required in military operations when sustainability and social logistics are integrated. By embracing these changes, military organizations can contribute to global stability, positive community relations, and the responsible use of resources while fulfilling their primary objectives.

3. The knowledge and insights necessary to implement sustainable and socially responsible practices within military endeavors

Our examination begins with a comprehensive review of existing literature, spanning disciplines such as environmental studies, logistics, strategic management, and international relations. By synthesizing the latest research findings, we aim to provide a foundational understanding of the theoretical underpinnings and practical applications of integrating sustainability and social logistics into military operations (Gong, D., Tian, J., Hu, W., Dong, J., Chen, Y., Ren, R., & Chen, Z., 2023). Key themes include the environmental impact of armed conflicts, the ethical dimensions of warfare, and strategies for sustainable resource management.

The environmental impact of armed conflicts is a multifaceted and often overlooked dimension of warfare. While the immediate human and economic costs of conflicts are widely acknowledged, the environmental consequences can be severe, pervasive, and long-lasting (Popovych, T., Andrushchenko, L., Olefir, V., Shumilo, O., & Gorinov, P., 2023). Understanding and addressing these impacts are crucial for both humanitarian and ecological reasons. Here, we explore key aspects of the environmental impact of armed conflicts.

Armed conflicts often lead to the depletion and destruction of natural resources. Deforestation, over-extraction of water, and damage to ecosystems result from military activities, affecting biodiversity and disrupting delicate ecological balances (Xu, Y., & Zhao, F., 2023).

Military operations can cause pollution and contamination of air, water, and soil through the release of hazardous substances, including oil spills, chemical weapons, and the burning of munitions. This poses risks to human health and ecosystems, with long-term consequences (Fernandez-Lopez, C., Posada-Baquero, R., & Ortega-Calvo, J. J., 2022).

Conflict zones frequently witness extensive deforestation and habitat destruction due to activities such as bombing, shelling, and the construction of military infrastructure. This leads to the loss of biodiversity and disrupts ecosystems, threatening the survival of numerous plant and animal species (Hirschfeld, K., de Beurs, K., Brayfield, B., & Melkonyan-Gottschalk, A., 2023).

Armed conflicts can exacerbate water scarcity by damaging water infrastructure, contaminating water sources, and disrupting water management systems. This not only affects local populations but can also contribute to prolonged humanitarian crises (Koebele, E. A., & Simpson, K., 2023).

The use of landmines and explosives in conflict areas can result in soil degradation and render large tracts of land unusable for agriculture. Landmines, in particular, pose ongoing threats to both human populations and wildlife (Parakhnenko, V. H., Liakhovska, N. O., & Blahopoluchna, A. H., 2023).

Military activities, especially those involving the combustion of fossil fuels, contribute to greenhouse gas emissions. This can exacerbate climate change, leading to long-term environmental consequences such as altered weather patterns, rising sea levels, and increased frequency of extreme events (de Vries, W., 2022).

Wildlife populations in conflict zones often experience displacement and disruption of migratory patterns. This can lead to changes in animal behavior, loss of habitats, and a decline in biodiversity (White, B. T., 2020).

Armed conflicts can force people to flee their homes, leading to both humanitarian and environmental refugees. Large movements of people place additional pressure on natural resources in areas where displaced populations seek refuge (Gilmartin, N., 2022).

After the cessation of hostilities, there is a need for environmental rehabilitation efforts to address the damage caused during conflicts. This may involve cleaning up contaminated sites, reforestation, and restoring ecosystems to promote long-term sustainability (Mitoulis, S. A., Argyroudis, S., Panteli, M., Fuggini, C., Valkaniotis, S., Hynes, W., & Linkov, I., 2023).

Recognizing the environmental impact of armed conflicts, international conventions and protocols, such as the Convention on Certain Conventional Weapons (CCW) and the Geneva Conventions, aim to limit environmental harm during warfare and promote responsible post-conflict reconstruction (Zheng, F., Xiao, C., & Feng, Z., 2023).

Environmental diplomacy plays a crucial role in addressing the environmental impact of armed conflicts. Collaborative efforts between nations and international organizations are essential for mitigating environmental damage and fostering sustainable post-conflict recovery (Popovych, T., Andrushchenko, L., Olefir, V., Shumilo, O., & Gorinov, P., 2023).

Understanding the environmental impact of armed conflicts is a vital step toward developing strategies for conflict prevention, resolution, and post-conflict rehabilitation that prioritize both human well-being and ecological sustainability. Addressing these challenges requires a holistic approach that integrates environmental considerations into conflict prevention and resolution frameworks, humanitarian efforts, and international diplomacy.

The ethical dimensions of warfare encompass a complex set of principles and considerations that guide the conduct of armed forces, policymakers, and societies during times of conflict. Ethical considerations are deeply intertwined with international law, cultural norms, and moral philosophy. Examining the ethical dimensions of warfare involves addressing issues such as the justifiability of war, the treatment of combatants and civilians, and the broader consequences of armed conflict (SÎRBU, L. , 2023). Here, we delve into key aspects of the ethical dimensions of warfare.

Just War Theory provides a centuries-old ethical framework for evaluating the justifiability of war. It delineates criteria for determining whether a war is morally justifiable, addressing issues such as just cause, proportionality, and the likelihood of success (Braun, C. N. , 2023).

Jus in Bello (Justice in War) principles govern the ethical conduct of parties engaged in war. These include the principles of discrimination (distinguishing between combatants and non-combatants), proportionality (using force in proportion to the military objective), and the prohibition of certain weapons (Rathour, M., 2023).

Ethical considerations demand the protection of non-combatants, including civilians, medical personnel, and prisoners of war. Deliberate targeting of civilians is widely condemned as a breach of ethical norms (Smith, B., 2022).

Military necessity and the principle of minimum force guide ethical decision-making in warfare. The use of force must be necessary for achieving a legitimate military objective, and the minimum force required should be employed to avoid unnecessary harm (Jasper, L., Lokhorst, N., & Rademaker, M., 2023).

As technology advances, the development and deployment of autonomous weapons raise ethical concerns. Issues include the potential for loss of human control, accountability for actions, and the ethical implications of delegating lethal decision-making to machines (Taddeo, M., & Blanchard, A., 2023).

Ethical considerations in warfare are closely aligned with human rights principles and international law. Violations of human rights, such as torture and indiscriminate attacks, are not only illegal but also considered ethically reprehensible (Juwita, R., 2023).

Ethical conduct in warfare prohibits the infliction of unnecessary suffering. This encompasses considerations of both physical and psychological harm to combatants and non-combatants.

Ethical Dilemmas for Soldiers. Soldiers often face ethical dilemmas on the battlefield, such as following orders that may conflict with their moral beliefs,

balancing loyalty to comrades with ethical principles, and grappling with the psychological toll of war (Renic, N. C., & Kaempf, S., 2023).

Ethical considerations extend beyond the battlefield to the post-conflict phase. Rebuilding communities, providing humanitarian aid, and addressing the root causes of conflict are seen as ethical imperatives (Horne, S., James, R., Draper, H., & Mayhew, E., 2023).

Cultural Sensitivity and Respect for the traditions and values of the populations affected by conflict are integral to ethical conduct. Avoiding actions that disrespect or harm cultural heritage is considered ethically important (Abeyasinghe, S., & Leppold, C., 2023).

Ethical frameworks emphasize the importance of accountability and justice for war crimes. Establishing tribunals and mechanisms to hold individuals accountable for violations contributes to the ethical aftermath of conflicts (Kowalczevska, K., 2023).

Public Opinion and Moral Justification play a role in the ethical evaluation of warfare. Wars that lack public support or fail to meet moral justifications may be perceived as ethically questionable (Koshulko, O., 2023).

Navigating the ethical dimensions of warfare requires constant reflection, adherence to international legal frameworks, and a commitment to minimizing harm to both combatants and non-combatants. The evolving nature of warfare and technological advancements continually challenge societies and military forces to reassess and adapt their ethical standards to ensure that conflicts are conducted with the utmost regard for human dignity and justice (Gruszczak, A., & Kaempf, S., 2023).

Strategies for sustainable resource management are crucial for ensuring the responsible use of natural resources while minimizing environmental impact. Whether applied in business, government, or other sectors, these strategies aim to balance resource utilization with conservation efforts to promote long-term ecological stability (Hao, X., Fu, W., & Albitar, K., 2023). Here are key strategies for sustainable resource management.

1. Resource Efficiency and Conservation:

- Principle: Enhance efficiency in resource use and implement conservation practices.

- Implementation: Invest in technologies and processes that optimize resource utilization, reduce waste, and promote conservation practices in production and consumption (Lindkvist, E., 2023).

2. Circular Economy Practices:

- Principle: Transition towards a circular economy model that prioritizes recycling, reuse, and waste reduction.

- Implementation: Design products and systems that minimize waste, encourage recycling, and promote the circular flow of resources to extend product lifecycles (Singh, R., Khan, S., & Dsilva, J., 2023).

3. Renewable Energy Adoption:

- Principle: Shift from non-renewable to renewable energy sources.

- Implementation: Invest in and promote the use of solar, wind, hydropower, and other renewable energy sources to reduce reliance on fossil fuels and decrease environmental impact. (Asif, M. H., Zhongfu, T., Dilanchiev, A., Irfan, M., Eyvazov, E., & Ahmad, B., 2023).

4. Sustainable Agriculture and Forestry:

- Principle: Implement practices that sustainably manage agricultural and forest resources.

- Implementation: Adopt agroecological farming methods, reforestation programs, and sustainable forestry practices to preserve biodiversity, soil health, and ecosystem services (Verma, K., Sharma, P., Bhardwaj, D. R., Kumar, R., Kumar, N. M., & Singh, A. K., 2023).

5. Eco-friendly Technologies:

- Principle: Embrace technologies that minimize environmental impact.

- Implementation: Invest in and adopt eco-friendly technologies, such as energy-efficient machinery, green building practices, and environmentally friendly production processes (Pratap, B., Kumar, S., Nand, S., Azad, I., Bharagava, R. N., Ferreira, L. F. R., & Dutta, V., 2023).

6. Water Conservation and Management:

- Principle: Conserve and manage water resources sustainably.

- Implementation: Implement water-efficient technologies, promote responsible water use in agriculture and industry, and invest in water recycling and purification systems (Nova, K., 2023).

7. Biodiversity Protection:

- Principle: Preserve and protect biodiversity in ecosystems.

- Implementation: Implement conservation strategies, protect natural habitats, and support initiatives that safeguard endangered species and promote ecosystem resilience (Panwar, R., Ober, H., & Pinkse, J., 2023).

8. Corporate Social Responsibility (CSR):

- Principle: Incorporate social and environmental considerations into business practices.

- Implementation: Adopt CSR practices that emphasize sustainable sourcing, ethical production, and environmental stewardship throughout the supply chain (García-Rivas, M. I., Gálvez-Sánchez, F. J., Noguera-Vivo, J. M., & Meseguer-Sánchez, V., 2023).

9. Waste Reduction and Recycling Programs:

- Principle: Minimize waste generation and promote recycling.
- Implementation: Establish waste reduction programs, implement recycling initiatives, and encourage the use of recycled materials in manufacturing processes (Kurniawan, T. A., Othman, M. H. D., Liang, X., Goh, H. H., Gikas, P., Kusworo, T. D., ... & Chew, K. W., 2023).

10. Sustainable Fisheries Management:

- Principle: Implement responsible practices in fisheries to prevent overfishing and protect marine ecosystems.
- Implementation: Enforce catch limits, support sustainable aquaculture practices, and invest in technologies that reduce bycatch and habitat destruction (Arnason, R., 2023).

11. Community Engagement and Education:

- Principle: Involve local communities in resource management decisions and promote awareness.
- Implementation: Engage with local communities, provide education on sustainable resource management, and seek their input in decision-making processes (Ohmer, M. L., Mendenhall, A. N., Mohr Carney, M., & Adams, D., 2022).

12. Government Policies and Regulations:

- Principle: Establish and enforce policies that promote sustainable resource management.
- Implementation: Develop and implement regulations that incentivize sustainable practices, discourage resource exploitation, and penalize environmental violations (Puri, M., Gandhi, K., & Kumar, M. S., 2023).

13. Carbon Offsetting and Climate Action:

- Principle: Offset carbon emissions and contribute to climate action.
- Implementation: Invest in projects that sequester carbon, support renewable energy initiatives, and actively participate in global efforts to address climate change (Miller, L., 2023).

14. Sustainable Urban Planning:

- Principle: Plan and design urban areas to optimize resource use and minimize environmental impact.

- Implementation: Prioritize green infrastructure, energy-efficient buildings, public transportation, and sustainable waste management in urban planning initiatives (Yu, P., Yung, E. H., Chan, E. H., Wong, M. S., Wang, S., & Chen, Y., 2023).

15. Monitoring and Assessment:

- Principle: Regularly monitor resource use and assess the effectiveness of sustainable management practices.

- Implementation: Implement monitoring systems to track resource consumption, evaluate the impact of management strategies, and make data-driven adjustments for continuous improvement (Pacyna, J. M., 2023).

Implementing these strategies for sustainable resource management requires collaboration among governments, businesses, communities, and individuals (Aftab, J., Abid, N., Cucari, N., & Savastano, M., 2023). By adopting these principles, organizations and societies can contribute to the preservation of ecosystems, mitigate environmental degradation, and ensure the availability of resources for future generations.

4. Case Studies

Drawing on a diverse set of case studies from various global contexts, we seek to distill practical insights into the challenges and successes of implementing sustainable and socially responsible practices in military settings. These case studies explore a spectrum of scenarios, ranging from peacekeeping missions to conflict zones, shedding light on the nuanced approaches and lessons learned by military forces engaged in sustainability initiatives. Analyzing real-world applications enables us to identify best practices and potential pitfalls, offering valuable guidance for future military endeavors (Paquay, M., Simon, R., Ancion, A., Graas, G., & Ghuysen, A., 2023).

While comprehensive case studies specifically focused on military sustainability initiatives might be limited, there are instances where armed forces and peacekeeping missions have integrated sustainable practices into their operations (Jalili, D., 2022). Here are a few examples that highlight nuanced approaches and lessons learned:

1. United Nations Mission in Liberia (UNMIL):

- Scenario: Peacekeeping Mission
- Approach: UNMIL incorporated sustainability initiatives by implementing a waste reduction and recycling program. The mission engaged local communities in

waste management projects, contributing to environmental conservation and community development

- Lesson Learned: Community involvement and collaboration with local organizations are essential for the success of sustainability initiatives in peacekeeping missions (Bjarnesen, M., 2023).

2. NATO's Green Defence Framework:

- Scenario: Military Alliance (NATO)
- Approach: NATO has developed the Green Defence Framework, an initiative aimed at enhancing the environmental performance of military activities. This includes reducing energy consumption, adopting renewable energy sources, and implementing sustainable procurement practices.

- Lesson Learned: Military organizations can proactively integrate sustainability into their policies and operations, emphasizing the importance of long-term planning (Barberini, P., 2022).

3. U.S. Department of Defense's Sustainable Range Program:

- Scenario: Military Training Ranges
- Approach: The U.S. Department of Defense implemented the Sustainable Range Program to balance military training needs with environmental conservation. This involved habitat restoration, wildlife management, and sustainable land use planning on military training ranges.

- Lesson Learned: Sustainable practices on military training ranges require a holistic approach that considers both training requirements and environmental preservation (Spencer, S. L. I., 2022).

4. Swedish Armed Forces' Greening the Blue Beret Initiative:

- Scenario: Peacekeeping Mission (Mali)
- Approach: The Swedish Armed Forces, as part of the MINUSMA peacekeeping mission in Mali, initiated the "Greening the Blue Beret" project. It focused on reducing the environmental impact of the mission by optimizing resource use and waste management.

- Lesson Learned: Integrating sustainability into peacekeeping operations requires awareness, education, and the commitment of military personnel (Alvinus, A., Starrin, B., & Larsson, G., 2016).

5. Australian Defence Force's Energy and Water Resilience Program:

- Scenario: Military Operations
- Approach: The Australian Defence Force implemented the Energy and Water Resilience Program to enhance the sustainability of its operations. This

involved investing in renewable energy, improving energy efficiency, and ensuring water conservation measures.

- Lesson Learned: Military organizations can enhance operational resilience by addressing energy and water sustainability, reducing dependence on traditional, resource-intensive practices (Osman, A. I., Chen, L., Yang, M., Msigwa, G., Farghali, M., Fawzy, S., ... & Yap, P. S., 2023).

These examples demonstrate that military forces and peacekeeping missions have started to recognize the importance of sustainability in their operations. While challenges remain, such as balancing mission effectiveness with sustainability goals, these initiatives provide valuable lessons on integrating environmental considerations into military planning and operations. They showcase the potential for armed forces to contribute positively to environmental conservation and community well-being, even in challenging and dynamic scenarios.

5. Strategic Frameworks.

Our exploration extends to the analysis of strategic frameworks that have been developed or adapted to incorporate sustainability and social responsibility into military planning. By dissecting these frameworks, we aim to elucidate the methodologies, metrics, and decision-making criteria that underpin the integration of sustainability principles. This section provides military leaders and policymakers with practical tools for translating theoretical concepts into actionable strategies, fostering a more holistic approach to national defense (Reynolds, D., & Cipler, D., 2023).

Specific detailed examples of analysis of strategic frameworks developed or adapted to incorporate sustainability and social responsibility into military planning were limited. However, the concept of integrating sustainability and social responsibility into military planning has gained traction, and various countries and military organizations have been working on developing such frameworks (Fried, Y., 2023). Here are some general principles and trends that have been observed.

1. NATO and the Green Defence Framework:

- Overview: NATO has been working on the Green Defence Framework, which aims to enhance the environmental performance of military activities.

- Analysis: Researchers and analysts have explored the implications of the Green Defence Framework, assessing how it integrates sustainability into NATO's strategic planning, operations, and procurement practices (Barberini, P., 2022).

2. The Swedish Armed Forces and Environmental Management:

- Overview: The Swedish Armed Forces have developed an environmental management system to address sustainability concerns. This includes considering environmental aspects in military planning and operations.

- Analysis: Scholars and experts have examined how the Swedish Armed Forces' environmental management system aligns with broader sustainability goals and contributes to more responsible military practices (Söder, R., 2023).

3. United States Department of Defense (DoD) and Operational Energy Strategy:

- Overview: The U.S. DoD has implemented an Operational Energy Strategy that includes a focus on energy efficiency, alternative energy sources, and reducing the environmental impact of military operations.

- Analysis: Researchers have conducted analyses of the DoD's Operational Energy Strategy to understand its effectiveness in incorporating sustainability principles and reducing the military's carbon footprint (Strakos, J. K., Quintanilla, J. A., & Huscroft, J. R., 2016).

4. United Nations Peacekeeping and Environmental Mainstreaming:

- Overview: The United Nations (UN) has been working on mainstreaming environmental considerations into peacekeeping operations. This involves incorporating sustainability principles into mission planning and execution.

- Analysis: Scholars and organizations have analyzed the UN's efforts in integrating environmental considerations into peacekeeping, examining the effectiveness and challenges of such initiatives (Scartozzi, C. M., 2022).

5. Australian Defence Force (ADF) and Sustainable Practices:

- Overview: The Australian Defence Force has implemented various sustainability initiatives, including the Energy and Water Resilience Program, to enhance the environmental sustainability of military operations.

- Analysis: Researchers and experts have examined the ADF's sustainability initiatives to assess how they align with broader sustainability goals and contribute to responsible military planning (McCaffrie, J., & Rahman, C., 2023).

These examples indicate a growing recognition of the need for integrating sustainability and social responsibility into military planning and operations. While specific analyses of these frameworks may vary, common themes include assessing the effectiveness of these initiatives in achieving sustainability goals, analyzing challenges in implementation, and exploring the broader implications for military planning and strategy. Ongoing research and analysis in this field contribute to the development of best practices and the refinement of strategic frameworks that balance military requirements with environmental and social considerations.

6. Environmental Considerations in Military Planning

The literature review emphasizes the importance of factoring environmental considerations into military planning. It explores how sustainable resource management, green technologies, and adherence to international environmental agreements can be seamlessly integrated into military strategies without compromising operational effectiveness. Our analysis highlights the potential for military forces to not only mitigate their ecological footprint but also contribute to global conservation efforts (Fouché, D., Smit, H., & Henrico, I., 2023).

Environmental considerations in military planning have become increasingly important as armed forces recognize the impact of their operations on the environment. While specific details of military planning are often classified, some examples showcase efforts to incorporate environmental considerations (Fried, Y., 2023).

1. United States Department of Defense (DoD) and Strategic Sustainability Performance Plan:

- Overview: The U.S. DoD has developed a Strategic Sustainability Performance Plan, which includes considerations for reducing the environmental footprint of military operations.

- Example: The incorporation of energy-efficient technologies, renewable energy sources, and sustainable practices into military installations and operations aligns with the broader goal of reducing the DoD's environmental impact (United States. Department of Defense, & Esper, M. T., 2020).

2. Swedish Armed Forces and Environmental Management System:

- Overview: The Swedish Armed Forces have implemented an environmental management system that considers environmental aspects in military planning.

- Example: The incorporation of environmental impact assessments in mission planning to identify and mitigate potential harm to ecosystems and biodiversity (Söder, R., 2023).

3. NATO's Operational Guidelines for the Environmental Impact of Military Activities:

- Overview: NATO has developed operational guidelines to address the environmental impact of military activities.

- Example: Consideration of the ecological consequences of training exercises, including measures to protect flora and fauna, and minimizing the use of harmful materials during military operations (Farhan, A., Kossmann, S., & van Rij, A., 2023).

4. United Nations Environment Programme (UNEP) and Environmental Mainstreaming in Peacekeeping Missions:

- Overview: The UN, through UNEP, has been working on mainstreaming environmental considerations into peacekeeping missions.

- Example: Incorporating environmental impact assessments in mission planning, including waste management, water conservation, and the responsible use of natural resources in UN peacekeeping operations (Maertens, L., & Shoshan, M., 2018).

5. Australian Defence Force (ADF) and Sustainable Range Management:

- Overview: The ADF has implemented sustainable range management practices to balance military training needs with environmental conservation.

- Example: Consideration of biodiversity preservation and habitat restoration in military training areas, with efforts to minimize the environmental impact of live-fire exercises (McCaffrie, J., & Rahman, C., 2023).

6. Environmental Security Considerations in Conflict Zones:

- Overview: Military planners in conflict zones are increasingly recognizing the link between environmental security and overall stability.

- Example: Integrating assessments of water scarcity, soil degradation, and other environmental factors into conflict analysis, acknowledging that addressing environmental issues can contribute to conflict resolution and long-term stability (Bothe, M., 2023).

7. Military Adaptation to Climate Change:

- Overview: Armed forces are acknowledging the impacts of climate change on security and adjusting military planning accordingly.

- Example: Factoring in the effects of climate change, such as altered weather patterns and increased frequency of extreme events, into strategic planning and infrastructure development (Zielonka, M., 2023).

8. Civil-Military Cooperation for Environmental Stewardship:

- Overview: Collaborative efforts between military forces and civilian environmental organizations for environmental stewardship.

- Example: Joint projects with environmental NGOs to address issues like deforestation, pollution, or wildlife protection in areas affected by military activities (Martinez, R., & Nino, O., 2023).

These examples illustrate how military forces and international organizations are increasingly considering environmental factors in their planning processes. The integration of environmental considerations is seen not only as a responsible practice but also as a strategic imperative for long-term mission success and global security.

7. Ethical Decision-Making and Community Engagement.

Central to our exploration is an examination of ethical decision-making models applicable to military operations. By delving into the ethical dimensions of warfare, we aim to equip military leaders with frameworks for navigating complex moral choices. Additionally, our research investigates the significance of community engagement in conflict zones, emphasizing the importance of building trust and fostering positive relationships with local populations to achieve sustainable outcomes (Sun, X., Qing, J., Shah, S. A. A., & Solangi, Y. A., 2023).

The synthesis of literature, case studies, and strategic frameworks culminates in the development of practical implementation strategies. Tailored for military leaders and policymakers, these strategies offer a roadmap for integrating sustainability and social responsibility into the fabric of military operations. From procurement practices to community outreach initiatives, our insights are designed to empower decision-makers with actionable steps for immediate and long-term implementation (Niyommaneerat, W., Suwanteep, K., & Chavalparit, O., 2023).

Ethical decision-making and community engagement are critical components for military operations, humanitarian efforts, and various organizations. Here are real-life examples that highlight instances of ethical decision-making and community engagement:

1. Community Engagement in UN Peacekeeping Operations (e.g., MINUSCA in Central African Republic):

- Scenario: United Nations Multidimensional Integrated Stabilization Mission in the Central African Republic (MINUSCA).

- Example: MINUSCA has actively engaged with local communities, seeking their input in decision-making processes and collaborating on initiatives for peacebuilding and development. This includes holding town hall meetings, conducting community outreach programs, and involving local leaders in dialogue (Barbelet, V., Soignet, K. M. E., & Yidong, M. C., 2023).

2. Ethical Decision-Making in Disaster Response (e.g., Nepal Earthquake 2015):

- Scenario: Humanitarian response to the earthquake in Nepal in 2015.

- Example: Aid organizations faced ethical dilemmas in allocating resources and prioritizing assistance. Ethical decision-making involved considerations of vulnerability, need, and fairness. Organizations engaged with affected communities to understand their priorities, ensuring that responses were culturally sensitive and aligned with local values (Carrasco, S., Egbelakin, T., & Dangol, N., 2023).

3. Civil-Military Cooperation in Environmental Stewardship (e.g., Baltic Sea Region Military Cooperation on Environmental Protection):

- Scenario: Cooperation among military forces in the Baltic Sea region to address environmental challenges.

- Example: Military organizations collaborated with environmental NGOs and local communities to address issues like marine pollution, habitat preservation, and sustainable resource management. Ethical decision-making involved recognizing the shared responsibility for environmental stewardship and engaging with communities to understand their environmental concerns (Wilén, N., & Strömbom, L., 2022).

4. Ethical Decision-Making in Counterterrorism (e.g., U.S. Military Operations against ISIS):

- Scenario: U.S. military operations against the Islamic State of Iraq and Syria (ISIS).

- Example: Ethical decision-making was crucial in determining rules of engagement, minimizing civilian casualties, and avoiding harm to non-combatants. Community engagement involved working with local populations to gather intelligence, build trust, and address concerns, contributing to more effective and ethical military operations (Boyle, M. J., 2022).

5. Military-Civilian Collaboration in Conflict Resolution (e.g., Colombia Peace Process):

- Scenario: Peace process in Colombia to end the armed conflict with the Revolutionary Armed Forces of Colombia (FARC).

- Example: The Colombian government engaged with various stakeholders, including local communities and indigenous groups, to ensure their perspectives were considered in the peace negotiations. Ethical decision-making involved addressing historical grievances, promoting justice, and fostering reconciliation (Khan, S. A., 2023).

6. Ethical Decision-Making in Humanitarian Aid Distribution (e.g., Syrian Refugee Crisis):

- Scenario: Humanitarian response to the Syrian refugee crisis.

- Example: Humanitarian organizations faced ethical dilemmas in resource allocation and aid distribution. Ethical decision-making involved considering vulnerability, needs, and the protection of marginalized groups. Community engagement included working with local leaders and organizations to understand cultural nuances and deliver aid effectively (Promsopha, G., & Tucci, I., 2022).

7. Military-Civilian Partnership in Post-Conflict Reconstruction (e.g., Afghanistan):

- Scenario: Post-conflict reconstruction efforts in Afghanistan.

- Example: Military forces engaged with local communities in rebuilding infrastructure, providing healthcare, and supporting education. Ethical decision-making included respecting cultural norms and collaborating with community leaders to ensure projects met the needs of the population (Altınçelep, B., 2023).

These examples illustrate the diverse contexts in which ethical decision-making and community engagement play pivotal roles. Whether in peacekeeping operations, disaster response, environmental conservation, or conflict resolution, the integration of ethical considerations and engagement with local communities is essential for building trust, ensuring legitimacy, and achieving sustainable outcomes.

Through this multifaceted exploration, our objective is to contribute a robust body of knowledge that not only enriches academic discourse but also serves as a practical guide for those at the helm of military decision-making. By bridging theory and practice, our research endeavors to foster a new era in which military operations are synonymous with environmental stewardship, social responsibility, and a commitment to a more sustainable and secure world.

Conclusion

The article "Strategic Sustainability Management in Military Operations: Integrating Social Logistics" delves into the theoretical foundations and practical applications of integrating sustainability principles and social logistics into military planning and operations. The exploration encompasses a wide spectrum, ranging from peacekeeping missions to conflict zones, emphasizing the need for a holistic approach to national defense that considers environmental impact, social responsibility, and long-term sustainability.

The theoretical foundations are rooted in concepts such as just war theory, ethical decision-making, and the integration of environmental considerations into military planning. Drawing on relevant literature, case studies, and strategic frameworks, the article establishes a framework for military leaders, policymakers, and scholars to navigate the complexities of incorporating sustainability and social responsibility into military endeavors.

Key themes explored include the environmental impact of armed conflicts, the ethical dimensions of warfare, and strategies for sustainable resource management. Case studies from various global contexts illustrate nuanced approaches and lessons learned by military forces engaged in sustainability initiatives. Practical examples highlight the integration of renewable energy sources, circular economy practices, and community engagement initiatives within military operations.

The article underscores the paradigm shift required in military operations, moving beyond traditional notions of national defense to embrace sustainability as an integral component.

Ethical considerations are paramount in military planning, necessitating a commitment to just war principles, protection of non-combatants, and responsible decision-making in conflict scenarios.

Acknowledging the environmental impact of armed conflicts, military organizations must adopt sustainable practices, ranging from eco-friendly technologies to biodiversity protection and circular economy principles.

Effective military operations integrate community engagement as a fundamental aspect. Collaborating with local populations ensures cultural sensitivity, builds trust, and fosters partnerships for sustainable development.

The analysis of strategic frameworks, including those developed by international organizations and individual military forces, reveals the evolving nature of sustainability integration. Case studies provide tangible examples of successful initiatives and lessons learned.

Sustainability initiatives contribute to operational resilience, enhancing the adaptability of military forces to changing environmental dynamics, resource constraints, and global challenges.

Emphasizing the interconnectedness of global security and sustainability, the article advocates for international collaboration, diplomatic engagement, and adherence to legal frameworks that promote responsible warfare and environmental protection.

The article calls for ongoing education and training for military personnel to instill a culture of sustainability, ethical decision-making, and community engagement at all levels of command.

In conclusion, the article entitled "Strategic Sustainability Management in Military Operations: Integrating Social Logistics" offers a comprehensive guide for military leaders, policymakers, and scholars navigating the complex terrain of sustainability integration. It asserts that a commitment to environmental responsibility, ethical conduct, and community collaboration is not only imperative for the well-being of the planet but also foundational for the long-term security and success of military endeavors.

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SUSTAINABILITY 2.0: THE ROLE OF NEUROMARKETING AND ORGANIZATIONAL BEHAVIOUR

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Abstract:

The accelerating pace of environmental degradation and societal challenges necessitates innovative approaches to sustainability. "Sustainability 2.0" represents a paradigm shift that inter-twines neuromarketing and organizational behaviour, unlocking new avenues for fostering sustainable practices. This article explores the intricate relationship between these two fields, dissecting how insights from neuroscience and organizational dynamics can steer society towards a more sustainable future.

The first dimension of Sustainability 2.0, examined through the lens of neuromarketing, delves into the neuroscience of consumer decision-making. By decoding the neural processes underpinning sustainable choices, businesses gain a nuanced understanding of consumer behaviour, enabling the development of products and communication strategies that resonate authentically with eco-conscious individuals.

On the organizational front, the article investigates the role of organizational behaviour as a catalyst for sustainable cultures. Leaders are

pivotal in this transformation, driving corporate practices that prioritize environmental stewardship and social responsibility. The integration of sustainability into organizational DNA is explored, emphasizing the role of positive organizational behaviour in shaping a workforce committed to sustainable practices.

This article not only charts the current landscape but also navigates the potential trajectory of Sustainability 2.0. Data-driven insights, behavioural economics, and technological advancements emerge as key components shaping this transformative alliance. The exploration of practical applications and ethical considerations provides a comprehensive view of the challenges and opportunities inherent in this convergence.

As the global community stands at the intersection of environmental responsibility and market dynamics, Sustainability 2.0 offers a roadmap for individuals, businesses, and policymakers. By inter-twining neuromarketing and organizational behaviour, we aim to illuminate the path towards a future where sustainability is not merely an aspiration but an intrinsic and neurologically resonant aspect of our collective consciousness.

Keywords: *Sustainability 2.0, Neuromarketing, Organizational Behaviour, Environmental Stewardship, Sustainable Practices, Consumer Decision-making, Corporate Culture, Positive Organizational behaviour, Leadership in Sustainability, Sustainable Cultures, Conscious Consumerism, Behavioural Economics, Data-driven Insights, Ethical Considerations, Technological Advancements, Sustainable Product Design, Employee Engagement, Social Responsibility, Corporate Practices, Future Prospects*

JEL Classification: *Q01, M31, D83, D21, M37, O31, D91*

Introduction

In the era of unprecedented environmental challenges and heightened global awareness, the intersection of sustainability, neuromarketing, and organizational behaviour emerges as a pivotal arena for transformative change. Dubbed as "Sustainability 2.0," this paradigm shift represents a fusion of cutting-edge insights from the realms of neuroscience, marketing, and organizational dynamics, aimed at catalysing a sustainable future.

Sustainability 2.0 acknowledges that addressing environmental and social issues requires more than just traditional approaches. It demands a deeper understanding of human behaviour and organizational culture. This article delves into the

synergistic relationship between neuromarketing and organizational behaviour, exploring how their convergence can propel sustainable practices to new heights.

The Neuromarketing Lens: Decoding Sustainable Choices. Neuromarketing, a discipline rooted in the exploration of brain responses to marketing stimuli, unveils the intricate tapestry of consumer behaviour. As individuals navigate an increasingly complex marketplace, understanding the neurological underpinnings of their choices becomes paramount. In Sustainability 2.0, neuromarketing serves as a compass, guiding businesses toward strategies that resonate with consumers on a profound level. From eco-friendly product design to compelling sustainability narratives, neuromarketing insights empower businesses to align their offerings with the evolving values of conscious consumers. By peering into the neural landscapes of decision-making, companies can craft messages that not only capture attention but also foster genuine connections with individuals committed to sustainable living.

Organizational behaviour: The Catalyst for Sustainable Cultures. Within the corporate ecosystem, the behaviour of organizations plays a pivotal role in shaping societal and environmental outcomes. Sustainability, as a core value, transforms from a mere checkbox on corporate agendas to an integral aspect of organizational DNA. Through the lens of organizational behaviour, Sustainability 2.0 examines how businesses can cultivate cultures that prioritize environmental stewardship and social responsibility. Employee engagement emerges as a linchpin in this process, where organizations leverage positive behavioural practices to inspire and empower their workforce. Leaders, as architects of corporate culture, become champions of sustainability, guiding their teams towards a shared vision of responsible business practices.

Charting the Course for Sustainability 2.0. As Sustainability 2.0 unfolds, the integration of neuromarketing and organizational behaviour offers a roadmap for businesses and individuals alike. The article navigates the potential of this interdisciplinary approach, exploring how data-driven insights, behavioural economics, and technological innovation can propel us towards a more sustainable and socially conscious future.

Join us on a journey through the uncharted territories of Sustainability 2.0, where the convergence of neuroscience and organizational dynamics is reshaping our understanding of sustainable practices. In the following sections, we will delve deeper into the practical applications, ethical considerations, and future prospects of this transformative alliance, paving the way for a world where sustainability is not just a goal, but a collective and neurologically resonant reality.

The convergence of neuroscience and organizational dynamics

The convergence of neuroscience and organizational dynamics represents a groundbreaking synergy that is fundamentally reshaping our understanding of sustainable practices. This interdisciplinary alliance transcends traditional boundaries, offering novel insights into the complex interplay between human cognition and the structures that govern our workplaces.

Neuroscience, with its ability to unravel the intricacies of the human brain, provides a profound lens through which we can comprehend the motivations and decision-making processes that underlie sustainable behaviours. (Nilashi, M., Yadegaridehkordi, E., Samad, S., Mardani, A., Ahani, A., Aljojo, N., ... & Tajuddin, T. , 2020) By delving into the neural mechanisms associated with environmental consciousness, neuroscience equips us with a deeper awareness of why individuals embrace sustainable practices and how these behaviours can be nurtured and sustained.

Simultaneously, organizational dynamics, the study of how individuals interact within the organizational context, becomes a key player in this narrative. As sustainability takes centre stage in the ethos of modern organizations, understanding how these principles permeate through the fabric of workplaces becomes imperative. Organizational behaviour, leadership styles, and corporate cultures are dissected to discern their role in fostering or hindering sustainable practices. (Bhardwaj, S., Rana, G. A., Behl, A., & de Caceres, S. J. G. , 2023)

The amalgamation of these disciplines transcends theoretical frameworks, finding practical applications in diverse spheres. From shaping marketing strategies that resonate with environmentally conscious consumers to influencing corporate policies and employee engagement initiatives, the convergence of neuroscience and organizational dynamics becomes a catalyst for tangible, positive change.

This synergy is not merely an academic exploration. It signifies a paradigm shift in how we approach sustainability. It heralds an era where our understanding of sustainable practices is not confined to ecological models alone but extends to the very roots of human cognition and organizational structures. As we navigate the complex terrain of Sustainability 2.0, this convergence becomes a guiding light, illuminating a path towards a future where sustainability is not only embraced but deeply ingrained in our collective mindset and professional endeavours. (Liu, Y., Zhao, R., Xiong, X., & Ren, X. , 2023).

Practical applications of the convergence of neuroscience and organizational dynamics that is reshaping our understanding of sustainable practices

The practical applications of the convergence of neuroscience and organizational dynamics in reshaping our understanding of sustainable practices are multifaceted, influencing various aspects of business and decision-making. Here are several key practical applications:

Tailored Sustainability Communication - Neuro-Informed Messaging: Understanding how the brain processes information allows for the creation of sustainability messages that resonate with individuals on a neurological level. This can lead to more effective communication strategies that evoke positive emotional responses and increase engagement with sustainable practices.

Product and Service Design - Neurodesign Principles: Incorporating neuroscientific insights into the design process can result in products and services that align with consumers' innate preferences. (Ćirović, M., Dimitriadis, N., Janić, M., Alevizou, P., & Dimitriadis, N. J., 2022). This can include sustainable product features that appeal to sensory and emotional responses, making eco-friendly choices more attractive.

Employee Engagement and Leadership - Neuroleadership for Sustainability: Applying neuroleadership principles can guide organizational leaders in fostering a culture of sustainability. Understanding how the brain responds to different leadership styles enables the promotion of positive organizational behaviour, encouraging employees to embrace and contribute to sustainable initiatives.

Decision-Making Processes - Neuro-Informed Decision-Making: Insights from neuroscience can inform decision-making processes related to sustainability at both individual and organizational levels. This includes understanding cognitive biases that may hinder sustainable choices and implementing strategies to overcome these biases.

Training and Education Programs - Neuroeducational Approaches: Incorporating neuroeducational principles into sustainability training programs can enhance learning and retention. This involves tailoring educational content to align with how the brain processes and retains information, fostering a deeper understanding of sustainable practices among employees. (Sharma, R. R., Kaur, T., & Syan, A. S., 2021).

Corporate Culture Transformation - Organizational Neuroplasticity: Applying the concept of neuroplasticity to organizations suggests that they can adapt and change. Organizations can leverage neuroscience insights to facilitate cultural

shifts, embedding sustainability into the core values and behaviours of the workforce.

Performance Metrics and Evaluation - Neuroscientific Evaluation Metrics: Developing metrics informed by neuroscience can provide more accurate assessments of the impact of sustainability initiatives. This goes beyond traditional key performance indicators (KPIs) to include measures that gauge neurological responses and behavioural changes. (Halkiopoulou, C., Antonopoulou, H., Gkintoni, E., & Aroutzidis, A., 2022, April).

Innovation and Problem-Solving - Neuro-Inspired Innovation: Neuroscience can inspire innovative problem-solving approaches for sustainability challenges. This might involve encouraging divergent thinking and fostering a culture that values creativity and adaptability in addressing environmental and social issues.

Consumer behaviour Analysis: - Neuroanalytics for Market Research: Utilizing neuroanalytics in market research allows for a deeper understanding of consumer preferences and motivations. This information can guide businesses in developing sustainable products and services that align with consumers' neurological responses (Siddique, J., Shamim, A., Nawaz, M., & Abid, M. F. , 2023).

The practical applications of this convergence extend beyond theoretical frameworks, offering tangible strategies for organizations to enhance their sustainability efforts. By integrating insights from neuroscience into organizational practices, businesses can create a more sustainable future while meeting the evolving needs and expectations of consumers and employees. (Naim, A. , 2023).

Now let's explore real-world examples for each of the practical applications mentioned.

1. Tailored Sustainability Communication. Coca-Cola introduced PlantBottle Technology, a sustainable packaging initiative. The company leveraged neuroscience insights to design marketing campaigns that emphasized the eco-friendly aspects of PlantBottle, tapping into consumers' emotional responses to sustainability. This approach aimed to make the sustainable choice more appealing by connecting with consumers on a deeper level. (Mehmet, B. A. Ş., TARAKÇI, İ. E., & ASLAN, R. (Eds.), 2023)

2. Product and Service Design. Tesla's Electric Vehicles (EVs) are designed with neurodesign principles in mind. The sleek and high-performance characteristics of Tesla cars appeal to consumers' sensory and emotional responses. By integrating sustainability into the design of attractive and technologically advanced electric vehicles, Tesla has successfully shifted perceptions and preferences in the automotive industry. (López, J. L. P., & Monroy, C. R. , 2023)

3. Employee Engagement and Leadership. Unilever's Sustainable Living Plan is led by CEO Paul Polman, who embraced a neuroleadership approach. Polman's leadership style emphasizes purpose-driven decision-making and encourages employees to align with the company's sustainability goals. This approach fosters a positive organizational culture that values sustainability and engages employees in collective efforts to achieve environmental and social targets.

4. Decision-Making Processes. Patagonia's Common Threads Initiative is a sustainability program that encourages customers to buy used Patagonia products or trade them in for store credit. This decision to promote reuse aligns with insights from neuro-informed decision-making, recognizing that individuals often value familiar and trusted brands. By creating a circular economy model, Patagonia addresses both environmental concerns and consumer decision-making patterns.

5. Training and Education Programs. Interface's Sustainability Training - Interface, a global carpet tile manufacturer, implemented sustainability training programs using neuroeducational approaches. The company designed training materials that align with how the brain processes and retains information, making the learning experience more engaging and effective. This has contributed to a more informed and environmentally conscious workforce.

6. Corporate Culture Transformation. Google's Focus on Sustainability - Google has embraced sustainability as a core value, showcasing organizational neuroplasticity. The company's commitment to renewable energy, waste reduction, and carbon neutrality reflects a cultural shift toward sustainability. Google's emphasis on innovation and adaptability aligns with neuroscience principles, creating a corporate culture that values and embeds sustainability.

7. Performance Metrics and Evaluation. SASB (Sustainability Accounting Standards Board) Standards - SASB develops industry-specific sustainability accounting standards that go beyond traditional financial metrics. These standards are informed by neuroscientific evaluation metrics, incorporating measures that assess the impact of sustainability initiatives on both financial and non-financial aspects, such as social and environmental performance.

8. Innovation and Problem-Solving. Circular Economy Initiatives - Companies like Philips and Adidas have embraced neuro-inspired innovation by adopting circular economy models. These companies are rethinking product lifecycles, designing products for disassembly and recycling. This approach requires innovative problem-solving to address sustainability challenges and aligns with neuroscientific principles by encouraging creative thinking and adaptability.

(Constantinescu, M., Orindaru, A., Pachitanu, A., Rosca, L., Caescu, S. C., & Orzan, M. C., 2019)

9. Consumer behaviour Analysis. Beyond Meat's Marketing Strategy - Beyond Meat, a plant-based meat substitute company, employs neuroanalytics in its market research to understand consumer preferences. The company's marketing strategy focuses on highlighting the sensory aspects of its products, appealing to the taste and texture preferences of consumers. This neuroanalytic approach helps Beyond Meat effectively position its sustainable products in the market.

These real examples showcase how the convergence of neuroscience and organizational dynamics is being applied in diverse industries to drive sustainability initiatives and reshape practices.

Ethical considerations of this transformative alliance

The convergence of neuroscience and organizational dynamics in the context of reshaping our understanding of sustainable practices raises important ethical considerations. Here are some ethical considerations, along with real-life examples that illustrate these concerns.

Privacy Concerns in Neuromarketing. In neuromarketing, the use of brain-imaging technologies to understand consumer preferences raises privacy concerns. If companies collect and analyse neural data without clear consent or proper safeguards, it can lead to ethical issues. For instance, if a retail store uses neuromarketing techniques without transparently informing customers, it could be seen as an invasion of privacy.

Manipulation of Consumer Behaviour. Online platforms and social media companies often use neuroscientific insights to optimize the design of interfaces and content delivery. However, the intentional design of these platforms to trigger specific neural responses for prolonged engagement raises ethical questions. For instance, techniques that exploit psychological vulnerabilities to keep users scrolling may be seen as manipulative and ethically problematic.

Neuroethics in Employee Engagement. Implementing neuroleadership principles for sustainability in organizational settings should be done ethically. If leaders use neuroscientific insights to manipulate employees' emotional responses without genuine concern for their well-being, it could lead to ethical issues. Ethical leadership involves transparency, fairness, and a genuine commitment to the welfare of employees.

Informed Consent in Neuroeducation. When implementing neuroeducational approaches in sustainability training programs, obtaining informed consent from

participants is crucial. If organizations fail to communicate the use of neuroscience-based methods and the potential implications, it may be considered an ethical lapse. Clear communication ensures that participants are aware of how their data and responses will be used. (González-Morales, A., Muñoz-Leiva, F., Sánchez-González, H., Fernández-Páramo, E., Aranda-Cuenca, M. I., Gómez-Plaza, A., ... & Ovando-Gil, M. , 2023).

Transparency in Decision-Making Processes. Organizations incorporating neuro-informed decision-making should be transparent about the factors influencing decisions. If there is a lack of transparency about how neuroscientific insights are used in decision-making, it may erode trust among stakeholders. Ethical decision-making involves openness about the methodologies and data sources guiding choices.

Corporate Greenwashing. Companies that leverage neuroscience and organizational dynamics to enhance their sustainability image must ensure that their actions align with their messaging. If a company uses neuromarketing to promote an eco-friendly image but fails to implement meaningful sustainable practices, it could be considered greenwashing—an unethical attempt to deceive consumers. (Martinez-Levy, A. C., Sasso, D., Vozzi, A., Menicocci, S., Trettel, A., Babiloni, F., ... & Cherubino, P. , 2023).

Equitable Access to Neuroscientific Insights. The use of neuroscientific insights in sustainability initiatives should consider issues of equity. If certain groups or individuals have privileged access to these insights, it could exacerbate existing inequalities. Ethical considerations involve ensuring that the benefits and knowledge derived from the convergence of neuroscience and organizational dynamics are accessible to a broad and diverse audience.

Unintended Consequences of Behavioral Interventions. Implementing behavioural interventions based on neuroscientific insights should consider potential unintended consequences. For instance, if a company introduces a reward system to encourage sustainable behaviour but it inadvertently creates a competitive or stressful environment, it could lead to negative psychological effects, raising ethical concerns.

Data Security and Accountability. The use of neuroscientific data in organizational settings requires robust data security measures. If companies fail to protect the privacy and security of neural data, it could lead to breaches and misuse. Ethical considerations involve implementing stringent data protection measures and being accountable for the responsible handling of sensitive information.

Addressing these ethical considerations requires a thoughtful and responsible approach to the convergence of neuroscience and organizational dynamics. Companies and researchers should prioritize transparency, consent, fairness, and the well-being of individuals and communities affected by these practices.

And now let's delve into real-life examples that illustrate the ethical considerations associated with the convergence of neuroscience and organizational dynamics in reshaping sustainable practices.

1. Privacy Concerns in Neuromarketing. In 2011, an experiment conducted by researchers at Stanford University raised privacy concerns. They used functional magnetic resonance imaging (fMRI) to predict individuals' preferences for various products. The study's findings highlighted the potential of neuromarketing, but the ethical concern arose from the sensitivity of the data and the potential for consumer manipulation without clear consent. (TARAKÇI, İ. E., & ASLAN, R. (Eds.), , 2023).

2. Manipulation of Consumer Behavior. Social media platforms, including Facebook, have faced criticism for using algorithms that leverage neuroscientific principles to maximize user engagement. The design, such as endless scrolling and personalized content, is intended to capture and hold users' attention. This has raised ethical concerns about the deliberate manipulation of user behaviour for commercial gain. (Dangwal, A., Bathla, D., Kukreti, M., Mehta, M., Chauhan, P., & Sarangal, R., 2023).

3. Neuroethics in Employee Engagement. A case study involving an unnamed technology company revealed concerns about neuroleadership practices. The company implemented brain-monitoring devices to assess employees' engagement levels. The lack of transparency and potential intrusiveness led to ethical concerns among employees, questioning the impact on their mental well-being. (Slager, E. , 2023).

4. Informed Consent in Neuroeducation. Neuroeducational interventions in the workplace have raised questions about informed consent. A scenario involved a company implementing a brain-training program without clearly communicating to employees how their neural data would be used. This lack of transparency resulted in ethical concerns regarding privacy and autonomy.

5. Transparency in Decision-Making Processes. A multinational corporation implementing neuro-informed decision-making faced backlash due to a lack of transparency. Stakeholders were critical when it was revealed that neural data was influencing strategic decisions without clear communication. The incident underscored the importance of transparency in ethical organizational practices.

6. Corporate Greenwashing. A major fashion retailer faced accusations of greenwashing despite using neuromarketing to promote sustainability. The company heavily marketed its eco-friendly initiatives, but investigative reports revealed minimal actual commitment to sustainable practices. This highlighted the ethical issue of misrepresenting sustainability efforts for branding purposes. (Sangari, N., Khamseh, P. M., & Sana, S. S. 2023)

7. Equitable Access to Neuroscientific Insights. The accessibility of neuroscientific insights became a concern in a research collaboration where the results were exclusively available to a select group of companies. This lack of inclusivity raised ethical questions about whether the benefits of neuroscience should be accessible to a broader range of businesses, including smaller enterprises.

8. Unintended Consequences of Behavioral Interventions. An energy company introduced a gamified system to encourage employees to reduce energy consumption. However, the competitive nature of the program inadvertently led to increased stress and unhealthy competition among employees. This unintended consequence highlighted the need for ethical considerations in the design and implementation of behavioural interventions. (Kant, S., & Yadete, F. D. , 2023).

9. Data Security and Accountability: A neurotech startup faced scrutiny when it experienced a data breach involving users' brainwave data. The incident highlighted the importance of robust data security measures in handling sensitive neuroscientific information and raised questions about the accountability of companies in safeguarding such data.

These examples underscore the importance of ethical considerations in the application of neuroscientific insights within organizational contexts, emphasizing the need for transparency, informed consent, and responsible practices.

Future prospects - Paving the way for a world where sustainability is a collective and neurologically resonant reality

The transformative alliance between neuroscience and organizational dynamics holds promising future prospects, envisioning a world where sustainability is not merely a goal but a deeply ingrained and neurologically resonant reality. Several key trends and possibilities contribute to this optimistic outlook

Neuroscience-Informed Sustainability Policies. Governments and organizations may increasingly leverage insights from neuroscience to shape policies that promote sustainable practices. Understanding how individuals process information

and make decisions can inform the design of regulations and incentives that encourage environmentally responsible behaviour.

Neuro-Responsive Sustainable Technologies. Advancements in technology may lead to the development of neuro-responsive tools and technologies that enhance sustainable living. Smart devices, for instance, could adapt to individuals' cognitive patterns to optimize energy usage, reducing environmental impact. (Alvino, L., Herrando, C., Leszkiewicz, A., Horsten, C., & Robben, H. , 2023).

Widespread Adoption of Sustainable Corporate Cultures. The alliance between neuroscience and organizational dynamics may accelerate the adoption of sustainable corporate cultures. Companies, inspired by neuroscientific insights, could prioritize employee well-being, ethical leadership, and a collective commitment to environmental stewardship.

Consumer Empowerment Through Neuro-Informed Choices. Consumers may become more empowered in making neuro-informed sustainable choices. Neuromarketing insights could contribute to the development of eco-friendly products and transparent communication, enabling consumers to align their preferences with sustainable options. (Costa-Feito, A., González-Fernández, A. M., Rodríguez-Santos, C., & Cervantes-Blanco, M. , 2023).

Education for Neurologically Resonant Sustainability. Educational programs may incorporate neuroeducational approaches to instill a deeper understanding and appreciation for sustainability. This could result in a generation of individuals who naturally prioritize and resonate with sustainable values in their personal and professional lives.

Global Collaboration for Sustainable Development. The convergence of neuroscience and organizational dynamics may foster global collaboration on sustainable development. By understanding shared neurological responses to environmental challenges, nations and organizations may work together more effectively to address complex issues like climate change and resource management. (Sengur, F. K., & Goncalves, M. V. , 2023).

Neuroscience-Driven Corporate Social Responsibility (CSR). Corporate Social Responsibility initiatives may become more neuroscience-driven. Companies could align their CSR efforts with the neurological preferences and values of their stakeholders, creating initiatives that resonate with both employees and the wider community.

Innovative Sustainable Business Models. The alliance may inspire the creation of innovative sustainable business models. Companies could develop circular

economy strategies, product-as-a-service models, and other neuro-informed approaches that prioritize long-term environmental and social impact.

Data Ethics and Privacy in Neuroscientific Insights. Future developments will likely involve increased emphasis on ethical considerations regarding the use of neuroscientific data. Stricter data ethics and privacy standards may emerge to safeguard individuals' neurological information, ensuring responsible and transparent use.

Integration with Artificial Intelligence (AI). The integration of neuroscience with AI technologies may lead to more sophisticated applications. AI algorithms could analyse large-scale neuroscientific and behavioural data, offering personalized recommendations for sustainable living and decision-making.

In essence, the future prospects of this transformative alliance suggest a paradigm shift where sustainability is not just an external goal but a deeply embedded aspect of human cognition, organizational behaviour, and societal values. By understanding and leveraging the neurological foundations of decision-making, this alliance has the potential to create a world where sustainable choices are not only rational but also instinctively embraced by individuals and organizations alike.

Conclusion

In conclusion, "Sustainability 2.0: The Role of Neuromarketing and Organizational Behavior" represents a pioneering exploration into the transformative potential of uniting neuroscience and organizational dynamics to usher in a new era of sustainability. This dynamic alliance promises not only to redefine how we perceive and approach sustainable practices, but also to fundamentally reshape the very fabric of our collective consciousness and corporate cultures.

The journey through the intricacies of neuromarketing and organizational behaviour has revealed a landscape rich with opportunities for positive change. Neuromarketing, with its insights into the intricacies of consumer decision-making, allows businesses to connect with individuals on a deeper, more meaningful level. Understanding the neurological underpinnings of sustainable choices empowers organizations to design products, services, and communication strategies that align seamlessly with the evolving values of conscious consumers.

Simultaneously, organizational behaviour emerges as a linchpin in the sustainability narrative. The leadership, culture, and dynamics within organizations play pivotal roles in shaping sustainable practices. Through a neuroleadership lens,

leaders can inspire their teams to not only embrace but champion sustainability as an integral aspect of corporate identity.

As we stand at the crossroads of technological innovation, environmental challenges, and shifting societal expectations, Sustainability 2.0 beckons us to rethink our strategies and paradigms. The integration of neuromarketing and organizational behaviour is not just a theoretical concept but a roadmap for tangible, impactful change.

Looking ahead, the future holds exciting possibilities. The convergence of these disciplines opens avenues for tailored sustainability communication, neuro-designed products, and innovative approaches to employee engagement. It sparks conversations about ethics, privacy, and the responsible use of neuroscientific insights in the pursuit of sustainability.

In this journey towards Sustainability 2.0, the vision extends beyond mere environmental consciousness; it envisions a world where sustainable choices are not only rational but instinctive, ingrained in the very neurological responses that drive human behaviour. The prospects are promising: corporations fostering cultures of environmental responsibility, consumers empowered by neuro-informed choices, and a global community collaborating on sustainable development.

As we navigate the uncharted territories of this transformative alliance, it is clear that the role of neuromarketing and organizational behaviour in sustainability is not a mere trend but a paradigm shift. It challenges us to think holistically, to bridge the gap between individual choices and organizational cultures, and to collectively pave the way for a world where sustainability is not just a goal but a lived reality, resonating in the neural pathways of our collective consciousness.

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MEDICINAL HERBS AND BIODIVERSITY RESOURCES IN NIGERIA: AN ETHNOGRAPHIC ANALYSIS OF THEIR GOVERNANCE MECHANISMS AND IMPLICATIONS FOR SUSTAINABLE AND ECONOMIC DEVELOPMENT

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Abstract:

This article examines the present systems for regulating biodiversity resource use, with a specific focus on Osun State, Nigeria. The study undertakes an exploratory research design due to the novelty of the subject matter. For data collection, qualitative research methodologies, specifically in-depth interviews (IDIs) and key informant interviews (KIIs), were purposefully adopted. Herbal medicine sellers were key participants in the in-depth interviews, while key informant interviewees included a diverse group of leaders of herb sellers' associations, traditional healthcare providers, government officials responsible for Forestry Resources Management, practicing ethnobotanists, and knowledgeable academics with expertise relevant to the subject matter. The study further unfolds a comprehensive analysis of the threats to biodiversity, delving into the underlying causes and far-reaching consequences of biodiversity depletion in Nigeria. The study's

findings further shed a discerning light on the regulatory mechanisms governing biodiversity utilisation in Nigeria. Despite the existence of these mechanisms, they have struggled to realise the anticipated positive outcomes. This predicament is largely attributable to a lack of strong political will on the part of the government to ensure compliance among users of Nigeria's rich biodiversity. A critical observation is that the legal and policy frameworks that oversee biodiversity in Nigeria have not undergone periodic reviews, rendering them out of touch with current societal dynamics. Consequently, traditional medicine practitioners and vendors of medicinal herbs, among other biodiversity users, have exploited this policy vacuum to exploit plant, tree, and other biodiversity resources unabated. Of notable concern is the unregulated exploitation of plants for medicinal purposes, particularly the trade in herbs, which has emerged as a significant threat to public health and well-being. This unchecked practice undermines the prospects of Sustainable Development Goal 3 (SDG-3), which prioritises health and well-being. In light of these findings, the study strongly advocates for a two-fold approach to address this pressing issue. First, it underscores the critical importance of fostering robust political will to enforce existing regulations and institute much-needed reforms. Secondly, constant monitoring and oversight of medicinal herb utilisation and other biodiversity resources in Nigeria by government agencies are deemed imperative to safeguard the nation's natural wealth and the health of its citizens.

Keywords: *Biodiversity, Mechanisms, Medicinal Herbs, Ethnobotanist, Economic Development, Sustainable Development*

JEL Classification: *I30; I38; J18; J38; Q01*

Introduction

Existing research has found that biodiversity-rich locations frequently lack the financial means, as well as the human and institutional skills, to enable effective conservation, despite their obvious need (Campos-Arceiz et al., 2018). There has been a case for unchecked economic expansion and the imminent repercussions of fast population growth, urbanisation, and various consumption patterns and habits on biodiversity's declining fortunes (Ünal et al., 2019; Coşkun, 2005). The difficulties of a lack of awareness of the potential effects of conservation aims and interconnections among target regions were not overlooked. Nicholson et al. (2019) additionally observed that passivity on actions required to achieve tangible goals accounted for (a) unusual, poor, or weak protection results, (b) inefficient actions,

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and (c) missed opportunities for achieving commitments to stemming the tides of extinction.

Biodiversity governance hence necessitates the employment of legislation to aid in its protection, management, and long-term usage (Food and Agricultural Organisation, 2023; Barral, 2017). The law determines a framework that supports countries in their efforts to achieve biodiversity objectives, both in response to national priorities and needs and in terms of commitment to addressing global biodiversity issues, by providing rules and institutional mechanisms through which action on biodiversity and ecosystems can be taken. It serves as a framework for governmental policies and actions to conserve and manage biodiversity and ecosystems, and by establishing relevant boundaries and social safeguards, it can ensure that the benefits of genetic resource utilisation are distributed fairly and equitably (Ullah and Kim, 2021). By establishing incentives and recognising rights and obligations, the law may also be used to enable local governments, individuals, indigenous peoples, local communities, entrepreneurs, enterprises, and others to take action for biodiversity.

Despite the evident imperative for the sustainable preservation of biodiversity, very little is known about the perspectives of those directly affected, particularly individuals whose daily livelihood relies on biodiversity resources. It is essential to gain insights into their understanding of the regulatory measures designed to ensure biodiversity's continuity. This study seeks to address this gap in knowledge and make a valuable contribution to the fields of biodiversity, sustainability, and the SDGs.

To bridge this knowledge gap, this study endeavors to investigate the following key research questions: what are the economic and social impacts stemming from the utilization of biodiversity resources in Nigeria? What are the legal and policy frameworks governing the utilization of these resources in Nigeria? How are the medicinal herbs and associated risks linked to the utilization of biodiversity resources? What are the lived experiences of those affected by the unregulated utilization of biodiversity in Nigeria? Finally, what is the effectiveness of the prevailing mechanisms in safeguarding and preserving biodiversity resources.

Introduction shall have a page at the most, however not less than half a page. The text must provide answers for four questions. (1) What matter does the paper cover? (2) Why is the studied matter important? (3) How does the author intend to answer to this matter? (4) What is the relation between the paper and the already existent specialized literature? This introductory section shall be written clearly and any confusion in communicating the four answers might result in paper rejection.

Literature Review

The study adopts the qualitative approaches of in-depth (IDI) and key informant interviews (KII). It involved 40 herb sellers that were engaged in IDI and sampled from herb markets selected from Oja-Oba Osogbo (Oyo speaking subgroup), Ereja Ilesa (Ijesa speaking subgroup), Ayegbaju (Ife speaking subgroup), and Ila (Igbomina subgroup). 12 KII participants were sampled among the herb sellers' group leaders, traditional health care providers, government officials in charge of forest resources management, practicing ethnobotanists in Osun State, and academics from Obafemi Awolowo University, Ile-Ife, and Osun State University, Ejigbo campus with expertise in forestry and biodiversity conservation. The herb markets were found in areas generally known as Oja-Oba (King's Market) across the state. The willingness to take part in the study was used to pick replacements in stalls where the qualified person refused to take part. The qualitative data collected were analysed using an open-source software package and ethnographic summaries. Some important quotations from respondents during IDI and KII sessions were reported verbatim for further illustration of the issues under focus.

Ethical Consideration

The principles of ethics governing research on human beings were strictly observed in this study. An informed consent form was administered prior to the conduct of interviews and discussions. The introductory part of the instruments for data collection (interview guides), which emphasised the issue of voluntary participation, was read and interpreted (where necessary) by each participant. The participants were informed of their rights to decline participation if they so desired. Thus, their right to withdraw from the study at any point was emphasised, and some respondents actually withdrew before the end of the process, and such responses were disregarded at the analysis stage. Also, respondents were free not to answer any question they considered offensive or an extreme intrusion into their privacy.

Section must comprise referrals to specialized literature, compared against the paper's subject, emphasizing the most important and relevant contributions on which the author will ground his/her argumentation. In the reviewing process there shall be taken into consideration the share of referrals to papers published in international journals recognized by the scientific community. This section must stress the fact that the author is familiar with the knowledge level in the studied

area, that he/she has sufficient scientific training, allowing him/her to have a pertinent opinion over the studied issues.

Data Presentation and Discussion

Demographic Distributions of Participants

This research work examined ethno-medical healing praxis and the unaccounted challenges of extinction associated with consumption of biodiversity resources in Osun State, Nigeria. The study adopted interview sessions as the main approach for data collection. The study population is composed of (a) herb sellers, (b) herb sellers' group leaders, (c) herb dealers, (d) traditional health care providers, (e) government officials in charge of forest resource management, (f) ethnobotanists, and (g) scholars in forestry and conservation. The majority of them are in the age range of 32 to 49 years of age. The educational qualifications of the participants included a university degree or higher national diploma, a national diploma or Nigerian certificate of education, secondary school education, some secondary school education, and primary school education. Their years of experience on the job they are engaging in range from 11 to 60 years. In line with the findings of this study, the participants demonstrated reasonable knowledge of what biodiversity and its resources imply, though from cultural perspectives. Virtually all aspects of biodiversity were declared useful for therapeutic purposes. Involvement in professions that require biodiversity resource usage (especially herb selling and traditional healing) was revealed to be in-house and through training. It is in-house because the majority of them met their parents engaging in the activities, hence their being socialised into it. Some were inducted into it through the normal entrepreneurial training system. The activities were shown as not limited to the unlettered but now involved formally educated people.

Economic and Social Impacts of Biodiversity Resources Utilization

Biodiversity offers a variety of ecological services that are critical to human well-being now and in the future. People rely on biodiversity in ways that are not often obvious or acknowledged in their daily lives. Human health is ultimately dependent on ecosystem products and services (such as access to clean water, food, and fuel), which are required for good human health and productive lives (Imarhiagbe et al., 2020). It has a significant impact on human nutrition because of its influence on the global food supply, since it assures soil fertility and supplies genetic resources for all crops, animals, and marine creatures collected for food.

Access to a sufficient supply of a nutritious variety of food is a critical health determinant.

The principal drivers of biodiversity loss include habitat destruction, overexploitation, pollution, and species introduction (Roka, 2021; He et al., 2020; Akamani, 2020). Consumption and production patterns, human population dynamics, commerce, and the use of technology are all influenced by society's values, inequalities, and behaviours. Irrigation, fertiliser usage, plant protection (pesticides), or the introduction of crop types and cropping patterns all have an impact on biodiversity (United Nations Environmental Programme, 2021; Luswaga and Nuppenau, 2020). This has a knock-on effect on global nutritional status and human health. Habitat simplification, species loss, and species succession frequently increase community vulnerabilities as a result of environmental receptivity to disease. When biodiversity loss occurs through these and other developing avenues, it has major direct human health consequences, particularly if ecosystem services are no longer enough to support social requirements. Changes in ecosystem services have an indirect impact on livelihoods, income, and local migration and, on occasion, may instigate or intensify political conflict (Abdul-Aziz, 2018).

Climate is an essential component of ecosystem functioning, and the effects of climatic conditions on terrestrial and marine ecosystems have an immediate and indirect impact on human health. Ocean acidification, which is linked to carbon levels in the atmosphere, has an impact on marine biodiversity. Climate change has an impact on terrestrial biodiversity. Extreme weather events, such as drought and floods, have a direct impact on ecosystem health as well as the productivity and availability of ecosystem commodities and services for human use. Longer-term climatic changes have an impact on the sustainability and health of ecosystems, influencing changes in the distribution of plants, diseases, animals, and even human settlements. This was supported by statistics on accessible species in Nigeria. According to data, Nigeria has an indigenous flora of 91 species from 44 groups, with the Rubiaceae having the most. A faunal species list was also provided. According to the IUCN Red List 2013, Nigeria has 309 threatened species in the following taxonomic groups: mammals (26), birds (19), reptiles (8), amphibians (13), fishes (60), mollusks (1), other invertebrates (14) and plants (168). (UNESCO, 2023; UNEP, 2021; He et al., 2020; Federal Ministry of Environment, 2015).

Legal and Policy Frameworks Governing the Utilization of Biodiversity Resources

The contributions of biodiversity and ecosystems to human development and well-being have long been recognized. All over the world, there is a high alarm rate at which biodiversity is being degraded. The loss of biodiversity resources continues as a result of both direct and indirect pressures, including habitat destruction, overexploitation, the spreading of invasive alien species, climate change, and population pressure. National, bilateral, and multilateral efforts to halt and reverse the loss have given rise to a number of legal, regulatory, and policy regimes that are currently under implementation. While policy and regulatory regimes are intended to provide an overarching framework for action on the ground, legal regimes and instruments provide the interpretation and protection services necessary for ensuring that policy and regulatory regimes are effectively implemented (UNEP, 2018). Governments at both national and international levels have devised several methods to curb the incessant assault on biodiversity. One of such methods is the instrument of legislation, which provides regulations for improving the protection and conservation of biodiversity (Ijaya, 2021).

Over the past three decades, most sub-Saharan African (SSA) countries have developed national policies, legislation, plans, and institutions that are geared towards biodiversity conservation and management. However, evidently lacking in these instruments are the mechanisms for the generation, processing, and sharing of biodiversity information. In the case of biodiversity conservation, governance-related actions have been taken. The Rio Conference of the Convention on Biodiversity has been the leading conference on biodiversity conservation under the global governance agenda. There have been some case-study-oriented works that follow the biodiversity governance perspective.

Many SSA countries have formulated separate policies and legislative instruments such as forest policy, wildlife policy, environmental policy, forest code, wildlife act, fisheries act, and environment management act, among others, that are implemented by different institutions with sometimes overlapping and duplications in responsibility. A major policy gap for biodiversity is that while all these policies are presumably geared towards biodiversity conservation and management, they have not been able to adequately address biodiversity due to the fact that biodiversity issues are spread between different policies and managed by different institutions. Most of the SSA countries, as revealed through the analysis, do not have a standalone biodiversity policy that specifically targets biodiversity issues, including biodiversity information. In the analyses of institutions in SSA

countries, it became evident that many countries have yet to establish specialised institutions that facilitate the generation, processing, and access to biodiversity data and information in Africa (Ozor *et al.*, 2016).

Conservation practices in Nigeria matter regarding the interaction between governments and NGOs. Government efforts regarding oil pollution in Nigeria have supported legal and institutional actions related to biodiversity (Altıparmak, 2022). It has been found that although attempts have been unsuccessful, Nigerian governments are aware that a governance approach is needed to solve biodiversity loss. However, a lack of local authority and disconnection between civil society and governments prevent a healthy working governance process for sustainable biodiversity. In the words of Ijaiya (2021), the legislation put in place in Nigeria on biodiversity conservation is rarely enforced, unlike what is being done in India and the United Kingdom. Also, the right to a clean environment, as a right in India and the United Kingdom, is lacking under the Nigerian Constitution.

Medicinal Component and risk of Utilizing Biodiversity Resources

Biodiversity is an essential ecological predictor of human health; conservation and sustainable use of biodiversity promote human health by preserving ecosystem services and providing future possibilities (King *et al.*, 2023; WHO and CBD, 2015). Aside from that, it supports human and societal necessities such as food and nutrition security, energy, medicine and pharmaceutical research, and freshwater, all of which contribute to good health (WHO, 2020; Hillman and Baydoun, 2016; WHO and CBD, 2015). A vast range of plants, animals, and fungi are employed in medicine, necessary vitamins, pain relievers, and other applications. Medicinal plants are now gaining prominence due to their unique properties as a rich source of medicinal phytochemicals that may lead to the creation of innovative medications (Azwanida, 2015). According to Venugopal and Liu (2012), most phytochemicals derived from plants, such as phenolics and flavonoids, have been shown to improve health and cancer prevention.

Many animals are recognised for their capacity to self-medicate with plants and other things. Plant medicine is used nearly totally for basic health care by more than 60% of the world's population (Gaston and Spicer, 2004). For example, around 119 pure compounds are isolated from less than 90 species of higher plants and used as medicines across the world (such as caffeine, methyl salicylate, and quinine) (Yeshiwas *et al.*, 2019; Izah *et al.*, 2016). Plants have been employed by humans for illness control and prevention since time immemorial (Yirga *et al.*, 2011). Medicinal plants continue to play key roles in the everyday lives of people

living in developing Asian and African nations (Yeshiwas et al., 2019). These plants not only supplement or substitute for current medical treatments, which are frequently in short supply, but they also improve the health and security of local people (Agidew, 2022; Sofowora et al., 2013). As a result, medicinal plants play essential roles in everyday life and are closely linked to a variety of social, cultural, and economic events related to life, ageing, disease, and death (Eshete and Molla, 2021; Ezekwesili-Ofilu and Okaka, 2019).

Globally, the estimated number of medical plant species ranges from 35,000 to 50,000, with between 4000 and 6000 species entering the global medicinal plant market (Bekele, 2007). Ethiopia has 6500 species of higher plants, making it one of the world's most varied floristic areas (Bekele, 2007). In terms of fundamental human requirements, the plant kingdom is the most important to human well-being. The number of people who use herbal medicine items and supplements has reportedly increased significantly. According to Ekor (2014), at least 80% of people globally rely on them for some aspect of basic health care. Traditional healers in Africa were acknowledged to have a thorough awareness of the therapeutic qualities of biological resources in their surroundings. The quantity of plant species with therapeutic properties that a community understands is usually astounding (Yeshiwas et al., 2019; Omobuwajo et al., 2008). With reference to the beneficial phytochemicals in medical plants and the trend towards natural goods in the pharmaceutical and cosmeceutical industries, medicinal plant research is very important (Azwanida, 2015).

Existing Regulatory Mechanisms for Regulating Biodiversity Resources Utilization

The Nigerian government has developed a variety of organisations to protect and maintain the country's biodiversity, including the Federal Environmental Protection Agency (FEPA), the National Resources Council (NARECO), the Nigerian Conservation Foundation (NCF), and others. These organisations collaborate with other efforts such as the World Wide Fund (WWF), the United Nations Environmental Programme (UNEP), and others. There are also a few biosphere reserves, or protected regions, throughout the nation. These include 8 national parks, 445 forest reserves, 12 stringent nature reserves, and 28 game reserves, all of which contribute to safeguarding wildlife and complementing domestic protein sources (Obayelu, 2014). The environmental dimensions of sustainable development as they pertain to this subject are best seen in light of the fact that the natural ecosystem in which people live is intrinsically linked to all

societies in the world. Given their relevance and need, stakeholders are unlikely to overlook the overall threat of overcollection of these resources in the course of fulfilling market demand. This indicates that they must recognise the importance of implementing conservation measures while utilising these resources. This is intended to be common practice for the long-term viability of their initiatives and overall growth. Scholars (Qiu et al., 2018, Waddington et al., 2018, Joshi and Rao, 2017, Sterling et al., 2017, Virapongse et al., 2016) have uncovered a high incidence of biodiversity resource loss in African communities, including our research location. Participants in this survey also recognised the critical significance of protected areas (Pas) in the long-term growth and preservation of biodiversity. According to one important informant, "the establishment of protected areas (PAs) is another mechanism for preserving biodiversity." PA designation has been a key method for preserving biodiversity for more than a century. It is well known that well-managed PAs not only help healthy ecosystems and threatened species, but they also provide many benefits to people; without them, global biodiversity loss would be even greater and more inevitable than it is now (Female KII/49 years old/Academic/Obafemi Awolowo University, Ile-Ife, Osun State, 2023). PAs continue to be at the heart of multi-party international policy activities. The RAMSAR Convention on Wetlands of International Importance, Waterfowl Habitat, the 2030 Agenda for Sustainable Development, and the Convention on Biological Diversity (CBD) are examples of these (Birben, 2019; UNEP WCMC et al., 2018; Bertzky et al., 2012). These are the most significant environmental and sustainable development promises made by nations in the international arena to date.

It demonstrates existing initiatives and the issues that result from them. 'We participate in the cautious use of these resources,' says one of them. We have various woods from which we obtain these materials. Our attention is not always focused on a certain forest; instead, we draw our requirements from other woods while leaving one forest to fallow. However, there are limitations on how this may be completely realised due to the lack of limits on the activities of our colleagues or those shopping for plants for personal use or as professional herbalists' (Female IDI/44 years old/Oja-Oba, Ila-Orangun, Osun State, 2023).

Another attendee stated, "Conservation is very difficult for us as herbal merchants because we are always in our shops on every blessed day." We rarely go out to collect herbs by ourselves; we hire somebody to do it. They wander about seeking the species we require or those they anticipate we may require. We don't know how they acquired it; our job is to price the things supplied to us' (Female

IDI/57 years old/Ereja Market, Ilesa, Osun State, 2023). Shedding light on conservation matters, another participant revealed that ‘we often discuss the possibility of the extinction of biodiversity resources that are constantly needed in our business among ourselves, but we are incapacitated based on the fact that we do not know how to overcome this. This is in view of our customer expectations in the face of the increasing rate of entrants into the business as well as the increasing operational cost of securing the commitments of our suppliers’ (Female IDI/50 years old/Ayegbaju Market, Ile-Ife, Osun State, 2023).

According to another statement, "we were told of the implications of biodiversity resource usage on the environment by some government officials who invited us to their Secretariat a few years ago." They told us about irreplaceable biodiversity values as well as a variety of other critical ecological services. They taught us about the importance of ensuring proper use of these resources in order to slow the fast loss of the world's remaining primary forest. However, no solution has been proposed on how to maintain us in business because we don't have any other source of income' (Male IDI/41 years old/Ereja Market, Ilesa, Osun State, 2023). According to one participant, "the officials who invited us for a discussion on environmental management informed us about the dangers inherent in unregulated harvesting of biodiversity resources." We were informed that this might lead to damaged landscapes and declining species, which would have disastrous effects for everyone's quality of life' (Female IDI/42 years old/Ayegbaju Market, Ile-Ife, Osun State, 2023). 'Aside from the exploitation of biodiversity resources for therapeutic purposes, numerous of these resources are under serious strain from increasing human populations and a burgeoning global economy,' it was also found. Several local and international non-governmental organisations (NGOs) have expanded their activities beyond seminars and workshops. They are continuously in contact with individuals whose actions have an influence on and are likely to result in the loss of biological biodiversity due to unregulated use.' (Academic/Obafemi Awolowo University, Ile-Ife, Osun State, 2023/Female KII/49 years old)

It was also noted that "herb sellers, professional herbalists, and individuals who use herbs for their daily survival and that of others rarely consider the possibility that these resources will not be available." During the conversation, participants were encouraged to reconsider herbs that were formerly readily available in their area but are no longer available as one of the many consequences of the wrong use of biodiversity resources. Others that were available but had to be conveyed many kilometres through 'middlemen' before they could be accessed equally constituted

components of what they were made to reflect upon. Through observation of the effects of several enlightenment programmes given to these people, ‘I have strong belief that they are ready to embrace whatever conservation policies are available as long as they are going to safeguard their business interests’ (Male KII/53 years old/Academic/Osun State University, Ejigbo Campus/Osun State, 2023). In corroboration of this, another participant said, ‘positive behavioural change is possible among the herb dealers; however, the commitment on the part of the government is poor. It is more or less a lip service being played every May 22 when celebrating World Biological Diversity Day or June 5 when World Environment Day is being celebrated. After the celebration, nothing is heard again. This has discouraged those directly involved in harvesting these resources. They more or less see our coming as ritualistic activity aimed at just fulfilling the righteousness’ (female KII/49 years old/Academic/Obafemi Awolowo University, Ile-Ife, Osun State, 2023).

In the words of another participant, ‘the beauty of nature can be affected through unregulated biodiversity resource usage. The attraction created by a rich and varied environment could be harnessed for nature tourism. However, these potentials could be lost when land and resources are strained by excessive use, as well as when impacts on vegetation, wildlife, and other elements within that are made up of biological diversity exceed the carrying capacity’ (Male KII/53 years old/Academic/Osun State University, Ejigbo Campus/Osun State, 2023). Further submission revealed that ‘NGOs and government agencies are working with partners in all sectors to better understand the implication of unregulated consumption of resources on global biodiversity and to promote conservation. I have worked as a consultant on this project a couple of times for NGOs such as the Nigeria Conservation Foundation (NCF), the Wildlife Conservation Society, the Global Environmental Facilities (GEF), and the National Park Service, among others. The efforts of these NGOs focus on mitigating climate change, conserving biodiversity, and promoting human welfare’ (female KII/49 years old/Academic/Obafemi Awolowo University, Ile-Ife, Osun State, 2023).

Effectiveness of existing Mechanisms in Protecting Biodiversity Resources

Natural forests are being destroyed by other forms of land use, like agriculture, grazing, and construction activities, as a result of uncoordinated land use policies and rapid urbanisation, leading to desertification and degradation of the environment (FAO, 2017). This thus pointed out the fact that the environment and, by extension, biodiversity lag behind other sectors in terms of policy and

legislative reforms (UNEP, 2018). The underpinning value elements of biodiversity as a life support system for millions of Nigerians have yet to receive recognition and serious consideration in national policy and legislative action. The existing laws relating to biodiversity are obsolete. Each succeeding administration at the federal level in Nigeria over the years has exhibited an absence of political will to implement various provisions of policies and acts enacted for the successful protection of biodiversity (Obayelu, 2014).

The process of policy review on biodiversity-related issues is very slow and given little or no consideration in major policy and strategic national discourse. Biodiversity issues have been relegated to the background and have only been the concern of conservationists, scientists, and environmentalists, despite their significant contribution to the livelihoods of rural and peri-urban communities and the ecosystem services they provide. FAO (2017) and USAID (2008) equally noted, among others, that the absence of adequate data on the status of biodiversity and the extent of degradation in the country are two of the factors obstructing the effective implementation of the Land Use Act and conservation policies.

The Federal Government of Nigeria has committed to international conventions and treaties, but their implementation has been plagued by substantial delays. This is reflected in the significant backlog of annual contributions to the trust funds linked to these conventions. Furthermore, as emphasised in a UNEP assessment from 2018, insufficient funding allocations to carry out decisions reached during conferences and meetings linked to these conventions, along with weak institutional ability, have resulted in suboptimal implementation.

Furthermore, cultural issues continue to impede the successful implementation of conservation programmes in the country. Many Nigerian groups view land as holy, passing it down through generations as a prized inheritance. Great opposition normally follows attempts by the government to convert what is regarded as personal or communal property to reserves. Many laws on biodiversity and forestry are difficult to enforce because of the high level of poverty in the country (USAID, 2008). A lot of people in both rural and urban areas depend on firewood and charcoal for cooking. Thus, the local trade in firewood and charcoal continues to thrive.

The medicinal plant business was not accounted for as part of the resources being overexploited. Yet, people depended on it for survival. In the process of shedding light on events within the study areas, the key informants in this study noted the inadequacy of a top-down approach to solving biodiversity challenges. According to one of the respondents, ‘...this approach has failed to deliver

effective management strategies for biodiversity conservation' (Male KII/53 years old/Academic/Osun State University, Ejigbo Campus/Osun State, 2023). Another submission also identified poor legislative enforcement as a glaring setback for biodiversity conservation in Nigeria. In her words, there is evidence of land conversion to agriculture in some forest reserves without any serious effort by the authorities to stop the trend, which is glaring' (female KII/49 years old/Academic/Obafemi Awolowo University, Ile-Ife, Osun State). Supporting this observation, it was further emphasised that many programmes and initiatives aimed at achieving their objectives suffer from inadequate design and ganization. An illustrative example is the lack of proper coordination in nationwide tree-planting campaigns, as noted by a senior Forest and Conservation Superintendent in the Ministry of Environment, Osun State, in 2023.

Another significant hindrance is the issue of inconsistent commitment to policies, exacerbated by the frequent turnover of political leadership in the country. This has led to varying levels of dedication to program implementation, as highlighted by an ethnobotanist from Oke Ayepe Community, Osogbo, Osun State (Male KII/69 years old/Ethnobotanist/Oke Ayepe Community, Osogbo, Osun State, 2023).

Discussion of Findings

There have been attempts at policy, political, institutional, organisational, and national levels for a solution to the unregulated utilisation of biodiversity resources. However, these interventions have largely missed their intended target due to a lack of political will on the part of the government in implementing the existing biodiversity laws and regimes. In this study, it has been made manifest that the poor commitment of the government to environmental and biodiversity issues has equally been the bane of biodiversity challenges in Nigeria. The study further implies that the regulatory mechanisms initiated by the government to regulate the utilisation of biodiversity failed to achieve the purpose of their existence. Some of the laws and policies on conservation of biodiversity and related matters could not achieve the expected results. The cause of this has been variously reported by several scholars as being systemic in nature. Typical in this case are the activities of the stakeholders in the medicinal herb business that were not adequately addressed. Policies and laws governing biodiversity have not also been subjected to periodic assessment and review in order to capture emerging realities. Meanwhile, periodic reviews of these policies will enhance the accommodation of those that were excluded at the beginning but whose activities are negatively impacting the

substance of biodiversity in Nigeria. For instance, Ayeni (1995), espousing wildlife resource conservation, noted that the laws enacted for the purpose of safeguarding the resources discriminated against local communities. By operation of this law, the local communities could not utilise wildlife resources for their basic necessities of life. The people therefore became alienated. Apart from this, the laws were repressive with no respect to the local populace, rural communities, or their traditional and cultural values.

Also worthy of note is that the bulk of the efforts at informing the grassroots of the necessity of biodiversity conservation are left with NGOs. Hence, much has not been achieved in this regard because the NGOs stake in the matter is limited by (a) the availability of funds to carry out their activities and (b) their constitutional role in the management of biodiversity, which is exclusively the preserve of the governments but only delegated as occasion demands. With this poor commitment to effective biodiversity management, it is obvious that Nigeria will continue to incur losses from environmental, biodiversity, and other allied ventures such as tourism, which effective management of biodiversity would have afforded the country.

Conclusions

The Biodiversity, arising from the outcome of this study, continues to face a number of threats in Nigeria, despite numerous policies that seek to address issues of conservation of biodiversity resources. It was affirmed that several policies, agencies, and departments were established to ensure proper protection and management of biodiversity resources. The implementation of the policy has not achieved the desired result of properly conserving the country's biodiversity. Management of protected areas in Nigeria is a top-down approach that involves only the agencies responsible and the managers. This approach is associated with several shortcomings, as they are unable to incorporate indigenous or local communities, which makes them lose their support in management. Involvement of local communities in protected area management is among the requirements of Decree 46 of 1999, in an effort to improve the management and conservation of national parks in Nigeria. Several factors contributed to this. First, for instance, Olawuyi and Olusegun (2018) traced the challenges to legal barriers to the implementation and attainment of the SDGs on biodiversity in Nigeria to a lack of institutional coordination, an absence of political will, and inadequate stakeholder engagement in evolving national biodiversity plans in Nigeria. The future of effective biodiversity preservation in natural ecosystems is constrained by factors

arising from overharvesting of resources, population increase, unequal land tenure systems, reliance on wild biotic resources by rural economies, and a land-intensive technique of agricultural production (Sambe *et al.*, 2021). Arising from the findings and analyses, the following recommendations are believed to be of critical expediency in addressing unregulated use of medicinal herbs and other biodiversity in Nigeria:

- (a) In order to generate a lasting change of behaviour in favour of conservation, critical audiences need to be reached. This should include decision maker/opinion leaders within the communities, journalists, teachers who should be commissioned with the assignments of developing an array of tools to implement effective communications and education strategies.
- (b) Environmental forestry should be encouraged at community level, most especially in the rural areas for adequate protection and effective management. This form of forestry entails gardening usually design for creative use of forest vegetation. It also involves land reconstruction for continuous and rational use of its renewable resources for humans' benefits.
- (c) Application of environmental forestry is very necessary in salvaging the biodiversity from impending depletion and genetic extinction. This can range from establishment of recreational parks, shelterbelt, trees or shrubs purposively planted for their ornamental and conservative effects.
- (d) Efforts should be made by the government to encourage constant interactions between the herbs' sellers and the herbalists or other stakeholders whose livelihood depends on biodiversity resources. Enlightenment programmes that will ingrain in them the implication of unsustainable usage of biodiversity resources on their means of livelihood. The same programme should educate them about their relevance in biodiversity conservation so as to reduce human impact and pressure on the limited natural resources in rural and biologically rich areas.

Conclusions section shall cover three elements: (1) it shall summarize the main outcomes; (2) it shall undertake the implications of such outcomes; (3) suggestions for future researches

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SUSTAINABILITY MARKETING PRACTICES DESIGN FOR SUSTAINABILITY

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Abstract:

To analyze and synchronize future sustainable design practices and thinking, it is crucial to interpret and keep design practice with urgent and future oriented goals in this field. Sustainable design practice objectives are human-centered, and also centered towards social, economic and environmental wellbeing, influenced by different design practices, in order to maintain comprehensive integrated value of the marketing practice. By complementing ideation, analysis, validated data and goals of the product design and transition design implemented in effective sustainability marketing practices, it is vital to consider context in which they are positioned. So that product design is perceived as a criterion of design sustainability in terms of the product's life cycle, social context and contemporary user. The participatory role of design serves not only to elevate sustainable goals, but to protect the environment and to be supporting system, while serving the human. It is vital to develop further and to extend even more design and social practices that can help to adopt and collaborate in future grater sustainable transition and transformation.

Keywords: *design for sustainability, transition design, product design, sustainable design practice, life cycle.*

JEL Classification: *Q01, Q 56, M31, M37, L21, L62, M14, C18, O13*

Introduction

Contemporary design practices in this field are human-oriented (but, also user-centered), considering, to a greater extent, sustainable design methods and relevance. In addition, exponential growth of this field conveys challenges and complexity of design solutions, reflects on diverse approaches to deliver a valuable product. Therefore, identifying consumers problems and needs upon growing urgency of sustainable products, delivers many questionable strategic problems in order to adopt advance design methods, and product development design research methodology. Nevertheless, it is important to observe challenges driven by transition design [Irwin, 2020] and responsible design [Hernandez, 2020], considering broader social aspects of (SO, PSS, COI), as a standpoint of design for sustainability and innovative processes. The goal of this paper is to analyze, how design for sustainability affects the design practice and processes and what will be the most efficient strategy(es), considering life cycle assessment of design for environment and design for sustainability [Gaziulusoy & Oztekin 2019]. It is observed user-centered approach regarding beneficial role of design integrated with purpose of sustainable development [UNEP, 2020]. Sustainable role in the scope of product design research methodology comparing opportunities and results of creation and realization, is considered. Further, examples of design for sustainability are presented and analyzed.

1 Design for sustainability/ design for environment

Transformative environment, that our society relies upon, delivers many questionable solutions answering urgent field of knowledge regarding sustainability. By tracing sustainability transition, we can obtain comprehensive new agenda of research and practice, system innovations [Dewbery, 2019]. Design research has been exploring, not only the role of design (in terms of approaches, strategies and tools), but also emergence of new role of design for sustainability which influences changes at the sociotechnical system level, which include translating the project vision into a transitional strategy [Ceschin, 2014]. In relation to this approach, theoretical standpoints will be conducted, considering user practices, social context and product development implementing consequential role of design for sustainability.

Transition model at the intersection of education, practice and advance design methods by identifying relevant ideas. Elaborative approach of transition design represents the logical development of trends that have taken place within design

according to Irwin [2020], one of the founders of this approach. At the Carnegie Mellon University, Irwin developed (beside Gideon Kossoff and Cameron Tonkinwise) transition design framework integrating sustainability transition and transition design regarding four fundamental bases: the first one considers the vision for transition which is based on communities that are in symbiotic relationships with the ecosystems, within which they are embedded; the second one, named Theories of Change, considers the dynamics of change within natural and social system, while third one called Posture & Mindset, is based on a holistic worldview and ecological paradigm. For this paper, interests are focused on the last one, New Ways of Designing, considering *new ways* of designing, oriented towards sustainable futures which correlates with main research question of this paper. According to authors those framework areas are considered mutually influencing. They see these as a context for the integration of multiple socio-technical sectors and for creation of new practices through which needs can be brought together in integrated and sustainable ways [Irwin, 2020].

When analyzing integration of design in sustainable processes, Gaziulusoy regard sustainability as a systemic property, therefore it needs to be addressed beyond the product [Gaziulusoy 2010]. By analyzing sustainable role in the scope of product design, research methodology compares opportunities and results of creation and realization. In the process of creating a new one or redesigning the old one, product design has a significant role in the company strategy besides adding the value of the multiple approaches, to design practices allowing marketers to evolve and lead business models.

Acaroglu underlines that, there is a dramatic and urgent need for designers to create with the intent to have positive impact, regarding applied knowledge system of thinking and understanding, how to design for circular systems. Acaroglu proposes analysis of the fundamental concepts of system thinking, in order to develop system mindset considering transitioning in Circular Economy [Acaroglu 2017].

The approaches towards importance of circular economy principles and innovation, consider transition to a circular economy and require product, business model and ecosystem innovation. [Konietzko, 2020]. Ceschin argues about challenging role of radical innovation required by sustainability, while considers the issue of radical sustainable changes, is still very limited [Ceschin 2014]. Therefore, proposition defined by Manzini and Vezzoli [2003] elaborates the need for design for sustainability to become systems thinking, regarding product design and to extend sustainable processes and Product Life Cycle (PLC), with evaluation

of implications of culture on the PLC as the significance, especially given different macro and microenvironment that products exist in globally [Iveson, 2022], regarding different socio-cultural context of appropriation.

UNEP creates comprehensive guide in the field of Design for Sustainability (D4S) for designers and other professionals in the area of product development, product innovation and life-cycle based efforts. UNEP agenda focuses to meet consumer needs through sustainability in a systematic way. By analyzing sustainable product design, UNEP proposes product development process and realization to be reviewed as a product of an innovation linked to design, considering the starting point with formulation of goals and strategies [UNEP, 2020].

In order to expand and develop valuable insights that guide innovation development, approaches based on exploration, experimentation, prototyping [Roth, 2020] and iterative processes may be analyzed. In order to aggregate methodology, by implementing Creative Design Tools (CDT) to develop and stimulate creative design thinking [Salah, 2008), and other versatile potential, which may lead to increase sustainable impact on social level. Sustainability guide from SVID, defines the design processes as: understanding and defining needs, generation of ideas, visualization and screening, development, testing, implementation. Regarding valuable insights, those approaches could provide and lead to innovative and advanced design practice by applying design thinking onto constitute of effective design (for sustainability).

Another standpoint considers meeting user needs and user practices regarding Circular Oriented Innovation (COI), may be analyzed as a potential. Brown elaborates on COI, as it is a problem centric and iterative process that needs a collaboration. Collaborative value potential is crucial when developing a circular proposition. Since the focus is on how to coordinate and combine circular strategies across multiple life cycles, author proposes this need within the initial ideation and design phase [Brown 2021]. Life cycle approach, from designing a product to design product life cycle, considering functional aspect of design, in order to fulfill environmental sustainability [Vezolli, 2018]. By appropriating variates of resourceful insights these approaches could provide, it is relevant how to situate innovative design processes implemented into design for sustainability future, through their interaction or to adopt relevant model efficient on cultural, social, technological, environmental stage user is located in, for which the product is created for.

1.1.Responsible design

Comprehensive understanding of design field and processes towards responsible innovative and solutions-oriented design leads to development of various aspects of design practices. Responsible design, above all, has to fulfill responsible role considering social context. According to Hernandez, responsible design, especially solution-oriented processes, aim to develop innovations aligned with social, environmental, political and cultural objectives [Hernandez, 2020]. Manzini proposes new types of collaboration between different actors which result in solutions with significant properties-solutions that are sensitive to context, while delivering environmental and economic efficiencies; as well as regarding multiplicity of collaborations in an effective way [Manzini, 2004].

The Responsible role and innovative aspect of broader design scope can be applied as a design of the sequence of steps to gradually reinforce-improve the innovation and foster its societal embedding and identifying and involvement of the actors that can support the societal embedding process, by applying PSS-oriented model to satisfy user through function. [Ceschin 2014]. As Morelli pointed, PSS are fundamental for the development of solutions-oriented partnership and consequently for sustainable solutions, considering importance of design in terms of the role of designers and is therefore essential to the definition of effective and attractive PSS [Morelli, 2006], by incentivizing each agent to maintain the value of the product and to design in order to extend durability [Acaroglu, 2018], by adopting and implementing investigated actions and practices called "solution options" [Lang, 2014] as a potential and influential reinforcement.

Evaluating one more possibility of identifying solution to successful responsible design, Solution Oriented Partnership (SOP), identifies key actions that are required in design (build, deliver, renew stages), regarding collaborative aspect and one of key areas contextual and systematic approaching towards effective design for sustainability [Manzini, 2004]; or as a Keitsch pointed out, how design for sustainability concept, beside ecological advantages, works as catalysts for the advancement of social sustainability [Keitsch, 2012].

2 Review Methodology

By analyzing everything mentioned prior to, on product innovation [UNEP, 2020], necessity of a radical sustainable changes, and limitations [Ceschin 2014], and overcoming the same, Aracoglu [2018] proposes concepts of development

system mindset. By appropriating complexity of sustainability, it is crucial to integrate sustainable context into design practices and recognize the importance of responsibility. Considering positive experience identified by usability, responsibility and innovative design, example presented by Apple company introducing new iPhone 15, made considering environmental impact. This concept depicts transition towards durability potential (by substituting Aluminum to Titanium). Another beneficial improvement of new model considers better ergonomic and bend-resistant improvement. Moreover, in accordance to sustainable thinking, company uses 100% recycled Aluminum for inner frame, to promote lifecycle of the product, disposal policies, and by that, represents one of the Apple's climate goals by 2030.

Regarding solution-oriented processes integrated in design, it is presented in Mill Bin. It dries and shrinks food waste so it can be reused, initially designed as an ultimate solution for a household. This device actually reveals how much food is wasted, and it might affect usage habits. Design of the Mill is a minimalistic and easily placeable at the interior space.

Analyzing social centric design approaches and social design impact is necessity for gaining insights into the wider scope of the design for sustainability or even 'social sustainability' concept [Corsini, 2021]. By identifying Human (and user) problems and needs, approaching them with solutions option /product lifecycle, social and design thinking identifying problem, in order to deliver design for vital sustainable solution based upon that. But, besides that, design for sustainability could be analyzed as transition design and Irwin's 4th principle based upon future design perspectives. Nevertheless, design for sustainability should provide and serve usability, product lifecycle, and functional aspect [SVID, 2018]. Hence, consumer experience should be aligned with specific context of innovative, experience driven design with sustained purpose, presented in design for sustainability examples, mentioned above.

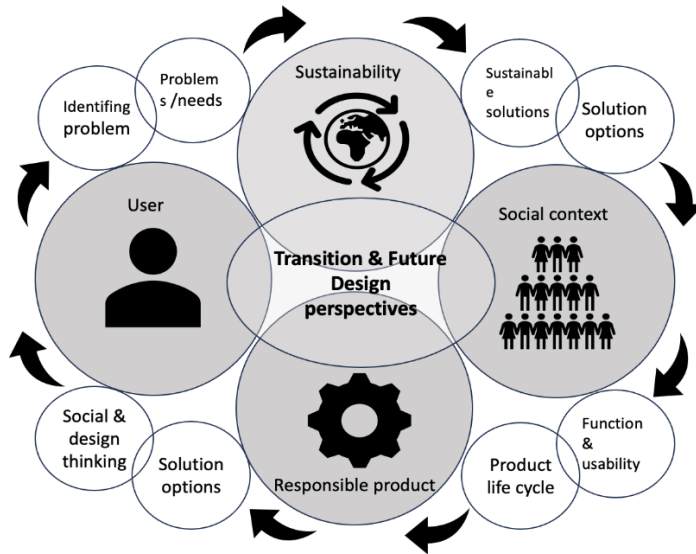


Figure 1. Design for sustainability model

And last to be analyzed is validated aspect based upon positive experience built on deeply understanding of using environmental positive product considered as beneficial aspects of design for environment and ecofriendly products, or as [Tonkinwise, 2007] pointed out, else we continue to let the unsustainable be sustained. By understanding evolving of, as Sherman [2018] elaborates, human-centered to humanity-centered design, to stretch beyond customers impact alone to factor-in the wider impact of design on society and the planet.

Conclusion

Considering responsible design pragmatism at sustainability practices it is important for them to serve future product design and sustainable development goals, considering usability issues with creative work frame. Design should contribute positive aspects of user receptiveness on usability potential and response on product. Thus, sustainable design product should also represent wider social context, not only collaborative, but possibly, by adopting PSS model, SO, or COI among others, to empower sustainable and socially responsible business models or attitudes toward better future. In order to present sustainable future goals, through joint creation by designer, user and social background, especially considering

environmental, social, cultural, ethnographic, ethical understanding of responsible meaning (referring to HCD). Design serves not only to elevate sustainable goals, by protecting environment, and as supporting system, but above all it serves human. It is vital to develop and to extend even more design and social practices that can help to adopt and collaborate in future grater sustainable transition and transformation.

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SUSTAINABLE FINANCE – A WAY TO IMPROVE SOCIAL AND ECONOMIC SUSTAINABILITY. THE ROMANIAN EXPERIENCE

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Abstract

Sustainable finance is a concept that refers not only to environmental problems, but also to social objectives such as those social goals included in the 2030 Agenda for Sustainable Development. Summarizing, it refers to societal impact. In literature, this term - societal impact – is used with the meaning of social, environmental, medical or cultural impact [Rizzi F. et al., 2018; EVPA Report, 2017].

The current challenges regarding the future development of the social finance market refer to the opacity of its conceptual bases. For this reason, this article aims, among other things, to clarify the basic concepts and instruments of social finance and their continuously developing market, analyzing the literature in the field. Thus, first of all, we analyze the structuration processes that take place in social finance and the institutional actors involved. Also, a conceptual delimitation of social investments and the way in which they are selected is necessary.

Last but not least, reviewing the literature, this article addresses to the analysis of the financial instruments (FI) used on the social finance market and their impact, also addressing the issue of the usefulness of tailored finance of a social purpose organization.

Regarding the experience on the social finance market in Romania, this article aims a static and dynamic analysis of the financial instruments used, as well as of the entities in the Romanian social economy, proposing solutions to

improve public policies in terms of sustainable finance and social economy from our country.

Keywords: *Social finance, social investment, social investor, social economy, Romania*

JEL Classification: *A13, B55, G41*

Introduction

Investments made with the aim of creating financial value but with social impact have been around for a very long time. Capital management by religious institutions, mutual societies, credit unions for social purposes has been done for centuries [Benedikter 2011].

There are a variety of definitions of social investment in literature. They are different depending on the interest group that uses the term, but also depending on the object to which it refers (the social impact of goods and services, but also the social impact of the process).

It is generally accepted in the literature that social finance should contribute to the elimination of financing deficiencies for investments that are necessary to achieve social goals. Also, by influencing the cost of capital, they should encourage companies to pursue business models that are better aligned with social goals.

By influencing the cost of capital, social finance could also encourage firms to pursue business models that are better aligned with social objectives. However, the extent to which social finance is able to live up to these promises has yet to be proven. [Hilbrich 2021].

Due to this opacity regarding the conceptual basis of social finance, many challenges arise in the further development of the social finance market. There is no common and concrete definition of social finance, nor uniform and mandatory criteria applicable to financial products traded as social financial products.

The aim of this article is to clarify the concepts and instruments that are the basis of social finance and their continuously developing market, analyzing the specialized literature in the field.

The article is structured in six parts. Thus, the problem arises, first of all, of establishing which are the structuring processes that take place in social finance and which are the institutional actors involved. Also, a conceptual delimitation of social investments and the way in which they are selected is necessary. Last but not

least, reviewing the specialized literature, an analysis of the financial instruments used on the social finance market and their impact is required.

Regarding the experience on the social finance market from Romania, the article aims at a static and dynamic analysis of the financial instruments used, of the entities in the Romanian social economy, proposing solutions to improve public policies in terms of sustainable financing and the social economy in our country.

Conceptual approaches regarding social finance

In the previous chapter, we said that there is a wide range of definitions in the literature regarding the concept of social finance, that there is no generally accepted definition and that the plurality of concepts differs both according to the institutional actors involved and the object to which relate.

On the one hand, regarding social investment at the macroeconomic and multinational level, many important social objectives can only be achieved if the financial system is aligned with these objectives and substantial financial resources are mobilized to finance the necessary investments. In this case, the Covid-19 pandemic has shown that there are large funding gaps in many social sectors, such as health.

On the other hand, at the microeconomic level, social finance could establish incentives for companies to engage in more sustainable business models, which would give them access to social financial instruments potentially associated with a lower cost of capital.

With regard to social finance, we can also talk about how social processes shape economic outcomes. There are studies that investigated how individuals' financial investments were influenced by family, friends and acquaintances, analyzing peer effects in explaining household financial decisions [Hirshleifer, 2020].

In this case, social interactions can influence people's economic and financial decisions through multiple channels, two mechanisms being particularly prominent when it comes to social finance. Kuchler & Stroebel (2020) believe that these mechanisms provide a useful framework to analyze equalization effects, even if they cannot be precisely attributed to these broad categories, but some observed equalization effects could be the result of both mechanisms operating at the same time. One of the mechanisms refers to "social learning" through social networks as a channel of information transmission, and individuals can be affected by the preferences of friends [Jackson, 2010]. The second mechanism refers to "social utility" [Abel, 1990], a concept that refers to how the actions of friends, acquaintances or family enter directly into the utility functions of individuals,

causing them to imitate patterns of consumption of others, either to stay on trend or not to lose a particularly attractive investment.

There is still no generally accepted definition for the concept of "social" in social finance. Market participants use a wide variety of definitions. In general, we can talk about two focuses and four selection procedures [Hilbrich S., 2021].

The two different focuses refer to the type of causal links that are considered:

a) economic activities can have an impact on the achievement of social objectives through the production of certain goods or services. The production of certain goods or services, such as medicine or educational services, are essential to the achievement of social goals, while other goods or services have no impact on these goals, and others are even harmful. From this point of view, many definitions of social investment refer to these social impacts of goods or services produced.

b) economic activities also have a direct process-related impact on social objectives, which have nothing to do with the nature of the goods or services produced. For example, working conditions are an important social issue, regardless of whether these conditions are present in sectors that produce socially beneficial goods or services or in other sectors. These impacts related to the process of an economic activity can also be positive: local communities that benefit from the taxes paid by a company have the number of jobs it creates locally. These process aspects are often found in definitions of social investment.

Regardless of the causal link that a definition of social finance refers to, there are four different selection procedures for social investments [Hilbrich S., 2021]:

- positive selection of sectors,
- exclusion of the sector,
- best-in-class procedures and
- the minimum criteria.

The positive selection of sector procedure refers to the consideration of investments in certain sectors of activity as eligible for social financial products. For example, investments in the health or education sector are considered to meet social objectives.

The selection procedure by excluding certain sectors of activity refers to the elimination of investments in certain sectors as ineligible for social finance, such as the armaments industry or the gambling industry.

The third procedure refers to the selection of those companies from all sectors of activity that best meet certain social indicators, thus classifying them as eligible for social investments (best-in-class procedure).

The fourth selection procedure (minimum criteria), considers all investment projects that meet certain minimum criteria, such as paying the legal minimum wage, as socially eligible.

This structuring, on the two focuses and four selection procedures, leads to eight different approaches. Definitions of social investment typically combine a number of these approaches in identifying social investment. For example, one can select certain sectors because of the social impact of the goods or services produced by them and use the minimum criteria procedure to ensure that the selected firms in these sectors are eligible for social investment. We can talk about the housing construction sector as a sector whose goods produced have a social impact and can additionally be used, as a selection procedure for eligible firms, minimum criteria such as the payment of the guaranteed minimum wage or the verification that these eligible firms in these sectors do not engage in certain harmful practices such as tax evasion or corruption.

Social investment and the social investor

According to OECD (2015), social investment or social impact investment refers to the provision of funding to organizations that address social needs with the explicit expectation of a measurable social and financial return. Also, social investments can be defined as investments made in companies, organizations and funds with the intention of generating a measurable, beneficial social or environmental impact alongside a financial return [The Global Impact Investing Network, 2017]. In understanding social impact investments, it is very important to identify the entire framework and logic of the interventions. The OECD has identified the following defining elements:

Social needs: which provide the basis for action, these include ageing, disability, health, children and families, affordable housing and jobs.

The demand side: service delivery organizations (or in some cases individuals) such as community organisations, charities or not-for-profit organizations, social enterprises and social impact enterprises.

The supply side: social investors who provide capital in exchange for financial and social goals. Typical social investors are foundations and philanthropies. Among philanthropists, high net worth individuals may act alone or as investment groups.

Intermediaries: these can be "mainstream" (commercial banks, investment banks, independent financial advisors, brokers) as well as new specialist

intermediaries (e.g., social venture capitalists, social exchanges, ethical-social banks, also as vehicles or social financial platforms).

Favorable conditions: the favorable national/regional conditions or environment underlying the social impact investment (SII) market. These include the regulatory framework, the availability of private capital, the tax system and technical/financial know-how.

According to The Global Impact Investing Network (GIIN) (2017), SII has four main characteristics:

Intentionality – The investor seeks to generate social and/or environmental impact through investments.

Expectations of return – Impact investments are expected to generate a financial return and at least a return on capital.

Range of return expectations and asset classes – Impact investments generate returns that range from below-market (“concession”) to risk-adjusted market rates.

Impact measurement – The investor requires measurement and reporting of the social and environmental performance and progress of the underlying investments.

The social investment ecosystem includes social finance providers and social enterprises, plus all stakeholders who participate in, influence or are affected by social investment activity. When we use the term social finance/social investment market, we will focus on the market, where supply and demand meet (i.e., transactions between investors, intermediaries and social enterprises) [European Commission, 2016].

Concluding, the ecosystem is made up of a growing number of investors seeking to use their capital to meet economic, social, cultural and environmental goals.

In contrast to social investment, classical investment can be defined as putting investors' financial funds to work to maximize the earning potential, in other words the act of committing capital or money to a project or business with the expectation of obtaining revenue or profit. In this case, the focus is on the return of private investors. In other words, it would be quite feasible to invest in a social project, but the primary motivation of any investor is to maximize profit, so this investment will be preferred if it offers an attractive rate of financial return.

From the above it is clear that social investment is the point where the investment (financial and non-financial) focuses on the social benefits: environmental, cultural and complete economic benefits of an initiative, on the activity of the organization and on the health of society. as a whole, overall.

Thus, the investment spectrum varies from a small or marginal social return, to a situation where the focus is on social return entirely, without expecting any financial return. At this part of the investment spectrum (where only social impact matters, or primarily social impact), there may be no expectation of return on capital, and the appropriate vehicle may be donation. Venture philanthropy only covers social impact and the first sections of the impact spectrum.

On the other hand, the first part of the investment spectrum refers to traditional businesses, which attract investors whose main goal is financial return. This type of investment is not considered a social investment, even if the social impact occurs as an "unintended consequence" [European Commission, 2016].

Social investment is not only about funding and support, but also about attracting people with similar values.

A social company is not a natural debtor/lender, but the sources of financing decreased quite a lot in the last global financial recession (2007-2008), which is why these companies were forced to look for alternative sources of financing, in the situation in which and government subsidies have decreased in most countries or sought new ways to launch new operating models. There were also companies interested in obtaining the necessary funds on the most affordable and least restrictive terms possible. Social financing can meet the needs of social enterprises, offering generally simple and easy-to-understand structures and being more flexible in terms of the conditions under which financing is granted. The level of flexibility is also likely to be linked to the source of funds.

Great providers of funds for social enterprises are value-based banks, also known as social banks. They understood that banking is a combination of social responsibility and making a reasonable profit to generate a fair livelihood, but they have a primary obligation to protect the savings of their depositors. For this reason, they do not have the flexible risk appetite that would allow them to offer higher risk social financing. Foundations could be natural partners in providing financing funds, taking on more risk, but they remain a minority. Most see grants as their only financial tool. However, as with venture philanthropy, there are simply not enough resources to meet the long-term needs of social enterprises.

However, social investing is not right for every company, and even where it is, it can be a challenging and time-consuming process. If we assume that most of the funds to finance the social objectives must be repaid, then the enterprise will need a reliable source of income to repay the investor's funds. This tends to favor the growth of already successful financial models, such as those of charities, associations or non-profit organizations. Where non-financial returns appear

strong, social investment can also open up access to finance for companies that do not have the asset coverage to access support from traditional financial providers. It can also help attract additional funding by demonstrating, through its due diligence process, belief in the viability of an organization and/or the feasibility of social returns.

Another issue is the size of the funds needed, the scale at which they can be accessed. Established social investment funds, especially those that have to bear the cost of regulation, tend to move towards larger deals as their portfolios mature and find it increasingly difficult to adapt their model to finance needs at scale small in a cost-effective way. Statistically, the greatest financial need is for small amounts (less than €250,000; often less than €50,000), which may be more suitable for small-scale individual investors or the crowdfunding market [European Commission, 2016]. At the other end of the spectrum, some of the biggest funding needs are too big for the nascent social investment market. Major investments in infrastructure or fixed assets or the development of new ways to meet the needs of society can be expensive and require a significant amount of financing. Social investors are geographically dispersed and often operate in distinct markets. Perhaps as a result of their different roots and missions, social investors do not syndicate investments with each other on the scale that commercial banks do.

Social investments can be made in the form of debt or equity instruments or in the form of hybrid models that incorporate both forms of financing/raising capital.

Social investors, unlike mainstream investors who happen to fund social initiatives, look at their investments globally. They understand the impact their financial decisions have on the world. Their values are based on transparency, sustainability, fairness, diversity and inclusion. Social investors live in the triple bottom line and can more easily relate to the needs and experiences of the businesses they invest in. Social investing offers a more empathetic approach than traditional investing. Social investors include venture philanthropy funds, charitable foundations or investment funds. These include financial cooperatives and cooperative banks, credit unions, funds of various types and motivations across the impact spectrum, wealthy or high-net-worth individuals (sometimes incentivized by tax breaks), and other individual retail investors. Crowdfunding (in its various forms) and community action have brought social investment to less well-off individual investors.

Individually, social investors deposit their funds in value-based banks, banking cooperatives or mutual financial institutions or other ethical financial institutions. They also use these organizations to save. They also invest their savings in

microfinance funds and tax-incentivized forms of social investment. They purchase charity bonds directly from social enterprises. They invest in community and social enterprise issues. Institutionally, as direct investors or as intermediaries, they make secured and unsecured loans, buy social impact bonds and charity bonds, and work with social enterprises in their supply chains. Social investors are those who work to raise awareness of social finance and social enterprise.

Financing mechanism and financial instruments used in the social finance market

Although social impact investing may use "traditional" financing schemes and products, in recent years authorities and financial institutions have increasingly explored the use of innovative financing instruments.

Traditional financing schemes include products that provide financial instruments like loan, guarantee, equity, quasi-equity (financing that ranks between equity and debt, having a higher risk than senior debt and a lower risk than common equity).

These four financial products can be used in the design and implementation of financial instruments. It should be emphasized that the financial product and the financial instrument do not coincide. The financial instrument is defined in the Common Provision Regulation as a form of support that incorporates the use of the selected product, combining it with other forms of support such as grants.

Social impact investing can use these "traditional" products, such as a Social Impact Fund that combines grants and equity products. However, the mechanism for the provision of SII must include the measurement of social needs and social outcomes and impact, which is a key challenge in this process. For this reason, SII may use more innovative delivery mechanisms, which may not be financial instruments.

The EU regulatory framework recognizes the use of results-based payments for grants and reimbursable assistance. Article 67 of the CPR lists the forms of grants and repayable assistance and among them standard scale of unit costs, lump sums (not exceeding EUR 100000 from public contributions) and lump sum funding. These are 'Simplified Cost Options' which can be results-based, meaning payment can be linked to the accomplishment of achievements and results.

The payment-by-result mechanism is increasingly used. The mechanism provides for a payment, or premium, proportional to the social results, financial results and social impact that have been achieved and measured.

It is important to note that while outputs are tangible products or services that result from funded activities, outcomes are the changes, lessons or other effects that

result from these activities. Finally, impact is a broader and long-term outcome that can be attributed solely to that intervention, excluding the actions of other interventions and unintended consequences.

The concept of pay-for-results is being used more and more due to several factors. These include reductions in public spending, increased demand for innovative financing tools, evidence-based models in public spending, and measurable community and environmental benefits.

The main benefits of paying for results relate to the use of private capital for social causes, new solutions and innovative financial models, reduced public expenditure and direct positive consequences for society.

The main problems, however, lie in the difficulties of impact measurement, cultural differences and regulatory obstacles in collaboration with public authorities.

Other innovative financing mechanisms for the social economy are illustrated in the table below.

Table 1. Financial mechanism and instruments for the social economy

Instrument	Features
Charity / Retail Bonds	Philanthropic institutions and social service providers may issue bonds as a form of long-term debt financing, given the potential returns that can repay investors. Retail Charity Bonds is a platform listed on the London Stock Exchange that accepts the issuance of charity bonds.
Investment funds – Social impact investment funds	investment funds, collective investment vehicles or collective investment schemes, managed funds or simply funds. These funds are for collective investment, normally short-term or in securities. Investors can fund the public through mutual funds, exchange-traded funds, special purpose vehicles or closed-end funds. For a private placement, investors can use hedge funds and private equity funds. Investment funds have a wide range of objectives, including specific geographic regions (e.g., emerging markets or Europe) or industry sectors (e.g., technology).
Microfinance/microcredit	Microcredits without guarantees and accompanied by guidance/coaching services for the borrower. These loans can be granted to small businesses (to support micro-entrepreneurship), non-profit organizations (both associations and cooperatives) and individuals in vulnerable economic conditions.

Instrument	Features
Revenue participation agreements (RPA)	RPAs are quasi-equity instruments that entitle the buyer to a predetermined percentage of proceeds up to a multiple of the capital invested. They are particularly suitable for financing non-profit organizations because they avoid selling equity to outside investors. Moreover, they allow investors to share risks and rewards while providing capital on more flexible terms than traditional debt. RPAs are mostly found in the UK with impact investors such as Bridges Ventures, Big Issue Invest, CAF Venturesome or Social Investment Businesses.
Social bonds	Social bonds are issued by financial institutions to raise capital for social initiatives. The issuing institution supports such initiatives through grants or debt financing (under favorable conditions). Investors in social bonds are rewarded with financial returns while supporting initiatives with positive social impact.
Social impact bonds	A SIB is a contract with a public sector authority that pays for better social outcomes and uses the savings to pay the investors who funded the initiative. The cost of financing varies as public institutions pay the bond issuer for measurable savings given agreed social outcomes. At the end of 2016, 60 SIBs were issued worldwide, according to Social Finance (UK). By January 2018, it had grown to 89 SIBs in over 20 countries.

Source: IFISE project, Multi-region assistance (MRA) initiative co-funded by the European Commission Handbook - Financial instruments for social impact – supported by ERDF and ESF, June 2019, p. 14

Sustainable finance and the social economy – the Romanian experience

For a developed social economy, a general framework favorable to social economy organizations is needed, and various public policy instruments and measures can be used for this.

To evaluate the national framework for the existence and operation of the social economy with the aim of developing public policies for this sector, the OECD has developed an evaluation tool based on the following criteria:

1. The culture of entrepreneurship
2. The institutional framework
3. Legal and regulatory frameworks

4. Access to financing
5. Access to markets
6. Skills and business development
7. Measuring, managing and reporting impact

Regarding the situation in Romania from the perspective of the first two evaluation criteria, things are presented as follows:

The first criterion - the culture of social entrepreneurship, from the OECD perspective, refers to:

- local traditions and activities, including those of civil society and existing social economy organizations;
- efforts to raise awareness of social entrepreneurship and whether support is given to citizen-led initiatives and social economy organizations;
- education providers promote social entrepreneurship in formal and non-formal learning and if universities carry out research activities in the field;
- statistical data on social enterprises are regularly collected and analyzed.

In Romania, according to a report from 2021 (Barometer of the social economy), the evaluation of this criterion led to the conclusion that the culture of social entrepreneurship in our country is quite low, because:

- civil society organizations approach economic activities as a source of income to a small extent (according to the 2021 report cited previously only 12% of them carry out such activities) and are very little involved in the debates on the social economy, thus supporting the development to a small extent social entrepreneurship;
- awareness activities are few - the month of the social economy (May is the month of promotion of the social economy in Romania) provided by law is not organized by the authorities in the field, only by a few resource centers in the sector. There are few initiatives to introduce the social economy into the school curriculum - in professional education CRIES Timisoara, studies of social entrepreneurship, social economy, pilot cooperatives in higher education at the bachelor's or master's cycle at only 5 universities in the country (Bucharest University, The Academy of Economic Studies in Bucharest, USAMV, West University of Timisoara and Babeș Bolay University Cluj-Napoca).
- The National Institute of Statistics does not publish official data on social economy entities (it carried out a study in 2014 in collaboration with the Institute of Social Economy / Foundation for the Development of Civil Society but did not continue the initiative).

- The Trade Register does not publish data on cooperatives, commercial companies with provisions according to Law 219/2015 in their statutes and those owned/controlled by entities of the social economy, such as NGOs

The second criterion – the institutional framework, from the OECD perspective, refers to:

- Institutional support for the development of social enterprises, including whether there is any state body responsible for policies and administration of the field.
- Adequate coordination between government agencies and the various levels of central and local public administration.
- Existence of a strategy to support social entrepreneurship, developed in consultation with relevant stakeholders.
- The situation in Romania, according to the previously cited report, regarding the institutional framework for supporting the social economy, is presented as follows:
- Institutions with the main responsibility in the development of policies are: Ministry of Labor and Social Protection for the field of social economy and related ones - including the employment of disadvantaged groups and social services; The Ministry of Justice for the non-governmental sector and the registration of commercial and cooperative companies through the National Office of the Trade Register and the NGO register; Ministry of Economy for cooperatives and business policy in general; Ministry of European Investments and Projects for European funds; Ministry of Development, Public Works and Administration for FEADR; The National Employment Agency and its county agencies for the recognition of social and insertion enterprises and their involvement at the local level through the county insertion plans.
- There is weak coordination between institutions responsible for policy making at the central level and between them and devolved services and local public authorities.
- There is a weak consultation of the actors in the field, there is no permanent consultation mechanism.
- Local public authorities, social services and county employment agencies are, with few exceptions, interested in the development of the social economy.

The growth and dissemination potential of social enterprises continues to be underexploited in Romania, as they face various obstacles. Social enterprises face

not only the problems typical of SMEs, but also specific difficulties, especially in terms of access to finance. When we talk about social financing in Romania, it is important to reflect first of all on the financing needs of social entrepreneurs and change agents.

On the Romanian market there is an obvious shortage of financing instruments that specifically target the needs of social entrepreneurs:

- Credits: there is no dedicated approach to social finance with its own eligibility criteria relevant to the type of operations of social entrepreneurs
- Fiscal instruments: Redirection of 20% of company profit/income tax and 2%/3.5% of personal income tax is widely underutilized (only 8% of Romanian companies and only 34% of individual employees redirect their taxes to non-profit organizations).

In Romania there are two tax redirection mechanisms available for social entrepreneurs that are quite underutilized. Namely, for profit, companies can redirect 20% of the profit tax (no more than 0.75% of the turnover when the companies exceed 1 million euros) or of the income tax (in the case of micro-enterprises with a figure of business less than 1 million euros) to an NGO of their choice, as well as individual employees can redirect up to 3.5% of their income tax to an NGO of their choice for up to two consecutive years.

- Corporate sponsors: For-profit organizations play increasing roles as important funders and supporters of social entrepreneurs, but there is no assessment of the impact these types of investments have.

According to aggregated data on the Donor Platform launched in 2021, the top 15 funders and 19 Community Foundations have already invested more than EUR 52 million (of which the main funding was more than EUR 3 million investment in education) in more than 54 of impact areas

- Crowdfunding: Support from individual donors continues to grow. In the last two years, we have observed emerging patterns in Romanians' behavior towards civic engagement through donations and supporting social entrepreneurs through crowdfunding. Two community currencies have emerged in recent years

This was even more visible through private donations of 20 million euros in the first months of the pandemic, according to data collected by Romania Insider. A big enabler of this process is increased access to technology platforms that facilitate donation-based crowdfunding. Campaigns also play an important role in raising awareness of the promise of smoother and easier to complete donation

processes, such as donatie.ro (SMS campaigns). It saw a 14.5% increase in recurring donations.

According to the USAID and FDSC Sustainability Index, the peer-to-peer platform reported a 47% increase in annual donations, benefiting 206 CSOs and 476 community projects.

- Grants: Grants are the most prominent instrument that finances social enterprises in Romania. Start-up funds have been made available, but there is no consolidation tool for existing social enterprises

According to the civil society sustainability index, central government funding and European funds remain a significant and crucial source of funding for social entrepreneurs. The most important opportunities come from the European Social Fund (ESF) 2014-2020 and the EEA and Norway Financial Mechanism 2014-2021. The European Social Fund 2014 - 2020 provided financial resources for acceleration programs for social entrepreneurs in 2 calls for proposals (SOLIDAR). The EEA and Norway Financial Mechanism 2014 – 2021 finances the Active Citizens Fund, a financing program dedicated to non-governmental organizations, which is implemented in Romania between 2019 and 2024 and has a total allocation of €46,000,000. 11 calls for proposals were launched in 6 areas of support.

No solid alternative financing mechanism, used in other EU countries, has yet been made available in Romania (bonds with social impact, crowd investing).

Regarding the gaps about financial instruments that could accelerate the social finance market in Romania, we can talk about:

- A common local guarantee fund between banks as a form of risk sharing instrument
- More collaboration between different types of investors (banks, corporate investors, etc.)
- Equity/debt funding platforms for social enterprises.

Conclusion

The current challenges regarding the future development of the social finance market refer to the opacity of its conceptual bases. For this reason, one of the objectives of this article was to clarify the concepts and instruments that are the basis of social finance and their continuously developing market, analyzing the specialized literature in the field.

The plurality of concepts encountered in specialized literature differs both depending on the institutional actors involved and the object to which they refer:

- at the macroeconomic and multinational level, many important social objectives can only be achieved if the financial system is aligned with these objectives and substantial financial resources are mobilized;
- at the microeconomic level, social finance could establish incentives for companies to engage in more sustainable business models, which would give them access to social financial instruments potentially associated with a lower cost of capital
- we can also talk about how social processes shape economic results. In this case, social interactions can influence people's economic and financial decisions through multiple channels, with two mechanisms being particularly prominent when it comes to social finance: one of the mechanisms refers to "social learning" through social networks as a channel of information transmission, and individuals can be affected by friends' preferences [Jackson, 2010]; the second mechanism refers to "social utility" [Abel, 1990], a concept that refers to the way in which the actions of friends, acquaintances or family enter directly into the utility functions of individuals, causing them to imitate the patterns of consumption of others, either to stay on trend or not to lose a particularly attractive investment.

Regarding the financing mechanism and financial instruments used in the social finance market, social impact investment can use both "traditional" products, such as a Social Impact Fund that combines grants and equity products, but also more innovative, which may not be financial instruments. Thus, the payment-by-result mechanism is used more and more. It provides for a payment, or premium, proportionate to the social results, financial results and social impact that have been achieved and measured. Other innovative financing mechanisms for the social economy are charitable bonds, Social Impact Investment Funds, Microfinance/Microcredit, Revenue Sharing Agreements (RPA), Social Bonds, Social Impact Bonds.

The growth and dissemination potential of social enterprises continues to be underexploited in Romania, as they face various obstacles. In Romania there is an obvious shortage of financing instruments for social entrepreneurs, and there is no solid alternative financing mechanism used in other EU countries, such as social impact bonds or crowd investing.

As financing mechanisms, social enterprises in our country use: credits, fiscal instruments, corporate sponsorships, crowdfunding and public grants, which is the most prominent financial instrument used for actions with social impact.

Among the challenges of the social finance market in Romania are:

- the limited number of actors to support social entrepreneurs, from funding issues to support organizations aimed at providing the tools and expertise needed to grow organizations from one stage of maturity to another.
- Existing players are reactive to the needs of social entrepreneurs, but not acting on a more shared, collaborative agenda

For these reasons, Romania should:

- Public authorities to be an ally in supporting social entrepreneurs with the know-how to access grants, comply with legislation and ensure that they have a sustainable plan after the end of the initial funding period. New regulations need to come into force to complete the initial Social Economy Act, to increase its practicality, based on insights and feedback from social entrepreneurs and support organizations with grassroots experience.
- Financial institutions and investors should create an impact investment fund or other financial instruments to take social entrepreneurs from where they are after accessing EU grants until they can be sustainable and credible to the bigger players on the market.
- Support organizations to create scalable investment training programs in Romania, which support social entrepreneurs in the development of their enterprises at any stage of development.
- Social entrepreneurs should put future and ongoing projects under a strategic lens, have clear methodologies for measuring impact, create a strong business plan and risk analysis, build a network of "allies"

In conclusion, the social finance market in Romania is still in the development phase and requires the activation of a stronger support system.

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THE ROLE OF RELIABILITY AND MAINTAINABILITY IN THE CIRCULAR ECONOMY

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Abstract: *The goal of this paper is to show that reliability and maintainability play important role in the circular economy. The goals of the circular economy are the creation and production of such products that have an extended lifespan not only through reliability, but also through maintenance, servicing and by recycling. To fulfil such goals, reliability and maintainability must be applied in proper way during the design of a product. The role of reliability, availability, maintainability and artificial intelligence in the circular economy is discussed in this paper.*

Keywords: *Circular Economy; Reliability; Availability; Maintainability; Maintenance.*

JEL Classification: *Q53; Y20.*

Introduction

A circular economy is an economic system designed with the intention that maximum use is extracted from resources and minimum waste is generated for disposal [Deutz, 2020]. So, the goals of the circular economy are the creation and production of such products that have an extended lifespan not only through reliability, but also through maintenance and servicing. Of course in order to

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reduce waste and pollution, we need to keep products and materials in longer use, and also recycling is needed. In order to achieve these goals, reliability, availability, maintainability and repairability are important for circular economy. And availability and maintainability are in relationship with reliability, and maintainability is in relationship with repairability.

Firstly, the brief explanation of circular economy, then the short definitions of reliability, availability, maintainability and repairability will be given, and after that the role of reliability, availability, maintainability and artificial intelligence in maintenance in the circular economy will be discussed.

1. Circular economy

The term circular economy has used very often over the last decade in businesses and governments. In China circular economy (CE) is promoted as a top-down national political objective while in other areas such as the European Union, Japan and USA, it is a tool to design bottom-up environmental and waste management policies.

There are many definitions of the circular economy. In [Deutz, 2020] is stated that circular economy is an economic system designed with the intention that maximum use is extracted from resources and minimum waste is generated for disposal.

The circular economy is a framework of three principles, driven by design: eliminate waste and pollution, keep products and materials in use and regenerate natural systems.

The circular economy model is in complete contrast to the currently dominant linear economy, which promotes the concept of production called "take (from nature), make (in the production process), use, discard (to waste)".

Doesn't matter of the definition of circular economy, the goals are to eliminate waste and pollution, and keep products and materials in use, and to do that we need product which are reliable and maintainable (it means repairable).

2. Reliability, availability, maintainability and repairability

Reliability as theory and practice began to develop in the 50's of the previous century. **Reliability** is defined as a probability that a component or a system will meet certain performance standards in yielding correct output for a desired time duration in certain environmental conditions [Pokorni, 2021a]. Let us say that in this way: if we say a person is reliable, we mean that we can depend on them -- that he or she won't fail us. The same is pretty much true when we talk about any

device or product (car, computer, airplane, component, system, etc.) that means there is a high-probability that it will work without failure- during a certain time.

Firstly reliability of hardware was developed, than software reliability and human reliability [Pokorni, 2021a]. From the point of circular economy hardware reliability is more important, because hardware produce waste. But now more hardware devices are realised as software, so software reliability is also important.

Because reliability is a measure of the ability of a product to perform a required function under stated conditions for a stated time period, or a probability that a component or a system will function without failure for a specified time, obviously reliability is important characteristic. Bigger reliability means longer use of a product, so less waste and pollution.

Bigger reliability means longer use without failure, but bigger reliability can be expensive. But if a product fails and it can be repaired, if it is designed in that way, this can prolonged life of its use. And characteristic for that is availability. And in that case a product is maintainable.

Availability is a metric used to assess the performance of repairable systems, incorporating both the reliability and maintainability properties of a component or a system. There are different definitions of availability and different ways to calculate it [Pokorni, 2014, 2021a].

For example, instantaneous availability (usually called availability) is defined as the probability that a system (or a component) will be operational at a specific point of time.

For an unrepairable component or system, reliability and availability mean the same, but for a repairable component or system, availability is bigger than reliability [Pokorni, 2014].

If the system is repairable, then availability is not the same as reliability.

For example, replacing an exhausted battery in an Internet of Things (IoT) device can reduce availability if the IoT system is supposed to work continuously.

Reliability and availability are connected with maintainability. For example, in order to achieve optimal cost in the life cycle of the product, maintainability must be considered in the design phase of the product [Pokorni, 2019].

Nowadays, **maintainability** refers to the ability for a system to be seamlessly and easily uncoupled, fixed and modified without causing an obstruction in the system processes or functionality. To evaluate the maintainability property of a device, in case of a problem, the system should allow easy replacement of faulty components without loss of service. Therefore, to characterize device as highly

maintainable, it has to enable maintenance tasks to be completed effectively and efficiently [Pokorni, 2021a].

Maintainability is connected with repairability. **Repairability** is a measure of the degree to ease with which a device or product can be repaired and maintained, usually by end users or services. In effective repair documentation, disassembly, spare parts availability, spare part pricing, and product specifications are important.

Reliability is not easy to calculate or evaluate. In calculation of reliability input data is the biggest problem. Not because there is too much data, but because, sometimes, there is too little data. Because reliability is very high for many elements or products, there is little data about their failures. So usually we have problem not with too many data (big data), but with too little data (not enough data).

From the point of circular economy, the goal can be maximally extend the life span of a product, but not only by reliability, but also by maintaining and servicing devices, and it means that there be some procedures the user can performs himself [Smith, 2022].

3. The role of reliability, availability and maintainability in the circular economy

The circular economy represents a regenerative economic system in which production resources, waste, waste emission and energy outflow are significantly reduced by slowing down, rounding off and extending energy and material cycles (life cycles) in production. This is achieved first of all by designing and creating products in such a way as to maximize their lifespan, but also by their maintenance, servicing and recycling [Center for Promotion of Circular Economy, 2023]. As we stated before, prolonging the lifespan of a product depends of reliability of the product and organization of maintenance (repairing) in case of failure. In order to achieve this reliability and maintainability must be incorporated in the design phase.

In 2012, the European Commission published a document called "Manifesto for a Resource-Efficient Europe" [Manifesto, 2012] which clearly emphasizes that "in a world of growing pressure on natural resources and the environment, the European Union has no other choice but to start the transition towards a resource-efficient and ultimately regenerative model of the circular economy".

In the past, the devices used to last for decades. Today, technology is changing rapidly, so devices are rapidly (in a couple of years) becoming obsolete. A new product with new, better functionalities is needed. Is it worth doing something that

lasts 20 years, if it becomes obsolete in 5 years? Is the computer replaced every 5 years?

In the past, devices were made so that they could be easily repaired in the event of a malfunction. There was an obligation to produce spare parts for at least seven years. But in the last decades some products are designed not work long or not to be maintainable. Manufacturers use special tools for opening the product, which users do not have, so they cannot open the product themselves, for example an iron. Having that in mind the EU introduces an obligation to provide spare parts for a certain period.

The TVset breaks down because, for example, the processor fails, so the repair is not worth it, because the processor is expensive, and maybe it is no longer produced, so it cannot be purchased, so it is cheaper to buy a new TV set. But the old is thrown away, and that pollutes the environment, or waste and the need for recycling increase, and materials are used to make the new one.

What if the user could repair some products himself? Usually, the instructions state that you must not open or repair anything yourself, because it is stated that there is a risk of, for example, an electric shock or something breaking. Of course, such a risk exists, but not everywhere and not if there is an appropriate instruction on how to do it. The user doesn't have to do it during the warranty period, but why couldn't he do it later?

Opposite to this, recently we can see different approach, which is called „right to repair” movement. In [Luyi at all, 2023] is stated that right-to-repair legislation is designed to break manufacturers’ monopoly on the repair market, thereby allowing consumers to hold on to their old products longer, so they do not throw away used products and buy new ones as quickly, and that this would reduce the environmental impact by reducing waste and new production.

In [Smith, 2022: 22] is stated that modern electronics often remain relevant for at least five years, but routers, displays, and high-end computers can be useful for a decade or more.

Some companies already accepted „right to repair” principle. In December 2021, just before CES, the world’s leading tech event, Dell introduced the Concept Luna, a reimagining of the laptop that focuses on repairability. This was the Dell’s concept to respond to the so called “right to repair” movement. So, the intention is to produce a laptop that’s fit to be fixed.

Modern laptops are notoriously hard (and some times impossible) to repair, a problem Luna’s designers address by reducing the number of screws to four and avoiding permanent adhesives. Instead, many parts lock into place. Dell has set

itself the goal of reusing or recycling one equivalent product for every product it sells. Luna, a laptop that can be disassembled and repurposed, could help achieve that goal. Luna would let users replace or upgrade components after purchasing. A stuck key or bulging battery would no longer be a death sentence.

There are other examples [Smith, 2022: 22]. Framework, a startup that released its first laptop in 2021 also follow this movement. The company's namesake laptop is designed for easy access to its internal hardware. Owners can replace the hard drive, battery, or Wi-Fi adapter, and expansion cards let owners replace or swap ports. Framework's laptop is not as compact or modular as Dell's concept, but it is in production.

Apple, too, is preparing a Self Service Repair program that will sell parts for iPhones, iPads, and Macs directly to consumers. Owners will be able to fix their devices with new, official repair manuals. In the case of iPhone and iPad, these will be the first official repair manuals ever released.

In the concept of Circular Economy the Reliability of systems and equipment, as well as their Maintenance throughout their life cycle, play a decisive role for their success [Jose & Ferreira, 2018].

There are other examples how to achieve longer use of a product. For example, the long-term durability provided by galvanizing is achieved at relatively low environmental burden in terms of energy and other globally relevant impacts. The life and durability of steel are greatly improved when coated with zinc and no other material can provide such efficient and cost-effective corrosion protection [Galvanizers Association, 2023].

Dell isn't alone in its focus on sustainability. LG announced at CES 2022 that its new OLED TVs will use more recyclable materials and cut packaging waste, and Lenovo introduced a Yoga laptop partially made of recycled plastics. These steps follow a trend set by Apple, which uses recycled aluminum in several devices including the MacBook Air and iPad.

4. The role of AI in maintenance in the circular economy

In [Pokorni, 2021b] is concluded that progress in Artificial intelligence (AI) is inevitable, so it is important to understand its potentials for the application in reliability and maintenance and also possible pitfalls of it. Also is concluded that AI can be applied in reliability and maintenance. In both cases, a problem is data, and problem is how to cope with large amounts of data on the one hand, and with very small amounts of data on the other hand, because both can be the case in reliability and maintenance.

Keywords used in the explanation and definition of Circular Economy, such as "repair", "reuse", "maintain" or "extend", show how the maintenance function plays an active role in this strategic concept.

In [Underhåll] is stated that maintenance will play an important role in the circular economy and AI will support smart manufacturing and maintenance. AI can help maintenance engineers decrease the time spent on maintenance activity. This means decreasing the cost. Using AI will also increase the opportunity for maintenance engineers to work in cyber space. This will increase the accuracy of maintenance and decrease the need to travel to the site of the machines.

Different types of jobs can also be created when AI is used. For example, software that implements the AI algorithm needs to be developed and this type of job will be required much more in the future.

Conclusion

The goals of the circular economy are the creation and production of such products that have an extended lifespan not only of reliability, but also through maintenance and servicing. This can reduce waste and pollution. Of course recycling is needed. Bigger reliability means longer use without failure, but bigger reliability can be expensive. But if a product fails and it can be repaired, if it is designed in that way, this can prolong life of its use, and need less repairing, so it will cost less.

In order to achieve these goals, reliability, availability, maintainability and repairability are important for circular economy. Maintenance will play an important role in the circular economy and AI has a certain potential in maintenance.

In accordance with this, recently we can see approach, which is called „right to repair” movement which is accepted with a number of well known companies.

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GREEN BUDGETING, ‘A MUST’ FOR ENVIRONMENTAL GOALS

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Abstract: *Budgets are a crucial instrument for climate action and the green transition. Faced with the imminent environmental threats, governments are increasingly deploying or planning to deploy green budgeting to better align their policies with climate and environmental commitments. Green budgeting means using the tools of budgetary policymaking to help achieve climate and environmental goals. These tools are part of a country’s annual and multiannual budgetary processes. Budgets can perform a crucial role in improving the consistency of public revenue and expenditure with these goals.*

Keywords: *green budgeting, green spending, green accounting, outcome-based budgeting, environmental goals.*

JEL classification: *E60, E61, H60, H61, Q50, Q51, Q58.*

Introduction

Climate change, biodiversity loss, pollution and environmental degradation are major, imminent threats facing our planet and our societies. As a result, the range of international initiatives now in place, notably the Paris Agreement and its aim to make financial flows consistent with a long-term, low-emission pathway, governments around the world are committed to pursuing co-ordinated action.

To advance national policies on climate and environmental goals, among the most important instruments that governments have at their disposal are the budget and fiscal policy more broadly. Budgets can perform a crucial role in improving the consistency of public revenue and expenditure with these goals. Such consistency helps governments reach their climate and environmental commitments and thus supports the transformation towards sustainable and resilient societies. Green budgeting means using the tools of budgetary policymaking to help achieve climate and environmental goals.

Green budgeting entails a systematic approach to assess the overall coherence of the budget relative to a country's climate and environmental agenda and to mainstream an environmentally-aware approach across all policy areas and within the budget process.

Many European countries are developing or plan to develop green budgeting practices and are keen to understand the experience of other countries in the region. Moreover, the experience of other European countries may be relevant and useful for countries in other regions pursuing similar practices. The European Commission (EC), the International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD) are deeply involved in shaping the process on green budgeting jointly to support a lucrative outcome.

1. International commitments and supporting arrangements

The Paris Agreement

The Paris Agreement, adopted in 2015 within the United Nations Framework Convention on Climate Change, commits countries to keep the rise in global temperature below 2 degrees Celsius this century. The 190 countries who are party to the Agreement also commit to pursuing efforts to limit the temperature increase to 1.5 degrees Celsius. The Paris Agreement has acknowledged that public spending and decision making need to address climate change impacts (United Nations, 2015).

The Sustainable Development Goals

The United Nations Sustainable Development Goals (UN SDGs) were adopted in 2015 by 193 countries. Each goal contains targets and indicators that governments can use to measure progress towards that goal and several goals are directly or indirectly related to climate change and environmental goals.

The Convention on Biological Diversity

The Convention was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993. Its objective is to develop national strategies for the conservation and sustainable use of biological diversity, and it is often seen as the key document regarding sustainable development. The convention has two supplementary agreements, the Cartagena Protocol and the Nagoya Protocol.²

The OECD Paris Collaborative on Green Budgeting

The OECD Paris Collaborative on Green Budgeting was launched in 2017 to help countries develop budgetary tools to progress towards national commitments on climate change and the environment. The Collaborative provides technical support to align national policy frameworks and financial flows towards lower greenhouse gas emissions and environmentally sustainable development.

The Coalition of Finance Ministers for Climate Action

The Coalition of Finance Ministers for Climate Action brings together finance ministers and policymakers from over 60 countries to lead the global climate response and secure a just transition towards low-carbon resilient development.

The IMF and Climate Change

The IMF is supporting its global membership to address the challenges of climate change for which fiscal and macroeconomic policies are an important component of the appropriate policy response.

The European Green Deal

In December 2019, the European Commission presented the European Union (EU) Green Deal (European Commission, 2019). The plan sets out a roadmap to make Europe a climate-neutral, resource-efficient, circular and competitive economy by 2050, turn climate and environmental challenges into opportunities and ensure a just and inclusive transition. These goals require integrated actions on several fronts, including investing in environmentally friendly technologies and circular economy, supporting innovation, promoting cleaner transport, decarbonising the energy sector, ensuring more energy efficiency in buildings, progressing towards zero-pollution while preserving and restoring ecosystems and biodiversity. The Green Deal includes an explicit commitment to foster green

² <https://www.cbd.int>

budgeting practices in the EU. Within the actions launched under its Green Deal, the EU has adopted a Climate Law to set:

- the legal objective for the Union to reach climate neutrality by 2050;
- a target at least of 55% reduction in net emissions of greenhouse gases compared to 1990 by 2030;
- a commitment to negative emissions after 2050;
- the establishment of an independent European Scientific Advisory Board on Climate Change.

To deliver on these targets, the European Commission launched a package of proposals, the 'Fit for 55' package, to make the EU's climate, energy, land use, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

Additional actions include among others the EU Biodiversity strategy, which broadens the network of protected areas and steps up efforts in nature restoration, and a Farm to Fork strategy to make food systems more sustainable, the new Circular Economy Action Plan to strengthen sustainable consumption/production and to reduce pressure on natural resources, the Zero Pollution Action Plan for a non-toxic environment and the Renewed Sustainable Finance Strategy.

2. Common elements of green budgeting

Countries use green budgeting to help achieve climate and environmental goals, ranging from climate mitigation to biodiversity and landscape protection³. National budgets play an important role in prioritising and resourcing governmental policies and can have significant implications for the economy, the environment and society. Green budgeting integrates climate and environmental objectives into a country's budgetary and public financial management framework and practices.

Green budgeting is a form of outcome-based budgeting. It enables governments to generate evidence that informs decisions on the likely climate and environmental

³ Some international classifications aim to cover environmental objectives comprehensively, such as the Classification of Environmental Protection Activities (CEPA) and the Classification of Resource Management Activities (CRoMA). More recently, the European Union taxonomy for environmentally sustainable activities considers six environmental objectives: climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy with waste prevention and recycling, pollution prevention control, and the protection of healthy ecosystems (European Commission, 2020a).

impacts of a budget. Other outcome-oriented approaches to budgeting sometimes refer to gender equality, poverty reduction, the UN SDGs or well-being. These approaches aim to embed systematic links between budget decision making and specific outcomes and entail refocusing resources towards cross-cutting strategic priorities (OECD, 2020a).

While the approach to green budgeting is often country-specific, common components underpin an effective green budgeting practice. The components that are discussed below help to ensure that efforts remain effective over the medium term. Many of these elements are clearly relevant for performant fiscal framework and effective budgetary planning, more broadly.

Strategic framework

As the first step in green budgeting, governments could set out their national plans and strategies on climate change (both for mitigation and adaptation) and the environment. Such plans and strategies help orient fiscal planning, guide public policy, investment and other decisions on revenue and expenditure to support green priorities. The strategic framework can include the scope of general government activity and budgetary items.

Tools and methods

Green budgeting tools can contribute to informed and evidence-based decision-making and budget preparation, and strengthen monitoring, reporting and accountability. Such tools sit within a country's existing annual and multiannual budgetary processes.

Institutional design

An enabling environment for green budgeting requires a strong institutional design where roles and responsibilities are clearly defined along with the timeline for actions and required deliverables and a well-designed legislative framework. While the finance ministries can take the lead in implementing the process, close collaboration and coordination with ministries responsible for the environment and climate change, or cross-cutting policies and other ministries is essential.

Reporting, transparency, and accountability

Transparency and accountability are crucial values in the management of public resources. Within the budgeting and public financial management frameworks, communicating the progress of green budgeting reforms is essential as it informs stakeholders about the government's actions. Reliable and regular reporting of

comprehensive, useful, and accessible information can be used by stakeholders, such as the parliament and citizens, in contributing to budget deliberations.

OECD and EU countries face a range of challenges when implementing green budgeting. The most common challenges relate to the lack of a methodology to assess environmental effects, lack of a modern multi-annual budgetary framework linked to strategic planning, lack of political will, lack of resources (time and staff), and lack of relevant knowledge and technical expertise.

To support governments around the globe, international institutions have developed green budgeting frameworks. The green budgeting frameworks, such as the European Commission Green Budgeting Reference Framework (European Commission, 2021b), the IMF's Green PFM Framework (Gonguet et al., 2021), OECD's Green Budgeting Framework, contain similarities and complement each other.

European Union Green Budgeting Reference Framework

The European Commission developed a Green Budgeting Reference Framework as a guidance tool for green budgeting practices (European Commission, 2021b). The Framework has five key elements which could be adopted in a three-stage implementation approach (*essential, developed, advanced*):

- Coverage: a comprehensive framework should encompass all environmental objectives and the entirety of budgetary elements and public sector entities.
- Methodology: initially, the methodology could imply identifying those budgetary items whose net impacts are broadly favourable or unfavourable to the environment, followed by a more comprehensive approach that identifies the green and brown content of the budget as a whole, eventually complemented by impact assessments.
- Deliverables: a national legal provision or administrative document on green budgeting should detail the content and calendar for green budgeting deliverables; these should be part of annual and multiannual budgetary plans and execution reports.
- Governance: the roles and responsibilities of the different stakeholders should be clearly defined, together with the timeline for action and deliverables. Initially, a temporary dedicated task-force could be put in place until a permanent structure is established with close involvement of line ministries.
- Transparency and accountability: all deliverables should be public and the methodology should be subject to an independent expert assessment. At a later stage, practices should include independent evaluations of the reports, parliamentary scrutiny and regular ex-post reviews of the methodology used.

Table 1: European Union Green Budgeting Reference Framework

ELEMENTS	LEVEL 1 - Essential	LEVEL 2 - Developed	LEVEL 3 - Advanced
Coverage <i>Environmental objectives</i>	Climate-related	Climate-related Some other objectives	All objectives
<i>Budgetary items</i>	Favourable expenditure Favourable revenue	Favourable items Unfavourable items	Favourable items Unfavourable items Tax expenditure
<i>General government</i>	State (incl. social security)	State (incl. social security) Subnational governments	State (incl. social security) Subnational governments Other extra-budgetary items (e.g. SOEs)
Methodology	Partial tagging methodology	Tagging methodology	Tagging methodology Impact assessment of policies methodology
Deliverables	Identification in annual budget Reporting on budget execution	Identification in annual budget Reporting on budget execution Estimates in multi-annual plans	Identification in annual budget Reporting on budget execution Estimates in multi-annual plans Extra-budgetary spending reports
Governance	Ad-hoc central task force	Permanent central structure (not necessarily separated)	Permanent central structure (not necessarily separated) Green budgeting correspondents in various ministries/agencies
Transparency & Accountability	All deliverables public Independent expert assessment of methodology	All deliverables public Independent expert assessment of methodology Independent assessment of deliverables Parliamentary discussion	All deliverables public Independent expert assessment of methodology Independent assessment of deliverables Parliamentary discussion Ex-post review

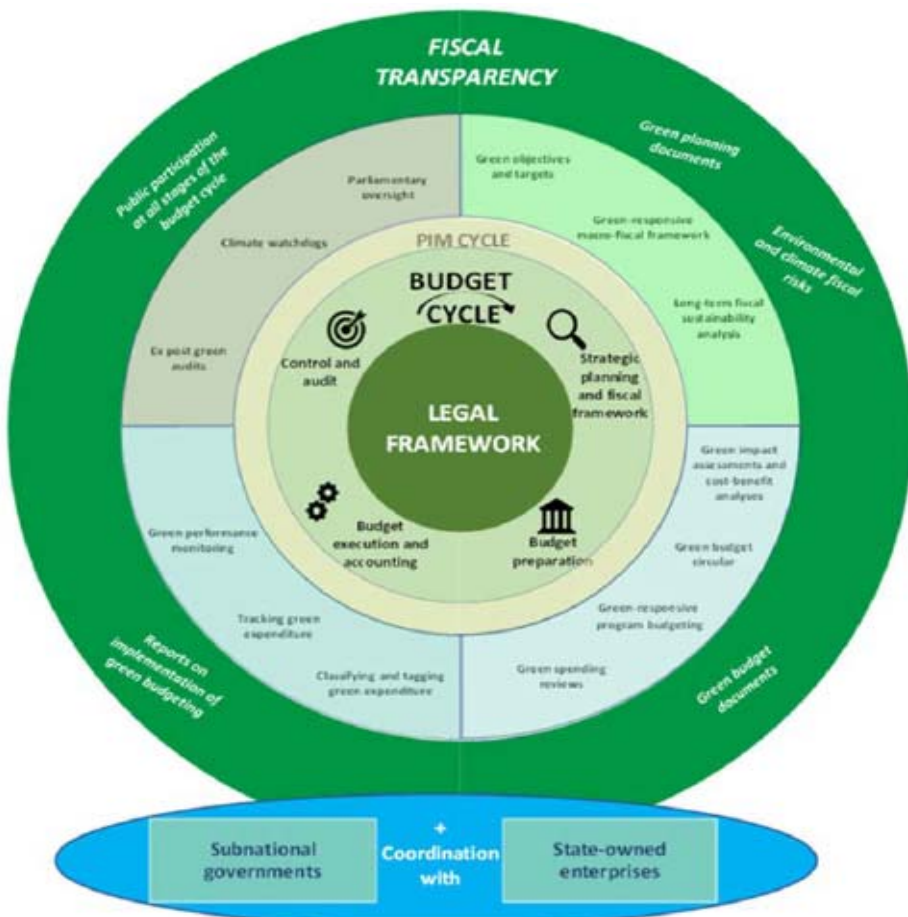
Source: European Commission

IMF Green PFM, Climate-Sensitive Management of Public Finances

The “Green PFM” framework developed by IMF staff aims at adapting existing PFM practices in countries of all income groups and capacity levels to support climate-sensitive or more broadly based environmental-friendly policies. With the cross-cutting nature of climate change and wider environmental concerns, green PFM can be a key enabler of an integrated government strategy to combat climate change.

Through the green PFM framework, the IMF emphasises the need for an approach combining various entry points within, across, and beyond the budget cycle. This includes components such as fiscal transparency and external oversight, and coordination with state-owned enterprises and subnational governments. This is set out in Figure 1 below, which outlines the main PFM areas where green concerns should be “mainstreamed”.

Fig. 1: Green PFM



Source: IMF

3. Key green budgeting tools and institutions

Medium-term Fiscal and Budgetary Frameworks

Green budgeting tools and institutions help gather evidence on how budget measures impact environmental and climate objectives. Green budgeting encompasses several tools to bring climate and environmental considerations into budgeting and fiscal policies, and sit within a country's existing annual and multiannual budgetary processes. This chapter presents more information about key green budgeting tools and institutions that are implemented by various governments drawing on examples from EU and OECD member countries.

Medium-term frameworks provide a logical home for climate and environmental objectives. Climate and environmental goals are set in a medium-term context that comprises short-term and long-term goals that are consistent with climate change and environmental strategies. Climate and environmental outcomes are also increasingly recognized as 'macro-critical'⁴ because mitigating, and adapting to, climate change can reduce risks to economic growth and long-term fiscal sustainability. Green outcomes can also be responsive to fiscal policy. For example, expansionary fiscal policy could lead to higher emissions if offsetting policies are insufficient. Ultimately, economic growth should be decoupled from GHG emissions, resource use and pollution.

The greening of medium-term frameworks provides an opportunity to integrate climate and environmental forecasts within macro-fiscal forecasts. The government's capacity to estimate the quantity and impact of climate-related spending over the medium term and then link these estimates with a baseline of sound macroeconomic and fiscal forecasts is crucial to green budgeting. However, with a few notable exceptions (Box 6) (OECD, 2021d), many existing macro-fiscal forecasting models in the EU and OECD are not designed to account for economic, budgetary, and financial costs resulting from climate change. Developing forecasting tools that capture the linkages between fiscal policy, the economy, and the environment could be prioritised as climate and environmental objectives are elevated in the budget.

⁴ For instance, see remarks by the IMF Managing Director to the Coalition of Finance Ministers for Climate Action in 2020 at <https://www.imf.org/en/News/Articles/2020/10/12/sp101220-managing-director-remarks-to-the-coalition-of-finance-ministers-for-climate-action>.

Fiscal Risk Management

Climate change presents governments with a large and diverse range of fiscal risks and should inform budgetary strategy. These include risks linked to climate- and weather-related events, such as floods and storms that damage property or disrupt trade, and the risks of substantial valuation changes to assets as policies and technology adjust to mitigate or adapt to climate change. Other forms of environmental degradation also pose fiscal risks to governments, such as rising sea levels, land erosion the loss of marine and land biodiversity, which could undermine the ecosystems that often support large sectors of the economy.⁵ The destruction of biodiversity is also one of the leading causes of infectious disease outbreaks and pandemics (OECD, 2021c).

To ensure the fiscal framework remains credible and mitigates negative contingencies, governments need to analyse and manage the risks related to climate change and environmental degradation. Climate change and related policies affect public debt sustainability risks. As the frequency and intensity of extreme weather events rises worldwide, they increasingly lead to large economic losses that are shared by the public and private sectors. Larger losses for the public sector come with the risk that governments may not be able to direct their resources to more productive uses, which could hamper economic recovery and growth. Fiscal policy responses to climate change-related weather events tend to increase general government deficits and debts, often beyond what is anticipated in budgetary documents (European Commission, 2020b).

Governments have access to several tools to assess and manage these types of fiscal risks. By distinguishing between unanticipated shocks such as extreme weather events and the gradual transformation of the environment, governments can develop an understanding of the exposure and vulnerability of public and private assets, activity and networks to future sudden impact and gradual onset disasters. Governments can start with a historical analysis of losses from the various types of disasters they are typically exposed to and identify and assess risks driven by climate change. The results of this type of analysis should inform and be integrated into the fiscal strategy, medium-term budget frameworks and the Public Sector Balance Sheet.

⁵ For biodiversity-associated risks, see e.g. the Dasgupta Review prepared for the UK's G7 Presidency in 2021 by Professor Dasgupta of Cambridge University <https://www.cam.ac.uk/stories/dasguptareview>.

Macro-fiscal scenario analysis and fiscal stress tests can be particularly helpful tools in analysing and managing fiscal risks related to climate change. Macro-fiscal scenarios should consider the probability of plausible climate change scenarios that can, in turn, be used as the basis for fiscal stress test exercises⁶. Scenarios and stress tests can help governments manage these risks more effectively, both by demonstrating the need for prevention and risk mitigation efforts and by ensuring the fiscal space is available to respond rapidly in the event of a risk realisation. Dedicated funds and instruments can help to facilitate this response⁷, as can maintaining sufficient fiscal space to absorb losses. Budget documentation should include elements on fiscal risks related to climate change and natural disasters, ideally as part of a fiscal risk statement or chapter.

Frameworks for understanding, managing, and disclosing climate change related fiscal risks are becoming increasingly important and necessary. Climate change acts as an amplifier of natural disasters and the increasing occurrence and intensity of such events call for reflection on how to deal with this challenge (Radu, 2021). Disaster risk management frameworks can better inform decisionmakers about climate-related fiscal risks, while disaster risk financing strategies can limit climate-related disasters impacts on public finances. Governments should look to build an accurate view of the explicit and implicit liabilities from natural disaster risks, especially when there is an expectation that they act as the insurer or relief provider of last resort. A variety of modelling and assessment tools can be used to estimate the economic and fiscal impacts of disasters, including Monte Carlo simulation, probabilistic disaster risk modelling, and stochastic analysis (Cevak and Huang, 2018). The results of disaster risk analysis should be used to build financial resilience to withstand both the immediate and long-lasting effects of disasters on public finances.

Long-term fiscal sustainability analysis should be broadened to consider the risks from climate change and environmental degradation. Long-term fiscal sustainability analysis has typically focused on the burden of demographic change on public finances. However, the fiscal consequences of climate change are an increasing concern in many countries. Climate change may lead to higher public

⁶ See IMF (2016) for a description of the Fiscal Stress Test and best practices for assessing and managing fiscal risks.

⁷ In the European Union, the EU Solidarity Fund can contribute to post-disaster emergency and recovery operations. This must include as a minimum “build back better” considerations.

expenditures related to the reconstruction of infrastructure or disaster relief transfers. It may have adverse economic effects that reduce the tax base and thus lower tax revenues. These fiscal consequences of climate change are of special interest to governments around the globe, given that demographic change will already place a large burden on public finances in the coming decades. Long-term fiscal sustainability analysis that accounts for climate and environmental factors can help identify the savings from early mitigation and adaptation efforts that might otherwise appear fiscally burdensome (OECD, 2021c).

The inclusion of climate change or environmental risks in long-term fiscal sustainability analysis can take different forms. A useful first step is to highlight the issue qualitatively and briefly to demonstrate awareness of the issue. Further steps can be taken to go beyond a qualitative assessment, even if they are initially limited to selected channels that are easier to quantify. Building this approach over time will ideally lead to a more comprehensive understanding of the fiscal impacts of climate change.

The quantification and management of environmental and climate change related risks should be transparently disclosed. The IMF's Fiscal Transparency Handbook (IMF, 2018) identifies natural disasters as key risks that should be quantified and disclosed in budget documents such as a Fiscal Risk Statement. The OECD Recommendation on Budgetary Governance (OECD, 2015) also calls on governments to "classify by type" their fiscal risks, with proposals on the methodological approach to estimating them. However, few countries consider climate or environmental risk in their fiscal risk statements, fiscal sustainability assessments or similar fiscal reports. Only 20% of European countries assessed under the IMF Fiscal Transparency Evaluation published quantitative information on environmental fiscal risks.

Green Budget Tagging

Green budget tagging classifies budget measures according to their climate and environmental impact and can enhance the transparency of a government's green actions (OECD, 2020b). The tool can provide a first step in assessing the relationships between the budget and climate and environmental goals. It identifies expenditure, revenue, and tax expenditure in the budgets and assigns a 'tag' based on their relevance to climate or environmental objectives.

Countries tend to take an adaptive approach to green budget tagging, allowing the scope and processes to evolve as capacities increase over time. Most countries start by identifying expenditures that have an explicit relationship with green objectives. Some countries also tag revenues and budget lines that impact green

objectives negatively. For example, France, Ireland and Italy tag items with a potential environmental impact. In doing so, Ireland implements a binary weighted approach, where the entire cost of a measure is tagged as green or not, while France and Italy implement a scaled approach to determine the green content of a measure (Bova 2021; OECD, 2020b).

For the EU budget, the tracking applies to climate and biodiversity, and builds on the existing OECD Rio Markers methodology (OECD, 2019a), i.e., a 100% marker applies when climate action is the primary goal; a 40% marker applies when the expenditure is only partially climate-related; and a 0% marker applies when the item has no climate related content. The tagging methodology is conducted at the most granular level possible (i.e., at the actions and grants level) and integrates elements of the EU Taxonomy for sustainable activities (European Commission, 2020a). More specifically: (i) compliance with the Taxonomy can allow for a higher climate contribution marker (from a 40% marker to 100% marker); and (ii) compliance with the ‘do no significant harm’ principle is required. 10 Approaches vary depending on the main reason for implementing green budget tagging. Over time, a convergence of approaches may emerge that would support cross-country comparisons and analysis.

Few Member States have incorporated in their Recovery and Resilience Plans measures to support the development and implementation of green budgeting practices. For instance, Austria plans to create a focal point in the Ministry of Finance responsible for implementing green budgeting standards in the budgetary process and conduct climate-related impact assessments. Spain plans to prepare a ‘green’ report to accompany the annual budget, mapping both green and brown expenditure items and France envisages to expand the scope of the analysis to other expenses. Italy plans to re-classify the general State budget, with reference to the environmental expenditure, according to the Sustainable Development Goals and targets of the Agenda 2030, and Slovenia plans to develop and implement a methodology for assessing (and tag) the impact of individual budget lines on environmental objectives in line with the EU Taxonomy.

There is no globally recognised standard that sets out definitions of government (tax) expenditure and revenues related to green commitments. Existing standards such as the Classification of the Functions of Government (COFOG) and Environmental Protection Expenditure Accounts (EPEA) mainly enable governments to collate information on spending related to certain green commitments, like environmental protection expenditure, but do not make it possible to assess how much expenditure and revenue contribute to the

achievement of green commitments. Moreover, the lack of an established definition of environmentally harmful expenditure highly limits comparability.

Emerging lessons have highlighted key challenges in the implementation of green budget tagging. These include identifying the appropriate level of granularity for tagging; assessing those budgetary measures that contribute to more than one environmental objective at the same time; balancing trade-offs across environmental, social and economic objectives; and accommodating the moving targets of environmental pressures (Bova, 2021; OECD, 2020b). Budget tagging requires sound judgements across government, even when there may be incentives to ‘greenwash’ or underestimate relevant budget items as part of the process. As such, it is important to ensure that tagging decisions are open to scrutiny, both internally and externally, with opportunities for oversight by the supreme audit institution, parliament and civil society as part of the larger effort (OECD, 2020b).

Performance and Impact Assessment

Performance frameworks enhance the effectiveness of public policy by linking inputs to socio economic outcomes. Within these frameworks, performance budgeting is the systematic use of performance information in budget decisions. This can be conducted as an input to budget allocation decisions and as contextual information for budget planning. It can provide transparency and accountability throughout the budget process, by providing information on the purposes of spending and the results achieved (OECD, 2019b).

Performance budgeting supports green budgeting. Well-developed performance budgeting frameworks facilitate green budgeting through the measurement of results and outcomes. Performance budgeting is usually underpinned by a programme structure of the budget, which facilitates the implementation of green budgeting as it identifies how expenditure is organised relative to the government’s policies.

Ex-ante policy evaluation and impact assessment contribute to policy development by better informed policy design and decision-making. Requiring environmental impact assessments to accompany new budget measures allows governments to incorporate considerations on the impact of measures on climate or environmental goals alongside considerations on efficiency.

By monetising environmental externalities during ex-ante evaluation, measures with a negative impact on green objectives would become more expensive than measures with a positive impact. Pricing environmental costs or GHG emissions could not only be a centrepiece in national climate policies, but environmental

costs or GHG prices can also be used in ex-ante evaluations such as cost-benefit analysis or green public procurement.

Ex-post impact assessments and evaluations are crucial for a government to understand how measures have affected the achievements of green commitments. Introducing ex-post impact assessments and evaluations enables governments to understand the appropriateness of the intervention design, the cost and efficiency of the intervention, its unintended effects, and how to use the experience from previous or ongoing interventions to improve the design of future interventions. The accumulation of policy lessons learned from these instruments helps to benchmark practices regarding the content of tools and the quality of implementation. Yet, OECD research also indicated that only around a third of OECD countries (12 in total) had environmental impact assessments as part of their policy development process.

The impact of green budgeting itself should also be evaluated. Green budgeting processes are relatively new, and many governments are developing different kinds of green budgeting tools and methodologies. Through monitoring and evaluating the effects of green budgeting on decisionmaking, governments become more able to strengthen their green budgeting tools and framework and progress towards green objectives.

Systematic evaluation of green budgeting could focus on increasing the relevance and fulfilment of its objectives, its efficiency and effectiveness, impact, and the sustainability of the framework. OECD evaluation criteria could provide a useful starting point for governments to evaluate the effects of green budgeting.

Impact assessments could be complemented by green spending reviews. A green spending review is a process that examines a government's baseline expenditure to assess the extent to which the expenditure aligns with the current government's policies on climate change and the environment. From the assessment, a green spending review is used to formulate options that would help the government achieve its policy goals and international commitments on climate change and the environment.

As a prerequisite, the design and implementation of spending reviews should follow best practices. These would include a clear strategic mandate specifying the objectives (potentially including quantified targets), the scope (a significant share of general government spending across several policies) and a centre of coordination, the use of pilots to build expertise, the provision of adequate resources and access to data, the use of guidelines for consistency in producing diagnosis, baselines, reform options and implementation roadmaps, and the use of

fact-based analysis linking spending across budget and administrative structures to policy outcomes.

To help prioritise investments that support environmental goals, spending reviews should consider environmental dimensions alongside efficiency and effectiveness. A number of countries in the EU have found it useful to develop such processes, whereby spending is analysed not only in terms of value for money but also through the lens of contributing to green commitments. The green spending review approach aims at increasing the value delivered for each public euro spent by optimising the mix between public funding and green impact.

Accounting and reporting

Although green budgeting and statistics can serve different primary purposes, there are synergies to exploit. A coherent approach between both functions, in terms of definitions and classifications, can help produce more coherent data on climate and environmentally related public finance indicators. National climate and environmental related accounting, classification and reporting methodologies should be suited to national needs and accounting frameworks and ideally facilitate international comparability. By using consistent, coherent and high-quality statistical data, governments can strengthen their impact assessment and evaluation processes as well as peer-review their performance, all contributing to the ultimate goal of green budgeting and achieving climate objectives.

The green budgeting frameworks developed at a national level can reinforce national financial management and accounting systems. Well-designed national green budgeting frameworks could also help secure data essential to produce comprehensive statistics on environmental revenue, expenditure and government green investments. Green budgeting could also be implemented alongside planned public sector accounting reforms, particularly those aiming to introduce more comprehensive charts of accounts and a greater degree of digitalisation of budgetary processes.

A specific green budget publication can provide a clear, transparent and comprehensive representation of the alignment of the budget with countries' green objectives. The document can contain several types of budget and performance information. Based on this information, the document can demonstrate monitoring and impacts. These documents are usually published as an annex to standard budget documents (OECD, 2020c):

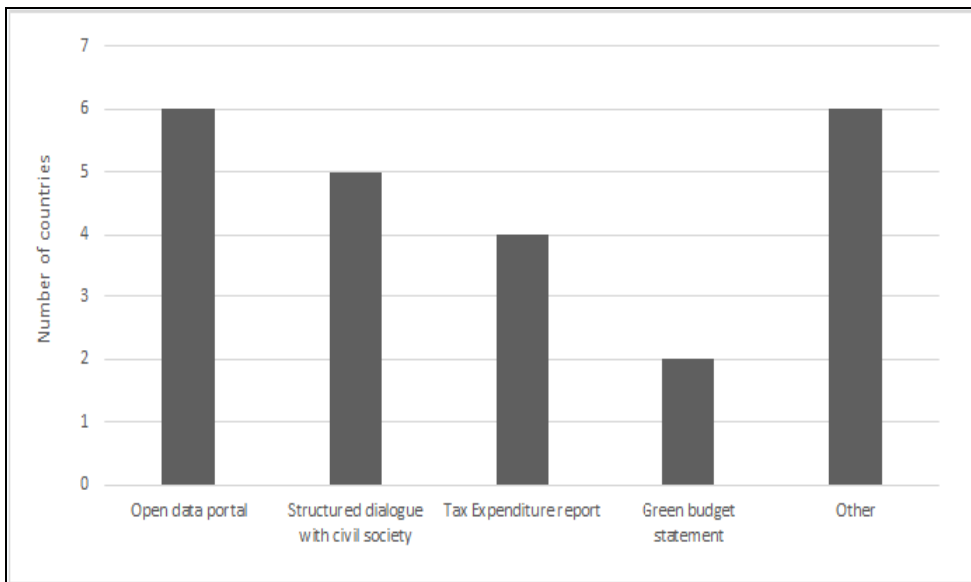
- a general green budgeting statement shows in a public and transparent way, how budget measures correspond to the country's environmental and climate objectives;

- a green progress statement allows for more analytical and detailed development and synthesis of the different budget and fiscal measures that have been adopted during the budget cycle. It provides a status of the government's objectives referring to the different targets and indicators that have been selected by countries. For example, the OECD proposes key indicators to accompany the achievement of stimulus measures in addition to economic, employment and other social indicators;

- a distributional impact analysis reflects the social and economic influence of green budget and fiscal measures. It puts a monetary value on the impact to measure the return on investment for a value paid out, especially in terms of avoided costs. To estimate this value, the country can measure the value of what has changed for people, comparing it with the value of a comparable item in the market.

Reporting methods on green budgeting vary across countries, from tables in budget plans to comprehensive reports. Across the countries reviewed in the joint European Commission and OECD survey, green budgeting information is reported through an open data portal, or in dialogue with civil society, and at times in tax expenditure reports or green budget statements.

Graph.1: Reporting methods on green budgeting in OECD and European countries



Source: OECD

Conclusions

Green budgeting can be a powerful mechanism to achieve increasingly critical climate and environmental commitments at national and global levels. The upcoming recovery period may represent a critical turning point in the global response to climate change. The early adoption of green budgeting principles in the recovery would be a highly effective tool for orienting government policies, public investment, consumption and taxation towards green objectives. Nevertheless, a whole-of-government approach, including legal, regulatory and other procedures not underpinned by budgetary allocation, is crucial in reaching the green goals.

While green budgeting practices are often evolving, country-specific and fit within the existing national fiscal frameworks, this paper defines common core elements that underpin an effective approach. National green budgeting practices can be developed in line with a country's priorities and adapted to the national governance framework and surrounding environment. Nevertheless, some key building blocks help ensure approaches are linked to the budget process such that efforts are sustained and remain effective over the longer term. They refer to:

- *Strategic framework*: clearly defining the national strategic priorities and plans related to climate and environment can help orient fiscal planning, guide public policy, investment and other decisions on revenue and expenditure to support the green priorities;

- *Tools and methods*: several tools can bring climate and environmental considerations into budgeting and fiscal policies, such as macroeconomic green budget tagging, modelling and forecasting, environmental impact assessments and evaluation, green spending reviews, fiscal risk management, incorporating green targets in the medium-term fiscal frameworks and performance frameworks;

- *Institutional design*: strong leadership and clearly defining the roles and responsibilities of the relevant parties involved is key, along with the timeline for actions and required deliverables. While the finance ministries can take the lead in implementing the process, close collaboration and coordination with line ministries is strongly encouraged;

- *Reporting, transparency and accountability*: communicating the progress of green reforms is essential as it informs stakeholders about the government's actions. Involving independent environmental experts in the process can further strengthen its accountability.

Countries may face several challenges when implementing green budgeting, but exchanging best practices and technical support from international organisations

can help overcome such barriers. Common impediments to the introduction of green budgeting practices refer to the lack of an existing methodology to assess environmental effects, weak multiannual budgetary frameworks, lack of political will, and lack of resources, relevant knowledge and technical expertise. International and supranational organisations support their membership in developing green budgeting practices by offering tailored technical support for capacity building and maintaining information repositories on best practices.

International organisations, experts and forums also actively support countries to exchange and develop national best practices. The OECD Paris Collaborative on Green Budgeting, the Coalition of Finance Ministers for Climate Action and the European Commission offer technical support for capacity building to the EU Member States and maintain repositories of information on green budgeting practices. The IMF is providing technical assistance to its member countries, regardless of their capacity levels, in adapting national Public Finance Management networks to climate and environmental objectives, and in assessing a government's capacity to manage climate-related public investment from the adaptation and mitigation perspectives.

Green budgeting is most often rooted in high-level political commitment, with a key role for finance ministries and ministries of environment/climate at the forefront. In most OECD and EU countries where green budgeting is practised, its introduction has been driven and underpinned by high-level political commitment to pursue national and international goals. In most of these countries, finance ministries, and more specifically, central budget authorities should play a leading role alongside the Ministry of Environment and line ministries as responsible authorities for green budgeting, suggesting a co-ordinated approach across government stakeholders.

Environmental assessments are a crucial aspect of green budgeting as they help to understand the impact and effectiveness of government policies in reaching the climate and environmental objectives. They are also useful to better grasp the link between inputs and outputs within the budgetary process. Overall, only few Member States have incorporated environmental assessments into their regular budgeting cycle, highlighting their extensive resource requirements. Building environmental assessment methodologies on already existing green budgeting tools can ease the process. It also helps ensuring consistency between different green practices and definitions at the national level and avoiding duplication of efforts.

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DIGITAL RIGHT MANAGEMENT: SAFEGUARDING COPYRIGHT IN THE CYBER ERA

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Abstract

Copyright infringement is commonly perceived as a private economic transgression, typically addressed through private legal actions and remedies. The advent of digitalization, encompassing copyrighted works such as text, music, and video, has enhanced the unauthorized reproduction. The ubiquity of the Internet enables infringers to replicate thousands of copyrighted works at minimal cost.

This article outlines the methodologies of digital rights management (DRM), clarifying its protective mechanisms and highlighting the adverse consequences associated with DRM implementation. As a technological framework, DRM is specifically engineered to prevent unauthorized copying of digital content. It assumes a pivotal role in safeguarding content exchanges within the digital landscape, thereby minimizing copyright infringement and plagiarism. The paper further explains potential future trends in copyright protection and the evolving landscape of DRM.

Keywords: *internet; copyright protection; copyright infringement; digital age; digital right management (DRM)*

JEL Classification: *K14, K24 O32, O31, O30*

Introduction

Since the enactment of the world's first copyright law in 1710 in England, copyright has played a significant role in shaping human history. Nowadays the

increasing reliance on computers and the Internet for information retrieval reflects a paradigm shift in our daily lives. The dynamic landscape of the digital world has introduced both opportunities and challenges. As electronic interactions become ubiquitous globally, governments and legal authorities are handling with the task of effectively regulating the new cyberspace. One of the paramount challenges lies in the regulation and control of electronic data processing, given the inherent difficulty in supervision of the vast online world (Dong & Wang, 2010).

Digital Rights Management (DRM) emerged as a technological solution to protect copyright. However, its effectiveness has come under scrutiny, necessitating legal protection. Paradoxically, in many jurisdictions, the legal safeguards for DRM often surpass those granted to the copyrighted works it seeks to protect (Hofman, 2009). This paper explores the intricate interplay between copyright, cyberspace regulation, and the evolving complexities of Digital Rights Management in the contemporary digital age.

Literature Review

Overprotection of copyright could threaten democratic traditions and impact on social justice principles by unreasonably restricting access to information and knowledge. If copyright protection is too strong, competition, innovation and creativity is restricted. Thus, there arises a critical need for equilibrium—an intricate balance must be maintained. This equilibrium should harmonize the rightful interests of copyright owners in securing fair remuneration for their endeavors with the legitimate interests of copyright users in obtaining reasonable access to copyrighted materials. In doing so, a delicate equilibrium can be achieved, fostering an environment that nurtures both the rewards of creative efforts and the broader societal imperative of unfettered access to knowledge and information.

Ben Depoorter argues that technology, by creating an environment of rapid and unpredictable change, establishes two major conditions that have a profound effect on copyright law: legal delay and legal uncertainty. In copyright law, breakthrough technologies make it more difficult to apply existing rules by analogy. Even when courts seek to apply the relatively bright line rules of copyright doctrine, the exact entitlement of rights may be surprisingly uncertain when applied to a novel technology (Depoorter, 2010).

John Perry Barlow wrote that the application of traditional copyright laws to the digital environment was a fundamental misunderstanding and mistake. According to him copyright was designed to protect ideas as expressed in fixed form, but not

the ideas or bits of information them. Barlow did not prescribe a solution to the digital dilemma; he only outlined the problems that the global economy can experience the next years. He predicted that copyright would not survive in the digital age (Barlow, 1994).

The Stanford law professor Paul Goldstein in his book “Copyright highway” (Goldstein, 2019) outlined an optimistic view of the digital moment and its potential for both producers and consumers. Goldstein saw on the horizon a day when all cultural content –text, music, video, software, and video games could be streamed into our homes through one wire and out of one box. Each consumer would have instant access to huge and substantive private libraries of culture and information.

Two prevailing perspectives in the discourse on copyright can be identified as minimalist and maximalist. Advocates of the minimalist approach, as articulated by Lessig (1996), posit that optimal conditions for innovation, economic growth, and creativity are fostered by a more limited scope of copyright protection. On the opposing end, maximalists, exemplified by Paul Goldstein (2019), contend that achieving these same objectives necessitates fortifying and expanding copyright protection comprehensively, encompassing every facet where consumers extract value from literary and artistic works.

The maximalist viewpoint assumes that existing constraints on copyright stem primarily from the perceived impracticality and expense of enforcing property rights against marginal users. Proponents of this stance argue that implementing robust rights management systems provides producers with sharp control over content usage. This, in turn, facilitates more precise price discrimination, bolstering production efficiency and overall economic efficacy. The ongoing debate between these two ideological camps underscores the complexity inherent in balancing the interests of content creators, consumers, and the broader objectives of fostering innovation and creativity within the framework of copyright law.

Theoretical Background

The landscape of copyright law is undergoing rapid transformations in response to the digitization of content and the expansive reach of the Internet. These changes present numerous challenges in how copyright-protected material is safeguarded, licensed, and managed. A seminal milestone in establishing the principle of national treatment in the realm of international copyright agreements is the Berne Convention, tracing its origins back to 1886. Despite subsequent revisions, the Berne Convention remains the preeminent international treaty in this domain. The

United States, recognizing the evolving nature of copyright, acceded to the Berne Convention in 1989. Prior to this, the U.S. advocated for countries to endorse the Universal Copyright Convention (UCC), either as a supplement to or, more commonly, in conjunction with the Berne Convention. This historical context underscores the dynamic nature of international efforts to address the complexities arising from the intersection of copyright law, technological advancements, and global connectivity. Later the challenges of digitisation resulted in the two latest international copyright treaties: the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty, both of December 1996 (Stokes,2005)

Cyberspace produced also new intellectual property items as computer graphics, electronic literature, software, databases with a great amount of useful information and even such notion as domains that are acknowledged as an intellectual property and are protected by the World Intellectual Property Organization. The two World Intellectual Property Organisation (WIPO) Treaties of 1996 dealing with copyright, related rights and new technology gave fresh legislative impetus to efforts in Europe to adapt and harmonise copyright law to the challenges of the information society. The result was the 2001 Copyright Directive (the Information Society Directive).

In 1998 the US Congress enacted the controversial Digital Millennium Copyright Act (DMCA). Passed in part to comply with international treaty obligations, the DMCA prohibits the circumvention of copyright protection systems. These systems are technologies that control access to copyrighted works. People may violate the DMCA simply by unlocking an “electronic lock” to gain access to a work even if they do not subsequently infringe the copyright in that work – for example, by copying for the purposes of “fair use.” These provisions may be enforced by both civil and criminal sanctions. Criminal penalties are limited to persons acting “willfully and for purposes of commercial advantage or private financial gain” (Law Commission of Canada, 2004). The DMCA includes protection for online service providers and creates limited immunity to the computer repair services.

An evident divergence between European and U.S. copyright legislation lies in the historical treatment of moral rights within the respective legal traditions. European copyright norms, rooted in the Berne Convention of 1886, have consistently embraced the inclusion of moral rights for authors. In contrast, American copyright law has traditionally omitted explicit provisions for moral rights. This dichotomy experienced a noteworthy shift with the advent of the WIPO Performances and Phonograms Treaty in 1996, marking a significant milestone in U.S. copyright law. For the first time, the legislation incorporated a codification of

moral rights specifically pertaining to composers. Moral rights, situated within the framework of copyright theory, encapsulate the notion that authors, composers, or directors wield considerable authority over the presentation and manipulation of their works. This legal evolution underscores a convergence between European and U.S. copyright practices and reflects an acknowledgment of the intrinsic rights of creators in shaping the destiny of their intellectual creations. Thus European law has for the last hundred years served the interests of artists and publishers, while the American law has purported to serve the interests of the public at large (Marke, 1997)

Copyright Dynamics in the digital age

Copyright serves as a protective framework for various categories of works, shielding them against unauthorized copying. These works may manifest in either analog or, under certain circumstances, digital formats. Notably, certain copyright works exclusively exist in digital form, exemplified by computer programs, constituting a distinct class termed 'digital copyright' works. Conversely, there are copyright works that exhibit the flexibility to exist in both analog and digital forms. This includes computer-generated literary, dramatic, musical, or artistic works, as well as musical compositions, sound recordings, and movie broadcasts.

The evolution of technology has consistently influenced copyright law, with digitization representing the latest transformative advancement. This novel technology has already demonstrated and is anticipated to exert a significant impact. Digital technology facilitates seamless, cost-effective, and flawless duplication of copyrighted works. Moreover, it enables the swift and widespread "one-to-many" distribution of content on a global scale through digital networks. The implications of digitization underscore the ongoing dynamism within copyright law as it endeavors to address the challenges posed by emerging technologies.

The digital moment has collapsed the distinctions among the three formerly distinct processes: gaining access to a work; using (reading) a work; and copying a work. One cannot gain access to a news story without making several copies of it by clicking on the website that contains the news story and making a copy attached to an email. Copyright was designed to regulate only copying and not supposed to regulate one's right to read and share. Nowadays copyright policy makers have found themselves faced with the challenge to expand copyright to regulate access and use, despite the effect this might have on creativity, community, and democracy (Vaidhyathan, 2005)

In the digital landscape, civil enforcement mechanisms for copyright face notable inadequacies. The ease of mass digital copying, facilitated by widely

available technology and peer-to-peer file-sharing software, undermines the efficacy of conventional enforcement. The Napster phenomenon serves as a paradigm, demonstrating how individuals with basic resources—personal computers, broadband Internet connections, and file-sharing software—can engage in large-scale piracy globally, often for noncommercial motives, such as obtaining copyrighted content for free.

The accessibility and affordability of copying technology contribute to a proliferation of potential infringers, expanding the pool of individuals engaged in copyright infringement. The simplicity of Internet-based file sharing further worsens the challenge, as individuals may infringe copyright without a comprehensive understanding of the legal consequences, often driven by the opportunity for free access to copyrighted works. Digitization thus gives rise to a substantial unit of new copyright infringers who may avoid conventional civil enforcement mechanisms.

The discourse surrounding digital copyright protection is multifaceted. Some argue that robust digital copyright protection jeopardizes free expression and democratic participation. Alternatively, proponents of "fair use rights" advocate for the reinforcement of these rights in the digital milieu, emphasizing the need for "fair access" rights. Another perspective posits that digitization obviates the necessity for copyright as a motivator for distribution, contending that, at least for certain types of works, copyright is not indispensable to incentivize production. The evolving landscape of digital copyright protection prompts a nuanced examination of how legal frameworks can effectively balance the preservation of intellectual property rights with broader considerations of freedom, democracy, and fair access.

Copyright protection in the digital age should remain as extensive as it was in the analog era. However it should respond to the challenges of digital copyright with increased criminalization. The scope of copyright protection depends on the availability and effectiveness of enforcement mechanisms. Copyright crime is as much about criminal law as copyright law. This does not mean that increased criminalization is always a bad idea or that the criminal law should remain immutable in the digital era. It does mean, however, that proposals to protect digital copyright through criminal sanctions should be scrutinized through the lens of criminal law as well as copyright law (Law Commission of Canada, 2004).

In many respects, the push to criminalize copyright infringement is understandable. The effectiveness of traditional civil-enforcement mechanisms is truly threatened by digitization. Peer-to-peer file-sharing networks, broadband connections, file compression formats, circumvention applications, and other

technologies have dramatically expanded the scope of copyright infringement. Whether this represents a net benefit or loss to the public interest is not clear. However, it tends to be skeptical whether criminal sanctions have the capacity to solve complex social problems, especially those lying outside the traditional core of the criminal category. Criminal law is too blunt instrument to mediate adequately between the complicated, conflicting interests facing the modern regulatory state. This leaves policy makers with two alternatives. They can attempt to live with the effects of digitization, hoping that the copyright minimalists are correct. Or they can attempt to bring into action noncriminal mechanisms to prevent infringement (Gasaway, 2001)

The Role of Digital Rights Management (DRM) in Safeguarding Copyrighted Material

DRM, a multifaceted set of hardware and software technologies, serves as a crucial instrument in controlling the utilization, modification, and distribution of content and information assets, both in online and offline domains. Widely recognized as Technological Protection Measures (TPM), DRM is specifically engineered to fortify copyright protections pertaining to technology-enabled content (BasuMallick, 2020).

As consumption of digital content increases, complexities around copyright management grow with it as well. Nowadays the definition of digital rights management took on new dimensions with the rise of OTT and cloud-based content sharing. Almost every piece of content we consume, from iTunes to Netflix, carries a specific DRM protocol. Most of the DRM tools operate through encryption, or computer code embedded in the digital content, to limit access or use. These tools can control the number of times, devices, people, or the time periods that the content can be accessed.

DRM finds application in a diverse array of copyrighted materials, encompassing software (games, operating systems, applications), multimedia content (audio, video, images), licensed eBooks (online libraries, eBook stores, digital subscriptions), and confidential documents (bank statements, financial records) (BasuMallick, 2020). Key restrictions imposed by DRM on digital content include:

- Copy Prevention: A longstanding DRM type where users can view or consume content from the primary channel but are prohibited from making copies. This is commonly employed by online publishers to deter plagiarism.

- **Copy Restrictions:** Similar to copy prevention, users are allowed to make a specified number of copies under certain conditions, such as a limited number of eBook copies for personal use.
- **Password Protection:** A straightforward yet effective DRM technique requiring a unique password for document access, often employed by financial services providers to secure consumer transactions.
- **Watermarks:** A cost-effective DRM method preventing the reuse of visual content by incorporating distinctive watermarks. This is prevalent in stock photographs, GIFs, and videos to discourage commercial misuse.
- **Device Control:** An advanced DRM technology that restricts file access to approved devices. Enterprise DRM and certain OTT media platforms heavily rely on device-based control, necessitating DRM certification for device manufacturers seeking compatibility with platforms like Netflix.

However, the effectiveness of Digital Rights Management (DRM) raises two critical concerns, as highlighted by Hofman (2009). The first affects the potential deprivation of users' legal rights to access copyright-protected works or works that are not subject to copyright. The second concern revolves around the invasion of individual privacy.

An intriguing question emerges regarding the removal of DRM by users to exercise their legal rights—does it constitute a breach of legislation safeguarding DRM? International agreements do not provide a clear stance on this matter, leaving the answer contingent upon the legislation of the respective country. Additionally, the interpretation may center on the significance attributed by the courts in that country to education and access to knowledge. In jurisdictions where constitutional rights prioritize access to knowledge and education over legislation, courts may rule that DRM protection does not apply when users are exercising these fundamental rights.

However DRM software, while apparently aiming to protect copyright, can inadvertently infringe on an individual's privacy by monitoring their usage of software or other copyrighted works. Moreover, the unintended consequences of robust DRM protection have been observed. For instance, in 2006, the Electronic Frontier Foundation published a paper highlighting how stringent DRM protection under the U.S. Digital Millennium Copyright Act impeded academic research and curtailed business competition. Similar consequences are likely to emerge in other countries adopting robust legal protections for DRM. The ubiquity of the Internet further complicates matters for copyright holders, making it increasingly challenging to collect royalties for works in digital formats.

Conclusion

The law has never granted copyright owners an absolute monopoly. Instead, the laws strike a balance between granting a certain level of protection and guaranteeing a certain level of access and use (Loren, 2010). In a very real sense, we are in the midst of an intellectual, moral, and legal struggle over the future of copyright-the struggle over the future of the rights to duplicate and transform information (Lawrance, 2005).

Indeed, Digital Rights Management (DRM) does not provide perfect protection against piracy. The hacking community demonstrates an adept ability to circumvent technological protection measures, rendering them inherently penetrable. From the perspective of the average internet user, such measures pose substantial impediments to the seamless utilization of purchased content. The legal fortification of DRM tools, while ostensibly aiming to combat piracy, has proven to be a rapidly applied legislative action. Presently, it is evident that this legal approach produces numerous unintended consequences. The efficacy of technological protection measures, as argued by Breimelyte (2014), should be gauged based on their technical capabilities and ongoing innovation rather than relying solely on legislative mandates. Recognizing the evolving landscape of technology and the inherent adaptability of determined hackers is crucial in framing effective strategies for content protection.

Copyright serves a dual role by ensuring the quality of information and preventing piracy, thereby contributing to the organization of the electronic publishing market. It provides a crucial financial incentive for individuals to create copyrightable materials, fostering innovation and creativity. Despite the evolving digital landscape, copyright remains indispensable in contemporary society, serving as a cornerstone for incentivizing and compensating creative activities.

As expressed by Laura Gasaway (Gasaway, 2001), the demise of copyright would be harmful to both users of copyrighted works and copyright holders. Recognizing its relevance, copyright is not expected to fade away in the new digital environment. Instead, its constant existence is vital for maintaining order, promoting creativity, and sustaining the economic ecosystem. However, it is acknowledged that copyright law should be subject to frequent revisions to adapt to the dynamics of the new digital era. This ongoing adjustment is imperative to ensure that copyright legislation remains effective, relevant, and responsive to the evolving challenges and opportunities presented by the digital environment.

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DIGITAL RESILIENCE IS THE NEW NORMAL OF HIGHER EDUCATION: STUDENT AND TEACHER PERCEPTIONS FROM ROMANIA

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Abstract

This paper aims to emphasize the fact that digital technologies in higher education are a necessity, both teachers and students must develop their ability to adapt and deal with informational technology challenges. Data collection was carried out through the administration of two online questionnaires, addressed both to students and teachers from the Faculty of Law and Economics, Spiru Haret University, in December 2021. The students shared their personal experience regarding distance learning in relation to the classical system (in classroom). Second questionnaire measures the frequency of teaching-learning methods, the ways of organizing the teaching materials existing in the eLearning platform, the media resources, evaluation methods used in teaching activities at distance and perceptions regarding some issues related with eLearning implementation. Based on the results, the authors highlighted that the online education process cannot be achieved through a simple translation of the didactic activity from the classroom to the virtual environment. The preparation of didactic materials for eLearning system requires more time and digital skills and special protection of intellectual property rights. The sanitary crisis accelerated the digitization of education,

so that students are already aware of the advantages of E-Learning, but some disadvantages of this system can only be combated through blended learning.

Keywords: *Higher education, Videoconference, E-Learning, Teaching-learning methods, Information and Communications Technology*

JEL Classification: *I23*

Introduction

The new digital technologies can help Europe become more competitive, but a digital dilemma is emerging; they can create or expand access to markets for smaller firms and in lagging regions or they can create challenges for the European convergence machine if they concentrate economic activity in large firms and leading regions. [Hallward-Driemeier et al, 2020, p.2]

In the education field, technology has already become a constant in the case of teaching activities, as teachers are using computer-assisted training, specialized software and so on. Communication with students is done both, synchronous and asynchronous, in physical or virtual classrooms, on educational platforms (e.g., Blackboard, Edmodo, Schoology, Coursera, Edu. Moodle, etc.), e-mail and through social networks (Facebook, WhatsApp, Twitter). Also, the academic environment has become dependent on information technology, access to the latest specialized articles being facilitated by scientific databases, such as: Web of Science-Thomson Reuters, EBSCO; ProQuest, JSTOR etc., these being the means of promoting and certifying their own scientific contributions [Patache et al., 2022a].

Based on a study conducted by World bank Romania needs to embrace digital innovation. On the one hand, the authorities must support the development of basic digital skills for all Romanians because only 28% of Romanians aged 16-74 have basic digital skills like sending/receiving emails, connecting to social media, or participating in ecommerce and Romanian rural citizens currently have the second lowest level of basic digital skills in the EU. On the other hand, the firms' management must be encouraged to manage digital and managerial training for employees. [Akhalkatsi & Kapil, 2022]

Literature Review

In the last few years, digital technology in tertiary education is subject of many articles. [Santos et al, 2019; Rabbanee et al,2019; Tudor & Popescu, 2020; Gudimetla et al, 2021; Qureshi et al, 2021; Patache et al, 2022a; David et al, 2022 and so on]

Resilience is the capacity of individuals, groups, or communities to respond and cope with any external or internal shock/crisis such as one caused by natural calamity or pandemic, by bouncing back or moving forward to adopt the disruptive change excreted by the shock [Roberts et al., 2015].

Digital resilience, a subset of resilience, represents the process of surviving major exogenous crises using digital means. [Bera & Kim, 2021, p.2]

Due to the increasing interest in resilience research, resilience has been contextualized at an individual level, family level, community level, national level, and cultural level. At individual level, “digital resilience is the capacity and dynamic cycle process of an individual to change their behavioral performance and psychological functioning through understanding the risk, knowing approaches, learning knowledge and skills, recovering from stress, and moving forward when facing various digital technology-related threats within the school education settings” [Sun et al, 2022, p.10]

Rabane et al (2019) define digital resilience as an individual student’s psychological capacity to remain functional by absorbing, recovering from, adapting to and learning from adversities stemming from the use of digital technology in the tertiary educational context.

The sanitary crisis accelerated in many countries the digitalization and in education system, too. Aristovnik et al. (2020) mentioned that the mental wellbeing of learners in higher education was most affected by the radical changes caused by the measures instituted to address COVID 19, and that this impact on their wellbeing negatively affected their academic performance. [Bozkurt, 2022, p.1]

Post-pandemic, the higher education institution must “regenerate itself and be born again” like the Phoenix and to embrace the new normal first: resilience, adaptability, and sustainability, second: psychological pressures, social uncertainty, and mental well-being of learners, and third aspect the rise of online distance education and blended-hybrid modes. [Bozkurt, 2022, p.12]

There is no doubt that without proper information and communication technology equipment, internet/mobile network connectivity, instructional resources, and teacher training, students cannot participate in distant education. But in our country also, students from resource-poor locations, isolated rural areas, and low-income households are more likely to fall behind. [Haleem et al, 2022; Eri et al, 2021; David et al, 2022; Patache et al, 2022b; Tudor & Popescu, 2020 and others]

In Australian system, the problems concerns students as some key disadvantages of using technology have been found, such as: feelings of

disconnection; a tendency toward procrastination; and technology-use anxiety. These not only affect students' learning performance adversely but also raise a fundamental question regarding tertiary-level student resilience when using digital technology in the education system. [Rabbanee et al, 2019]

In study conducted in a Portuguese university (in 2018) it has shown that students pragmatically choose the most appropriate device to communicate with their teachers, and it is a low expectation regarding the use of social networks and videoconferencing and voice systems, although these systems are widely used daily for other purposes. [Santos et al, 2019, p.129]

By teachers' point of view, other studies showed that there are barriers to the use of digital technologies in universities, many university teachers use digital technologies infrequently in their teaching practice and, on the few occasions that they are used, teachers tend to turn to the same type: technologies that can be used more for supporting their lecture sessions, and less so the development of student-centered activities. [Mercader & Gairin, 2020; Wang et al, 2020; etc.]

Based on the results of a study conducted in Spain, scholars strongly recommended implementing continuous training in diverse online teaching strategies among educational professionals for the purpose of avoiding work overload and overwhelming conditions in any situation, as for developing digital communication skills to improve contact with students. [Aguirre, 2022, p.7]

Teaching-learning methods on distance learning

The teaching-learning process includes three major categories of methods usable in the educational process, respectively:

a. **Expository method** - is a way of teaching in which the teacher gives information to the students, without interacting with them much, except - sometimes - when asking questions by calling on students for answers. It is a very common method of teaching and is used especially when what needs to be learned are new, difficult concepts that are difficult for students to grasp. It is used to facilitate the process of knowledge accumulation (conceptual and factual), to guide students in the learning process, to motivate them to determine students' attitudinal change. The major problem is that students' listening ability in the learning process, so "after about 10-15 minutes their attention begins to drift, first for brief moments and then for longer intervals, and by the end of the lecture they are receiving very little and retaining less" [Ruutmann & Hant, 2011, p.38].

The expository includes didactic activities such as: presentation, exemplification, case studies, and demonstrations.

b. ***Practical problem-solving methods*** – concern the involvement of learners in practical activities that can vary from simple exercises to more complex methods such as simulations or research activities. The use of these methods involves the presence of a teacher to provide guidance and facilitate student reflection.

The applications include didactic activities such as: the demonstrative-practical method, guiding students in carrying out work tasks, case studies, role-playing games, simulations, guided research, project development etc.

c. ***Collaborative methods*** - Collaborative learning is an instructional learning method that involves grouping students to work together toward a common academic goal. The method is based on the theory that knowledge is a social construct, and educational experiences that involve social interaction and exchange that are contextually relevant and engaging being learner-centered, lead to deeper learning.

Collaborative methods include didactic methods such as: online discussions guided by the teaching staff, projects developed in teams, collegial tutoring.

In the distance learning system, we appreciate that the following methods are more appropriate (see Annex 1):

Regarding expository the didactic methods are:

- ✓ *Word and Power Point presentations* – present the content to be learned, students can access them from a dedicated virtual space or receive them by e-mail. Accessing them does not imply collaboration with the teaching staff. Teachers can control the access to the course content in Blackboard by using Adaptive release options.
- ✓ *Audio-video recorded presentations* made by the teaching staff and uploaded in a virtual space, from which the students can access. Access does not imply collaboration with the teaching staff.
- ✓ *Virtual courses* – The teaching staff presents the course to a group of learners who are connected to an online platform simultaneously. Students can interact with faculty and ask questions and receive immediate feedback. Access to the Internet and the use of a platform that allows the organization of virtual classes is necessary. Also, it may also be necessary to use some useful tools in conducting synchronous teaching activities: whiteboard, chat applications, etc.

Recommended practical problem-solving methods are:

- ✓ *Demonstration* that represents a method used to teach a work procedure - using direct instruction. In the application of this didactic method in the e-learning system, the way to apply the procedure is first demonstrated by the

teacher, then the students are asked to practice the procedure by using a specialized software or not or in audio-video presentations and/ or virtual classroom.

- ✓ *Case studies* are used to develop cognitive skills in a specific area. In this method, students apply knowledge and principles to a concrete situation. Usually, this method is built around a scenario, for example, a difficult situation where students must make decisions by choosing between different options. They are given an overview of the different assessment methods, criteria, and information about the specific program to be assessed, and the teacher then comments on the learners' choices. To carry out online case studies, methods such as virtual courses, simulations using specialized software, individual tutoring (teacher - student), activities carried out by student teams can be used.
- ✓ *Guided research* - students are tasked by the teaching staff to carry out research on a certain topic. The teaching staff can guide the learner in gathering and organizing information. To carry out online guided research activities, methods such as: discussion forums, e-mails, chats and audio or video conferences for communication between the student and the teaching staff, jointly completed documents for the presentation of the results can be used.
- ✓ *Developing projects* – students are given the task, by the teaching staff, of developing a project by applying the principles and concepts learned in a specific context. To carry out project development activities online, methods such as discussion forums, e-mails, chats and audio or video conferences can be used for communication between the student and the teaching staff, jointly completed documents for the presentation of the results.

We mention the following *collaborative methods at distance*:

- ✓ *Team-based teaching activities* – in this case, students work together to carry out different types of activities, such as assessment, analysis, or project development. The essence of the method lies in the fact that students must collaborate, listen to each other, and confront their opinions to develop their interpersonal skills and problem-solving skills. To carry out team activities online, methods such as: discussion forums, e-mails, chats and audio or video conferences can be used for communication between the student and the teaching staff, jointly completed documents for the presentation of the results.

- ✓ *Peer tutoring* – is a method in which learners monitor and support each other. By practicing this method, students could learn from each other's work and practice mentoring methods. To carry out such activities online, methods such as: discussion forums, e-mails, chats and audio or video conferences can be used for communication between the student and the teaching staff, jointly completed documents for the presentation of the results.

According to Ruutmann & Hant direct instruction has four key components: clear determination and articulation of goals; teacher-directed instruction; careful monitoring of students' outcomes and consistent use of effective classroom organization and management methods. [Ruutmann & Hant, 2011, p.38]

Indirect instruction is an approach to teaching and learning in which concepts, patterns and abstractions are taught in the context of strategies that emphasize concept learning, inquiry learning and problem-centered learning. [Ruutmann & Hant, 2011, p.40]

USH students and teachers' perception regarding distance learning

Spiru Haret University (USH) management has been visionary and implemented specific systems for distance learning. Since 2006, USH has been using one of the most performing educational platforms in the world, Blackboard, with over 100 million global users.

With a friendly and easy to use interface, Blackboard allows the didactic activity based on the login with the personal account.

Students have access to courses and support materials, both in text format and in the form of audio-video files with attractive graphics, as well as information on the schedule, scheduling exams or grades obtained.

At the evaluation level, the Blackboard platform offers the possibility to test and computerize the activity of each student (monitoring each student and information accessed).

Thus, students must solve applications, create essays, or go through evaluation grids throughout the semester and there is also the possibility to take the final exam with the help of the platform.

During the COVID_19 pandemic, teaching activities took place mostly online in all study programs. Activities were carried out both synchronously and asynchronously. For video conferencing was available to everyone Google Meet service.

To identify *students' perception* regarding the quality of the distance education system during the pandemic, at the end of the academic year 2021-2022, we applied an online *questionnaire*.

We registered 155 responses from students of Faculty Law and Economics Constanta.

We mention the fact that the respondents are following our student profile that is not a typical one; 83% are between 25-44 years old and almost 10% are more than 45 years, many of them have a part-time or full-time job and families with children. So, the main problem of these students is time management.

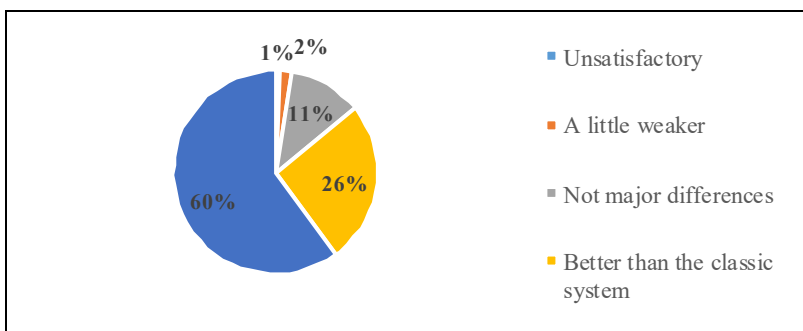


Figure no.1. Students' general perception regarding distance learning vs classical system

Source: Authors

Based on their learning needs, students shared their personal experience regarding distance learning in relation to the classical system (in classroom). More than 80% of them appreciated as being more appropriate for their needs the system of distance learning. (Figure 1)

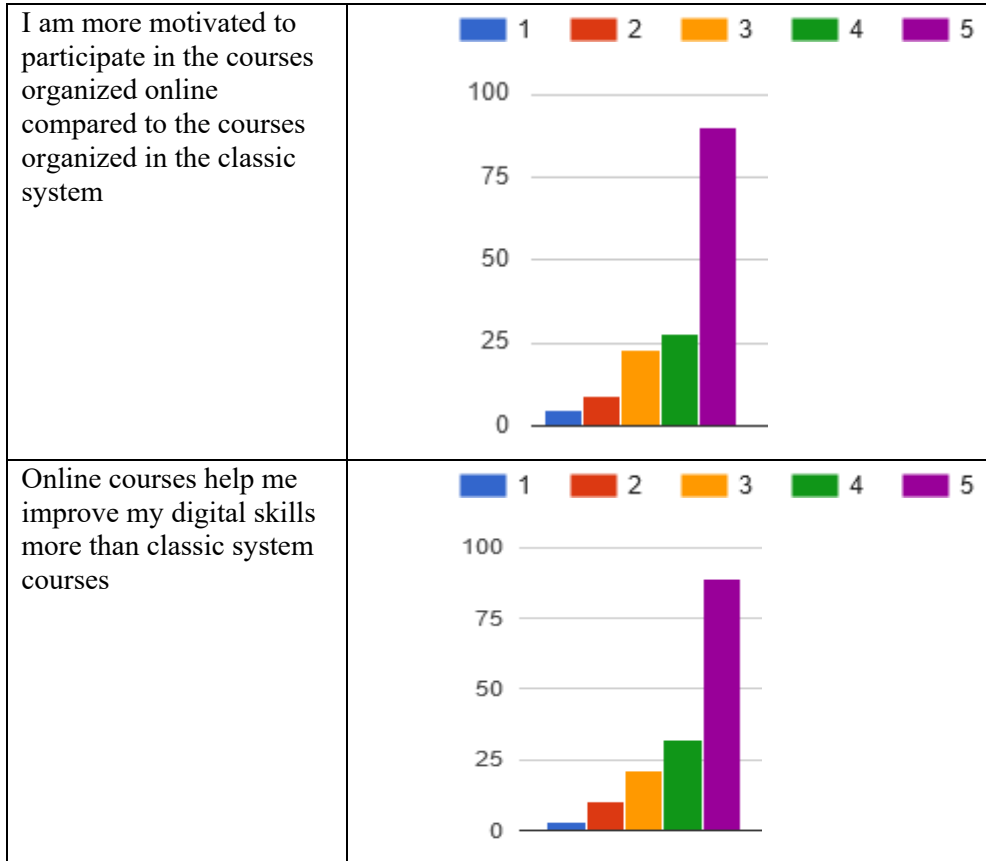
All students have access to at least one device (laptop, desktop, tablet) exclusive (87.1%) or shared (12.9%). They mentioned laptops as the most commonly device used (52.9%), smartphone (36.8%) and desktop (9%).

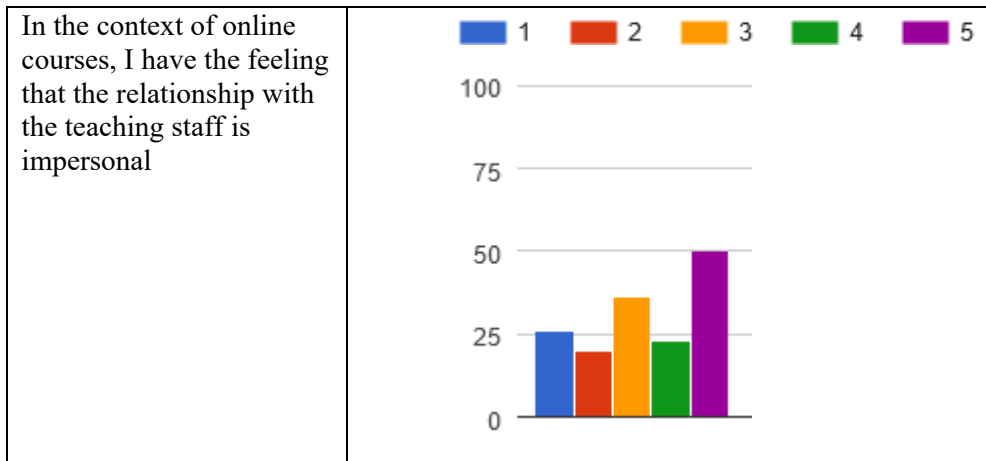
The online resources provided by the university were appreciated as invaluable by 72.3 of respondents, very useful of 24.5 and useful for the rest of them.

Regarding the possible strengths and weaknesses of the implementation of eLearning, students appreciated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), some of previous identified issues as follows:



<p>The comfort's degree I feel in online educational communication is higher than in classic educational communication</p>	<table border="1"><thead><tr><th>Degree</th><th>Percentage</th></tr></thead><tbody><tr><td>1</td><td>5</td></tr><tr><td>2</td><td>5</td></tr><tr><td>3</td><td>18</td></tr><tr><td>4</td><td>22</td></tr><tr><td>5</td><td>50</td></tr></tbody></table>	Degree	Percentage	1	5	2	5	3	18	4	22	5	50
Degree	Percentage												
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2	5												
3	18												
4	22												
5	50												
<p>I have a greater opportunity to make friends with colleagues in the context of online compared to classic educational communication</p>	<table border="1"><thead><tr><th>Degree</th><th>Percentage</th></tr></thead><tbody><tr><td>1</td><td>15</td></tr><tr><td>2</td><td>15</td></tr><tr><td>3</td><td>30</td></tr><tr><td>4</td><td>28</td></tr><tr><td>5</td><td>50</td></tr></tbody></table>	Degree	Percentage	1	15	2	15	3	30	4	28	5	50
Degree	Percentage												
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Many students feel much more comfortable using the online communication environment than using the classic educational communication, the possibility of making friends is much greater than in the classic system, they are more motivated to participate in the courses organized online compared to the courses organized in classic system, online courses help them improve their digital skills more than classic system courses, and the relationship with the teaching staff is impersonal.

Finally, the students were asked if they had to opt for doing the didactic activities online, respectively in the classic system, what would they choose, and 65.2% of them would choose the online system, 20.6% of them rather the online development of didactic activities, blended learning was the option for 11% and only 3.2% have chosen the classical system.

From 151 subjects according to the education plans of the Management and Law study programs, following an analysis based on the competencies identified as priority by the business environment, were selected 43 courses taught by 18 teachers (80% of the staff) for evaluation of online teaching-learning methods.

Based on the results of *the second questionnaire* applied, most of *the teachers* used video recordings of courses and/or other teaching materials useful in the educational process, frequently (for 29 of the courses) or occasionally (10 courses).

Only for 2 courses the response was” No, but I will consider using this method” and one teacher appreciated that he does not consider this method useful.

Most of the respondents held synchronous distance courses and 2 teachers appreciated that the method is not useful.

Email correspondence with students to provide support/feedback regarding the course is a frequent method of communication for 27 of the evaluated courses and occasionally used at 15 of them. The results are similar in the case of submitting assignments that students solve online.

Online assessment and automated grade calculation throughout the semester, in our faculty is facilitated by Blackboard platform, so 95% of the courses are using this system, except for master’s courses.

Using software methods to prevent plagiarism and copying from one student to another is frequently applied in the case of 39 courses and just 1 teacher mentioned that he has not used the method but will do so in the future.

Interactive activities carried out online with students are a frequently used and unanimously accepted way of working.

Concerning the ways of organizing existing teaching materials in the Blackboard platform all of respondents organize the course by modules, 98% displays bibliographic materials, other than the course support/seminar notebook and 75% shares external links to bibliographic materials.

Based on a scale from 1-4 (4- very important) teachers appreciated the most useful media resources, that supported teacher's verbal presentation, in the online teaching-learning process such as: text in Power Point Presentation (PPT) format, graphical presentation, audio-video content and text in word/pdf format, as in the figure below.

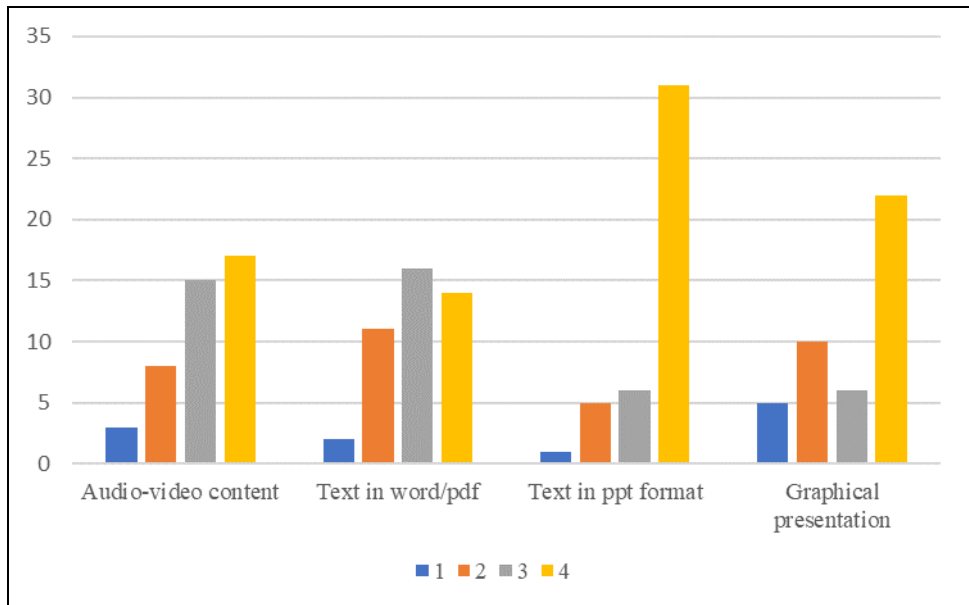


Figure no.2. Teachers' perception regarding the most useful media resources for courses

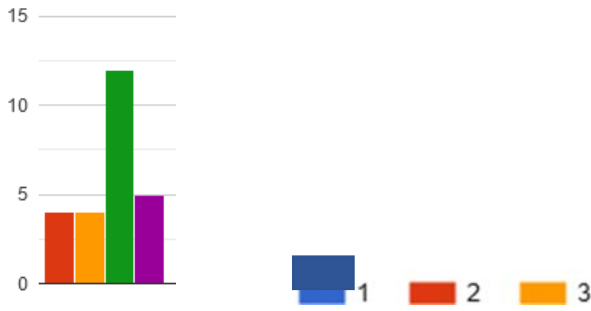
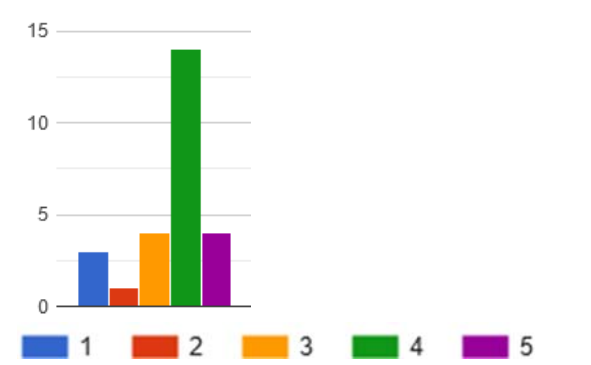
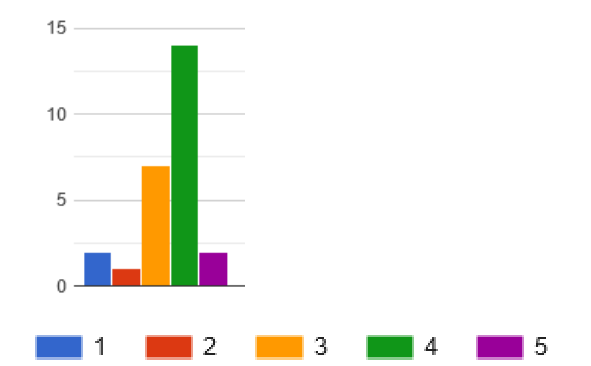
Source: Authors

During the pandemic when courses were held remotely, the evaluation process was composed of 2 assessments and 1 final exam. Teachers mentioned that 81.4 % used multiple choice grille tests, 46.5% evaluation based on students' written elaboration of some required subjects and 46.5% evaluation based on oral presentation of some subjects/report/case study etc.

The teaching staff of our faculty appreciated the way was carried out online the teaching-learning process, on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), as follows:



<p>Online teaching activities contribute to improving the reputation of our university</p>	<table border="1"><thead><tr><th>Category</th><th>Count</th></tr></thead><tbody><tr><td>1</td><td>14</td></tr><tr><td>2</td><td>11</td></tr><tr><td>3</td><td>3</td></tr><tr><td>4</td><td>11</td></tr><tr><td>5</td><td>12</td></tr></tbody></table>	Category	Count	1	14	2	11	3	3	4	11	5	12
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<p>Online teaching activities may affect intellectual property rights</p>	<table border="1"><thead><tr><th>Category</th><th>Count</th></tr></thead><tbody><tr><td>1</td><td>6</td></tr><tr><td>2</td><td>6</td></tr><tr><td>3</td><td>8</td></tr><tr><td>4</td><td>3</td></tr><tr><td>5</td><td>3</td></tr></tbody></table>	Category	Count	1	6	2	6	3	8	4	3	5	3
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<p>The online preparation and running of the didactic activities do not involve a greater time consumption for the preparation of the didactic materials, compared to the running of the didactic activities in the classic system</p>	<table border="1"><thead><tr><th>Category</th><th>Count</th></tr></thead><tbody><tr><td>1</td><td>4</td></tr><tr><td>2</td><td>9</td></tr><tr><td>3</td><td>4</td></tr><tr><td>4</td><td>5</td></tr><tr><td>5</td><td>4</td></tr></tbody></table>	Category	Count	1	4	2	9	3	4	4	5	5	4
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<p>The on-line development of didactic activities allows greater flexibility than the development of didactic activities in the classic system</p>	 <table border="1"> <thead> <tr> <th>Response</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>2</td> <td>4</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>12</td> </tr> <tr> <td>5</td> <td>5</td> </tr> </tbody> </table>	Response	Count	1	1	2	4	3	4	4	12	5	5
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<p>On-line teaching activities allow access to a wider range of teaching tools than traditional teaching activities</p>	 <table border="1"> <thead> <tr> <th>Response</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3</td> </tr> <tr> <td>2</td> <td>1</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>14</td> </tr> <tr> <td>5</td> <td>4</td> </tr> </tbody> </table>	Response	Count	1	3	2	1	3	4	4	14	5	4
Response	Count												
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<p>The online development of didactic activities allows greater customization of the educational process compared to the development of didactic activities in the classic system</p>	 <table border="1"> <thead> <tr> <th>Response</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>1</td> </tr> <tr> <td>3</td> <td>7</td> </tr> <tr> <td>4</td> <td>14</td> </tr> <tr> <td>5</td> <td>2</td> </tr> </tbody> </table>	Response	Count	1	2	2	1	3	7	4	14	5	2
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The last question asked was of the suggestions for improving the online performance of didactic activities and the responses were:

- ✓ Diversification of teaching-learning methods and tools.

- ✓ Increasing interactivity and diversifying evaluation methods.
- ✓ More materials in video format.
- ✓ Topics for debate, in larger numbers.
- ✓ Permanent adaptation to the problems that arise at the level of public institutions, with the aim of preparing future public officials to contribute successfully to serving the general interest of society.
- ✓ Permanent update, as many practical applications (case studies and simulations) as possible.
- ✓ The use of several teaching methods and tools to increase interactivity. For example, guests who will talk to the students about the development of economic activity during the communist period or visits to museums/institutions (virtual tours also), etc.
- ✓ The use of only rudimentary education methods through online platforms will reduce the efficiency of students making them unable to deal with problems that require various skills that are generally acquired through conventional and methodical education. To replace the inability to follow the model of the conventional and systematic approach to learning, online courses must lead to the motivation and involvement of students through methods such as: creative tools, materials in the form of modern presentations. The course materials must be conducted with the support of various professionals, subject matter experts, animators, video editors, designers and website administrators, and others.

Based on the results of the two questionnaires, the authors highlighted that the online education process cannot be achieved through a simple translation of the didactic activity from the classroom to the virtual environment. The preparation of didactic materials for eLearning system requires more time and digital skills and the protection of intellectual property rights needs more attention. A course to be attractive must capture the student's attention and inspire his curiosity. [Patache et al, 2022]

Both teachers and students need digital skills. In the teacher's case, the materials support for course must be elaborated together with various professionals to be appropriate for digital environment.

Conclusions

Higher education institutions are more and more competitive even if we talk about the rivalry of the public system with the private one or between national and international institutions.

Future teaching is wholly based on digital mediums and devices; avoiding digitalization is not possible at this point. Artificial Intelligence is supported by the Industrial Revolution 4.0 to transform volatile digital strategies and challenge the whole world. Effectual use of digital learning settings in academic putting involves an advantage in answering many critical techno-social concerns jointly. [Qureshi et al, 2021, p.41]

Even though teachers are less attracted to adapt and learn new educational methods; simultaneously, students are positive toward learning new technologies [Qureshi et al, 2021, p.43], so, in a student-centered university, the client has the final decision.

Today, the old method of teaching and learning will lead to the failure of educational institutions, students have a much wider range of choice and like any current consumer are better informed and more demanding.

To adapt to technological pedagogical content knowledge (TPACK) it is necessary that teachers participate in professional development training. Furthermore, the very nature of education generally results in a substantial lag between the time at which the initial cost of reform is incurred and that at which intended benefits materialize (or not) [Schleicher, 2018].

Educational innovation can be crucial to improve quality in teaching and learning and is understood as the permanent training of teachers to adapt and respond to the current needs of their students and society. [Aguirre et al, 2022, p.1]

Without training, teachers are unlikely to understand exactly how these feedback mechanisms work and therefore will not optimize their effectiveness [Johnson et al, 2016].

In hybrid or exclusively online academic environment, new platforms as well as new pedagogies are necessary for a better response to the educational needs of today's students. [Cramarenco & Burcă-Voicu, 2021, p.11]

Fun education, based on action and interaction, has positive effects, and shows us a higher potential to explore and apply.

After the pandemic, while students and teachers became aware of the advantages of the eLearning system, the return to traditional teaching methods is no longer possible.

Blended learning with gamification throughout the semester and more interactivity in synchronous activities is the key to success in attracting and motivating students.

It is about the fact that the digitization of education, a phenomenon that tends to become the norm and not the exception in higher education, needs a solid scientific

foundation that addresses to the complexity of these activities, their advantages, and limits, as well as the coordinates that define its quality.

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METHODES	DIDACTIC ACTIVITIES	RECOMMENDATION REGARDING USE	DISTANCE LEARNING TOOLS	ADVANTAGES	DISADVANTAGES
EXPOSITORY	Presentation, exemplification, case studies, demonstrations.	It facilitates the acquisition of knowledge (mainly conceptual and factual), orienting students in the learning process, motivating students, changing attitudes.	Word/PDF/PPT Text	They can be developed quickly	They do not support interactivity, they support teaching – passive learning.
			Interactive presentations that combine images, text, animations, questions to those who follow the course	High degree of flexibility, allow the use of various training techniques	Low to medium interactivity, they support teaching – passive learning. To reduce the risks, a good knowledge of how to use e-learning tools is necessary.
			Video recorded courses	They can be developed quickly	They do not support interactivity.
			Courses held in the virtual classroom	They allow interaction between teaching staff and students.	The teaching staff must have the competence to teach online, they must use appropriate support teaching materials, a good internet connectivity is needed.
PRACTICAL PROBLEM-SOLVING	Demonstrations	Develops skills related to the application of procedures	Simulations, Virtual Classroom	They allow students to practice certain work procedures.	To be performed at the highest level, it is necessary to use specialized software.



METHODES	DIDACTIC ACTIVITIES	RECOMMENDATION REGARDING USE	DISTANCE LEARNING TOOLS	ADVANTAGES	DISADVANTAGES
	Guiding students in carrying out work tasks	They provide assistance and advice from the teaching staff, when the student prepares a work assignment.	Presentations of documents, manuals, work procedures.	They promote the transfer of theoretical notions into practice.	To be performed at the highest level, it is necessary to use specialized software.
	Case studies	They develop the cognitive skills specific to various professions.	Interactive courses held in the e-learning system; Simulations; Individual tutoring activities; teamwork carried out online.	High level of interactivity, possibility to provide personalized feedback, social dimension.	They require a lot of time for the development of didactic materials, the permanent presence of the teaching staff is necessary.
	Role-playing games	They develop interpersonal skills, stimulates attitudinal change.	Interactive courses held in the e-learning system; Simulations; Individual tutoring activities; teamwork carried out online.	High level of interactivity, possibility to provide personalized feedback, social dimension.	They require a lot of time for the development of didactic materials, the permanent presence of the teaching staff is necessary.
	Guided research and project development	They develop active knowledge.	Forum discussions, e-mail, chat, online conferencing, document sharing.	They allow obtaining a high level of active knowledge.	They require the frequent involvement of the teaching staff for advice and feedback.



METHODES	DIDACTIC ACTIVITIES	RECOMMENDATION REGARDING USE	DISTANCE LEARNING TOOLS	ADVANTAGES	DISADVANTAGES
COLLABORATIVE	Online guided discussions	They stimulate critical thinking and analysis, develop interpersonal skills, stimulate attitudinal change	Forum discussions, e-mail, chat, online conferencing, document sharing.	They encourage reflection, socialization, and knowledge sharing	They are less effective than project development in terms of achieving learning objectives.
	Peer tutoring	They stimulate critical thinking and analysis, develop interpersonal skills, and stimulate attitudinal change.	Forum discussions, e-mail, chat, online conferencing, document sharing.	They support the development of projects.	The presence of a teaching staff may also be necessary.

Source: Parvu I. (coord.), *Procedure for carrying out teaching-learning methods through the distance educational communication system*, (2021), Project: Innovative solutions for the practical training of students, ID 130332, co-financed by the European Social Fund through Human Capital Operational Program 2014 – 2020

AI NLP-GPT MODELS: CHALLENGES AND PROSPECTS IN BUSINESS DECISION REALMS

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Abstract

This paper represents a natural progression in the ongoing investigation into the potentials and challenges associated with the application of AI NLP GPT models for decision support. Building upon the foundation laid by the prior study titled "Conceptual Analysis and Potential Applications of DL NN Transformer and GPT Artificial Intelligence Models for the Transformation and Enhancement of Enterprise Management, EIS/ESS, and Decision Support Integrated Information Systems," the current work serves as a valuable continuum, providing further insights and validation of previous research findings. The study not only reaffirms the robustness of AI models in structured environments but also ventures into exploring their limitations when confronted with unstructured and non-pretrained scenarios inherent in real-world business decision-making. Through an in-depth conceptual analysis, the paper sheds light on the intricacies and potential shortcomings of deploying AI models in such dynamic and complex decision-making contexts. This iterative approach contributes to a more nuanced understanding of the capabilities and constraints of contemporary AI systems, providing valuable guidance for their practical implementation in diverse business scenarios.

In essence, this work extends beyond a mere sequel, serving as a critical checkpoint in the continuous evolution of research in this domain. It accentuates the adaptability and real-world relevance of AI models while critically examining their applicability in less controlled decision-making environments.

Keywords: *Artificial Intelligence (AI); Decision Support Systems (DSS); Neural Networks (NN); Deep Learning (DL); Generative Pre-trained Transformer (GPT); Enterprise Management systems; Data-driven Decision-making; Digital Transformation.*

JEL Classification: C45, C55, C88, L63, L86, M15

Introduction

In the era of digital advancement, organizations encounter escalating challenges in information management, decision-making, and the optimization of business processes. Artificial Intelligence (AI) and deep learning emerge as pivotal catalysts, presenting unprecedented opportunities for the evolution of enterprise management, Executive Information Systems (EIS/ESS), and Decision Support integrated information systems.

Deep Learning, a subset of AI, empowers machines to autonomously learn from vast datasets, offering solutions for natural language processing, image recognition, sentiment analysis, and various other tasks. Within the realm of integrated information systems, DL NN Transformer and GPT models have assumed a paramount role. The DL NN Transformer signifies a neural network architecture distinguished by its proficiency in modeling intricate dependencies within sequential data elements. Conversely, GPT (Generative Pre-trained Transformer) models leverage the Transformer architecture to pre-train on substantial amounts of unlabeled data, subsequently fine-tuning them for specific tasks. These models have demonstrated exceptional performance in natural language processing, text generation, translation, and diverse applications.

The application of these cutting-edge technologies furnishes myriad advantages to organizational Management, EIS/ESS, and Decision Support information systems. Implementation of DL NN Transformer and GPT models holds promise for enhancing data analytics, predicting trends, delivering personalized recommendations, automating business processes, and facilitating decision-making. Integrating these models into existing information systems equips organizations to harness their data more efficiently, identify crucial patterns, predict user behavior, adapt to market dynamics, and streamline operations. Nevertheless, the utilization of these technologies in business contexts raises substantial questions encompassing data privacy, ethical considerations, security, model interpretability, and alignment with specific business requirements.

Addressing these challenges necessitates meticulous planning and implementation, especially considering the large-scale data requirements for training.

Data security emerges as a critical factor in the developmental trajectory of these technologies. Safeguarding sensitive business data utilized in information systems against unauthorized access and misuse mandates the implementation of robust security measures, standards, and protocols, ensuring data integrity and confidentiality.

Model interpretability presents another challenge, given the complexity of many deep learning models. This complexity may hinder the understanding of model decisions, a crucial aspect in business scenarios where comprehension of how models arrive at specific predictions or recommendations holds paramount importance.

This research undertakes a conceptual analysis and explores the potential applications of DL NN Transformer and GPT models in artificial intelligence. The focus lies in transforming and enhancing organizational Management, EIS/ESS, and Decision Support integrated information systems. The objective is to comprehensively examine the merits and demerits of applying these technologies in the business milieu. Subsequent sections will delve deeper into key AI technologies and methodologies, including deep learning, DL NN Transformer, and GPT models. This groundwork aims to serve as a foundation for further research and practical implementation of these technologies in organizations, with the overarching goal of enhancing business performance and efficiency. [Goodfellow et al.,2016]; [Vaswani et al.,2017]; [Radford et al.,2019]; [Chen et al.,2014]; [Davenport & Short,2018]; [Davenport,2018]

Furthermore, in navigating the evolving landscape of AI and deep learning, it is essential to underscore the iterative nature of research in this domain. The field continuously unveils new possibilities and unveils fresh challenges that warrant attention. As we embark on this exploration of AI NLP-GPT models, it is crucial to recognize the symbiotic relationship between theoretical advancements and real-world applications. This study positions itself not merely as an exploration of the present but as a step forward in the ongoing dialogue within the scientific community.

In the subsequent sections, we delve into a detailed examination of key AI methodologies, including deep learning, DL NN Transformer, and GPT models. By establishing a robust foundation, we aim to pave the way for future investigations that will refine and expand our understanding of these technologies. The journey of enhancing business decision support through AI models is an exciting and dynamic one, and this research aims to contribute meaningfully to the unfolding narrative of technological innovation.

1. Technology and business processes

In the era of digital advancement, organizations encounter escalating challenges in information management, decision-making, and the optimization of business processes. Artificial Intelligence (AI) and deep learning emerge as pivotal catalysts, presenting unprecedented opportunities for the evolution of enterprise management, Executive Information Systems (EIS/ESS), and Decision Support integrated information systems.

Recurrent Neural Networks (RNNs) constitute a type of neural network employed in natural language processing for modeling sequential data. They find application in processing data wherein information is temporally related, such as the sequential order of words in a sentence. Their development commenced with the Elman network in 1990, gaining significant traction in 1997 with the introduction of Long Short-Term Memory (LSTM) networks that effectively addressed the vanishing gradient problem inherent in conventional RNNs. Subsequent variations, including Gated Recurrent Units (GRU), emerged, simplifying the structure of LSTM networks.

RNNs are composed of multiple cells arranged in an array. Each cell features a hidden layer comprising a set of neurons responsible for processing inputs and generating outputs. This characteristic renders RNNs and LSTMs adept at processing sequential data, such as sentences. They find utility across various Natural Language Processing (NLP) applications, including speech recognition, machine translation, sentiment analysis, text generation, natural language translation, and stylistic analysis.

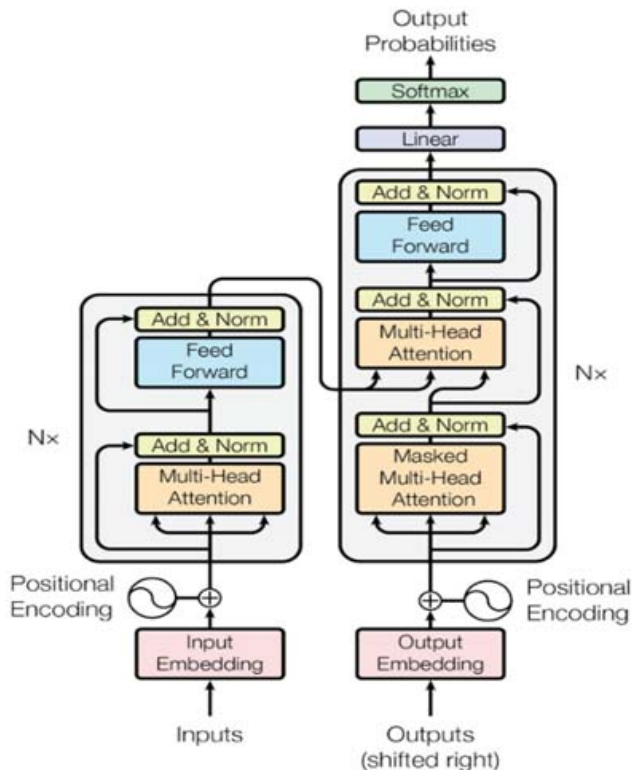
Establishing an RNN network in NLP involves training the network on extensive datasets, necessitating robust hardware and extended training periods.

The Transformer, a natural language processing model introduced by Google researchers in 2017, marks a significant breakthrough in the realm of artificial intelligence. It comprises fully connected layers of encoders and decoders, aiming to facilitate fully parallel processing of inputs and outputs without sequential processing requirements. This design enhances its speed and efficiency compared to Convolutional Neural Networks (CNN) and RNNs.

Encoders and decoders consist of attention multiplexers and fully connected layers. Encoders process input sequences, while decoders generate output sequences. The attention multiplexer focuses on different parts of a sequence during task execution. The model is self-trained using the masked multilayer attention method, granting it the ability to avoid generating outputs dependent on non-existent information in the time sequence. The Transformer finds application

in various NLP tasks, such as machine translation, text generation, and natural language comprehension. Its capacity to be trained on extensive datasets contributes to superior performance compared to other models.

Generative Pre-trained Transformer 4 (GPT-4), an artificial intelligence model for natural language processing developed by OpenAI, represents a notable evolution in this domain. GPT underwent four iterations from 2018 to 2023, with the number of parameters progressively increasing from 110 million to 1.76 trillion in GPT-4. Built on the transformer architecture with an extensive parameter count, GPT-4 can tackle complex language tasks. Its training involves pre-training on a large corpus of texts, followed by fine-tuning on specific tasks and domains using a smaller dataset. GPT-4 boasts advantages such as generating coherent and relevant text based on input, with no observed inclination towards plagiarism, unlike BERT and BART.



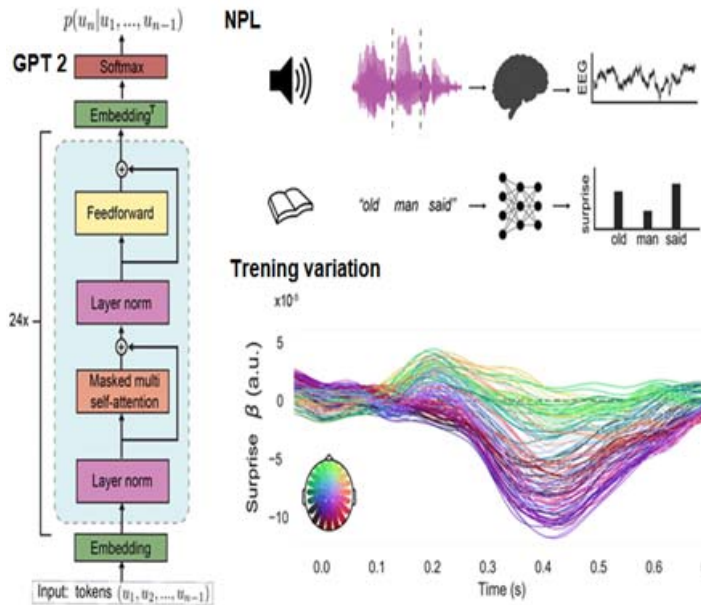


Figure nr. 1. Architecture of DL NN NLP Transformer model [Vaswani et al.,2017], right - its GPT 2 implementation. [Heilbron et al.,2019].

Left fig. source: Vaswani, A.; Shazeer, N.; Parmar, N.; Uszkoreit, J.; Jones, L.; Gomez, A. N.; Polosukhin, I. (2017). "Attention is All You Need", In Advances in Neural Information Processing Systems (pp. 5998-6008) Right fig. source: Heilbron M.; Et al.:(2019). "Tracking Naturalistic Linguistic Predictions with Deep Neural Language Models", researchgate.net,

1.1 Integration of Artificial Intelligence into Business Information Systems

The integration of Artificial Intelligence (AI) systems into the framework of Business Information Systems for management support, encompassing Management Information Systems (MIS), decision support, and executive information systems, heralds a paradigm shift. These contemporary AI models, characterized by cognitive and contextual awareness and trained on extensive datasets, possess the capacity to generate content aligning with standardized workflows. This quality stands as a pivotal advantage in their assimilation into existing management information systems.

Conventional information systems supporting management rely on diverse supporting datasets stored in data warehouse repositories. These datasets are extracted by Online Analytical Processing (OLAP) systems and translated into information and

knowledge essential for managers, employing statistical methods and earlier machine learning models. The proposed innovation suggests harnessing new AI models, such as those powered by Deep Learning Neural Network (DL NN) networks realized through the transformer architecture. These models would undergo training using operational data from both the Online Transactional Processing (OLTP) system and prepared OLAP warehouses. The outcome would be the creation of AI agents tailored to specific user categories, from business process managers to middle and top management.

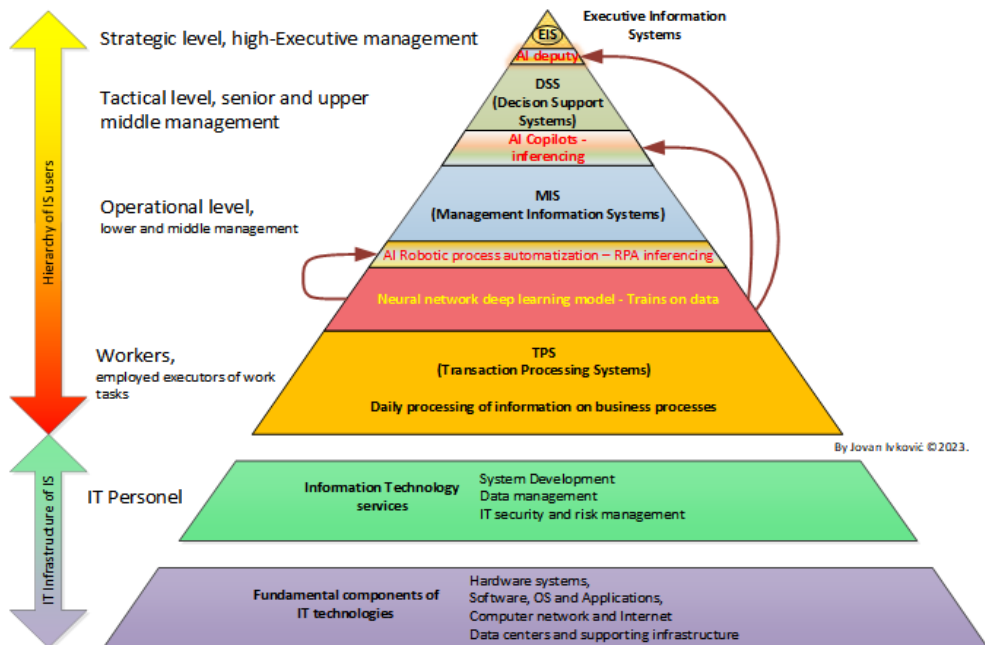


Figure nr. 2. A proposal for a new model of hierarchical structure of management and executive information systems with future AI bots, agents and deputies included.
[Ivković & Lužija Ivković, 2023]

Source: Ivković, J.; Lužija Ivković, J.; (2023). “Conceptual Analysis and potential Applications of DL NN Transformer and GPT Artificial Intelligence models for the Transformation and enhancement of Enterprise Management, EIS/ESS, and Decision Support Integrated Information Systems “, LINK IT > EdTech International Scientific Conference, Belgrade, R. Serbia 2023., Book of Proceedings (p. 92-102),

Segmenting AI system support also aligns with ISO27000 Information Security Management System (ISMS) standards, ensuring that each organizational position possesses knowledge pertinent to its domain. AI bots or robots, designed to automate tasks, would be restricted from accessing information about strategic planning and high-level decision-making. This separation ensures that employees and their assisting AI agents operate within their designated functions, enhancing information security.

Figure 2 illustrates the proposed solution, indicating a common layer in the IT systems hierarchy above the TPS/OLTP system. This layer corresponds to the OLAP content generation phase, where training occurs for AI bots, robots, co-pilots, and AI-deputies' agents. Access rights of these agents would be limited based on their function, enhancing information security coverage.

To gain a comprehensive market perspective within existing Decision Support Systems (DSS), Executive Support (ES), and Executive Information Systems (EIS), the integration of external information and knowledge sources is essential. Figure 3 depicts the architecture of the proposed DSS/EIS solutions, necessitating internal, external, and Cloud service sources amalgamated into internal Data Warehouse (DW) capacities. Validation and data cleaning processes precede the training of DL NN models. The selection of an appropriate machine learning (ML) or ML DL NN model depends on specific goals and challenges, guiding the training of the AI system for its intended purpose.

The output generator, informed by user needs and preferences, conducts inferencing based on the trained model and available data in DW or other external sources, if required. This DSS model can be extrapolated to advanced EIS 'AI-deputies', with similar building blocks but requiring more meticulous training, control, and likely broader datasets. Introduction of AI-assistants and deputies at the DSS and ES/EIS control information systems level necessitates heightened cognitive potential, possibly employing a multi-model approach for generative characteristics while ensuring precision and conciseness. Early indications of this approach emerge with new models such as MoE (2023) [Heilbron et al.,2019]; [Ivković & Lužija Ivković,2023]

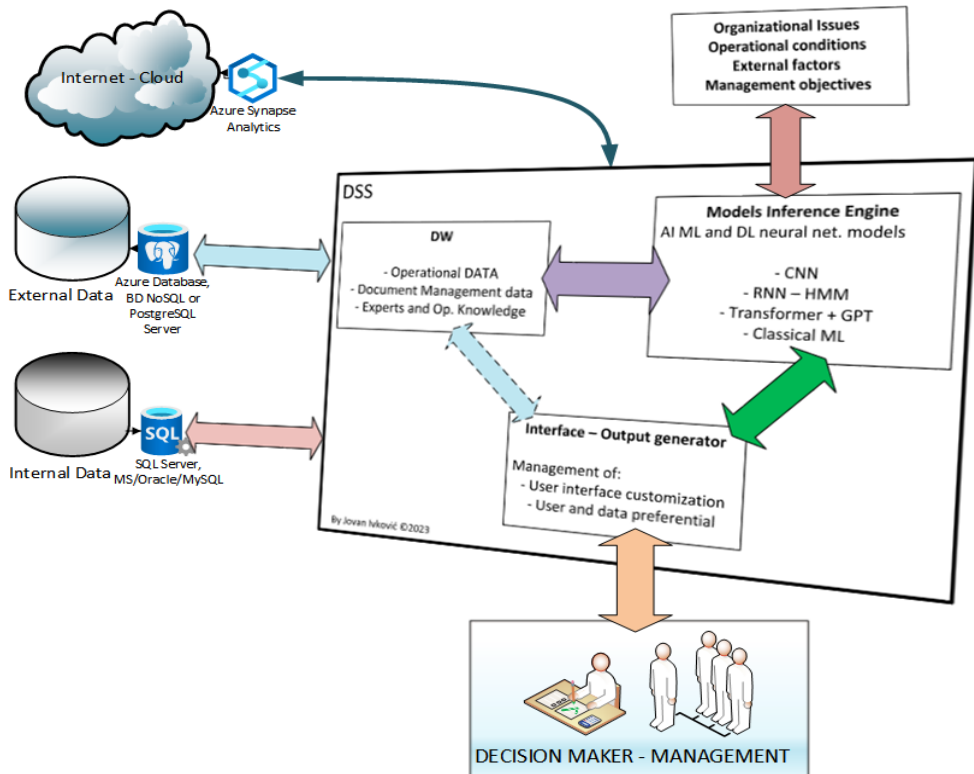


Figure nr. 3. An AI architecture proposal for an upgraded DSS/ES information system intended for executive managers. [Ivković & Lužija Ivković,2023]

Source: Ivković, J.; Lužija Ivković, J.; (2023). “Conceptual Analysis and potential Applications of DL NN Transformer and GPT Artificial Intelligence models for the Transformation and enhancement of Enterprise Management, EIS/ESS, and Decision Support Integrated Information Systems“, LINK IT > EdTech International Scientific Conference, Belgrade, R. Serbia 2023., Book of Proceedings (p. 92-102),

2. Implementations of AI Tools in Corporate Information Systems

This section explores practical cases of integrating AI tools into company information systems, highlighting their current capabilities and potential benefits.

2.1. Microsoft Dynamics 365 Copilot—“Your AI Assistant” (March 2023)

Microsoft's latest offering, Microsoft Dynamics 365 Copilot, serves as the world's first commercial AI co-pilot integrated into CRM and ERP solutions. Developed in collaboration with OpenAI, this solution, powered by the GPT-4 model, aims to revolutionize various business domains.

The strategic partnership with OpenAI positions Microsoft to introduce AI support across diverse business areas. GPT-4, integrated into modules like ERP Sales and Viva Sales, automates administrative tasks, reducing time spent on emails and correspondence. Virtual Agents within Customer Service facilitate automated responses based on extensive data sources.

This AI integration extends to Supply Chain Management, Dynamics 365 Customer In-sights, and Marketing, offering advanced analytics for a competitive edge. Microsoft emphasizes a phased approach, initially demonstrating AI benefits in operational tasks to gain management trust. [Bubeck et al.,2023]; [Microsoft,2023]; [Riley,2023]; [Cunningham,2023]

2.2. SAP RPA (Robotic Process Automation) - Intelligent AI Module for ERP (2023)

SAP, a leader in ERP solutions, introduces an Intelligent RPA subsystem in SAP/HANA 4, streamlining activities across key functional units. This system significantly improves efficiency by automating various tasks in finance, procurement, sales, and customer service.

In finance, SAP RPA automates general ledger entries, invoice processing, and payment settlement, enhancing accuracy and reducing manual efforts. Procurement-for-payment processes, supported by consistent automation, ensure standardized and timely invoice processing. SAP RPA's application extends to debt collection, where it automates tasks like initiating disputes for unpaid debts.

The system proves beneficial in sales, retail, and customer service by dynamically adjusting prices based on market conditions. It streamlines ordering, CRM, and pre-sales processes, ensuring prompt responses and improved interactions with customers. In human resources, SAP RPA supports recruitment processes and facilitates automation and monitoring of employed workers, fostering a healthy work environment. [SAP - 1, 2023]; [SAP - 2, 2023]; [SAP - 3, 2023]; [SAP - 4, 2023]; [SAP - 5, 2023]

The application of SAP RPA in production and preventive maintenance optimizes manual and repetitive administrative tasks. It ensures efficient monitoring of production processes, timely procurement of parts, and implementation of preventive maintenance cycles. SAP's AI SaaS (Cloud) platform service enables companies to create custom AI solutions in various enterprise domains.

3. Challenges and Reflections: A Narrative Perspective

In the ever-evolving landscape of AI, recent inquiries utilizing DL NPL models, exemplified by the GPT (2.0), have revealed notable limitations in providing

accurate responses or classifying problems not adequately covered in the training datasets. The inherent short-coming lies in the inability to predict the next element when faced with scenarios lacking associative links within the training set, underscoring that these models are far from perfection. The absence of a cohesive link that should be an integral part of the training set showcases that these models still struggle with non-structured and ad-hoc decision-making, especially in situations where managers must make on-the-spot decisions without prior comprehensive context or similar past experiences. [Yadlowsky et al.,2023]

This limitation becomes apparent when confronted with the complexity of unstructured problems requiring decisions in real-time. The inability to adapt to situations that deviate from the norm, lacking predefined patterns, emphasizes the need for a paradigm shift. These circumstances demand more than the statistical modeling provided by the evolution from binary perceptron's to DL NN Transformer networks.

The chaotic nature of circumstances where business decisions unfold, often relying on sheer intuition, suggests that these models are not yet equipped to replace the nuanced and ad-hoc decisions that managers face. The complexities of decision-making in unpredictable scenarios, where every element is not statistically represented or predetermined, require a leap beyond existing models. The evolution towards neuromorphic NN concepts, introducing a creative-chaotic domain for evaluating intricate Spiking Neural Network patterns, seems to be the path forward. [Ivković & Lužija Ivković - 2,2023]

Current NN DL NPL models, despite training on trillions of parameters and the entirety of internet correspondence, function as statistical evaluators of proximity and likelihood based on pre-existing data. They generate letters and words within the context of what they have encountered before. However, the leap into the realm of creative-chaotic evaluation is an aspiration that beckons the development of novel neuromorphic NN concepts. These would pave the way for systems capable of navigating the intricacies of complex decision-making, embracing the inherent chaos of unstructured scenarios. The journey towards incorporating creativity and adaptability into AI decision-making is an evolving narrative that promises new insights and possibilities beyond the current statistical confines.

Conclusion: Charting the AI Odyssey in Corporate Realms

Our expedition through the realms of artificial intelligence (AI) in the corporate domain has unearthed a transformative journey characterized by technological leaps and strategic integration. With our gaze firmly fixed on the future, guided by the narrative of "AI Odyssey: Navigating the Business Cosmos," our exploration traversed

diverse landscapes, from the theoretical foundations delineated in the abstract to the nuanced applications elucidated in each chapter.

As depicted in the evolving landscape of AI investment, the financial currents are poised to surge, with projections indicating a trajectory beyond the trillion-dollar mark by 2029. This financial metamorphosis symbolizes the growing recognition and trust bestowed upon AI technologies to redefine, optimize, and elevate conventional business paradigms. [Statista - 1, 2023]; [Statista - 2, 2023]; [Statista - 3, 2023]

Our chapters, each a testament to the multifaceted applications of AI, unwrapped the potential of cutting-edge technologies like DL RNN Transformers and SAP RPA. From redefining operational processes to orchestrating strategic decisions, AI emerges not merely as a tool but as a strategic ally in steering businesses towards unprecedented realms of success.

The narrative arc of this odyssey echoes a symphony of innovation, where DL RNN Transformers and their ilk are poised to demonstrate their capabilities in the crucible of real-world operational scenarios. This phase, crucial for cultivating trust and reliability, lays the foundation for AI to assume the mantle of a proficient decision-making companion, capable of navigating the intricate tapestry of modern business.

In our odyssey, the fusion of creativity and chaos, as introduced by emerging neuromorphic NN concepts, emerges as a potent force. It signifies an evolution beyond structured patterns, adapting to the unpredictable and transforming AI into a dynamic force, capable of steering businesses through uncharted territories.

As we pen the concluding chapter of our AI odyssey, the overarching sentiment is one of anticipation and optimism. The future beckons, laden with possibilities as AI solidifies its role not just as a technological marvel but as a transformative agent in the business cosmos. Our journey through these chapters is but a prelude to the ongoing saga of AI, a saga that promises to script new narratives of success, innovation, and unparalleled growth in the ever-evolving landscape of corporate enterprise.

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AUTOMATED (SEMANTICS DRIVEN) DATA RETRIEVAL FROM FISCAL DOCUMENTS: A COMPREHENSIVE APPROACH

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Abstract

The importance of paper documents in regular business flow cannot be underestimated. They are an important part of the business domain increasingly digital landscape, complementing digital solutions by providing a plus of transparency, reliability and security. Making prompt decisions in the business world requires fast access to relevant and up-to-date data, and working with paper-based documents is very inefficient. Digitization of documents is ubiquitous, and digital document management systems (DMS) play an important role in fields like science, business or health. In the business domain, Enterprise Resource Planning (ERP) systems represent an entire ecosystem of solutions, meant to address every aspect of the business process, in a unified approach. An important aspect of successful ERP implementations

is related to the integration of DMS into the ERP. Enabling automated retrieval of data from all kinds of fiscal paper documents into the ERP is the next logical step. In this paper, we provide a hands-on approach for the task of automated text retrieval from fiscal documents. The novelty of our work resides in the manner in which we addressed the semantics of the retrieved data, such that the system associates meaning to the retrieved text elements, at the same time easing the processing of future documents. The solution is presented in a generic form, with a thorough discussion of the technological aspects. It is further implemented in the ERP system. We present and discuss experimental results, finally drawing conclusions and providing several ideas to further develop our work.

Keywords: *automated data retrieval, semantics-driven, fiscal documents, comprehensive approach, data extraction, semantic technology, information retrieval, document analysis, machine learning, financial data, tax documents, semantic web, natural language processing, computational linguistics, intelligent information retrieval, data integration, taxonomy, document processing, information extraction, semantic annotation*

JEL Classification: C88, D83, E62, G38, H83, O33

Introduction

Fiscal documents are documents utilized to register taxes, sales, purchases, transfer of ownership of goods or assets. Possessing legal validity, they constitute vital components in the audit and financial review processes. For regulation purposes, fiscal documents are required to be stored in physical format, in order to have them reviewed, in case of necessity [1]. Paper documents are a pillar of business domain, due to their tangibility and sense of permanence and advantages with respect to legal value, their potential for traceability of financial activities. The business domain relies heavily on the use of paper documents, such as contracts, invoices or receipts, despite the digital transformation era. Physical documents cannot yet be eliminated from the business flow: traditional industries, but not only them, rely on the use of paper documents because of their familiarity and the trust they still instil in people, but also because paper documents may serve parties in cases of regulatory compliance, basic accounting tasks and even for historical record keeping. Even though digital business solution prevail, paper documents

may, finally, serve as a dependable emergency backup of the businesses' information.

In today's modern world, the volume of information dealt in the business domain, and not only, is huge. The storage space required to store physical documents is a challenge for business owners, also raising security concerns due to their vulnerability to damage or loss. Searching data in a physical archive of paper documents may prove to be a challenging, time consuming task, while exposing such documents to various environmental conditions may contribute to their fast deterioration. Information retrieval from documents is essential for efficient collaboration, such that digitization of documents is a prevalent task across various business fields [8]. For example, in Brazil, the implementation of electronic invoices was intended to provide improved control over the tax assessment, and it led, as a side effect, to a significant increase in the collection of taxes [15].

Text extracted from paper documents is introduced into digital document management systems (DMS), where information can be efficiently found and managed, and easily searched. Digital DMS are highly scalable, handling large volumes of documents with ease, and they profit from all kinds of technological advances to ensure timely and reliable backups. DMS facilitate aggregation of data and collaboration among members of a company, allowing them to simultaneously work on the same documents and communicate by means of specific annotations on the text, while ensuring increased security by means of tracking access and changes to the digital documents, or by specific security policies that limit access to sensitive data.

Enterprise Resource Planning (ERP) systems represent a modern approach to managing and controlling business activities in a unified manner. Every aspect of the business activity such as planning, distribution, production and all business specific information is treated integratively in ERP systems. These systems are typically built as modular information systems, enabling the various modules to evolve and be maintained independently. DMS are an important module within well-designed ERP systems, handling all the information available in the system.

The quality of information stored in the ERP ecosystem is crucial for driving intelligent decision-making processes. Data within the ERP may originate from various sources, collected automatically from digital sources or manually from paper-based documents. Big Data Analytics (BDA) techniques work in conjunction with ERP systems to gather, analyse, and visualize data, to informing decision-making processes [3].

The importance of data stored in DMS is paramount, since important business decisions are based on business intelligence techniques that involve data analytics [2]. Manual data entry is a highly time-consuming process, heavily dependent on the knowledge and attention of individuals performing the task. Automating this process enhances efficiency, reduces erroneous data, and enables the swift processing of large document volumes.

Various technological solutions have emerged in recent decades to address the challenge of automated data capture, with Optical Character Recognition (OCR) being a notable example. OCR involves automatically recognizing characters from scanned images [5]. While OCR process is not error free, as errors are common, complete elimination of manual intervention by human operators is challenging [6].

This paper introduces a hands-on approach to integrate OCR techniques for the automatic processing of financial paper documents, aiming to enhance the data collection process in an ERP. Our interest extends beyond retrieving text from the paper documents: we focus on meaningful data extraction, ensuring that the retrieved data is stored in the database within specific fields. Our emphasis lies on both error detection and correction, involving user intervention during the data extraction process. We leverage the OCR capabilities implemented in Microsoft Azure, specifically Document Intelligence, and we seamlessly integrate them into the SeniorERP system. Experimental results exemplify and validate our approach.

In the following, we review specific works in the literature, related to the topic of our research. Then, we present in detail the research method, providing details on the integration process of Microsoft Azure's Document Intelligence component within the SeniorERP software system. The subsequent section focuses on validating the proposed methodology and presenting the experimental results. We conclude the paper by discussing the advantages and limitations of the proposed approach. Furthermore, we outline several directions for future research.

Related Work

ERP implementation is an endeavour of mature IT companies, both global players such as Oracle or SAS, or local IT firms such as Senior Software¹ or MentorSoft². Each country has very specific regulations [14], making it a difficult task to use directly a generic ERP system out-of-the-box. This enables custom-made solutions, that are adapted to the particularities of a certain market, to have an

¹ <https://www.senioreerp.ro/en/>

² <https://portal.winmentor.ro/winmentor/distributie/>

advantage over general purpose ERP systems [9]. In Romania, the economic growth witnessed by the country since joining the EU has influenced greatly the offerings of IT companies with respect to software for management of all the aspects of the business, such as distribution, manufacturing, services, and retail activities.

In an ERP system, a vital component involves the data warehouse of the system, where data is stored securely, in such a manner that it allows easy access and search. Nowadays, the volume of data is so large that Big Data techniques are employed regularly in the business field. Big Data Analytics have a significant impact on the development of management strategies and activities [3]. Integrating BDA in the digitalized healthcare supply chain in [4] they obtained improved efficiency and a strict control over the process of manufacturing and delivering of medicines [4].

At the core of BDA lies the data that the analysts use, data that is usually automatically fetched from the various modules of an ERP system. Data from paper documents is usually manually introduced in the system, but great advantages are obtained from the automation of this task [10]. Optical Character Recognition is the task of converting handwritten or printed documents into digital data, by automatically identifying and recognizing the text. A systematic review of OCR capabilities available is documented in [7]. Automatic processing of documents achieves a low degree of intrusiveness and significant reduction of operational costs [9]. From the point of view of implementation of Industry 4.0 processes, "robotic process automation" entails text recognition by means of OCR based software, followed by automatic data extraction and automatic document classification, when such a process is possible [10].

Following OCR recognition of characters, the retrieved text is further processed. Post-processing involves the detection of errors [11], which may involve segmentation errors or even recognition errors. Further, error correction is attempted, and this process usually involves the generation of plausible candidates to replace the erroneous words [11]. Other more sophisticated approaches to error correction involve the use of a lexicon of accepted words [12]. When dealing with documents that have a structured format, error correction may address pairing information from the recognized text and the expected structure of the document [13].

Various platforms offer powerful OCR algorithm implementation as services [16], such as Azure AI Document Intelligence³, Google Document AI⁴, Amazon Textract⁵, Base64.ai⁶, Clova OCR⁷, AbbyCloud OCR⁸, Parashift.IO⁹ or IBM Cloud¹⁰, Rossum AI¹¹. Among these, Azure's Document Intelligence (ADI) features recommend it for high precision OCR tasks [17], in contexts such as integration with ERP system [18]. From our point of view, ADI is the preferred choice also because it offers excellent support for the Romanian language.

After extraction of text from paper documents, it must be associated with semantics, in order to truly be valuable for search and analysis. Information Retrieval (IR) is a task related to OCR, but with the focus on the meaning of the data retrieved from documents [19]. In [20], an OCR Search Engine is described in order to extract meaningful information from digitized books. In [21], a library of OCR annotations for industry documents is presented, in order to offer a baseline comparison of various commercial tools. Three methods for "hand-marked semantic text recognition" are presented in [22], where images from scanned paper documents are processed in order to extract semantic text. Several quantitative measures are introduced in [23], in order to evaluate dataset specific biases in automated document annotation tasks.

Proposed approach

The creation of semantic association between automatically recognized text from paper documents and meaningful information from the specific domain of the text is a task of great interest in the context of the digitization of documents in various fields. In our approach, we build on Azure Document Intelligence (ADI) and provide an original approach for the semantic annotation of automatically OCR documents. ADI offers a General Document Model (GDM) which extract data stored in documents, such as text, tables, key-value pairs and text. We embed this

³ <https://azure.microsoft.com/en-us/products/ai-services/ai-document-intelligence>

⁴ https://cloud.google.com/document-ai/docs/overview?hl=en_US

⁵ <https://docs.aws.amazon.com/textract/latest/dg/what-is.html>

⁶ <https://documenter.getpostman.com/view/10132588/SWT5hfdz>

⁷ <https://www.ncloud.com/product/aiService/ocr>

⁸ <https://www.abbyy.com/vantage/ocr-skill/features/>

⁹ <https://docs.parashift.io/#intro>

¹⁰ <https://cloud.ibm.com/docs/discovery-data>

¹¹ <https://elis.rossum.ai/api/docs/#getting-started>

and propose specific workflow in order to structure and organize information, and link it to business concepts integrated in the ERP system, such that the information is fructified within the ERP system.

Methodology

The transformation of a mage-type Document into OCR Data is described in the following. We implemented this step as a web application, such that it is offered as a service. In Figure 1, we present the dynamic view of the OCR application behaviour, by means of a sequence diagram. It depicts the interaction between the user, the OCR module of the ERP application and Microsoft Azure Document Intelligence.

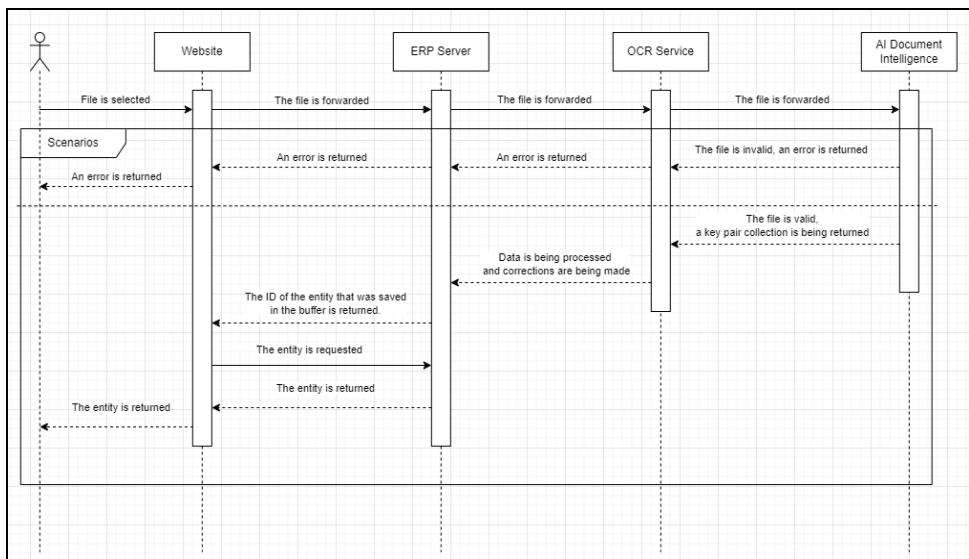


Figure 1: Sequence diagram of the OCR flow

The process is described in more detail in the following (see Figure 2). As a first step, the user accesses the website, where they have the option to upload a PDF or image document and select the document model they want to use. There exist several predefined template documents for some common types of specific invoices (such as those from some common companies in the Romanian market). The document is transformed into a vector of bytes and, along with information

about the model, is transmitted to the ERP server. The ERP server forwards the data to the OCR service, hosted in the Microsoft Azure Cloud. The OCR service calls AI Document Intelligence to transform the document into OCR data. At this stage, there exist two possible scenarios, from our point of view.

In the first scenario, AI Document Intelligence returns that the file is not valid or does not correspond to a specific model and the optical character recognition process failed. The OCR service receives the error and passes it on to the ERP server. The ERP server further sends the error to the website. The website displays a user-friendly message informing the user of the error.

In the second scenario, AI Document Intelligence signals that the transmitted file is valid and returns a key-value collection with the results obtained from the OCR process. The OCR service receives the information, processes the data, and makes corrections where necessary, then forwards the information to the ERP server. The ERP server saves the data in a Buffer table and returns the ID of the saved entity to the website. The website requests the data for the entity with the received ID. The ERP server returns the requested entity. The website displays the user with the data resulting from the OCR process.

In order to assimilate the OCR Data into a valid ERP Document, the OCR document is sent for conversion. During the conversion process, it is checked whether the business partner (individual or legal entity on the OCR document) already exists in the ERP database. Mapping is done by searching for a partner in ERP with the same code or name. If no entity with these characteristics is identified, the partner is marked as unmapped. If there is an entity in ERP that matches the characteristics, its data is set in the new ERP document being constructed. It is checked if there is a county in the database that matches the one in the OCR document. Similarly, if it does not exist, the OCR document is marked as unmapped for the county. If it does exist, its data is set in the ERP document. The process is repeated for other document entities: City, Document Currency, General VAT Rate, etc.

A detail is then read from the tabular area of the document. By detail, we mean information related to a product on the document, including code, name, unit of measure, quantity, price, net value, gross value etc. It is searched in the database if a product with the same barcode as the one in the OCR document exists. If found, it proceeds to setting the data for a new ERP document detail. It is searched in the database if there is a product with any alternative name or code set to match the name or code of the product in the OCR document detail. If found, it proceeds to setting the data for a new ERP document detail.

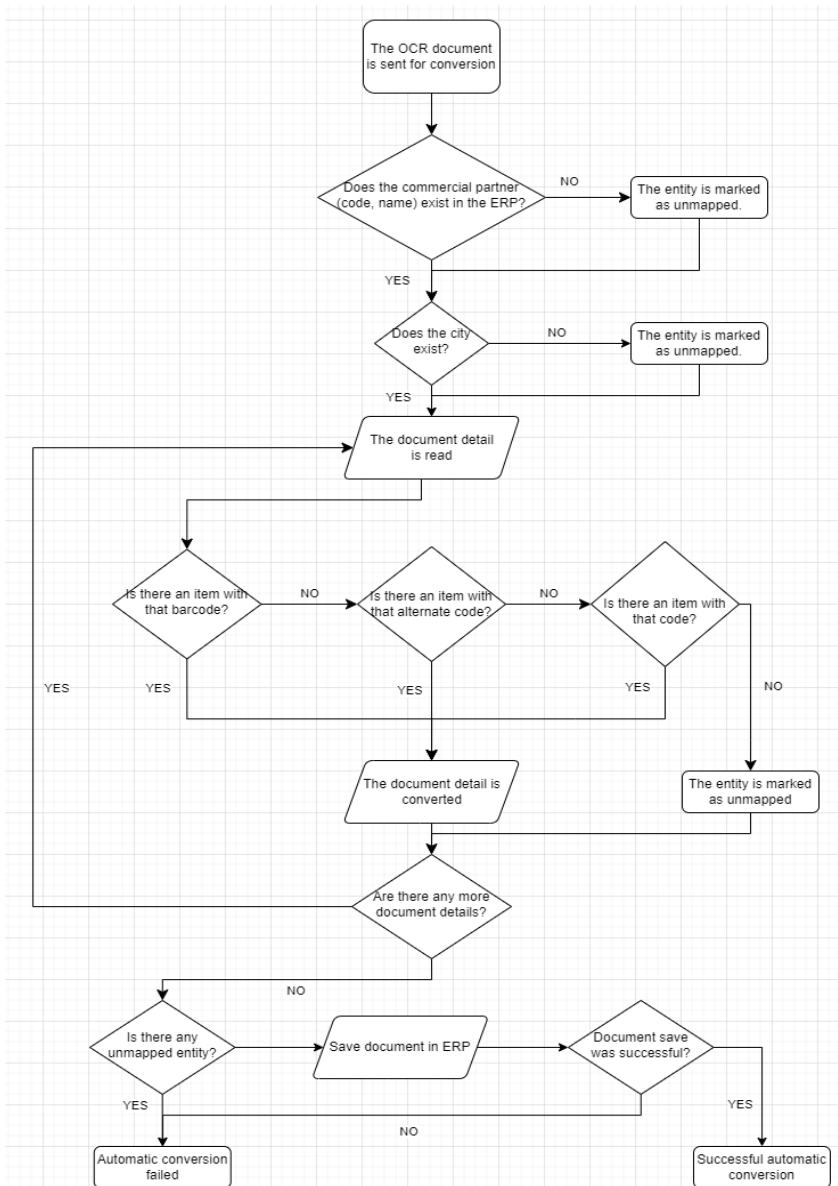


Figure 2: OCR Application Usage Flow: Transformation of Image-Type Document into OCR Data, Transformation of OCR Data into ERP Document.

An ERP database product can have alternative codes and names set (often being the names customers and suppliers use for the same product) to help with future mapping. If automatic mapping fails, the user can manually select a product, in which case the values for code and name that appear in the OCR are automatically set to ensure automatic mapping in the future. The data of the identified product obtained from the database is set in a new detail of the ERP document being constructed. It is searched in the database if there is a product with a name or code that matches the name or code of the product in the OCR document detail. If not found, the OCR document detail is marked as unmapped. It is checked if there are other details on the OCR document that have not been read. If there are, it returns to the stage of reading another detail from the document. Finally, it is checked if there are entities in the OCR document that could not be mapped. If there are, the conversion of the OCR document to the ERP document is marked as failed. If not, an attempt is made to save the constructed document in ERP. If the saving in ERP is successful, the conversion of the OCR document to the ERP document is marked as successful. Otherwise, it is marked as failed.

The user has the option to intervene and manually select entities that could not be identified automatically by the system. Within some of these, associations are made in the system so that for a future conversion with similar values, the identification will be automatic.

Performance Measures

For the evaluation of the performance in the OCR tasks, we used Word Error Rate (WER) and Entity Error Rate (EER). These are widely used in similar tasks in the literature.

The WER is defined as $WER = (S + D + I)/N$, where

- ∨ S denotes the number of words incorrectly identified
 For example: the word “*Calea*” may be misidentified as “*Caiea*” because the letter “l” is wrongfully identified as “i”
- ∨ D – is the number of missed words
 For example: “*Furnizor SC IMPEX SRL*” may be identified as “*Furnizor SC*”
- ∨ I - the number of words erroneously added (these words do not exist in the real text, but are returned as recognized by the system)
 For example: “*Piulita S29*” may be recognized as “*Piu lia S29*”

The number of correct words is denoted as C , and the total number of words is N . It results that

$$N = S + D + C.$$

For example, if we consider the original and the recognized texts to be as in Table 1 below:

Table 1: An example of original text and automatically recognized text.

<i>“Furnizor SC IMPEX SRL</i>	<i>“Furnizor SC</i>
<i>Adresa: Calea Ferentari nr. 8</i>	<i>Adresa: Caiea Ferentari nr. 8</i>
<i>Articole:</i>	<i>Articole:</i>
<i>Piulita S29 3 bucati x 0.3 lei”</i>	<i>Piu lita S29 3 bucati x 0.3 lei”</i>

It results that:

$$S = 1 \text{ (Caiea)}$$

$$D = 2 \text{ (IMPEX SRL)}$$

$$I = 2 \text{ (Piu lita)}$$

$$C = 13$$

and the $WER = 6/16 = 0.375$, hence a percentual error of 37.5%.

The Entity Error Rate (EER) represents the percentage of misidentified entities in a document. It is computed as:

$$EER = Et / Nt$$

where Et – is the number of misclassified entities, and Nt - is the total number of entities in the document.

Experimental results

The system was thoroughly tested, on fiscal documents specific to the Romanian market. Such a document is presented in Figure 3. We tested the system on other documents, where various fields were missing, or document where the text was hardly visible or hardly readable.

PAGINA: 1/1

Furnizor: **SOCIETATE**
 Adresa: **ACAA Strada modificata 412 Bl. Sc Ap. Bucuresti sector Cod**
 C.I.F.: **519**
 Nr.Reg.Com: **101010101029**
 Telefon:
 Cap.Soc.: 1060898
 Banca: **Banca Transilvania/Banca Transilvania - I. Iritii**
 Cont nr: **SUBESTROUN**

Factura client

Cumparator: **PERFECTUPAMB SAN VE TIC A.S.**
 Adresa: **CSF-NT**
 C.I.F.: **519010101029**
 Nr.Reg.Com: **101010101029**
 Banca:
 Cont nr:
 Livrat la: **PERFECTUPAMB SAN VE TIC A.S.**
 Adresa livrare: **CSF-NT**
 Data scadenta: **10/10/2020**

Serie/Numar: **INNOCAS**
 Data (zi.luna.an): **10/10/2020**

Nr. Crt.	Descrierea produselor sau serviciilor	UM	Canitate	Pret unitar -RON-	Valoare neta -RON-	Valoare TVA -RON-
1	INSTRUMENTE	PIECE	1000	1000	1000	1000
2	INSTRUMENTE	PIECE	1000	1000	1000	1000
3	INSTRUMENTE	PIECE	1000	1000	1000	1000
4	INSTRUMENTE	PIECE	1000	1000	1000	1000
5	INSTRUMENTE	PIECE	1000	1000	1000	1000
6	INSTRUMENTE	PIECE	1000	1000	1000	1000
7	INSTRUMENTE	PIECE	1000	1000	1000	1000
8	INSTRUMENTE	PIECE	1000	1000	1000	1000
9	INSTRUMENTE	PIECE	1000	1000	1000	1000
10	INSTRUMENTE	PIECE	1000	1000	1000	1000

Total: **1000000** **1000000**
 Total de plata: **1000000**

Numar total pozitii: 8
 Observatii:

Semnatura si stampila furnizorului	Operator facturare: ionut c Agent comercial:	Nume delegat: Act identitate: / Mijloc transport: Semnatura delegat:	Semnatura si stampila de primire
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Figure 3: Automatic labels in a document, placed by Document Intelligence.

In a battery of 10 tests, involving variations of the standard fiscal document of above, we annotated 20 labels and, on top of these, the values for each item in the fiscal document. The accuracy of the annotations identified is presented below (Figure 4).

Field Name	Accuracy
ProviderName	99.50 %
Provider Address	90.00 %
ProviderCIF	99.50 %
InvoiceNumber	90.00 %
InvoiceDate	90.00 %
ClientName	90.00 %
ClientAddress	70.00 %
ClientCIF	99.50 %
InvoiceDueDate	99.50 %
articles-details	99.50 %

DeliveryAddress	90.00 %
DeliverTo	70.00 %
ProviderTRN	99.50 %
ClientTRN	99.50 %
ProviderBank	90.00 %
ProviderBankAccount	99.50 %
ClientBank	90.00 %
ClientBankAccount	90.00 %
NetTotal	99.50 %
TVA>Total	90.00 %
TotalToPay	99.50 %

A summary of the results for the 10 tested fiscal documents is presented below:

File	S	D	I	C	N	WER
48.pdf	0	0	1	55	55	0.018
29.pdf	0	0	0	79	79	0
25.pdf	0	0	0	66	66	0
34.pdf	0	1	0	96	97	0.01
20.pdf	0	0	0	68	68	0
60.pdf	0	0	0	84	84	0
22.pdf	0	0	0	66	66	0
54.pdf	0	0	4	69	69	0.058
47.pdf	0	0	0	106	106	0
37.pdf	0	0	2	90	90	0.022
Average						0.0108

Conclusions

This paper tackled the task of implementing OCR text recognition for fiscal documents as a service provided in a complex ERP system. The OCR process is realized by the integration of Microsoft Azure Document Intelligence system. Our approach involved the extraction of text and the automatic annotation of the data such that it is stored as an ERP document, in the system's data warehouse. To this end, we devised a workflow that proceeds in well-designed stages in order to treat all the data received from the OCR service. In this respect, we offer ERP system users the possibility to accept automatic labelling of the retrieved entities, or to assign new labels, which are memorized and will be made available in future processing of documents. Digitization of paper fiscal documents facilitates quicker analysis of financial data, allowing for faster processing and easier interpretation. It reduces the time and effort required for data entry, minimizing errors and streamlining fiscal document processing. It serves purposes of compliance and auditing, because it helps with fast and accurate record keeping, with small costs and reduced need of manual labour. Digitized fiscal documents that are further annotated, become meaningful resources of information, easily searchable. We provided a solution for a pivotal problem in the process of digital transformation of business processes, by using OCR for fiscal paper documents.

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MANAGEMENT OF THE ORGANIZATION OF PERSONNEL DOCUMENTS AND ACCOUNTING OPERATIONS RELATED TO PERSONNEL SETTLEMENTS

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Abstract: *Lately in Romania it has been noted that there is a concern for establishing ethical rules of the accounting profession to ensure professionalism, confidentiality and objectivity in performing the management work. The accounting theories underlying the management personnel settlements assists the public entity to meet its objectives through a systematic and methodical approach that evaluates and improves the effectiveness of the management system based on risk management, control and management processes.*

Keywords: *risk management; economy; documents; profesional organisations*

JEL Classification: C88, E02, M41, I25

Introduction

Work is an activity carried out by people. The freedom of work is guaranteed by the Constitution, and the right to work cannot be restricted, so that everyone is free to choose the job and the profession, trade or activity to be performed.

Everyone may not be compelled to work or not to work in any particular job or profession.

At the same time, forced labor performed by a person, for which he has not expressed consent, is prohibited by the law in force.

Workers have the right to pay, negotiation, protection against unfair dismissal and protection of personal data. Within the employment relationship we encounter two forms:

- employee - the person who performs work in return for a salary;
- employer - natural or legal person who, under an employment contract, undertakes to pay to the employee in exchange for the work performed a remuneration called salary.

Salary is the amount of money obtained as a result of the work done. Salary over time has undergone numerous changes in terms of size, significance and forms of pay.

Organizing personnel documents

The activity of enterprises could not take place without the involvement of human resources to be rewarded for their work in the form of salaries, but also in the form of contributions that the company pays on account of wages paid. Both salaries and contributions must be paid by the company regardless of the category of personnel to which the employee belongs, four main types of employees being identified in the literature: workers, operative staff, executive staff, management personnel.

Although the amount of remuneration is different for each category of employees, certain types of benefits can be identified that can be granted regardless of the category of staff to which we refer. A brief overview of the most frequently granted benefits is provided below:

Salary

This is the amount by which the employer remunerates the employee for the work done.

Meal vouchers

They have a nominal value related to a working day, In the first semester of 2022, the nominal value of meal vouchers granted to employees was a maximum of 20.17 lei.

Holiday vouchers

These are value tickets granted to employees on account of expenses that employees make during annual leave. Companies can annually grant holiday vouchers with a maximum value of 6 gross minimum wages per country.

Gift vouchers

They can be given on account of various gifts given to employees and their minor children, but also on account of gifts that are offered to women on the occasion of March 8 or on account of gifts offered on June 1 to employees who have minor children.

Medical subscriptions

These are health insurance premiums borne by the employer on behalf of its own employees. Medical subscriptions with a maximum value of 400 euros annually are not taxable and are thus not subject to social contributions

Reimbursement of transport to the place of work and from the headquarters of the enterprise to the employee's own home

According to the Tax Code, enterprises do not have to pay income tax or social contributions if the remuneration for the transport of employees is provided for in the employee's employment contract or in the company's internal regulations.

Employee profit-sharing

This type of remuneration is assimilated to wages by the Romanian Tax Code, so that the amounts granted for employee participation in profit are subject to taxation rules specific to salary income.

Professional training courses

The expenses related to such courses are generally stipulated in the employment contracts of employees, in the articles of incorporation of the enterprise or in decisions taken at company level. If this rule is observed, then remuneration granted on account of vocational training courses is not considered taxable income and thus is not subject to social contributions.

Sick leave

Remuneration in this category is granted if the employee is temporarily unable to work, but also in case of special situations, such as the birth of a child, care of sick children, care of patients with oncological diseases, etc.

Personal deductions

This form of remuneration is granted to employees in the form of a reduction in the taxable base. To reflect the calculation of personal deductions, we can refer to a particular example, that of a basic salary of 2,550 lei on January 1, 2022, for which the following types of deductions could be granted:

Grid for granting personal deductions

The situation in which the employee finds himself	Amount of deduction (lei)
The employee has no dependents	330
The employee has a dependant	490
The employee has two dependents	650
The employee has three dependents	810
The employee has at least four dependents	1130

Source: Dragoş Cerasela, Deductions from employee income, Wolters Kluwer, November 17, 2021, <https://www.wolterskluwer.com/ro-ro/expert-insights/deduceri-din-venituri-angajati-dragos>

In addition to these types of benefits that are granted relatively frequently by Romanian companies, other forms of remuneration can be identified that are granted occasionally, in certain situations and only within certain types of companies: compensation amounts, adoption aid, non-compete allowance, relocation expenses, night bonuses, weekend bonuses.

Therefore, there are many types of benefits that can be granted to employees, the complexity of the salary and salary-related benefits system being reflected indirectly in the field of personnel settlement accounting, which is, in turn, a very complex one.

How to organize personnel documents

Accounting for settlements with personnel is carried out on the basis of two main categories of documents: primary documents and operative documents.

The first category, that of primary documents, includes the following types of documents:

- payment orders for the payment of salaries;
- documents that help determine and record salary rights:
 - o the list of annual leave allowances;
 - o payroll;
 - o chenzinal advance lists;
 - o summary list of payrolls.
- documents evidencing working time:
 - o the situation of presence at work of employees;
 - o situation of absences;
 - o collective attendance sheets.
- documents indicating the presence of employees at work:
 - o timesheets;
 - o attendance registers.

- documents drawn up at the time of hiring a person (individual employment contract) and containing provisions on the amount of wages and other provisions related to how the work of the new employee will be carried out.

The second category of documents, that of operative documents, includes supporting documents that contribute to the determination and settlement of salary rights related to each employee. An example of an operative document is the payroll, which usually contains the following information: identification data of the company; month and year for which the payroll is drawn up; identification data of the employee; employee's job/position; employment salary; information on time worked; information on salary rights; information on taxes related to salary.

Accounting operations relating to staff settlements

Accounting of staff settlements is carried out mainly using the following accounting accounts:

- account 421 ("Personnel – wages due);
- account 423 ("Staff - material aid due")
- account 425 ("Advances to staff")
- account 426 ("Personnel rights not raised")
- account 427 ("Deductions from wages due to third parties")
- account 428 ("Other payables and receivables in relation to personnel")

How these accounts contribute to recording the different staff settlement operations is as follows:

Payroll registration operations

They are carried out by crediting account 641 "Expenses with staff salaries" and debiting account 421 "Personal wages due"

The amount related to this registration is represented by the fund of gross wages in a given month in the enterprise.

Detention registration operations

This is done by debiting account 421 "Personnel – wages due" and crediting various withholding accounts:

Examples of accounts used to record deductions related to staff salaries

Account number	Account name
427	Deductions from wages and other entitlements due to third parties
444	Payroll income tax
428	Claims in relation to personnel
431	Social security and health insurance contributions

Source: *** General chart of accounts. Function and correspondence of accounts, Rentrop & Straton Publishing House, 2022, pp. 55-58

When analyzing deductions from wages, we must also highlight the weights related to each deduction, as provided in the Tax Code:

- share of pension contribution;
- share of health contribution;
- share of income tax;
- share of insurance contribution for work.

Share of deductions from employees' salaries

Name of detention	Weight
Pension contribution	25%
Health contribution	10%
Contribution to income tax	10%
Work insurance contribution	2,25%

Settlements with employees, social security and social protection occupy an important place in economic theory and practice, exerting a strong influence on working and living conditions of the population, on the quality of life.

It is good to deepen some notions of salary, social insurance, social protection, notions that during the period of transformation our country is going through acquire very special content and connotations, with an impact on the consciousness and living standards of the population.

Salaries, social insurance, social protection are economic levers that ensure the handling of both economic indicators, but especially of the population, thus becoming political levers.

The accounting of these settlements gives another dimension to the notion of wages, offering another angle of view on economic efficiency, angle from which the notion of expenditure appears very visible.

The market economy requires compliance with certain economic rules, of which the one regarding the settlement of incomes and expenditures on a real basis is impossible to circumvent.

Currently, more and more companies are faced with the need to increase productivity and for this they have limited possibilities. One of the least exploited ways to increase performance is to improve human performance. Productivity growth can be achieved by increasing the quantity of products or by improving the quality of labor, information, capital, and the combination of factors.

The first way involves more labor, more capital, more raw materials. Through the second, human resources are involved in all qualitative actions, managers aiming to improve the quality of work by training and better understanding of employees, quality of information, by amplifying communication, by better qualification of staff and combining factors.

Performance evaluation proves to have a special influence on the economic and social activity and organizational climate within a company with direct repercussions on increasing efficiency in general and productivity in particular. Therefore, performance appraisal systems constitute an extremely important part of the management system in general and human resource management in particular.

In order to achieve a correct evaluation of human resources performance, appropriate evaluation criteria are required. Assuming that evaluators are motivated and competent, we must consider the evaluation system in general and evaluation criteria in particular. There are three types of criteria: personality traits, behaviors, and outcome.

The evaluation of personality traits involves evaluating elements such as: dynamism, intelligence, creativity, self-confidence, enthusiasm, sense of responsibility, loyalty, etc. These criteria are difficult to define, to measure, but especially to communicate.

About behaviors and outcomes, some theorists say that one can evaluate results without worrying about how they were obtained. Others, on the contrary, point out that results rarely depend on a single employee and that very good results in the short term can also be achieved through behaviors that in the long run will harm the organization.

Another reason to evaluate behaviors and not just results lies in the effort made by the employee. Thus, a less gifted employee can work hard achieving only average results, while his more gifted colleague can reach the same results effortlessly. It follows that these employees achieve the same result, but through different components. Therefore, it is advisable for their evaluation to refer not only to results but also to components.

The evaluation criteria must always be established by means of job analysis. If changes in employee behaviour are to be desired, they must be linked to important aspects of their work. What is suitable for one job may be totally unsuitable for another.

At the basis of the separation of employees it is necessary to find the criteria for evaluating individual performance. Generally, the criterion defining professional

performance, partial or total, is constructed by the manager from elements specific to the job and position.

The dimensions based on which the assessment of professional performance is made are: flexibility, adaptability, multilateralism, precision, ability to complete the work, compliance with the established deadlines. When evaluating professional performance, the professional experience gained over time is particularly important and should not be neglected.

The relationship between current, momentary professional performances and those defining the general professional level of the individual needs to be analyzed with discernment. Mere spontaneous comparison between people cannot lead to a correct assessment of individual professional performance. The loss of the employee's level of professional performance is mainly due to the manager, who is unable to take him out of routine, repetitive and stereotyped activities, to make him strengthen and strengthen his motivation in the activities he carries out. The most complex activity that needs to be better stimulated is that of creation

When increasing the professional performance of the staff, an important role is played by the manager who has the obligation to ensure the employees an appropriate socio-professional climate.

Conclusion

Incorrect evaluation by the manager of individual professional performance leads to the establishment of an unfavorable climate that has repercussions on labor productivity through non-fulfillment of norms and service duties and inadequate quality of products, works and services. The unfavorable working climate is characterized by a high percentage of delays from the program, absences, high staff turnover rate, failure to perform tasks on deadlines, etc.

The professional failure of employees rests entirely with the manager, i.e. he is not able to achieve results with the team he leads. In this situation, it is necessary to replace the manager and not change the work team.

On the side of increasing the efficiency of the economic activity, there are also the efforts that are currently being made in the line of introducing IT into the Romanian society, starting from the microeconomic level of the economic agent, and tending towards the macroeconomic level of the entire economy.

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- *** https://www.mfinante.gov.ro/static/10/Mfp/legislatie/regl_contabile/preciz_MO.pdf
- *** https://www.globalinfo.ro/z/contul_431_asigurari_sociale.htm
- *** <https://mfinante.gov.ro/domenii/informatii-contribuabili/persoane-juridice/info-pj-selectie-dupa-cui>
- *** <https://www.financialmarket.ro/terms/productivitatea-muncii/>

CARBON ACCOUNTING IN THE CIRCULAR ECONOMY

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Abstract: Carbon accounting in the circular economy became a priority for the professional organisations because climate changes are an important issue on international level and carbon emissions are increasing across the globe.

Research on carbon accounting is a new area, but public or private entities must quantify their greenhouse gas emissions in order to reduce operational costs, and to improve operational efficiency.

Carbon accounting and professional organisations can provide leadership and explain what needs to change within organisations in order to achieve carbon emission reductions at the pace and scale that is required.

IASB (International Accounting Standards Board) is actively seeking to embed carbon accounting into current accounting practice and to develop standards for reporting on carbon emissions. Professional accountants will play a central role in helping managers to integrate climate and other environmental and social value into traditional reporting. The governments and professional organisations are working together in preparing for and delivering carbon reduction and net zero targets. The European Union has already set targets to reduce greenhouse gas emissions by 2050.

Keywords: *sustainability reporting; economy; carbon accounting; professional organisations*

JEL Classification: C88, E02, M41, I25

Introduction

Carbon accounting or greenhouse gas accounting is a framework of methods to measure how much greenhouse gas (GHG) an organization emits². Carbon accounting is a priority for managers, accountants, professional organisations, but also for public entities such governments or European Parliament. According to the International Business Machines Corporation (IBM)³, greenhouse gas accounting is the process of quantifying the amount of greenhouse gases (GHGs) produced directly and indirectly from a business's or organization's activities within a set of boundaries. Thus, access to accurate, granular GHG emissions data is essential for organizations looking to identify where to focus emissions reduction efforts, develop a strategy and track the impact of emissions reduction initiatives. Recently, IBM organization developed a specific emissions management software with accounting and reporting modules to follow progress towards emissions-reduction costs. With the recent increase in demand for net-zero targets and pathways, accurate carbon accounting will be needed to ensure a standardized, transparent, and auditable approach (Marlowe, J. and Clarke, A. 2021).

1. Greenhouse Gas Emissions and Carbon Accounting

Carbon accounting in the circular economy is used by researchers and professional accountants to understand the extent of an organization's carbon emissions – both direct and indirect⁴. Carbon accounting⁵ is a complex process that requires access to accurate, real-time and historical energy data and factor sets. Also, energy data must reflect the complexity and hierarchy of the organization so that emissions can be traced back to their source for reporting and compliance. Climate change indicators reflect how global greenhouse gas emissions increased since 1990 until today, threatening ecosystems and biodiversity:

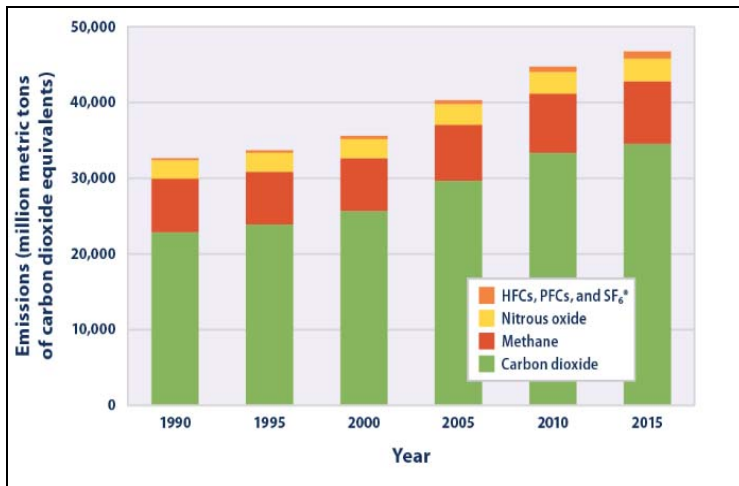
² <https://corporatefinanceinstitute.com/resources/esg/carbon-accounting/>

³ <https://www.ibm.com/topics/carbon-accounting>

⁴ <https://corporatefinanceinstitute.com/resources/esg/carbon-accounting/>

⁵ <https://www.ibm.com/topics/carbon-accounting>

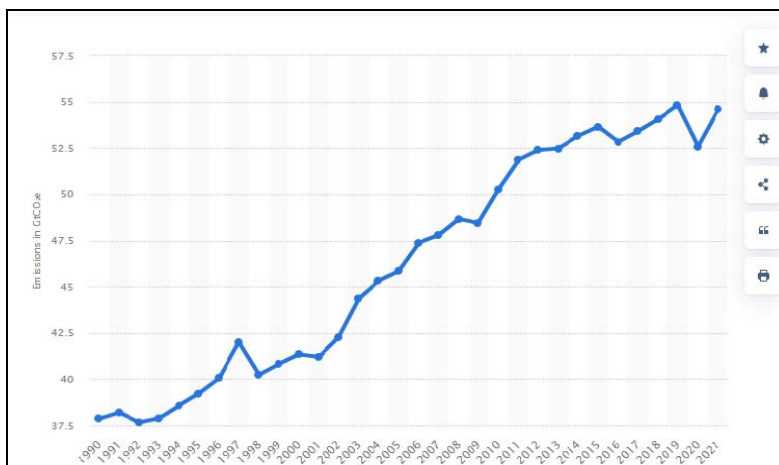
Figure 1. Global Greenhouse Gas Emissions by Gas, 1990–2015



Source: <https://www.epa.gov/climate-indicators/climate-change-indicators-global-greenhouse-gas-emissions>

Thus, the demand for robust greenhouse gas (GHG) accounting is rapidly growing as investors and businesses seek to demonstrate their commitment to decarbonization.

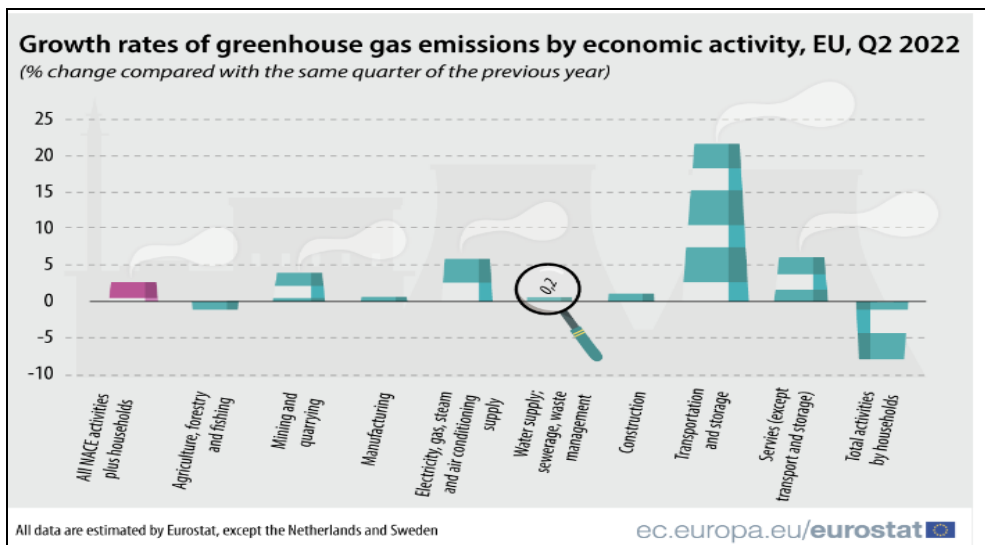
Figure 2. Annual greenhouse gas emissions worldwide 1990-2021 (billion metric tons of carbon dioxide equivalent)



Source: <https://www.statista.com/statistics/1285502/annual-global-greenhouse-gas-emissions/>

We could observed in the figure no. 2 how gas emissions have been declining in 2020 due to the COVID-19 pandemic and economic slowdown. To help fight climate change, the EU has set ambitious targets to reduce its greenhouse gas emissions. In the figure below, we could observe the growth rates of greenhouse gas emissions in EU by economic activity for second quarter of year 2022:

Figure 3. Growth rates of greenhouse gas emissions by economic activity, EU, Q2, 2022



Source: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20221115-2>

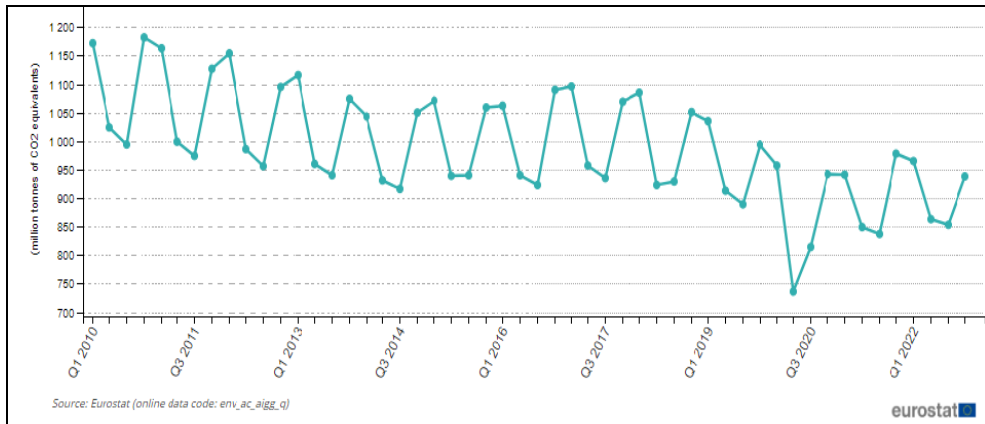
In the figure above, we could observe that greenhouse gas emissions increased in most sectors compared with the year 2021. There are two exception such as: *households* which decreased by 8% and *agriculture*, which decreased by 1%. The highest increases were recorded in the sector of *transportation and storage*, which increased by 22% , sector of *electricity or gas supply*, which increased by 6%, and sector of *services* which increased by 6%.

Eurostat statistics provide general economic information about the fourth quarter of 2022, when EU economy greenhouse gas emissions totalled 939 million tonnes of CO₂-equivalents, a 4 % decrease compared with the same quarter of

2021⁶. In order to achieve environmental sustainability, EU wants to reach climate neutrality by 2050 and this target, along with an interim target of 55% CO₂ emission reduction by 2030, are set in the European Climate Law⁷.

While climate change helped to spur the development of carbon accounting as an offshoot of environmental accounting, international discussions were fostering debates on related global concern – conservation through the valuation of biodiversity (Galvin S.S. and Garzon D.Z, 2023). Carbon accounting could help investors and managers to understand in a better way the greenhouse gas emissions for activities and households. In the figure below, we could observe the evolution of greenhouse gas emissions in EU for the period 2010-2022:

Figure 4. Greenhouse gas emissions for all activities and households in EU period 2010 - 2022



Source: <https://www.statista.com/statistics/1391510/eu-european-union-greenhouse-gas-emissions-by-quarter/>

Human emissions of carbon dioxide and other greenhouse gases are a primary driver of climate change. Particularly notable is the way that carbon accounting revolves around the production of data about GHG emissions, the reductions of

⁶ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Quarterly_greenhouse_gas_emissions_in_the_EU#:~:text=Greenhouse%20gas%20emissions,In%20the%20fourth%20quarter%20of%202022%2C%20EU%20economy%20greenhouse%20gas,tonnes%20of%20CO2%20equivalents\).](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Quarterly_greenhouse_gas_emissions_in_the_EU#:~:text=Greenhouse%20gas%20emissions,In%20the%20fourth%20quarter%20of%202022%2C%20EU%20economy%20greenhouse%20gas,tonnes%20of%20CO2%20equivalents).)

⁷ <https://www.europarl.europa.eu/news/en/headlines/society/20180208STO97442/cutting-eu-greenhouse-gas-emissions-national-targets-for-2030>

which can be monetized in carbon and agricultural markets (Galvin S.S. and Garzon D.Z, 2023).

2. Current Trends in Carbon Accounting

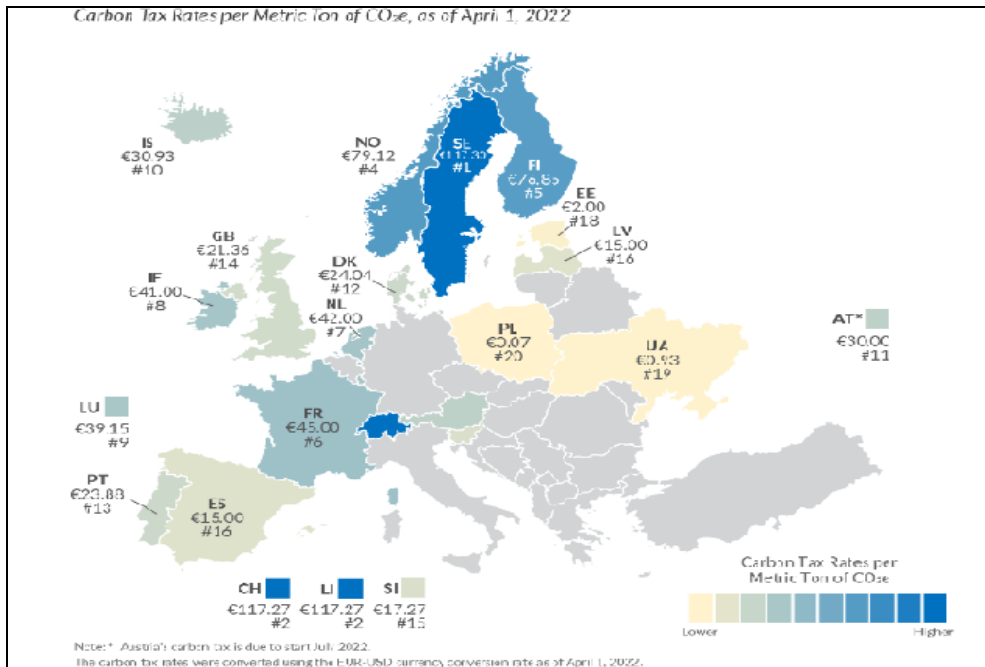
Carbon accounting is related to sustainability accounting and integrated reporting in the circular economy. The global nature of GHG emissions requires new financial reporting and accountability for public and private entities. Also, carbon accounting could help managers from public and private sector to adopt better decisions for production, distribution, procurement and supply chain management. In order to implement carbon accounting, public and private entities must gather comprehensive data on their emissions. As most major management decisions, a good information system is also crucial to design and measure GHG emissions (Schaltegger,S. and Csutora, M.,2012). Given that accounting conventionally provides the financial reporting, carbon management accounting can increasingly become a crucial tool for combatting climate change (Schaltegger,S. and Csutora, M.,2012).

A carbon tax may supply driving forces for economies (Lăzăroiu et al., 2020) to diminish their carbon emissions in a financially rewarding way. In the last decades, several countries have taken measures to reduce carbon emissions, including instituting environmental regulations, and carbon taxes (Ionescu L., 2020). Thus, Finland was the world's first country to introduce a carbon tax in 1990, followed by other countries with the same policy⁸. As a result of this strategy, all EU member states of the European Union became part of the EU Emissions Trading System (EU ETS), a market created to trade a capped number of greenhouse gas emission allowances⁹.

⁸ <https://taxfoundation.org/data/all/eu/carbon-taxes-in-europe-2022/>

⁹ <https://taxfoundation.org/data/all/eu/carbon-taxes-in-europe-2022/>

Figure 5. Carbon Taxes in Europe year 2022



Source: <https://carbonpricingdashboard.worldbank.org/>

Carbon tax and carbon accounting became important for professional organisations, such as IFAC (International Federation of Accountants). Thus, IFAC adopted the GHG Protocol Corporate Accounting and Reporting Standard in order to provide requirements and guidance for companies preparing a corporate-level GHG emissions inventory. As a result of this accounting protocol, new regulations were adopted for¹⁰:

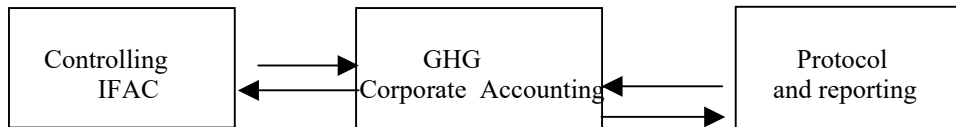
- GHG Accounting and Reporting Principles;
- Accounting for GHG Reduction;
- Reporting GHG Emissions;
- Verification of GHG Emissions;
- Setting GHG Targets;

¹⁰<https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>
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- Accounting for Indirect Emissions from Electricity;
- Accounting for Sequestered Atmospheric Carbon.

In this way, carbon accounting is implementing calculation tools and choosing activity data and emission factors. The carbon accounting system is auditable and the internal reporting system provides guidance on internal documentation to support emissions calculations for any company.

Figure 6. Relation between Corporate Accounting, controlling and reporting



Implementing carbon accounting can have substantial consequences for a company, such as: minimize risk, effective internal control, build brand equity, and reduce inefficiency.

Conclusion

Carbon tax is an important instrument for curbing GHG, with significant impact over prices of goods and services all over the world. Thus, greenhouse gas accounting is useful to measure impact of the carbon tax on business and profitability. Carbon accounting became important in the last few decades, because public and private entities must measure their GHG emissions in order to reduce operational costs, to develop a quality management plan and to improve operational efficiency. In order to achieve that, companies must perform generic quality checks, investigate activity data, review final inventory estimates and management reports for GHG emissions.

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SUSTAINABILITY ACCOUNTING AND INTEGRATED REPORTING IN THE CIRCULAR ECONOMY

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Abstract: Circular economy is a priority for the European Commission and European Parliament. Recently, the European Commission adopted the new circular economy action plan, in order to reduce pressure to natural resources and to provide the necessary conditions for the sustainable economy.

Sustainability accounting has attracted the attention of professional accountants, private organizations, public institutions and governments all over the world, in order to implement new methods to the circular economy and to measure the circular economy disclosure.

Sustainability accounting and integrating reporting in the circular economy are catalysts for circular business models, very useful to redefine values, measuring the impact and risks in waste management and recycling. Thus, the circular economy is a good opportunity to make European economy more competitive and innovative, associated with financing and accounting for circular business. Contributing to the global economy, sustainability accounting provides opportunities for investors to transform their businesses and increase business profitability.

Keywords: *sustainability reporting; economy; accounting; sustainability risk*

JEL classification: C88, E02, M41, I25

Introduction

Sustainability accounting and integrated reporting are catalysts for businesses to driving sustainable development in the circular economy. Sustainability accounting, integrated financial reporting and accountability are fundamental in low-carbon society and circular economy. This paper is analysing social accounting, sustainable development and sustainability management. Social accounting or sustainability accounting is important to develop internal communication and reporting systems to be both developed and use to provide an effective flow of information between all organization's departments and managers.

Sustainability risks could lead to a significant impact on business, in a world influenced by the effects of climate. Therefore, sustainability risk management became a priority for governments all over the world. According to the World Bank, a better risk management can unlock opportunities and prevent crises².

1. Sustainability Accounting and Sustainable Development

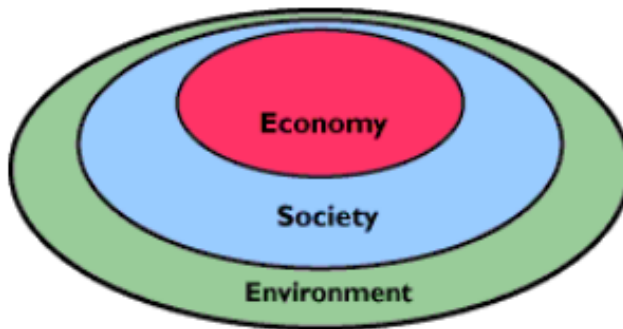
Social accounting or environmental accounting became important for public and private entities to be sustainable and responsible to the society. Social accounting also known as sustainability accounting was discovered recently, as part of financial accounting that explain the disclosure of non-financial information about a firm's performance to external stakeholders, such as capital holders, creditors, and other authorities³.

Sustainability accounting became very well known in the last couple of decades, due to the three key dimensions of sustainability and the scheme of sustainable development (Adams, W. M., 2006).

² <https://www.worldbank.org/en/news/press-release/2013/10/06/better-risk-management-unlock-opportunities-prevent-crises-protect-poor-amidst-disasters-shocks>

³ https://en.wikipedia.org/wiki/Sustainability_accounting

Figure 1: The dimensions of sustainable development



Source: Adams, W. M, The future of sustainability : re-thinking environment and development in the twenty-first century, <https://portals.iucn.org/library/node/12635>

In figure 1, we could observed the three dimensions of sustainability, on three different level, such as: environment, society and economy. The professional organisations consider sustainability a triple bottom line because managers, shareholders and stakeholders expect organisations to meet standards of social, environmental and economic performance⁴, in order to ensure performance transparency and accountability. In our opinion, transparency and accountability are critical for the efficient functioning of a modern and circular economy. In the table 1 we present the three dimensions of sustainability and some actions to consider in the near future:

⁴ www.sustainabilityexchange.ac.uk/files/how_sustainability_has_expanded_the_cfos_role.pdf

Table 1: The triple dimension of sustainability

Environmental	Economic	Social
<ul style="list-style-type: none"> • Energy—fuel, oil, alternative • Water • Greenhouse gases • Emissions • Waste reduction: medical; hazardous; non-hazardous; construction • Recycling • Reprocessing/re-use • Green cleaning • Agriculture/organic foods • Packaging • Product content • Biodiversity 	<ul style="list-style-type: none"> •Accountability/transparency • Corporate governance • Stakeholder value • Economic performance 	<ul style="list-style-type: none"> Public policy and advocacy • Community investments • Working conditions • Health/nutrition • Diversity • Human rights • Socially responsible investing • Anticorruption and bribery • Safety

Source: EY, 2011, Climate change and sustainability How sustainability has expanded the CFO’s role www.sustainabilityexchange.ac.uk/files/how_sustainability_has_expanded_the_cfos_role.pdf

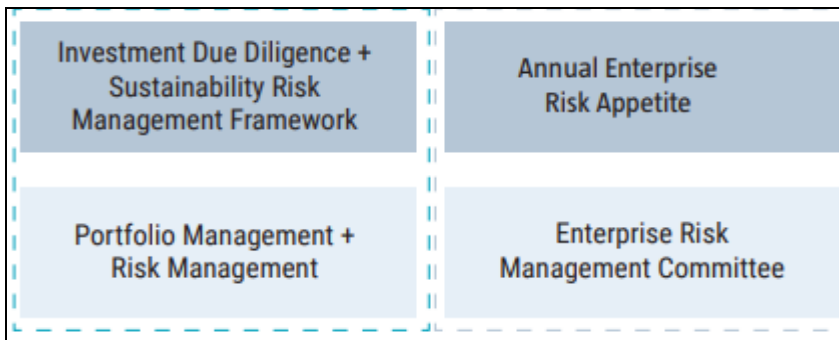
In the last decades, sustainability issues and financial performance have begun to intertwine. Our research focuses on the role of sustainability accounting, and the relation to management, measurement and reporting of the companies’ sustainability activities. Sustainability accounting reflects the management of a corporation’s environmental and social impacts arising from production of goods and services. Also, reporting on sustainability performance could potentially provide numerous benefits for a company, such as increased access to capital or increased credibility (Opferkuch, K. et al. 2021). Thus, sustainability reporting helps organisations to become more sustainable and contribute to a sustainable global economy, and support management in order to improve corporate sustainability and responsibility.

2. Sustainability Risk Management

A strong challenge in implementing the sustainability accounting system is managing the financial risks. Sustainability risks can be climate-related, or related to other environmental, social and governance practices⁵. Thus, many companies integrated climate-related and environmental risks into the risk management strategy.

We identified in our research the following types of sustainability risks: climate risks, geopolitical risks and political instability, social responsibility risks, technological risks, etc. We present in figure no. 2 sustainability risks identification and prioritization on company level:

Figure 2: Sustainability Risks Identification and Prioritization



Source: www.robeco.com/files/docm/docu-robeco-sustainability-risk-policy.pdf

Sustainability risk relates to the potential financial impact on the investments, while principal adverse impact reflects the negative effect investments may have on society (societal impact)⁶. Additional trends in sustainability risk include risks to financial performance from volatile energy prices, compliance risks triggered by new carbon regulations and risks from product substitution as customers switch to

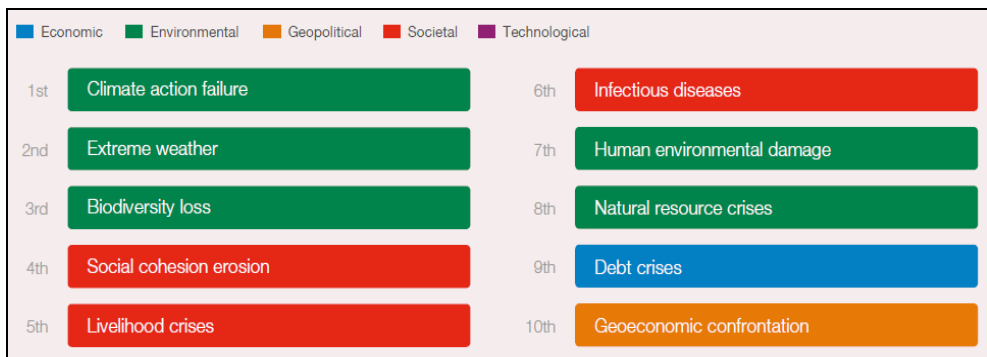
⁵ www.robeco.com/files/docm/docu-robeco-sustainability-risk-policy.pdf

⁶ www.robeco.com/files/docm/docu-robeco-sustainability-risk-policy.pdf

more sustainable alternatives⁷. Also, sustainability risk is related to technology adoption (Andronie M. *et al.*, 2021) and may be associated with high stress level or antisocial behavior.

According to Global Risks Report 2023, *intangible risks*—such as disinformation, fraud and lack of digital safety will also impact public trust in digital systems. We noticed that *rapid digitalization risks* exposing economies to new and more intense cyber vulnerabilities, as new technologies and an ever-expanding attack surface enable a more dangerous and diverse range of cybercrimes⁸. Again, in our opinion, those risks will develop in the next 5 to 10 years in an internationally disruptive period.

Figure 3: The Most Severe Risks on a Global Scale



Source: World Economic Forum Global Risks Perception Survey 2021-2022 www.weforum.org/reports/global-risks-report-2022

Based on these results, managing the risks of sustainability became difficult due to the erosion of social cohesion because Inequality—economic, political, technological and intergenerational—was already challenging societies even before the health crisis generated by the COVID-19 pandemic. In the near future, enhanced risk identification and foresight can be vital for strategic decision-making and managing the risks of sustainability.

⁷ Wilbury Stratton International Executive Search, Sustainability risks and opportunities report, <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/risk/Board%20of%20Directors/in-gc-sustainability-risks-and-opportunities-report-noexp.pdf>

⁸ www3.weforum.org/docs/WEF_Global_Risks_Report_2023.pdf, p.21

3. Future Perspectives of Sustainability Accounting

To implement sustainability accounting through accounting standards has become important for companies and professional organisations, as well. In the last few years, significant progress has been made toward establishing global sustainability reporting standards. Thus, international professional organisations made efforts to develop robust, globally consistent sustainability reporting standards. Recently new regulations were adopted to improve transparency and accountability, and to encourage companies to adopt more sustainable practices. The environmental, social and corporate governance (ESG) regulations can help companies to better measure and manage their exposures to ESG-related risks and to prevent the consequences.

Nowadays, most of the businesses are preparing for future sustainability disclosures and committing to transparency and accountability in order to improve their businesses and managing the risks of sustainability. Recently, political and policy influencers interact closely with business influencers in a two-way fashion, whereas societal actors have engaged with political/policy and business influencers in a one-way stream⁹. In this way, every company must not only deliver financial performance, but also show how it makes a positive contribution to society¹⁰.

Finally, more environmental, social and corporate governance (ESG) regulations will be developed in the near future and many countries will implement obligatory rules into national legislation. As a consequence, the general set of rules of sustainability accounting will likely become mandatory worldwide.

Conclusion

In our research we identified that sustainability risks are often more challenging to quantify than traditional risks. The transformation of society and globalization can lead to unequal economic development. Combined with the economic and financial risks, there are other global risks, such as evolution of data and cyber insecurity, rapidly accelerating risk clusters. However, climate and environmental risks are the most important factors to dominate the next decade. Thus,

⁹ https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/sustainability/ey-the-future-of-sustainability-reporting-standards-june-2021.pdf

¹⁰ Larry Fink- Chairman and Chief Executive Officer, BlackRock 2018 Letter to CEOs

sustainability risks are growing and sustainability risk management became important for all executives, investors, lenders and regulators all over the world.

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ECONOMIC REFLECTIONS ON THE RISK AND MATERIALITY LEVELS IN INTERNAL AUDIT

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Abstract: *The risk assessment is an important phase in carrying out the internal audit mission, it is necessary to involve experienced internal auditors, who know well the audited entity and the methodology around risk assessment.*

In an ever-evolving economic landscape, the role of internal audit is also paramount in ensuring organizational resilience and sustainability. This article, titled "Economic Reflections on the Risk and Materiality Levels in Internal Audit," explores the intricate relationship between economic dynamics and critical components of internal audit practices. Delving into the core concepts of risk and materiality, the article examines how economic conditions shape the risk profile of organizations and influence the assessment of materiality thresholds. Furthermore, it addresses the impact of technological advancements on internal audit methodologies, emphasizing the need for alignment with broader business objectives. By providing a comprehensive overview of the economic dimensions within internal audit, this article serves as a valuable guide for professionals navigating the complex terrain of risk management and materiality assessment in contemporary business environments.

Keywords: *knowledge, audit, net result, audit risk, internal and external factors*

1.Introduction

In the dynamic landscape of today's business environment, organizations face a multitude of challenges that can impact their financial health, operational efficiency, and overall sustainability. In navigating this complex terrain, internal audit functions play a pivotal role in ensuring that risks are identified, assessed, and mitigated effectively. This article delves into the economic reflections surrounding the critical aspects of risk and materiality levels within the realm of internal audit (Carrera, N., Trombetta, M., & Wilford, A., 2023).

Understanding the Economic Context: To comprehend the significance of risk and materiality in internal audit, it is essential to first contextualize these concepts within the broader economic landscape. Economic conditions, both global and local, exert a profound influence on the risk profile of organizations. Factors such as inflation rates, interest rates, and geopolitical developments can significantly impact business operations, necessitating a keen understanding of the economic backdrop (Al-Tae, S. H. H., & Flayyih, H. H., 2023).

Risk Management in Internal Audit: The identification and management of risks form the core of internal audit activities. This section explores the various types of risks that organizations encounter, ranging from financial and operational to strategic and compliance risks. An analysis of economic indicators and their correlation with specific risk categories provides insights into the proactive measures that internal auditors can adopt to safeguard organizational interests (Asgari Alouj, H., & Nia, N. M., 2023).

Materiality in Internal Audit: Materiality, a concept deeply rooted in accounting and auditing, holds immense relevance for internal audit practitioners. Examining economic reflections on materiality involves exploring the thresholds beyond which financial misstatements or operational discrepancies become significant. The article investigates how economic conditions influence materiality assessments, guiding internal auditors in determining the magnitude of errors or irregularities that warrant attention (Kochinev, Y. Y., Antysheva, E. R., & Isroilov, B., 2022, April).

Impact of Technological Advancements: In the era of rapid technological advancements, the economic landscape is continually reshaped by innovations such as artificial intelligence, blockchain, and data analytics. This section explores how these technological disruptions affect risk profiles and materiality considerations

for organizations. Internal auditors must adapt their methodologies to account for the evolving economic dimensions introduced by technological progress (Abirami, M., Abbas, S. S. J., Jamal, N., Magar, A., & Swathi, T. V. S. S., 2023).

Aligning Internal Audit with Business Objectives: Recognizing that internal audit is not merely a compliance function but a strategic partner in organizational success, this part of the article underscores the importance of aligning internal audit activities with broader business objectives. By integrating economic insights into the audit process, organizations can position internal audit as a value-adding function that contributes to the achievement of overall economic goals (Selg, M., & Shachmurove, Y., 2023).

In conclusion, the economic reflections on risk and materiality levels in internal audit underscore the dynamic nature of the business environment. By understanding and adapting to economic shifts, internal auditors can enhance their ability to safeguard organizational assets, promote financial integrity, and contribute to sustained economic success (Engelbrecht, L., Yasseen, Y., & Omarjee, I., 2018). This article serves as a comprehensive guide for internal audit professionals seeking to navigate the intricate interplay between economics, risk, and materiality in their crucial roles within organizations.

2. Materials and methods

Risk assessment for the internal audit program is a stage of major importance in the conduct of internal audit missions. That is why, for the correct and efficient implementation of this stage, experienced internal auditors must be involved, who know the audited entity and the risk assessment methodology well.

Reviewing the audit plan is the responsibility of the director, who must ensure that it contains sufficient activities aimed at achieving the audit objectives. Therefore, he must verify that the plan is consistent with applicable policies and standards, including that the professional judgment used by the auditors is justified in the working papers (Cederholm, C., & Åkerlund, L., 2023). For example, the director will analyse the way of establishing the level of materiality, as well as the manner in which the risk assessment was carried out. He also checks that the planned analytical procedures are the most appropriate.

If he is satisfied with the content of the plan presented by the audit team, he approves it. Otherwise, he will discuss with the auditors to make the necessary adjustments.

If there are changes to the general audit plan and the audit program, then the first change appears in the general audit plan and the audit program, which must be revised whenever necessary during the course of the audit. Planning is continuous during the engagement due to changing conditions or unexpected results of audit procedures. The reasons for significant changes must also be recorded (Farhan, K. A., & Kawther, B. I., 2023).

What we can conclude about the planning of the audit mission is the fact that the internal audit function has become a managerial assistance function through which internal auditors help managers, at any level, to master well the other functions and all accounting activities (Shekhany, S. A., & Farhan, K. A., 2023).

Internal audit, as defined by the International Institute of Internal Auditors, is an independent and objective function, which gives an entity assurance over the level of control held within their operations and enables management to improve the company's activities. Internal audit helps the entity to achieve its goals by evaluating, through a systematic and methodical approach, its risk management, control and governance processes and making proposals to enhance their effectiveness (Shuwaili, A. M. J., Hesarzadeh, R., & Bagherpour Velashani, M. A., 2023).

The control environment, which is largely determined by management's policies and the operating style of the entity, is fundamental to the way the controls are carried out within an organisation (Masharipov, O., Khamidova, Z., Tursunkulova, G., & Azizov, O., 2023).

In order to obtain a full understanding of the control environment, the auditor should focus more on the high-level policies and practices of the audited entity and less on the detailed controls within individual operations. The auditor must take into account the following elements, when he intends to obtain an understanding the control environment (Rubino, M., Vitolla, F., & Garzoni, A., 2017):

- The ethical values and integrity of management;
- The objectives set up by the management and risks implications involved in achieving these objectives;
- The operating style of management (e.g.: through codes of conduct and manuals of procedures) and the organizational structure;
- How responsibilities are established by management (e.g.: through the organizational structure and through the separation of tasks);
- The policies for maintaining the competent personnel, respectively the recruitment policies and improvement of the professional training;

- Management oversight of the control procedures and the way the accounting system operates, including review of operations and budget monitoring (including internal audit);

- The way in which management of the entity ensures compliance with the laws and regulations.

When preparing the audit program, the auditor will consider the specific assessments of the inherent and control risks, as well as the level of certification required to be provided by the detailed audit tests (Lois, P., Drogalas, G., Nerantzidis, M., Georgiou, I., & Gkampeta, E., 2021).

Furthermore, the auditor should consider the duration of the controls tested and the detailed procedures, the assistance expected from the entity side, the assistants 'availability and involvement of other auditors or experts (Suzuki, K., & Takada, T., 2023).

Professional scepticism is of great importance when assessing the control risk. The auditor must apply it when verifying how the internal controls, implemented by the management of the entity, have acted in the direction of reducing the specific inherent risks (Rahimi, R., Ghanbari, M., Jamshidnavid, B., & Jamshidpor, R., 2023).

If the auditor is not satisfied with the controls established by management to mitigate these risks, he may decide that the control risk is higher than he initially assessed. In this case, the auditor initially recognises that there is an inherent risk of fraud when collecting proceeds from entertainment or the delivery of goods and services for example (Toumeh, A. A., Yahya, S., & Amran, A., 2023).

The auditor will evaluate whether the entity's accounting policies are appropriate for its activity and in accordance with the applicable accounting financial reporting framework and the accounting policies used in the relevant sector of activity (Shirobokov, V. G., Logvinova, T. I., Pavlyuchenko, T. N., Feskova, M. V., & Fedulova, L. I., 2022).

Basically, the audited entity proceeded to the direct substantive testing through the audit procedure, namely "inspection" which represents the physical examination of the tangible assets. This type of audit sample is most often associated with the inventory audit, as physical examination provides useful and reliable audit evidence (Akinduko, A. O., 2023).

Identifying the inherent risks associated with the entity's activities is achieved by managing change: people change, methods change, organizations and policies change and as such, risks change.

Risk assessment means identifying and analysing the relevant risks in meeting the objectives, in order to know how they should be managed.

Risk assessment is part of the operational process and must identify and evaluate "internal and external factors" that could affect the organization's objectives.

External factors include changes of the economic conditions, change in the regulatory framework, political factors or changes in technology. (Lois, P., Drogalas, G., Nerantzidis, M., Georgiou, I., & Gkampeta, E.. 2021).

The identification of the risks associated with the entity's activities must take into account the forms of internal control, respectively the existence and the functionality of the relevant procedures. Each activity should have a procedure developed that will contain internal controls, therefore if this is missing, the activity presents potentially greater risks than those for which procedures are developed.

This is based on the fact that the execution personnel, not having a consistent procedure, will have difficulties in understanding the activity and implicitly implementing it in practice.

The auditor should establish a global materiality to ensure proper planning and guidance of the audit missions (Barrett AO, P., 2022).

During the audit mission, the materiality used prevents performing certain testes over areas that do not have a significant impact on the audit opinion.

At the conclusion of the mission, a possible exceedance of the materiality will cause the auditor to propose correction of the errors identified or to mention them in the audit report.

In order to determine the materiality level for an entity the auditors can use as a basis equity, net income or turnover. These elements are known as the baseline, against which materiality is determined in absolute or relative values (Quick, R., Zaman, M., & Mandalawattha, G., 2023, January).

The auditor's findings could have an impact:

- on the results of the exercise;
- on the disclosures of the balance sheet and income statement (Velte, P. , 2023).

The net result of the exercise is used as a reference. If its size is not important, this could be changed to another reference base, such as the operating result or the company's self-financing capacity.

Increased attention is also given to the exceptional items that will be grouped together so they would only refer to the current financial year.

Last but not least, the auditor must review the previous results to avoid using an abnormal net result as a basis for materiality (Goh, B. W., Lee, J., Li, D., Li, N., & Wang, M., 2023).

The findings result from an inaccurate classification of accounts or an unjustified net-off between debtor and creditor balances. If two bank accounts, one in a credit position and the another in a debit position, are compensated, the importance of the compensation is determined by comparing it with the total of the respective positions (Xie, L., Xu, T., Ju, T., & Xia, B., 2023).

The elements specific to materiality are as follows:

- 1) The needs of the users of the annual accounts;
- 2) The characteristics of the company;
- 3) The characteristics of the elements considered significant.

The annual accounts of an entity are providing information to different categories of users: shareholders, associates, staff, creditors, tax authorities, unions, clients, statisticians, economists, financial analysts, etc. Therefore, the auditor will set up materiality considering the needs of different users (DeZoort, F. T., Holt, T. P., & Stanley, J. D., 2023).

Risk assessment is an important phase in carrying out the internal audit missions. As such, in order to complete this phase correctly and effective, it is necessary to involve experienced internal auditors, who know well the audited entity and the methodology around risk assessment.

If the auditor is aware of errors identified in previous years audits, he will consider these when setting up materiality levels. If previous experience indicates the possibility of material errors, then a different audit approach might be required.

The auditors calculate a numerically expressed size, known as "precision" which is also used in calculating the size of each selected sample. This is determined by applying a percentage between 80% and 90% on the difference between the materiality level and the estimated value of the error (Cole, P. S., Gow, A. D., Byrnes, C. T., & Patil, S. P., 2023).

If the auditor has suspicions or discovers errors or irregularities, he needs to quantify the extent of the error or irregularity identified.

The auditors do not set the precision level as the difference between materiality and the estimated error as it would lead to an insufficient sample size. This is because the auditor may have underestimated the error, and the formula is only valid when there are no errors in the sample.

Any error found leads to an increase in the sample size required to achieve the planned procedures (Balan, I., & Moldovan, M., 2023).

The revision of the audit plan is the responsibility of the partner, who must ensure that it contains sufficient activities designed to achieve the audit objectives. Therefore, he must verify that the plan is in accordance with applicable policies and standards, including whether the professional scepticism used by the auditors is justified in the working papers. For example, the partner will analyse how the level of materiality was determined and also how the risk assessment was carried out. He will also check whether the planned analytical procedures are the most appropriate. If he is satisfied with the content of the plan presented by the audit team, he will then approve it. Otherwise, he will discuss with the auditors to make the necessary adjustments (Burke, J. J., Hoitash, R., & Hoitash, U., 2019).

If changes to the general audit plan and the audit program happen, then the first change appears in the general audit plan and audit program which is reviewed during the course of the audit. The audit approach is continuously reviewed during the engagement to respond to changing conditions or unexpected results of audit procedures performed. The reasons for significant changes must also be documented (Mökander, J., & Floridi, L., 2023).

We can conclude that the internal audit function has become a managerial assistance function whereby internal auditors help managers, at any level, to master the other functions within an entity and all accounting activities (Ashfaq, K., Rehman, S. U., Haq, M. U., & Usman, M., 2023).

The general objective of a financial audit is to provide assurance that the financial statements examined presents a fair view of the economic operations of the entity and are prepared in accordance with the relevant laws and regulations (Yusran, I. N., 2023).

Providing an absolute assurance over the financial statements, even if it is possible to achieve, requires a costly activity. However, to reduce these costs, there is the possibility of performing audits based on tests. In this context, the auditors, through their reports, seek to provide a reasonable assurance - not an absolute assurance - that the financial statements examined are complete and prepared in accordance with the relevant laws and regulations.

3.Results and discussion

The auditors are not responsible for the prevention and detection of corruption, fraud and errors, even though the annual audits can prevent mistakes and possible negligence. The responsibility for the prevention and detection of corruption, fraud and errors, as well as for taking appropriate measures, rests with the management of the audited public entities.

However, even under these conditions, the auditors must be alert when they find weaknesses in the internal control environment, inconsistencies or errors in the financial accounting records, unusual results or conditions, which indicates the existence of fraud, lack of probity or corruption.

4. Conclusions

The examination of economic reflections on the risk and materiality levels in internal audit reveals the critical interplay between economic conditions and the effectiveness of audit practices. The economic landscape, marked by volatility and technological advancements, necessitates a dynamic approach to risk management and materiality assessment.

Internal auditors must acknowledge the ever-changing nature of risks influenced by global and local economic factors. By understanding these economic reflections, auditors can enhance their ability to identify, assess, and mitigate risks that pose threats to organizational stability and success.

Moreover, the integration of technological considerations into audit methodologies is imperative. The transformative impact of technologies such as artificial intelligence and blockchain requires internal auditors to adapt their strategies to effectively address emerging risks and opportunities.

The article underscores that internal audit is not solely a compliance function but a strategic partner in achieving organizational objectives. Aligning audit practices with broader business goals ensures that the insights gained from economic reflections contribute meaningfully to the overall success of the organization.

Ultimately, the economic reflections presented in this article serve as a guide for internal audit professionals, empowering them to navigate the complex nexus of economics, risk, and materiality.

By embracing a forward-thinking approach and leveraging economic insights, internal auditors can fulfill their crucial role in safeguarding organizational assets and promoting sustained economic resilience. This article provides a foundation for continuous adaptation, encouraging internal audit practitioners to stay abreast of economic trends and technological advancements for a proactive and effective risk management approach.

The auditor should review and evaluate the conclusions drawn from the audit evidence obtained as a basis for expressing an opinion on the financial statements. This review and evaluation involve taking into account the fact that the financial statements have been prepared in accordance with an accepted general financial

reporting framework, which could be the International Accounting Standards, or relevant national standards and practices.

In practice it was found that the implementation and improvement of the effectiveness of the relevant departments' records are not consistent. Thus, a permanent control over the link of the accounting records of the receipts was ensured in the context of the existence of a clear situation of the locations where the activity is supported.

In conclusion, the auditor appreciated that, based on the verifications made, the communication carried out with management and the information contained in the self-evaluation report are slightly erroneous, due to the lack of clear records of the activities supported.

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OPPORTUNITIES FOR IMPROVING FINANCIAL CONTROL IN COMBATING AND LIMITING TAX EVASION IN THE CONTEXT OF ROMANIA'S MEMBERSHIP IN THE EU

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Abstract: The integration of Romania into the European Union has transformed the domestic fight against tax fraud into a matter of community interest. Following integration, tax fraud no longer affects only the national public budget but also the communal one. European interest in preventing and combating fraudulent practices and tax evasion stems not only from budgetary losses but also from the distortions they can cause in the circulation of capital and competitive conditions, thus affecting the functioning of the common market. Close collaboration between financial administrations within the community, in accordance with common principles and norms, is essential for the efficient prevention and combating of tax fraud and evasion, given that national measures alone are insufficient. The importance of effective money management, rigorous control of tax evasion, and respect for employees' rights are emphasized to achieve a balance between social classes and sustainable economic development. In this context, continuous measures are necessary to optimize the Romanian tax system in line with European Union requirements.

Keywords: *tax evasion; financial control; financial interests; profesional organisations*

JEL Classification: H26, F36, H84

1.Introduction

Romania's integration into the European Union translates into an internal struggle against the tax authorities in a community interest and because, after integration, the tax authorities will not affect the national public budget but also the community budget, given that the system of own resources necessary to finance the budget of the European Union, introduced in 1970, includes a number of financial sources, and names: agricultural levies, customs samples, resources derived from VAT applications and own resources taken from the gross national product. The interest at European level in preventing and combating tax problems and tax avoidance does not arise only from the budget losses they generate, but also from the distortions that these can cause to circulate copies and conditions of competition, thus affecting the functioning of the common market. In order to prevent and combat tax protection and evasion, close cooperation between financial administrations within the community is required, in accordance with common principles and rules, national measures are not sufficient because the effect does not go beyond national borders; All these considerations conclude that a law common to all areas covered by Community policies will be concluded. The protection of the financial interests of the EU and the fight against the brotherhood and other legitimate activities in the interests of the financial interests of the Communities are the main objectives of the tax policy of the European Union, for which a specific structure of the European Commission – the European Commission Office (O.L.A.F.) has been established.

This structure shall exercise all the powers of the Commission to conduct administrative investigations with the aim of intensifying the fight against friction, corruption and other activities illegible to affect in an unreasonable manner the financial interests of the Community, but also against any act contrary to the provisions of the Community. Olaf's activities focus on detecting and monitoring tax margins, appropriating subsidies and tax evasion, affecting the community budget and tax evasion.

2.Possibilities of improving legislation in the field of combating tax protection

Until the Law no. 87/1994 on combating tax evasion and sanctioning some of the violations of tax discipline violations shall be reconsidered, through applications of confrontational men, the only regulation in the profession is

represented by O.G. nr. 17 of 20 August 1993 on the settlement and sanctioning of financial and tax regulations, a situation which was not able to ensure a proper remedy for violations of law in this field.

Law no. 87/1994, in force until August 2015, defines tax evengel as being "suspended by any means of taxation or payment of taxes, taxes, contributions, contributions and other amounts due to the state budget, housing budgets, budget of social insurance and special funds by Romanian or foreign individuals and legal persons".

It should be noted that, even in its republic form, this law does not distinguish between tax and tax evasion, confusing these two notions with implied understanding of the uses that generate the two forms of tax avoidance and measures to be taken to combat it, because retaliation measures involve a certain specific risk and those related to evasion, being of high quality, it soon involves legal improvements. In the text of the law, the notion of tax evasion is used in the sense of tax evasion, the form of tax evasion which consists in circumvention of tax laws and which is sanctioned by law. The headings stipulated by Law No. 87 were divided according to their weight into two categories: twinning and controversies.

Starting with October 2015, a new law to prevent and combat tax evasion entered into force. It should be noted that the new law establishes specific liability for taxpayers, the other taxes, tax contracts are not subject to the new regulations, these being regulated and sanctioned by the Tax Code and the Tax Procedure Code.

From the explanation of the structure of offences provided by Law 227/2015 it follows that part of them are regulated for the first time, while the other were taken over from Law no. 87/1994 and reformulated. In accordance with the old legislation in the field, the legislator instituted, through the new regulation, severe measures for sanctioning tax evasion phases.

3. Offences also provided by Law no. 87/1994, reformulated in Law no. 227/2015

- ✓ unjustified refusal of a person present to competent bodies, after being summoned three times, of binding documents and goods made of patrimony, in order to prevent financial checks, tax authorities or border taxes;
- ✓ putting into circulation, without right, stamps, shapes or standard forms, with special regime, as well as copying and introduction into the economic circuit with science, falsify;
- ✓ the disposal of goods, or the source that can be imposed;
- ✓ omission, in all parts, records, accounts or other binding documents, transactions carried out and income restored;

- ✓ highlighting, in accounting documents or other same documents, expenses that do not comply with reality or highlighting other fictitious operations;
- ✓ Destruction, destruction of accounts, memories, electronic records or documents, or other means of storing documents;
- ✓ management of accounting records, using documents or other means on electronic support;
- ✓ Suppression of financial checks, tax authorities or border taxes by fictitious non-disclosure or inexplicable disclosure of the main premises or second offices of verified contributors.

Taking into account the immediate interest in covering the damages caused to the consolidated general budget, the norm establishes some exemptions from liability penal, in the sense of non-punishment of crimes committed or reduction of sentences, under certain conditions, if during the prosecution, or trial, until the first term, the accused or the defendant, against the tax evasion offenses, It covers the entire damage caused.

Law nr. 227/2015 a was improved by H.G. nr. 873/28 July 2015, on the probation of certain specific measures for the prevention and control of tax evasion phases in the field of ethyl alcohol of agricultural origin, spirits, tobacco products and mineral oils, published in Official Journal nr. 739/15 October 2015. Thus, in order to prevent and combat tax evasion phases in the areas concerned, the norm provides for the establishment of a central coordination commission and control teams at territorial level, selling that the tasks of verifying the module in which the same law is observed.

The new law on preventing and combating tax evasion also presents a series of shortcomings, including:

- Even the title of the law creates confusion regarding the actions pursued and sanctioned by the legislator, thus, although the title of the law includes the concept of "tax evasion", it is about tax evasion fraudulent, which is sanctioned and criminalized by law;
- The other law consists in not defining the concept of evengel (fraudulent), by which it was possible to establish unequivocally the competence of the competences of the specification of the locutory public authorities, in terms of preventing and combating the evasion of illicit tax authorities;
- omission of the provision that infringements of certain offenses such as, suspension of payment of tax obligations by taxpayers, by assignment of non-withholding and non-payment of corporate parties, according to the law, to legal

terms, taxes, taxes and contributions that are reestablished by stop at source, by virtue of infringements by Law no. 87/1994 of the Republic of Moldova.

However, these legislative acts are not able to diminish the importance and role of the new norm as well as the other measures with legal legislation and the negative effects it generates.

The most important spectrum, however, is that the law should be applied correctly and unitedly for all contributors.

4. Obstacles and difficulties in implementing fiscal control, detecting, and combating tax evasion

The objectives of improving the possibilities for improving financial control can only be achieved after a hierarches and initial detection; Referring in principle to:

Tax laws

1. Maintaining a busy, confusing, interpretable law, which generates difficulties in implementation and tensions between control bodies and contributors;
2. Tax legislation, frequent changes and late publication in the Gazette of the Republic of Regulations;
3. Maintaining a permissive and tolerant tax law;
4. Inclusion in the norms of application of provisions that exceed those provided for in laws, ordinances, emergency ordinances, which lead to loss in the institution of lawsuits regarding tax obligations established by tax control documents;
5. Late publication of norms of application of laws, emergency ordinances;
6. Establishing by law the obligation to carry out tax control in situations in other Western countries, taxpayers' requests are solved not by tax control, but on tax receipts and tax records received by other taxpayers (TVA refund, tax agreements, etc.);
7. Lack of protection by law of tax control of events and research organizations, as well as non-existence of professional risk insurance;
8. Receiving with increasing delay, and in some cases reduced in number, not receiving answers from the departments of specialists in the ministry for compliance and compliance with the provisions of some cases encountered in tax control activities;
9. Lack of coordination and correlation in some cases, solutions given in the application of tax legislation by the Directorates of Specification and General Legal Directorate, allegation by these conflicting points of view, sometimes completely opposite, which creates difficulties in tax control activities;

10. Not delimited by legislation the contributions of each link in the tax administration, maintaining certain burdens generating confusion and perplexity for taxpayers.

5. Ensuring the safety of the mestiteria is necessary to carry out the tax control activity

1. Insufficiency, in some cases, of spaces and offices for carrying out the activity of the tax control office;

2. Reduced endowment with documents, programs and applications specific to tax control activity;

3. Allocation of reduced financial resources for procurement of goods necessary for normal performance (writing and multiplication paper, consumable goods, office supplies, etc.);

4. Currently equipping tax control directorates with a single means of transport;

5. The cumbersome access of tax control organizations to the provisions of tax legislation, in particulars of information applications on tax laws, in the entirety of publications and specialized journals (Finance Review, Credit and Accounting, Economic Tribuna, The Economist).

6. Organization, conduct and management of tax control activity

1. The absence of a strategy regarding the management of tax control activity under risk conditions;

2. The non-existence within the tax control directorates of a structure for the analysis of tax information, processing and use by the entire tax office for the development of the fiscal code regarding the ways and methods of tax enforcement by taxpayers.

3. There is a lack at the level of the General Directorate of Tax Inspection of a structure for verifying the application of the control methodology and tax legislation by the tax control department in counties and Bucharest.

4. Maintaining tax control structures for global income tax in the tax departments of counties and Bucharest;

5. Insufficient coordination by the management of the general directorates and public finances, the activity of the tax control directorates and the Financial Guard;

6. Insufficient collaboration between tax control directorates and directorates of methodology and administration of state revenues;

7. Lack of collaboration, in some counties, between the management of the general directorate and the management of the control directorate;

7. Resources, stimulation and professional training of tax control

1. Mismatch in the number of posts allocated to tax control activities with tasks;

2. A charge regarding the excessive loading is represented by the Tax Control Directorate in Bucharest, where each inspector has over 500 economic agents, while in the country the average loading level is about 180 economic agents/inspector.

3. The absence of a higher education institution specialized for the training of the person who is to carry out his/her activities in tax administration;

4. Professional training of a part of the tax control system, especially that coming from the tax control structures of the territorial tax administrations;

5. Non-existence of a continuous professional training program correlated with economic needs;

6. Uncorrelation of the level of security in the tax control activity with the social importance of work, the difficulties, risks and neuropsychic pressures that this entails.

7. Maintain the level of the Ministry of Public Finance and many audit grids for specific control structures (tax control, internal control, delegated preventive control), the ones reduced unduly affecting the tax control activity.

Although the fiscal policy efforts imposed by the European standards and regulations have led to a restructuring both in substance and form of the Romanian economy, changes in the tax system should not be understood as a process concluded with integrity in the European Union, but rather that a continuous process that must take into account the European dynamicity, but, internal dynamics and social impact of tax measures. In this respect, it can be affirmed that the process of European integration was only a first stage of the restructuring of the Romanian tax system, but the measures circumscribed to this were necessary, not sufficient in the approach to cargo and optimize the Romanian tax system on a longer time horizon imposed by the requirements of a lasting economic development.

An efficient management of banks, along with rigorous control of tax and tax rights, control over the observance of the rights of tax officials leads to many moneys and fairness at the level of any society, so that balance can be achieved between social buildings and thus a balance at the level of any state.

8. Conclusion

In the exploration of opportunities for improving financial control to combat and limit tax evasion in the context of Romania's membership in the EU, several key conclusions emerge. This article has highlighted critical aspects that can contribute to a more robust and effective financial control framework, fostering transparency, compliance, and integrity in Romania's tax landscape.

Collaboration and Information Sharing. The need for enhanced collaboration and information sharing among tax authorities, regulatory bodies, and other relevant stakeholders is evident. The article underscores that a cohesive and coordinated approach can facilitate the identification and prevention of tax evasion more effectively.

Technological Integration. Embracing advanced technologies and data analytics emerges as a crucial opportunity. The integration of technological solutions can streamline the monitoring of financial transactions, improve data accuracy, and expedite the identification of irregularities, ultimately strengthening the fight against tax evasion.

Capacity Building and Training. The importance of continuous capacity building and training for tax officials is emphasized. Equipping professionals with the skills to navigate evolving tax landscapes, understand emerging evasion tactics, and stay updated on international best practices is paramount for an effective financial control framework.

Legislative Reforms. The article underscores the significance of periodic reviews and reforms in tax legislation. A dynamic and adaptive legal framework is essential to address the ever-evolving nature of tax evasion schemes, ensuring that regulations remain effective and serve as deterrents.

International Cooperation. Recognizing the transnational nature of tax evasion, fostering increased international cooperation is vital. The article suggests that Romania, as an EU member, should actively engage in collaborative efforts with other member states to share intelligence, harmonize practices, and collectively combat cross-border tax evasion.

Public Awareness and Education. Public awareness and education campaigns play a crucial role in cultivating a culture of tax compliance. The article advocates for initiatives that inform and educate the public about the consequences of tax evasion, fostering a sense of responsibility and ethical tax behavior.

Continuous Evaluation and Adaptation. Finally, the conclusion emphasizes the need for a continuous evaluation of the effectiveness of implemented measures.

Regular assessments will enable authorities to identify gaps, adjust strategies, and proactively address emerging challenges, ensuring the sustainability and relevance of financial control mechanisms.

In summation, by seizing the outlined opportunities, Romania can strengthen its financial control framework, foster a culture of compliance, and contribute to the broader EU efforts in combating and limiting tax evasion. The recommendations presented in this article provide a roadmap for policymakers, tax authorities, and stakeholders to collectively work towards a more resilient and proactive approach to financial control in the fight against tax evasion.

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NEW PRODUCT DEVELOPMENT (NPD) IN GLOBALIZED MARKET

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Abstract: In the introduction of the paper has been clarified the meaning and content of the term new product development, then analyzed the relationship between globalization and product development, and how one influences the other. Furthermore, was analyzed the importance of the steps of the product development process, without which a company cannot develop new products successfully and efficiently. Example of Nestlé corporation was described in details. Important key concepts and the process of product development were explained and finally was described the way Nestlé develops its products.

Keywords: *new product development (NPD), process development, Nestlé, managing product development.*

JEL Classification: M31, F64

Introduction

New product development (NPD) refers to the process of creating a new product and bringing it to market. It consists of several stages, including idea

generation, market research, product design and development, testing and launch. The goal of new product development is to create a successful product that meets the needs and wishes of customers while generating revenue for the company.

Nowadays globalization is one of the major trends which affect the business world and also to product development. Globalization refers to the increasing interconnectedness and interdependence of the world's economies, cultures and populations. This phenomenon is the result of advances in technology, transport, communication and trade. On the positive side, globalization has allowed increased trade and investment between countries, leading to economic growth and job creation. It has also enabled better access to goods and services from around the world, resulting in a more diverse and varied consumer experience. Globalization has also facilitated the cross-border spread of ideas, information and culture, fostering greater understanding and cooperation between nations. However, it is also important to see that it had negative consequences. It has contributed to the outsourcing of jobs to countries with lower labor costs, leading to job losses in developed countries. It has also led to increased competition between countries and companies, which can further lead to a "race to the bottom" in terms of labor and environmental standards. In addition, globalization has contributed to increasing income inequalities both within and between countries.

Globalization is the result of the increased international competitions between the enterprises and on the other hand offers many opportunities. This world of business developing new products gives a major challenge for businesses because they have to react well to different changes and they need to create teams globally which are responsible for the new product development. These teams must have talent and great knowledge to succeed in this complex and competitive business world.

For the companies these new product development teams are the key for further success, stabilization or win of new customers and firms can effectively take advantage of a much more diverse range of perspectives, experiences and cultural sensitivities in global NPD activities. Companies' ability to successfully develop and launch new products is influenced by a number of factors. The performance of the NPD teams depends on the team's ability, environment, the leadership style, the communication of external or internal and not least the clarity of objectives. Research shows that NPD teams led by a transformational leader with significant experience are more successful in developing new products. Some conditions are necessary, but these alone are not sufficient to lead to the development of a new product, because like any internal organizational process, it must be managed by people. Consequently, the concepts of strategy, marketing and technology must all

be aligned and managed effectively. Product ideas can come from different sources therefore new product development usually does not belong to a single department. That is why it can be complicated and hard to manage because several departments, divisions can work on it. New products can bring distinct product characteristics and involve different market and technological considerations to deal with and here it comes the human factor to the picture because for new product development to be successful, it needs to involve a wide range of team members within the organization. That is why a group of people is necessary, working as a team, to develop an idea or project proposal into a marketable end product. Usually, large companies are creating new project teams to develop this process and the project is usually run and iterated between marketing, technical and production teams and specialists.

1. “The Valley of Death”

“The Valley of Death” is a metaphor used to describe the separate segment of development between research and product development. The metaphor is used to suggest that on both sides of the valley there are comparatively more available resources: on one side in the form of research expertise and on the other side in the form of commercial expertise and resources.

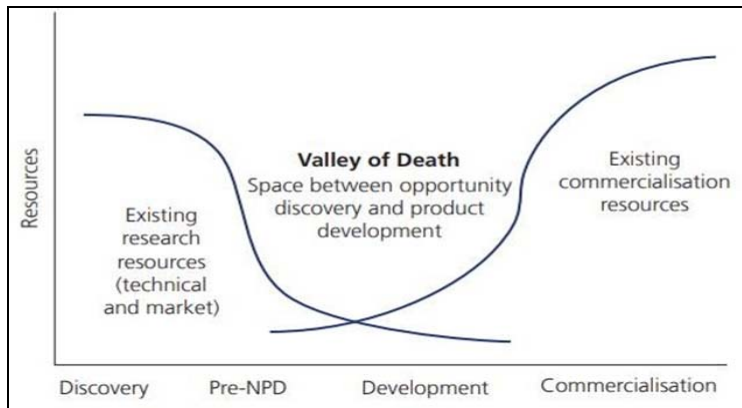
This can be a challenging time for a company, as it may need to invest significant resources in marketing, manufacturing, and distribution before the product is generating any revenue. Additionally, there may be significant uncertainty about whether the product will be successful in the marketplace, which can make investors and financiers hesitant to commit funds. A key challenge in navigating the NPD valley of death is securing sufficient funding to support the commercialization process. This can be particularly difficult for start-ups and small businesses that lack the resources and track record to attract significant investment. To overcome this challenge, companies need to seek alternative sources of finance, such as government grants, venture capital or crowdfunding.

This term is usually demonstrated in a diagram where the y-axis reflects the availability of resources, while the x-axis reflects the level of development. This diagram can be seen below.

It is shown that if an idea makes it through the valley to the new product development, there are sufficient resources available to bring the idea to market. In a related paper, Markham and colleagues [2010] found that they identified a number of interdependent roles that move projects from one side to the other. The study also showed that considerable improvement occurs before projects become

part of a company's formal product development process. [Espinoza-Orias, Cooper, & Lariani, 2018]

Figure 1: “ The valley of death”



Source: Espinoza-Orias, Cooper, & Lariani, 2018

Managing new product development involves a number of key activities to ensure a smooth and successful process. There are some important activities to consider: [Espinoza-Orias, Cooper, & Lariani, 2018]

Idea generation: encourage the generation of new product ideas from a variety of sources, including employees, customers, market research and competitive analysis. Support a culture of innovation and creativity within the organization.

- Idea screening: evaluating and screening product ideas based on pre-defined criteria such as market potential, alignment with corporate strategy, technical feasibility and resource availability. Ranking of ideas with the highest potential for success.
- Concept development and testing: developing detailed product concepts and prototypes based on selected ideas. Conduct consumer research and testing to gather feedback on concept appeal, features and potential improvements.
- Business analysis: thorough analysis of the market potential, profitability and financial feasibility of the product. Assess factors such as target market size, competition, pricing, distribution channels and cost projections. Assess the potential risks and returns associated with the new product.
- Product development: once the concept and business analysis have been approved, start the product development process. This includes planning and

designing the product, conducting technical feasibility studies, prototyping, and refining the product based on testing and feedback.

- Testing and validation: rigorous testing and validation of the product to ensure that it meets quality standards, safety regulations and customer expectations. This may include laboratory testing, consumer testing and compliance with industry standards.
- Marketing and launch planning: developing a comprehensive marketing strategy and launch plan for the new product. Define target market, positioning, branding, pricing, distribution channels and promotional activities. Create compelling marketing materials and prepare for a successful product launch.
- Production and operations: setting up the production facilities, equipment and supply chain necessary for the manufacture and delivery of the new product. Ensure efficient production processes, quality control measures and timely delivery in line with market demand.
- Sales and distribution: developing effective sales channels and distribution networks to reach the target market. Train sales teams, develop sales tools and materials, and create incentives to encourage sales. Monitor sales performance and make necessary adjustments to optimize distribution and availability.
- Monitoring and evaluation: continuous monitoring of the market performance of the new product. Collect feedback from customers, monitor sales and market share and analyse data to identify areas for improvement. Use this information to refine the product, address customer concerns and make informed decisions on future product development efforts.
- Post-launch support and maintenance: ongoing support and maintenance of the new product. Immediate handling of customer enquiries and problems. Collect customer feedback and use it to improve the product or develop future versions. [Espinoza-Orias, Cooper, & Lariani, 2018]
- Overall, managing new product development requires a cross-functional approach, effective communication and collaboration between different departments within the organization. Each activity must be carefully planned, executed and monitored to ensure the successful launch and long-term success of the new product. Introducing a new product to the market could be risky and may be full of uncertainties. However, the companies can avoid or at least reduce this risk factor if they use the systematic New Product Development process which can give the businesses a hand to be

more confident and to see clearly through the development. For this there are seven stages of the new product lifecycle development process which can lead you to build up the new product successfully. [Singh, 2019]

2. Different roles in a product development team

A product development team typically comprises different roles, each contributing to different aspects of the product creation and launch. Here are some common roles you may encounter in a product development team: [Haff, n.d.]

- **Product Manager:** the Product Manager is responsible for the overall product strategy, setting the product roadmap and coordinating the activities of the development team and work closely with stakeholders to gather requirements, prioritize features and ensure that the product meets customer needs.
- **Project Manager:** the Project Manager oversees the implementation and delivery of the product. They prepare project plans, manage the schedule and resources, monitor progress and ensure that the project stays on schedule and within budget.
- **Designers:** Designers, such as UX (user experience) designers and UI (user interface) designers, focus on creating a user-friendly and visually appealing product. They conduct user research, wireframes and prototypes, and work with developers to ensure a seamless user experience.
- **Developers/Engineers:** Developers or engineers are responsible for coding and programming the product. They implement features and functions defined by the product and design teams, ensure the technical soundness of the product, and perform testing and bug fixing. [Haff, n.d.]

Building and managing a product development team requires careful planning and consideration. collecting the following steps to help set up and manage product development team effectively: [Haff, n.d.]

- **Define the team's purpose and goals:** Start by clearly defining the purpose and goals of the product development team. What does the company want to achieve? Outline the main objectives, deliverables and timeline for the team's work. This will provide clear direction and focus for team members. [Haff, n.d.]
- **Identify the skills needed:** identify the skills and expertise needed for the product development process. Consider technical skills, domain knowledge, design expertise, project management skills and communication skills.

Making a list of roles and responsibilities can help to achieve the objectives. [Haff, n.d.]

- Hiring the right team members: look for people with the right skills and experience. Conduct interviews and assessments to ensure the right fit. Look for candidates who are passionate, collaborative and have experience in successfully delivering products or projects. [Haff, n.d.]
- Facilitate effective communication: establish open and transparent communication channels within the team. Encourage regular updates, feedback, and brainstorming. Use collaboration tools and platforms to facilitate communication and project tracking. [Haff, n.d.]
- Promote a culture of cooperation: encourage cooperation and teamwork between team members. Encourage cooperation and collaboration among colleagues and promote teamwork. Encourage knowledge sharing and cross-functional collaboration to take advantage of the diverse skills in the team. [Haff, n.d.]
- Ensure adequate resources: ensure that the team has access to the necessary resources, including tools, software, equipment and budget. Lack of resources can hinder the team's ability to deliver high quality products. [Haff, n.d.]
- Encourage continuous learning and professional development: support your team members' professional development by providing training opportunities, workshops and access to relevant industry resources. Encourage them to stay up to date with the latest trends and technologies in their field. [Haff, n.d.]
- Set up a feedback and performance appraisal system: provide regular feedback and performance appraisals to individual team members. Recognize and reward their achievements and promptly address any problems with their performance. This will help maintain a motivated and high performing team. [Haff, n.d.]
- Adapt and iterate: as the product development process progresses, be open to feedback and be willing to adapt strategies. Constantly evaluate team performance and make adjustments as necessary to optimize productivity and efficiency. [Haff, n.d.]

3. Nestlé - New Product Development

In the product development field, their aim is to meet the consumer with the quality Nestlé products. Nestlé is focusing on making healthier and finer products all at an affordable price. For this the company needs some key departments which can do the scientific and technological part for the product development. For this purpose, the Research and Development (R&D) field is responsible. To develop successful new products within the R&D they need a team of talented scientists, technologists, quality professionals, engineers, nutritionists and sensory analysts from different countries. [Nestlé, n.d.] There are main areas of scope at Nestlé's R&D like: [Nestlé, n.d.]

- Accelerate innovation through concept/prototype creation and market testing.
- The different kinds of ingredients, packaging of products' process solutions of development and implementation.
- Strategic and affordable raw materials research across the business in plant science and agronomy.
- Market-by-market knowledge of nutritional deficiencies and key sensory attributes. [Nestlé, n.d.]

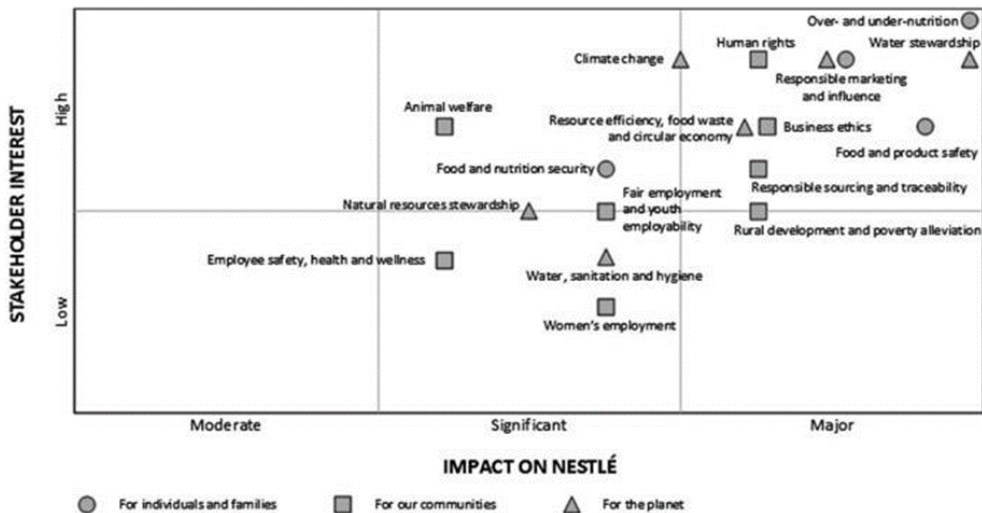
The Research and Development center is located at Abidjan in Ivory Coast. Therefore, taking care of the environment and local people they use local raw materials. To assist R & D work, they created the Nestlé Nutrition Profiling System (NNPS) determine the nutritional value of foods and drinks helping them in their work. Their aim is also to make their recipes healthier and tastier, which works by looking at how the product fits into the general diet, what public health issues might be relevant and also examine how much of its customers would like to consume. [Nestlé, n.d.]

Nestlé works with partners and stakeholders, inspired by values based on respect, to create shared value (CSV) in all their activities that contribute to society. Nevertheless, at the same time securing the long-term sustainability and profitability of their business. There are three main focus areas where their objectives are achieved while they are interrelated. [Espinoza-Orias, Cooper, & Lariani, 2018]

1. The first and maybe the most important is the individuals and families which offer healthy and tasty products and services in order to fulfill their needs.

2. The second one is their communities. Those people who they work with or live with to offer them vibrant and balanced communities and help them to develop into one of these communities and at the same time support human rights.
3. Finally, our planet which is also our present but also our future. Nestlé tries to be sustainable and manage future resources. For example: the water use issue, tackling climate change and developing sustainable energy use. [Espinoza-Orias, Cooper, & Lariani, 2018]

Figure 2: Nestlé Materiality Matrix



Source from: Espinoza-Orias, Cooper, & Lariani, 2018

4. Sustainability through planning

The company's research department leads a program called Sustainability by Design. This program will help to integrate sustainability into their products and also evaluates sustainability considerations at the very beginning of the product development cycle. Through the product development process, the goal is to optimize the impacts in the whole value chain with an iterative approach. That is what the table below shows. The different elements considered are outlined. [Espinoza-Orias, Cooper, & Lariani, 2018]

Figure 3: The elements taken into account when assessing the sustainability of Nestlé products

WHEN TO ASSESS?	WHERE IN THE VALUE CHAIN?								
<p><i>At the various stages of the Product Development Process</i></p> <ol style="list-style-type: none"> 1. Ideation 2. Conceptualization 3. Development 4. Industrialization 5. Launch 6. Post-Launch 	<p><i>At the various life cycle stages of the product</i></p> <ol style="list-style-type: none"> 1. Agricultural production of ingredients 2. Manufacture of packaging materials 3. Manufacture of food products 4. Distribution 5. Retail 6. Consumption 7. End of life 								
WHO IS IMPACTED?	WHAT IS ADDRESSED?								
<p><i>Internal and external stakeholders</i></p> <table border="0"> <tr> <td>1. Farmers</td> <td>5. Pets</td> </tr> <tr> <td>2. Suppliers</td> <td>6. Families</td> </tr> <tr> <td>3. Employees</td> <td>7. Communities</td> </tr> <tr> <td>4. Consumers</td> <td>8. The planet</td> </tr> </table>	1. Farmers	5. Pets	2. Suppliers	6. Families	3. Employees	7. Communities	4. Consumers	8. The planet	<p><i>Contribution through our products to:</i></p> <ol style="list-style-type: none"> 1. Nestlé Public Commitments 2. Materiality issues 3. Ambitions for our focus areas 4. Sustainable Development Goals
1. Farmers	5. Pets								
2. Suppliers	6. Families								
3. Employees	7. Communities								
4. Consumers	8. The planet								

Source from: Espinoza-Orias, Cooper, & Lariani, 2018

The projects are evaluated systematically and already in the Starting from the early stages of product development. They consist of the following steps: [Espinoza-Orias, Cooper, & Lariani, 2018]

Identify as soon as possible the environmental, social or "hotspots" opportunities for recognition. Within the projects the company developed a mechanism which led projects through the process of considering potential effects on individuals and families, our communities and the planet and for this the project leaders work with sustainability departments. With this collaboration they can make sure that their project could have a positive or negative impact on the social commitments. They are always reconsidering these considerations at the key moments in the project, for example if a major change occurs.

- To alleviate or exploit the potential impacts they designed an action plan which is documented as part of the project process. Actions could include further detailed evaluations as the project develops and more information becomes publicly accessible.

- The processing in factories, packaging and the consumer use are covered every step of the value chain by the tool and with this it enables them to look at certain aspects in depth such as ingredients and responsible purchasing and relate them to the supply side of the business.
- Within the whole project portfolio, a special score is given for its potential environmental sustainability impact which is a key performance indicator (KPI) monitored strategically throughout the project.
- The evaluation process itself ends at this stage, after around an hour, but it provides important information on achieving sustainability and improving the action plan.
- Monitoring of the measures adopted is usually done using EcodEX, a simplified environmental life cycle assessment tool developed in collaboration with an external IT company. Several scenarios can be compared with this tool and its early use enables comprehensive and detailed information on the potential environmental problems and advantages and this information can be available at a time when there is more planning flexibility and less cost to make changes. (Espinoza- Orias, Cooper, & Lariani, 2018)

In case of Nestlé, the product development needs to be consumer focused and have to examine the current customer trends, food and drink purchasing decisions and also the taste, price, health, convenience and sustainability which influence the NPD process. The Nestlé Research team introduced a holistic approach, PrIME, which is more effective than the incremental approach which focuses on optimizing one component at a time in a complex environment. This holistic approach which simultaneously optimizes healthiness, consumer preferences, durability and affordability etc. With these elements and with the thorough knowledge of consumer needs and preferences assisted in the identification of optimal recipes by maximizing these different elements. The PrIME is used to maximize the total product experience by designing products and packaging like:

1. Controlling healthiness and sensory product attributes, for instance, providing product sweetness with reduced sugar levels while maintaining the best possible product design.
2. Enhancing the functionality of packaging to provide:
 1. involving all individuals (e.g., the elderly), and
 2. less frustrating packaging environment.

In the past years Nestlé has reached the customer location development in all of their main brands and they have started to extend it to the main markets in order to promote their local brands. With this customer focused access helps to get a better

understanding of the customers and make connection with the people and the product comprehension all possible with standardized methodologies. The main pillar for this is how they handle the knowledge and data because this is the foundation of the process and with this it can be accelerated. They are therefore engaged in a number of activities to improve the way we manage and exchange consumer and customer information. Overall PrIME operates with a huge database and techniques for data in order to guarantee that the development needs of individuals and families are met on an ongoing basis. PrIME linked to the following steps: [Espinoza-Orias, Cooper, & Lariani, 2018]

1. Identifying the factors that add value for consumers: What is relevant for the families and individuals? What do they like to eat? What is important when consuming their products? What makes them dissatisfied? With this step we can outline the customer priorities and preferences but we have not yet fully understood their needs and desires.
2. At the heart of this approach is an understanding of people's desires and attitudes. We use cutting-edge consumer research to translate multidimensional needs into objective product attributes and characteristics.

Conclusion

Developing new products is important for every company and is essential for continuous growth and survival. It is important to assess the target audience and the nature of the product, who it is for, what its purpose is and how it will help customers in their daily lives. It is important to realize that globalization offers many opportunities in the business world developing new products is a major challenge for businesses as they need to respond well to different changes and create teams globally responsible for developing new products. With globalization comes the need to keep pace with innovation, which is essential for product development. Every company has its own way of developing new products effectively, but there is a set of generally accepted steps that should be followed to ensure success.

Within the company there should be a team and department dedicated to product development, and appropriate and qualified staff should be recruited from different disciplines to ensure that the process is more careful and transparent.

Nestlé is a globally recognized company with a variety of products that appeal to consumers and a relatively wide range of products. Therefore, the process and steps of product development are key for them. To create the right department and the right skills to hire and develop an efficient and successful product development process and methodology, with the help of which they have a large database and

data management techniques that enable Nestlé to maintain its market leadership to this day.

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GLOBALISATION AND CURRENT EMPLOYMENT SITUATION IN SOUTH AFRICA: AN EXPLORATORY ENQUIRY

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Abstract. *Globalisation is a broad concept that has continuously impacted various aspects of human endeavours. Globalisation has influenced the realignment of business strategies as well as impacted the availability of jobs in many countries. In modern organisations, managers must understand how current globalisation impacts employment situations. Since the dawn of contemporary globalisation in the early 1990s, several path breaking advances have emerged. These advances have also impacted the ways works are coordinated in the workplace. For instance, recently the use of independent contractors has increased as opposed to permanent appointed employees. As a matter of fact, globalisation has impacted employment situations in several ways. Hence, the current paper is an attempt to explore how globalisation has impacted employment situations in South Africa. The main finding of the paper revealed that there is a rising trend in job insecurity in most organisations owing to advanced sophisticated technologies and the utilisation of more atypical employment pattern in the form of casualisation.*

Keywords: *Globalization; Employment situation; Technology; Casual employees*

Introduction

Global historians argue that globalisation is a trend that started ages ago (O'Rourke and Williamson, 2002). In other words, the globalisation concept has been around for centuries. It is a trend that became a wildfire toward the end of the 1980s but was not entirely a new phenomenon (Savrul & Ahmet, 2015). Nayyar (2006) concurs with the above position by stating that globalisation is not entirely something new. In current globalisation era, employees are beginning to enter into agreements directly with their employer without union representation. Abbott (2006) was of the view that new developments have moved collective bargaining down to the level of the firm. In concurrence, Pulignano, Kohler, & Stewart, (2016) mention that there has been a rise in the use of company-level agreements and a decline in sector and other multi-employer collective agreements (CA). This notable change in employment situations in terms of less utilisation of collective bargaining intensified to become the norm, since dawn of globalisation. Furthermore, the logics of globalisation although sometimes amoral became a key idea for business practices, which have stimulated several academic debates (Cuterela, 2012). Globalisation, no doubt has accelerated the transformation of human resource management, which includes talent management and employee engagements in organisations (Pace, 2011).

Other aspects of employment situations that have been impacted by globalisation, include working hours, labour market flexibility, pay related strategies and job security. According to Virkkunen (2018), unparalleled technological developments, shifting labour markets and recent job security threats are affecting many organisations globally. Competition from foreign competitor is indeed pressuring South African firms to improve their products to enable them to compete globally (Kolb, 2018). This may cause shifts in employment situations as production strategies are developed by organisations who want to remain competitive and sustainable. Stiff competition has also forced some organisations to close down, which has led to job destruction and losses (Olungo, 2017).

Problem Statement

Organisations need to articulate ways of managing changes in the employment situations, particularly when they face the realities of globalisation and its by-product, namely the 4th industrial revolution disruptive technological innovations.

Globalisation has accelerated labour market volatility, such as job insecurity and decline in collective bargaining. The current state of affairs has adversely affected employment situations. Numerous studies have been conducted on the effects of globalisation on employment situations globally. However, more study needs to be done in this domain within the SADC region, particularly in South Africa.

Research Question

- How has globalisation impacted employment situations in South Africa?

Research Objectives

- To explore how globalisation has impacted employment situations in South Africa.

Literature Review

Globalisation has accelerated competition between organisations globally. As a result, management is implementing strategies to boost quality, efficiency, and productivity (Spooner & Haidar, 2005). Globalisation entails the spreading of ideas, practices, and technologies (Cuterela, 2012). Ukpere (2009) indicated that globalisation has had an impact on technology same as technology has impacted globalisation. To become more competitive, organisations are now beginning to replace human labour with machine in the form of computers, robotics, and artificial intelligence, which are all products innovation. Currently without adopting new technological innovations organisations cannot maintain competitiveness. However, on the flipside this state of affairs has ultimately resulted in high level job insecurity, which negatively affects decent job creation. The current trend has negatively impacted employment situations and eroded the trust relationship in the workplace between employees and management.

The growing trend to embrace technological changes in the workplace has its own impact on employees' creativity, remuneration employment relations, and constant skill development (Lee & Kang, 2012). In recent times, organisations are currently making earnest efforts to train and develop their employees to handle some of the new emerging technologies. Certainly, training and development of employees have to a great extent some positive effects on employment relations, as employees perceive such as being valued and invested in. Conversely, it could create an opportunity for employees to seek alternative lucrative jobs in another organisation.

The use of new technology requires organisations to hire skilled workers to handle most of the jobs. This has impacted negatively on unskilled employees as many of them becomes automatically redundant, since they lack the skills to handle

the modern implements of production, namely new technologies (Olungo, 2017). In addition, the current development would as a matter of fact lead to more demand for talent, which would render many employees obsolete, and as such, retrenched. The outcome of this new working conditions will certainly lead to tension and frustration. Owing to the retrenchment of redundant employees, the workload of the remaining employees may increase, which also increases the stress level of employees in the workplace. As a result of continuous training and development some employees are of the view the frequent training may also affect their quality of work life due to lack of relaxation time as they are constantly required to prepare for training on new technologies, which is made compulsory (Lee & Kang, 2012). However, this reinforces the concept of life-long learning for employees, which could also be perceived from a positive light both from the employees and management, as employers gain more talented employees in their workforce.

Currently, unemployment rate has accelerated globally, forcing people, particularly from developing nations, into global migration in search for more favourable working conditions else (Ukperere & Slabbert, 2009). Some of the major causes of workers displacements are labour-replacing technologies such as artificial intelligence and automated machines (Kolb, 2018). Those new technologies have the capabilities to displace employees from their jobs (Pietro, Girsberger, & Vuille, 2010). Indeed, technological advancement such as automation and robotics will certainly destroy some jobs, whilst at the same time creating new ones (Virkkunen, 2018).

Globalisation and casualisation

Previously, labour market changes have increased due to globalisation. There is a considerable expansion of non-regular labour, as well as the re-organisation of work, including massive downsizing (Lee & Kang, 2012). Kim *et al.* (2001) argue that the effects of globalisation are extensive. Ali (2005) highlights that globalisation has played a role in accelerating unemployment, casualisation and erosion of labour movements. Globalisation logics push firms to reduce their labour costs and increase labour mobility, thereby weakening trade union power to protect workers (Philips & Eamets, 2015). For example, the tenacious recession in Japan has encouraged the development of new strategies to reduce labour costs; for example, by employing casual workers (Kim *et al.*, 2001).

Casualisation refers to hiring casual workers, which causes a decline in the number of employees that are employed permanently in full-time employment (Hudson, 2014). In the past twenty years, there has seemingly been an increase in

the utilisation of casual labour in South Africa. Recently, at least 82.5% of firms in South Africa have hired casual employees (Standing, Sender, & Weeks, 1996). Furthermore, casual employees have minimum to no protection because trade unions do not generally represented them. Casualisation is also characterised by job insecurity, as most contracts may not be renewed (Hudson, 2014). Therefore, employers may prefer this employment pattern to reduce labour costs and to achieve flexibility by increasing working hours to increase productivity and efficiency. Conversely, employees may engage in casual labour to obtain the required experience that will enable them to obtain full-time employment. Standing et al. (1996) substantiate this by mentioning that such form of employment is perceived as a stepping stone to future standard employment. Engaging casual workers has adverse effects on the employment relationship (Olungo, 2017). The kind of employment relationship in casualisation makes it difficult for casual labourers to negotiate for a better pay.

Restructuring of work in the era of globalisation

One specific aspect of globalisation is the intensity of the changes in the way things are done that have been witness across the globe (Cuterela, 2012). Managerial decision making in organisations is increasingly influenced by the global environmental forces rather than local or domestic environmental forces (Cambridge, 2001). Globalisation may have impacted office working hours and location. At least for one thing, it has influenced the use of virtual workplaces and virtual teams. The organisation of work is another aspect of the workplace that globalisation has affected (Spooner & Haidar, 2005). Employees may now work in an environment where they feel more relaxed. For example, a scriptwriter may think of a storyline in his/her home or coffee shop and immediately start working on it. The re-organisation of work is vital for organisational flexibility and efficiency in productivity. Indeed, organisational required requires flexibility and efficiency to respond swiftly and effectively to market demands (Spooner & Haidar, 2005). Virtual workplaces may be favourable for employees due to its flexibility, which has tendency to improve their employment situations as employees can work in any environments.

Due to globalisations, some organisations have resorted to the restructuring of their workforce through downsizing. The phenomenon of downsizing has shattered employees' belief in job for life (Lee & Kang, 2012). The progressive rise of deregulated labour markets has enabled employers to pursue the ideas of atypical job and downsizing to the highest level (Cambridge, 2001).

Globalisation and employee remuneration

Olungo (2017) observes that organisations have changed how they operate owing to global competition. For example, introduction of performance for pay reward system to compensate employees. This may be done through appraisal systems, which some employees may deem to be unfair, and may be seen to breach their psychological contract. Other organisations have since resorted to retrenchments and cutting salaries to reduce labour costs, in other to remain competitive. Some businesses retrench employees as a way to lower their salary costs (Olungo, 2017). This trend may also have a negative effect if employees are insecure about their jobs and dissatisfied with their salaries. Job satisfaction is an essential policy aspect of any organisation (Tansel & Gazioglu, 2014). An organisation's management is responsible for fostering a harmonious employment relationship by ensuring that employees have all their required resources, which ultimately leads to job satisfaction (Olungo, 2017).

Employment relations in most organisations globally have been affected by the trend of global competition (Olungo, 2017). Olungo (2017) further maintains that the decision-making capabilities of managers regarding employment relations issues seem to have improved since the dawn of globalisation. This may be because managers in the 21st century now have to view the organisations from an objective point of view.

Globalisation has resulted in changes in the production process, which has ultimately impacted employment situations. Globalisation has adversely affected the unskilled workers, while the skilled workers seem to have been positively affected (Dadush, 2014). Due to globalisation, skilled employees are presently relatively at a better advantage and are able to negotiate higher wages because they are in higher managerial positions, which require certain skills and knowledge. However, unskilled employees may be at a receiving end as they lack the required technological knowledge to fit into the new workspace. Highly skilled and educated migrants tend to respond positively when it comes to how globalisation has affected them (Testa & Celi, 2016). This has led to an increase in the talent pool in labour markets, whilst also increasing competitiveness.

Indeed, perceptions regarding globalisation are quite blurring and polarising (Ukpere, 2009). Accordingly, as insecurities are associated with globalisation, increasing retrenchments and pay cuts will also accelerate. This reflects the high level of job destruction since the dawn of globalisation. Furthermore, flexibility in the labour market owing to globalisation has negatively affected labour standard,

which compromises decent work. According to Breakey (2018), one of the challenges confronting workers in South Africa is poor working conditions.

Research Methodology

The current paper adopted a qualitative research approach to address the research question. The current study was carried out at an organization in the film industry that is situated in the north-western part of Johannesburg in South Africa. A purposive sampling technique was utilised to select ten employees that were from different managerial levels in the organization. Semi-structured, in-depth interviews were conducted. For credible data reporting and writing, interview transcripts were repetitively reviewed to determine common themes.

Findings and discussion

Table 1: Profile of Research Participants

<i>Research Participant</i>	<i>Sex</i>	<i>Age</i>	<i>Org Management Level</i>	<i>Tenure</i>	<i>Highest Level Of Education</i>	<i>Union Affiliation</i>
REP1	F	60	Top Level	14	Diploma	No
REP2	M	43	Junior Level	15	Grade 10	No
REP3	M	41	Middle Level	Undisclosed	Degree	No
REP4	F	33	Middle Level	11	Matric	No
REP5	M	33	Actor	4	Matric	No
REP6	M	53	Top Level	9	Degree	No
REP7	F	20	Actress	4	Matric/Currently studying towards degree	No
REP8	F	34	Top Level	7	Diploma/Currently studying towards degree	No
REP9	F	40	Non-Managerial	8	Diploma	No
REP10	M	38	Middle Level	3	Degree	No

Source: Authors Fieldwork 2021

Pseudonyms were assigned to research participants for protection of their identities of the. Quite a number of the participants have been employed in the film industry for over 7 years. 60% of the participants obtained a tertiary qualification and 20% are studying towards a qualification currently. Most participants have gained immense experience at the organization. There is only one participant under the age of 30 years amongst the ten research participants. This revealed that majority of the participants clearly understood how globalization had transformed operations in the organization. The research also revealed that all participants did not belong to a union. The researcher took field notes during the interviews. The researcher also concurrently identified and noted participants’ gestures. Furthermore, an interview guide was used to ensure that the study maintained its objective. Lastly, the notes from the interviews were compared against the posed questions.

Findings and discussion

The study sought to establish the impact of globalisation on employment situations within South African organisations. Responses of the research participants are summarised in the following table.

Table 2. Keywords used by participants to describe the impact of globalisation on employment situation

<p>Rep1=Competition, working hours; Rep2=Working hours; Rep3=Technology and systems; Rep4= Technology, working hours, contracts; Rep5=Competition, use of short-term contracts; Rep6=Process of globalisation changing the world, technology; Rep7=Technology, type of contracts; Rep8= Management systems, competition, innovation; Rep9=Equality especially between genders Rep10=Ever changing technology</p>
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Source: Authors Fieldwork

Findings revealed that some research participants shared similar opinions regarding the impact of globalisation on employment situations in South African.

Globalisation and employment situation in South Africa

The findings reveal that the effects of globalisation on employment situations are twofold, namely, they have both positive and negative effects on the workplace. The findings revealed that while globalisation has brought new opportunities, such as high standards and improved communication channels, has on the contrary accelerated the use of casual labour, which has resulted in several conflicts and allegations of unfair labour practices such as discrimination and labour exploitation. The findings of this study also corroborated with existing literature on globalisation and employment situations, confirming what other authorities have said about the phenomenon. For instance, the study's finding corroborated Hudson (2014) view that casualisation in the era of globalisation accelerates job insecurity as most contracts are often not renewed at the end of the contract. In fact, all efforts towards casualisation are to the benefit of the employers, in terms of cost cutting, as opposed to the employees. This state of affairs has tendency to negatively affect the employment situations as well as employment relations within an organisation.

There is a perception that collective bargaining has improved since the dawn of globalisation. Collective bargaining, which entails negotiation with an intention to reach an agreement related to employee remuneration, working conditions, as well as expectations of both parties in the employment relationship. Collective bargaining has always been encouraged because its potency to reduces conflicts and turnover intentions in the workplace. As a matter of fact, collective bargaining helps to create an atmosphere of trust, which supports work restructuring based on mutual agreement between employers and employees (Hayter & Lee, 2018; Abbott, 2006). The process of collective bargaining seems to have been positively impacted by globalisation in most industries, which has boosted more agreements between employers and employees without the presence of a third party. Therefore, globalisation has created room for employees to make their own informed decisions. In concordance with the above, **Rep9** observed that collective bargaining had improved in recent times. However, entering into agreements with respective employees without the unions will also go a long way to harm collective bargaining since what is playing out is individual bargaining as opposed to collective bargaining.

Due to a rise in production standards and competition, the employers seem to be demanding additional work input, innovation, and flexibility, while employees in

turn are demanding increased remuneration and improved working condition. The current study's findings confirmed the above notion as reflected **Rep8** statement: *“Increased competition and new strategies to stay competitive and relevant in the industry has cause employers to demand for more work, while employees, in turn, demand for more pay, which ultimately satisfies the needs of both parties”*.

The current study also found that the rise in the use of 4IR technology is accompanied by a rise in job insecurity amongst employees. However, organisations cannot do without embracing the rapid technological advancements within a highly competitive business environment. In line with that, **Rep3** stated: *“There is a need to continuously be in touch with technology and know the advancements so as to find effective and efficient ways to work because once you snooze, you lose.”* This is, however, a major challenge as organisations must keep up with technological advancements, which is also a threat to job security owing to technological displacement of workers.

Limitations of the study

As every research endeavours have their own limitations, so does the current study. The current enquiry was restricted to a single organisation in a film industry located in the Gauteng province in South African, as such, the current findings of the study cannot be generalised to other enterprises in other regions in South Africa. Additionally, only ten employees were interviewed hence the study did not include all employees during the data gathering phase. Consequently, not every worker's perception was taken into account. This study analysed the views of a tiny proportion of the population that are conversant with the phenomenon under study. Hence, the current study's outcome might have been affected by some level of bias. The COVID-19 pandemic also posed affected the study, particularly during data collection. Hence, some interviews were carried out telephonically, and others through video conferencing, which mostly limited the full observation of participants' expressions and nonverbal cues.

Recommendations

From the foregoing the following recommendations are worth pondering:

Recognise and reward employees constantly

Employers should consider appraising and recognising their employees and reward their good performance on a continuous basis. This strategy needs to be

developed and implemented during restructuring of work as a result of globalisation. Recognition reinforces good performance as employees will through that perceive their organisation is caring and appreciative their contribution. Employees are happier when recognition and reward happens on a regular basis, which positively affects employees' motivation and morale in the workplace. Amoatema and Kyeremeh (2016) opine that several companies are gradually adopting the concept of employee recognition to achieve increased productivity, higher performance as well as motivate employees. Good relationship is very important in the workplace for both employers and employees to achieve the strategic goals of the organisation and regular recognition and reward helps to foster good relationship through employee involvement and engagement.

Improve the level job security in organisations

According to Lansbury (2000), the right to job security does not apply to casual employee. However, technological displacement of worker also applies to permanent employees nowadays as they have also become insecure due to rapid technological incursion of the workplace. Based on these new threats, there is an urgent need to improve labour standards based on the prescriptions of the ILO through their various conventions. There is also a need for a shift in some of the human resource policies that focus only on cutting cost through job destruction, as a way of reducing job insecurity amongst workers (Kim et al., 2001). Hence, HR policies should be drafted in such a way that job security is enhanced.

A need to improved working conditions in organisations

Working in a pleasant environment has a positive effect on employees, as it motivates them to give their best performance. Hence, good working conditions will motivate employees to add values to their organisations. All employees, regardless of the type of employment contract they hold, should be made to feel safe and secure within their workplaces (Mpabanga, Ukpere & Knight 2022). Therefore, employers should provide safer and secure environments for employees to function effectively. HR policies that support fair labour practices should be encouraged and adopted.

Conclusion

Globalisation has impacted labour situations in organisations in South Africa in both positive and negative ways. Accordingly, the current findings reveal that there

has been an increase in direct interactions between the employers and employees since globalisation. Rapid technological innovations and casualisation of labour are conspicuous aspects of globalisation that have affected employment situation in South Africa. The current findings revealed that there is an inevitable rise in job insecurity in most organisations owing to the increasing use of casual employees and the rapid incursion of advanced technological innovation into the workplace use. Fair treatment of all employees should be a paramount way of curbing perceptions of inequality and discrimination induced by globalization. This will enhance employment situation in the South Africa or elsewhere in the age of globalisation and its corollary, the Fourth Industrial Revolution.

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STRATEGIC TOTAL REWARDS ACCROSS GENERATIONS DURING PANDEMIC

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Abstract

The reward system is crucial in pulling and preserving highly endowed employees, leading to high-quality performance. Many organisations still value systems where base pay and benefits are the significant components. The research study explored the influence of the Fourth Industrial Revolution (4IR) on total rewards within the pharmaceutical industry, specifically focusing on Middle and Senior Managers as the sample. A dearth of empirical research on the total rewards factors associated with the 4IR and employees' perceptions of rewards in the pharmaceutical industry have been identified. A qualitative research approach utilised for the current study using phenomenology to explore the lived experiences of employees in the pharmaceutical industry about total rewards in the Fourth Industrial Revolution. The findings indicated that 4IR and Covid-19 influenced pharmaceutical industry employees' total rewards preferences. The findings also indicated that total rewards preferences depend on an employee's age, gender and life roles. An interesting finding was that regardless of age and gender, all employees valued the total reward of well-being above all others, but this reward was the most difficult to attain from their employer. The research findings will assist organisations and managers in determining total reward strategies that are fit for purpose to enable them to attract, retain, and motivate talent in a global

4IR marketplace. The study will inform HR managers in the pharmaceutical industry regarding the total rewards preferences of employees, which could then be used to enhance attraction and retention strategies.

Keywords: *total rewards, generational theory, career development, total rewards, age, gender, life roles, 4IR, Covid-19*

JEL Classification: J24, J28, J38, I10, I18, O11, O19, M12

Introduction

The implementation of the Fourth Industrial Revolution has been accelerated globally by the coronavirus pandemic (Neto et al., 2020). The COVID-19 pandemic forced organisations to move towards a remote working culture faster than anticipated (Crous, 2020). Office-based jobs are becoming less prevalent, and there is a marked worldwide surge in remote working (Farrer, 2020). Working from home or remotely required managers to learn how to manage their staff when they are not in the office or even in the same geographic location. COVID-19 accelerated the Fourth Industrial Revolution (4IR) by making technology the solution to social distancing and working during a pandemic (Crous, 2020). These changes have led to new mindsets and shifts in motivation about how people view rewards (Farrer, 2020). While some employees might view a high salary as important in a job and career, others might view flexibility, a work-life balance, and working from home as motivation to remain with an employer or even in an industry (Farrer, 2020). Employers, therefore, need to be cognisant of where their employees are in their career- and life stages to more accurately determine the rewards they prefer (Bussin et al., 2017).

This study explores the influence of 4IR on total rewards within the pharmaceutical industry. The pharmaceutical industry was impacted by the Covid-19 pandemic from business and employee perspectives (Ayati, 2020). Pharmaceutical companies had lower productivity at an operational level due to social distancing and reduced workforces during lockdown (Barshikar, 2020). However, the pandemic increased customers' need for pharmaceutical products, which enabled pharmaceutical organisations to thrive through growth in demand. The increase in demand for pharmaceutical products meant a need to increase the supply. However, due to global travel restrictions, the supply of products to consumers was delayed (Barshikar, 2020). The pharmaceutical industry experienced changes in demand for the stock, a move to a hybrid model of

working, and changes in regulations. The industry moved from face-to-face interactions (to market and sell their products) to remote interactions to comply with social distancing precautions (Ayati, 2020).

However, the positive aspect of the pandemic has been that it also brought about flexibility in the workplace. This allowed employees to spend more time with their families while coping with work responsibilities. COVID-19 showed employers and employees that working from home is possible without the supervision of a manager or having to be in a physical office space (Khwela-Mdluli & Beharry-Ramraj, 2020). Perceptions of the normal portfolio career must change as the career path has changed (Oosthuizen & Mayer, 2019). Organisations that did not implement flexible working hours or remote working risked having employees opt out of the workforce or even decline career development. However, they were ready to progress within the organisation (Khwela-Mdluli & Beharry-Ramraj, 2020). While the context of the impact of COVID-19 and the Fourth Industrial Revolution on the pharmaceutical industry provided, it indicates a research gap in terms of the influence of these factors on total rewards and employee perceptions within the industry. Previous studies have focused on the business and operational aspects of the pharmaceutical industry during the pandemic, but there is a dearth of research on the specific impact on total rewards and how employees' preferences have evolved in light of remote working and flexible arrangements. This study aims to bridge this gap by exploring the relationship between the Fourth Industrial Revolution, the COVID-19 pandemic, and total rewards within the pharmaceutical industry, providing insights for organizations and managers to enhance their reward strategies and effectively attract, retain, and motivate talent in this evolving landscape.

Aim of the study and research questions

The current study aims to investigate the impact of the Fourth Industrial Revolution (4IR) and the COVID-19 pandemic on total rewards and work arrangements within the pharmaceutical industry, with a focus on the shift towards remote working and its influence on employee motivations and preferences. The aim encompasses exploring how the implementation of 4IR and the pandemic have affected the pharmaceutical industry, including changes in productivity, supply chain, and regulations. It also aims to understand how these factors have shaped employees' perceptions of rewards, particularly in relation to remote working, flexibility, work-life balance, and career development. By examining these aspects, the research seeks to provide insights for organizations to adapt their reward strategies and effectively address the evolving needs of employees in a rapidly

changing work environment. In addition, the current study seeks to answer these questions, how has the Fourth Industrial Revolution (4IR) affected the total rewards system in the pharmaceutical industry? What are the specific challenges faced by pharmaceutical companies in terms of productivity, supply chain, and workforces during the COVID-19 pandemic? How have remote working and flexible work arrangements influenced employees' perceptions of total rewards in the pharmaceutical industry?

Literature review

Theory underpinning the study

Social Exchange Theory

Social exchange theory and generational theory underpins the current study. According to social exchange theory, humans tend to select behaviours that serve their own interests (Miller, 2019). Social exchange theory makes a few assumptions (“Social exchange theory,” 2004). The first assumption is that individuals are rational beings who base decisions on costs and benefit (“Social Exchange Theory,” 2004). The second assumption is that social exchanges happen between individuals, as individuals want to fulfil their needs. The third assumption is that social exchange is around the notion of exchanges that result in pay-offs or rewards for individuals. Individuals tend to take part in interactions that will help them achieve their needs. The fourth assumption is that individuals are driven by goals that are competitive, and because of this, there is a result of power and privilege in exchanges. People with power benefit more from exchanges. In summary, social exchange theory holds that the way in which humans behave is due to their motivation to be rewarded without a significant cost. Individuals want to perceive that the rewards they receive equate to what they put into the exchange (“Social Exchange Theory,” 2004). In relation to the study, the social exchange theory states that individuals compare the costs and benefits when it comes to the way in which they behave. People are more likely to take part in an exchange that will yield benefits for them, and they also want the rewards that they get to equate to what they put in. This theory relates to this particular study, as when employees are given the rewards that they deem as fair and acceptable, they will partake in organisation business as a result of being provided with the rewards that meet their needs. This exchange that they are partaking in shows that the rewards that they obtain influences the effort that they put into the exchange. This observation is similar to that of equity theory, discussed before social exchange theory. Social

exchange theory relates to the incentive theory by Burrhus Frederic Skinner. Incentive theory expresses that employees are more likely to act in a particular way due to their being motivated by certain reinforcements, as well as rewards or incentives. This means that employees are more likely to perform in a way that will result in their obtaining certain results (Indeed Editorial Team, 2021).

Generational theory

Generational theory is best described by Strauss and Howe (2009), who stated that a generation is a group of people of similar ages in a specific time in history and, therefore, share similar personality traits. Strauss and Howe (2009) use a cyclical theory of history to explain generational theory (Papenhausen, 2009). The generational theory posits that people of similar age or within the same generation share key characteristics based on similar experiences, differentiating them from other generations. A social generation spans approximately 20 years, and people experience four life cycles over 80 years (Okros, 2020). The life cycles are childhood (from birth to 20 years), young/ rising adulthood (from 20 to 40 years), midlife (from 40 to 60 years), and elderhood (from 60 to 80 years) (Okros, 2020).

Conceptualisation of Total rewards

Total rewards represent an organisation's strategy of rewarding employees by integrating different components such as compensation, benefits, learning and develop, work-life effectiveness (Nienaber et al., 2011; Mabaso & Dlamini, 2018). Muse et al. (2008) attest that total rewards considered as the essential technique that affects employees' motivation to join and stay with the organisation and support effectiveness and members' well-being. This assertion is further supported by Chiboiwa et al. (2010) and Newman and Sheikh (2012a) who further added that offering total rewards will attract and retain talent in organisations. Total rewards are considered as the critical way that affects members' motivation to join and stay with the organization and support organizational effectiveness and members' wellbeing (Muse et al., 2008; Chiboiwa et al., 2010; Newman and Sheikh, 2012b). WorldatWork model provides a comprehensive list of financial and non-financial rewards to employees for their performance, efforts, and time (Bussin et al., 2019). The TRM focuses on five factors, i.e., compensation, well-being, benefits, development, and recognition, which influence an organisation's strategy to attract, motivate and retain employees (WorldatWork, 2020). These factors are shown in Figure 1.

Figure 1. *World at Work Total Rewards Model*



Note. Adopted from WorldatWork (2020, p. 2)

Total reward consists of all monetary, non-monetary, extrinsic, intrinsic, and social benefits that an employee might receive from his or her employer organisation (Dobson, 2009; Twenge et al., 2010; Dessler & Cole, 2011; Morgan et al., 2013; Chinyio, Suresh, & Salisu, 2018). Several studies have shown that a total rewards approach plays a critical role in keeping talent with the organisation longer (Medcof & Rumpel, 2007; Chiboiwa et al., 2010; Newman & Sheikh, 2012; Morgan et al., 2013;). Wang (2004) further argued that increased employee motivation and retention as a result of total rewards helps ensure top-notch individual performance and workforce loyalty. Implementation of total rewards in organisations can enhance employee performance (Ji & Cui, 2021).

Influence of 4IR on Total Rewards in organisations

The term “Fourth Industrial Revolution” (4IR) was created by the founder and executive chairman of the World Economic Forum, Klaus Schwab. Schwab described the Fourth Industrial Revolution as a place where people were connected by technology to manage their lives (Xu, 2018). Digitisation was increased by 4IR and connected people, objects and systems via real-time data exchange (Oosthuizen & Mayer, 2019). The Fourth Industrial Revolution enabled social-technology governance, technology transformation, techno-materials and cyber-physical systems (Skilton & Hovsepian, 2018); the technology used in the Fourth Industrial Revolution allowed the physical and digital environments to merge. According to Sarfraz et al. (2021), the Fourth Industrial Revolution or Industry 4.0

began in 2011. 4IR has led to rapid growth and transformation of technology and is sustained by information exchange between companies, humans, and machines. The ability of technology has led to 4IR being implemented in digital health care services, enabling a person-centred approach to 4IR. According to Bennett and McWhorter (2021), digital transformation was already in progress when the COVID-19 pandemic struck, and regulations to curb its spread accelerated the use of 4IR. Social distancing and isolation led to people using technology and the internet of things more frequently. The Internet of Things (IoT) allowed for advanced connectivity of devices and systems, which brought about automation in almost every industry (Xu, 2018). Working from home has become important to business continuity during the pandemic (Bonacini et al., 2021). 4IR connected employers to employees, businesses to clients, friends to family, and peers to colleagues through video conferencing platforms such as Zoom. Technology has become vital for communication (Bennett & McWhorter, 2021). Not knowing when the lockdown would end and when future waves would occur led companies to view working from home and remote as the ‘new normal’ method of working (Bonacini et al., 2021). In the 4IR world of work, organisations must have an integrated reward approach. Traditional financial rewards do not ensure employees’ organisational commitment. Employee rewards should attract and retain talent, ensure employee loyalty, encourage employees to learn and develop within the company, and motivate employees to increase their performance. Like Generation X before them, Millennials seek employers who offer development opportunities, promote work–life balance, and create supportive work environments and positions that are less stressful (Beck-Krala, 2020). Work-life balance is important in retaining women employees. Salary inequities result in turnover amongst women, as women value remuneration and performance recognition as rewards. Financial benefits are considered more important to men than women (Bussin et al., 2017).

Prospective employees are attracted to organisations that offer a competitive salary and non-financial benefits, such as flexible working hours. A total rewards model (TRM) forms part of the employee value proposition (EVP), which is the value employees gain from the employment relationship with an organisation. A TRM takes a holistic approach to rewards and includes compensation, benefits, and learning and development, to name a few (Beck-Krala, 2020). A TRM includes intrinsic and extrinsic motivation reward factors that retain employees and financial and non-financial rewards that attract employees (Bwowe & Marongwe, 2018).

The implementation of the Fourth Industrial Revolution has been accelerated globally by the coronavirus epidemic (Neto et al., 2020). The COVID-19 pandemic forced organisations to move towards a remote working culture faster than anticipated (Crous, 2020). Office-based jobs are becoming less prevalent, and there is a marked worldwide surge in remote working (Farrer, 2020). The COVID-19 pandemic and lockdown forced many companies to have their employees work from home. It was the only way to ensure business continuity while minimising the risk of exposure to and spread of the Coronavirus (Bonacini et al., 2021). COVID-19 accelerated the Fourth Industrial Revolution (4IR) by making technology the solution to social distancing and working during a pandemic (Crous, 2020). 4IR connected employers to employees, businesses to clients, friends to family, and colleagues through video conferencing platforms such as Zoom (Bennett & McWhorter, 2021). These changes have led to new mindsets and shifts in motivation with regard to how people view rewards (Farrer, 2020).

A total rewards model (TRM) contributes to the value employees gain from the employment relationship with an organisation. A TRM takes a holistic approach to rewards and includes compensation, benefits, and learning and development, to name a few (Beck-Krala, 2020). A TRM includes intrinsic and extrinsic motivation reward factors that retain employees and financial and non-financial rewards that attract employees. The five factors of the model, which influence employee productivity, commitment and inspiration are compensation, well-being, benefits, development, and recognition (Bwowe & Marongwe, 2018). Future careers will require flexible, adaptable employees who can work in multi-functional teams and deal with complex organisational tasks (Ghislieri, 2018). A total rewards framework will allow employers to determine which rewards their employees' value (Manyika et al., 2017). Organisations that customise their reward strategies will benefit by attracting and retaining talent (Martin & Ottemann, 2016). According to Snelgar (2013), the needs of employees change as they get older.

Some employees view the emergence of 4IR and its technology as positive, while others see it as a threat to their jobs (Mhlanga & Moloi, 2020). A quantitative study conducted in the Czech Republic indicated that 64% of the participants perceived 4IR technologies as a potential threat to their jobs as they feared being replaced by robots and machinery (Soukupová et al., 2020). A study conducted by Narayanamurthy and Tortorella (2021) indicated that job insecurity was a concern of employees and was caused by their managers' poor comprehension of 4IR technologies. Participants indicated that the technologies implemented by the company were used to complete macro tasks, which did not

directly improve their outputs as employees. Some service organisations have not fully grasped the benefits of implementing 4IR technology in their companies, such as the ability to attract talent by offering flexibility, increasing productivity, and enhancing performance (Narayanamurthy & Tortorella, 2021).

Employee productivity and job satisfaction increased when employees worked remotely (Narayanamurthy & Tortorella, 2021). A study conducted in Kuwait to determine employees' thoughts on pre-and post-COVID-19 work settings indicated that more than half of the participants believed they could complete between 80% and 90% of their workload using a hybrid model, i.e., working remotely and from the office (Diab-Bahman & Al-Enzi, 2020). Participants favoured a hybrid model of work, as the lockdown regulations brought more family obligations, e.g., children being home, and they were, therefore, more productive at home as they could concentrate on work knowing that their children were taken care of at home (Diab-Bahman & Al-Enzi, 2020). This indicates that employee performance is driven by individual employee factors such as adaptability and intrinsic motivation and organisational factors such as leadership and culture (Narayanamurthy & Tortorella, 2021). Therefore, employees prefer the flexibility of setting their working hours. They also attribute the increase in their productivity as it allows them to cater to their families needs during lockdown (Diab-Bahman & Al-Enzi, 2020).

Research methodology

The study followed a qualitative research approach. Qualitative research involves analysing non-numerical data, such as audio recordings, transcripts, videos, etc., of semi-structured interviews to explore and understand the lived experiences of the research participants (Alase, 2017). Qualitative research had been chosen as the preferred approach as this method was used to answer questions about the participants' experiences and perspectives from their viewpoint. Semi-structured interviews were used to gain insight into focused topics, such as 4IR, COVID-19, total reward preferences, age and gender in the pharmaceutical industry. The participants were key informants as they provided key information about their perspectives as pharmaceutical company employees (Hammarberg & Kirkman, 2016). The study was based on a phenomenological philosophy, which sought to describe the lived experiences from the perspectives of those in the study. Phenomenology aims to describe and analyse phenomena and how things appear (Emiliussen et al., 2021). It analyses phenomena shown to one's consciousness. It posits that this phenomenon is part of a greater whole that needs to be analysed in a holistic approach to the experience that created it (Guillen & Elida). The meaning

participants ascribed to their experiences were described in terms of what they experienced and how they experienced it (Neubauer, 2019).

Participants

The target population were male and female Baby Boomers, Gen X and Millennial employees of the pharmaceutical company who held either Middle Management or Senior Management positions. The participant criteria of age and gender were sent to the HR Director of the company, who then provided a list of employees who could be contacted to volunteer to participate in the research study. Purposive sampling was used in the study, a form of non-probability sampling. Therefore, participants were selected for their knowledge and experience of the pharmaceutical industry, the 4IR and digital technology, and total reward preferences. The final sample size for the study was 12 employees from the Senior Management and Middle Management Occupational Levels.

The demographic characteristics of the participants are presented in Table 1 below.

Participant ID.	Age	Gender	Generational Group	Career Stage	Generational Life Stage	Occupational Level
1	Between 27 to 40 years	Female	Millennial	Establishment	Young Adulthood	Middle Management
2	Between 27 to 40 years	Male	Millennial	Establishment	Young Adulthood	Middle Management
3	Between 46 to 56 years	Female	Generation X	Maintenance	Midlife	Middle Management
4	Between 46 to 56 years	Male	Generation X	Maintenance	Midlife	Middle Management
5	Over the age of 60 years	Female	Baby Boomer	Decline	Elderhood	Middle Management
6	Over the age of 60 years	Male	Baby Boomer	Decline	Elderhood	Middle Management
7	Between 27 to 40 years	Female	Millennial	Establishment	Young Adulthood	Senior Management
8	Between 27 to 40 years	Male	Millennial	Establishment	Young Adulthood	Senior Management
9	Between 46 to 56 years	Female	Generation X	Maintenance	Midlife	Senior Management
10	Between 46 to 56 years	Male	Generation X	Maintenance	Midlife	Senior Management
11	Over the age of 60 years	Female	Baby Boomer	Decline	Elderhood	Senior Management
12	Over the age of 60 years	Male	Baby Boomer	Decline	Elderhood	Senior Management

Data Collection Method

Data was collected through semi-structured one-on-one interviews with participants, either in person or using an online platform such as Zoom. The semi-structured interviews followed an interview guide consisting of open-ended questions. Participants were requested to relate their honest opinions, beliefs, and lived experiences with regard to the phenomenon being studied. The researcher used follow-up questions to probe issues to gain in-depth, rich data (DeJonckheere & Vaughn, 2019) and clarified issues that arose (Kallio et al., 2016). The interviews were conducted in a private area of the participant's choice, providing participants with a safe space to share their views and opinions. One-on-one interviews were conducted, which is the most effective method for gathering candid and honest information (Barrett & Twycross, 2018).

Data collection and storing of data

The 12 participants were interviewed and asked 10 questions to elicit information regarding their age, total rewards preferences that were influenced by 4IR and COVID-19, total rewards preferences influenced by their career stage, and total rewards preferences influenced by their life roles. Their interviews were audio-recorded and then transcribed verbatim. The researcher also compiled field notes during the interviews, which were used to supplement the audio recordings. Transcripts will be stored in a locked cupboard in the researcher's home office. Only the researcher and the study supervisors will have access to the data.

Data Verification

Data verification was ensured by the data having trustworthiness and rigour. Trustworthiness and rigour were achieved by credible, dependable, confirmable, and transferable data. The researcher achieved credibility by having prolonged engagements with the participants, having a reflective journal, and questioning the data to ensure an iterative process was established. Dependability was achieved by the researcher having notes of the activities and decisions related to the study, such as criteria for participants to be chosen, dates and times of the interviews, etc. (Connelly, 2016). The research process achieved transferability, with data and findings having a thick description to transfer the phenomenon to other settings, times, and people. The researcher's reflexivity ensured confirmability and the triangulation of multiple data sources (Amankwaa, 2016).

Research Procedure

Permission for the study was obtained from the Director of the Pharmaceutical company. Once permission was received in writing, the researcher sent a list of

criteria meant for purposive sampling to the HR Director for her to provide a list of employees who matched the criteria and who the researcher could contact to ask to volunteer in the study. The researcher ensured that the signed informed consent form was received from the participant before conducting the interview. During the interview, the researcher reiterated that the participant was free to decline at any stage of the research process and that their participation was voluntary and confidential.

Data analyses

The transcriptions were analysed using thematic analysis. The thematic analysis allows for the study of different perspectives of different research participants, indicating the similarities and differences in views while also generating unanticipated insights (Nowell, 2017). Thematic analysis analyses non-numerical data to identify patterns that emerge from the data. The patterns were coded, and the codes were grouped into themes (Roberts et al., 2019). In conducting thematic analysis, the researcher examined the participants' different perspectives, noting similarities and differences, and developed insights from the data (Nowell, 2017). The thematic analysis allowed the researcher to describe and interpret the data to derive meaning (Roberts et al., 2019). The transcripts were broken down into meaningful texts and labels (Nowell, 2017).

Strategies to ensure the quality and rigour of the proposed research design

Data quality was ensured through rich, in-depth, and detailed descriptions of the participants' lived experiences through immersion in the data. Researcher objectivity was maintained by the researcher being aware of researcher bias, noting it in the data analysis, and ensuring an iterative analysis was carried out. The researcher kept a reflexive journal to document the thoughts, beliefs, and insights, as recommended by (Nowell, 2017). Quality data was achieved by ensuring trustworthiness, transferability, dependability, confirmability, maintaining an audit trail, and implementing reflexivity during the research process. Trustworthiness was ensured by having a robust description of the research procedure, i.e., the purpose of the research, how the research was conducted, and how the data was gathered and stored (Hammarberg & Kirkman, 2016).

Research Findings

Theme 1: Compensation

One female Baby Boomer indicated that the pandemic made her focus on compensation to save money for unforeseen expenses, such as medical expenses.

“I now have a greater focus on savings for unexpected occurrences.”

(Participant 6, Female, age, Manager)

“My current focus is on adequate cash, medical and retirement cover”

(Participant 5, Female, 60 years old, Manager)

Theme 2: Benefits

A male Baby Boomer indicated that he didn't consider petrol cards as a benefit but considered the petrol allowance and paid WIFI. He also stated that the company had not implemented any new benefits since the pandemic.

“as result of Covid...was it took quite a while...is now that they're now paying for internet at home, which wasn't paid before, so that's at least a change. But from...in terms of other compensation and benefits, it's still the same.”

(Participant 12, Male, 61 years old, Senior Manager)

Male and female millennial participants stated that they value the total reward of benefits from their employer, specifically, car and petrol allowance and data for their phone.

“I get a phone I've got with 30 gigs of data and you know, I've got lots of minutes and so forth so that I think it would be the only thing that has been unique, you know which is post-Covid.” (Participant 2, Male, 40 years old, Manager)

However, the two Senior Manager participants stated that they did not feel the company implemented any additional benefits post the pandemic. The female participant even indicated that the one benefit she valued, i.e., the petrol card, was taken away due to the pandemic and employees working remotely.

“The other benefits like the allowances and stuff like that didn't really change I think (due to COVID-19 and 4IR).” (Participant 7, Female, 40 years old, Senior Manager)

“...for me personally, that was, there was nothing extra (in terms of benefits). It's compensation, recognition and well-being that I value, and the petrol card which they took away.” (Participant 7, Female, 40 years old, Senior Manager)

“When they took away the petrol card, that was a little bit hard because I've had that petrol card for 11-12 years and then now they taking it away. Because now you have to re-budget in your salary instead of just having it on the side.” (Participant 7, Female, 40 years old, Senior Manager)

“...the UPS and data, but it’s not a benefit, it’s just a necessary thing for us to be online, be available and able to connect to meetings and whatever work you need to do.” (Participant 8, Male, 31 years old, Senior Manager)

A male Gen X participant indicated that COVID-19 and the pandemic made him focus heavily on having the employer’s good medical aid benefit.

“I also realised the importance of medical aid. So I paid for it. And I chose a plan that I thought has us covered, and I’m happy with that. But the last two years, I’m actually focused properly on what benefits we have and what benefits we don’t have. Do I need to upgrade the medical aid plan and the fact that the medical aid is paid – the company pays 60% is amazing.” (Participant 10, Male, 51 years old, Senior Manager)

“... post-COVID-19 I realised the importance of a medical aid, that you have to have a good and reliable medical aid.” (Participant 10, Male, 51 years old, Senior Manager)

A male Gen X participant stated that his core life role is that of a Parent and having medical aid to cover his family and children is a necessity and data and a cellphone allowance.

“...especially in 2020, when my son was sick, the flexibility that we had during COVID-19 was great and the fact that I could Zoom call from my phone from the hospital. And the fact that we get a good cell phone allowance, data.” (Participant 10, Male, 51 years old, Senior Manager)

Theme 3: Well-being

Sub-theme 3.1: Flexibility and Remote Working due to COVID-19

From both male and female participants, the value placed on well-being was overwhelming. The findings indicated that both male and female Baby Boomers valued flexibility and the option to work remotely.

“The mere fact that we can work remotely and think outside of the box...for me personally, it was a pleasure not to sit in traffic for two to three hours at night.” (Participant 11, Female, 57 years old, Senior Manager)

“There is a greater focus (from the company) on rewards flexibility and employee well-being.” (Participant 5, Female, 60 years old, Manager)

“what I do certainly enjoy at this stage – and this is the result of COVID-19 - is the Flexi sort of working hours. Not say working hours, only Flexi days, so

between the office and home so that certainly benefits.” (Participant 12, Male, 61 years old, Senior Manager)

Male and female Baby Boomers indicated that they valued the company’s flexi-policy, which allows employees to work from home 3 days a week, which was implemented during the pandemic.

“So it certainly for me a benefit – the new the working, the new flexi policy. And I think it, so in a way that was a good outcome of Covid, because now flexi is expected.” (Participant 12, Male, 61 years old, Senior Manager)

“I had a foot operation about two and a half years ago, and I actually had to sort of, with crutches and stuff, hop on out of my car to go to the office every day because it’s kind of expected. Whereas now I would have been at home if I had a foot operation - because I just felt guilty for not going to the office. So you know, that’s certainly changed us to a whole new mindset, so I really enjoy that.” (Participant 12, Male, 61 years old, Senior Manager)

“Like this week, it’s two days only (in the office) so but, I really like the fact that you can actually also, I have to admit you also don’t want to work permanently from home because you know, I live on my own, so it’s also a case of just sometimes having just to get out and just come to the office, I really enjoy that.” (Participant 12, Male, 61 years old, Senior Manager)

Theme 4: Recognition and Appreciation

The total reward of recognition was also valued by both male and female participants. The participants indicated that they value their performance being recognised by their employer, managers and colleagues. Recognition is the total reward that motivated them to perform within their roles and for the company.

“...acknowledgement of performance so especially around our performance reviews and bonuses and things like that.” (Participant 10, Male, 51 years old, Senior Manager)

“... it’s a combination of your history with the company and working for them, but they know that you have a good work ethic and you’ll do what needs to be done and if you need to work after hours then you work after hours, and if I need a half a day off because my child has to go to the doctor then they’ll say, “It’s fine. Go for it”, and you know don’t have to take leave. So I think it’s a combination of you having proven yourself and their management style.” (Participant 4, Male, 55 years old, Manager)

"...the management team that I was going to be reporting to when I came back, for me, was a team that I knew and had worked with previously and had a lot of respect for me, and that's very, very important." (Participant 4, Male, 55 years old, Manager)

"I think firstly is recognition as a female...as a female leader, yeah. I think, for me, that is crucial." (Participant 9, Female, 50 years old, Senior Manager)

"I've always valued recognition by far the most." (Participant 3, Female, 46 years old, Manager)

Theme 5: Talent Development

Development refers to the opportunities employees have access to regarding their development within and without the company. Development can refer to on-the-job training, employee upskilling, promotions, lateral moves, career mobility, career growth, mentoring or coaching, and formal training/education subsidised by the employer (Van Dyk & Coetzee, 2012).

Sub-theme 5.1: Mentoring/Coaching

The female employee indicated that they had direct reports to manage. However, the male indicated that he does not have or want employees to report to him. The total reward of development was the least valued amongst Baby Boomers of both genders.

"At this stage of my life, I don't want actual people to report to me." (Participant 12, Male, 61 years old, Senior Manager)

"Earlier in your life, you look at how many people report you; the older you get, you want fewer people to report to you. And so my job is measured with what I do, not because somebody else had to do something." (Participant 12, Male, 61 years old, Senior Manager)

Sub-theme 5.2: Career Growth/Promotions

The total reward of development was the least valued reward by male Gen X participants.

"I don't need any more development. I'm happy getting my benefits." (Participant 10, Male, 51 years old, Senior Manager)

However, the female participants indicated that they value development in their roles and responsibilities and their careers as they require growth within the company. They value exposure to network and learning and development opportunities.

"You got to move up the ranks in terms of levels and grading. Because if you sit at you know...you know to move from Level 3 to level 4 in terms of position,

you've gotta gain exposure." (Participant 9, Female, 50 years old, Senior Manager)

"So now in 2022, I need more [job responsibilities]. So I'm looking for more exposure." (Participant 9, Female, 50 years old, Senior Manager)

"I'm in the HR program to speed up my networking with the region to gain exposure." (Participant 9, Female, 50 years old, Senior Manager)

"I've missed lots of prizegiving day. I've missed so many special days, but I've come to terms with that because I want to climb the corporate ladder." (Participant 9, Female, 50 years old, Senior Manager)

Discussion

The aim of this research was to explore the influence of 4IR and COVID-19 on the total reward preferences of male and female pharmaceutical industry employees based on their generational cohorts in the 'new normal' world of work. The research study findings indicated that female Baby Boomers focused on passing on their skills and knowledge through supervising and mentoring their subordinates using 4IR. In contrast, the male Baby Boomer did not want to supervise employees and pass on their knowledge. According to generational theory, he did not embody the typical characteristics of a Baby Boomer in the decline stage of his career, or an Elder. One female Baby Boomer indicated that she trusted her direct reports and recognised that they could complete their deliverables while working from home during the pandemic, using 4IR and tools to connect to her and the team, such as Zoom and Microsoft Teams. Male and female Baby Boomers indicated that the pharmaceutical company had kept up with technology and 4IR, which helped them complete their tasks and deliverables during the pandemic. They felt that the pandemic and 4IR forced the organisation to use technology to ensure business continuity and allow employees to work from home during the pandemic. The male Baby Boomer indicated that he was able to achieve his work-life balance by connecting to global colleagues and suppliers through the technology provided by the company, which was accelerated due to the pandemic, such as Zoom and Microsoft Teams. However, participants felt that 4IR and the pandemic increased workloads and working hours.

Research findings indicated that male Gen X participants felt that 4IR had enabled them to work remotely, requiring their employer to provide them with the necessary technical support and tools to connect anywhere and at any time. These tools were seen as an added benefit to the employee. Still, if they were not provided, the participants indicated that they would have expected an increase in

remuneration to compensate them. However, a female Gen X participant indicated that the technical tools provided by the employer were not added benefits, or even innovative benefits, as they were implemented years ago by her previous employers. Participants indicated that COVID-19 and the pandemic forced the company to adapt, allowing employees to work from home more frequently and therefore using Zoom or Microsoft Teams to have meetings with their customers and colleagues. Female Gen X participants indicated that 4IR led to a much-needed implementation of a flexi-working policy, i.e., working from home 3 days a week, as it provided them with opportunities to have flexibility during work to accommodate their children's needs, thereby fulfilling their core life role of Parent.

Both male and female participants indicated that 4IR enabled them to have flexibility regarding working from home or going to the office and allowed them to work on platforms which made completing their tasks easier. 4IR enabled them to work from home as they joined team meetings using Zoom, thus negating them from sitting in hours of traffic to get to the office. This led to an improved state of well-being, which was one of the main total rewards valued by Gen X participants. However, the issue of not having a work-life balance was heavily emphasised by both male and female Gen X participants. The participants indicated that 4IR and the technological platforms that it enabled, such as Zoom and Microsoft Teams, led to employees feeling as if they needed to be constantly available to the employer, as if they had to work extra hours and as if the company no longer respected their boundaries when they were meant to have stopped working because 4IR made it easier for their employers to connect with them regardless of the time.

The total recognition reward was also valued by both male and female participants. The participants indicated that they value their performance being recognised by their employer, managers and colleagues. Recognition is the total reward that motivates them to perform within their roles and for the company. The participants also indicated that trust and respect are needed from their managers to have flexibility during working hours. Trust was ensured by connecting with their managers remotely using 4IR tools, such as Zoom and Microsoft Teams. The total reward of development was the least valued reward by male Gen X participants. However, female participants indicated that they value development in their roles and responsibilities and their careers as they require growth within the company. They value exposure to networks and learning and development opportunities. A female participant went so far as to explain that she would even take a pay cut to develop in her dream role.

Practical implications

The research findings have practical implications for companies and HR managers in the pharmaceutical industry. The findings can help in the development of total rewards strategies that are aligned with employee preferences and needs. This in turn can improve talent attraction, retention and motivation in the evolving global 4IR market.

Conclusion

The study addresses a research gap by examining the impact of the 4IR on total remuneration in the pharmaceutical industry. It sheds light on how the 4IR affects employees' perceptions of rewards, an area that has been little researched. Using a qualitative phenomenological research approach, the study delves into the lived experiences of employees in the pharmaceutical industry. It identifies the factors that influence employee preferences for total compensation, including the impact of the 4IR and the pandemic COVID -19. This understanding is valuable for companies in developing effective total compensation strategies. Research shows that total compensation preferences are influenced by employees' age, gender and life roles. This nuanced understanding contributes to a more targeted and individualised approach to total compensation management and enables companies to address the diverse needs of their employees. The study shows that employees, regardless of age and gender, highly value total rewards for well-being. However, it also highlights how difficult it is to obtain these rewards from employers. This finding highlights the importance of prioritising employee wellbeing and offers insights into areas where companies can focus on meeting employee expectations. Overall, this study contributes to the existing body of knowledge by shedding light on total compensation in the context of 4IR and the pharmaceutical industry, offering insights into employee preferences and providing actionable recommendations for companies and HR managers.

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AN ASSESSMENT OF THE COVID-19 PANDEMIC IN SOUTH AFRICA: FROM ITS IMPACT ON THE ECONOMY TO THE REBUILDING STRATEGY

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Abstract

The conventional understanding is that the coronavirus pandemic (Covid-19) has challenged the development of the economies at all levels – global, regional and domestic. The need to assess its damage to the South African economy became imperative if the economy has to be resuscitated in an informed and targeted way. The study therefore aimed at assessing the impact of the Covid-19 Pandemic in South Africa, assessing the effectiveness of the South African government response to Covid-19 and outlining government strategies that have been employed in an effort to rebuild the South African economy. The study utilised the qualitative research approach in which semi-structured interviews were used to collect information on a purposive sample of 12 participants. Through the use of thematic analysis as the data analysis method, the study discovered that the Covid-19 pandemic has both long-term

¹ This paper is based on the author’s MBL research at the University of South Africa (UNISA). The usual disclaimer applies.

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and short-term impacts on the South African economy such as loss of employment, contracting GDP, depressed growth below pre-pandemic projections and lack of organisational performance. In response to Covid-19, the government introduced supporting programmes to businesses, regulations aimed at allowing credit facilities and partnership with various stakeholders. Strategies such as expansionary monetary strategies and the introduction of specific programmes targeting the resuscitation of key economic sectors have been implemented to rebuild the economy. The study, therefore, recommends that the government needs to build a buffer of resources in preparation of devastating pandemics such as Covid-19, such that when the country is hit by the pandemic, there are avenues that can be explored to resuscitate the economy. There is also need to ensure that there is a platform where business organisations can flourish as they can access capital and resources.

Keywords: *Coronavirus, Covid-19, Economy, South Africa, Government support programmes, Rebuilding Strategies*

JEL Classification: A10, I10; I15, O40

1. Introduction

The coronavirus (Covid-19) pandemic has had wide and diverse impacts on the economies across the globe. As noted by Berger and Reupert (2020) the Covid-19 hit the global, regional and domestic economies harder than the 2008 financial crisis and most sectors are recovering at a slower pace as compared to the financial crisis of 2008. In addition, the consequences of the pandemic are being experienced in all sectors such as financial markets, travel and industry, tourism, sales, investments, hospitality and tourism to mention just but a few. In today's global, regional, and domestic economies, there is an intertwine between economies such that certain types of economic and financial shock such as the Covid-19 pandemic, have medium to high impact on other countries. As noted by the International Labour Organisation (ILO, 2020), COvid-19 crisis has already transformed into an economic and labour market crisis. There is increased unemployment and loss of revenue by business organisations.

Two years after the emergence of the pandemic, the topic of Covid-19 continues in dominating every narrative in respect to the global economy. As noted by Muchenje (2021), the future of trade, tourism, migration, education, supply chain and innovation in Africa amongst other aspects remain constrained by the uneven

recovery from the pandemic. Returning to ‘normal’ indeed will require a truly global effort aimed at curbing and addressing the rampage caused by Covid-19 is continuing to have on human and financial health in economies. Instead, the world is now witnessing the emergence of parallel but diverging world where there is the rich and the vaccinated and the poor and unvaccinated (Muchenje, 2021). Africa remains amongst the latter and the region is being left behind during global economic recovery.

As of 2021, there major themes in Africa were that of divergence in vaccination rates, intensification of fiscal pressures, increased b=debt levels and uneven economic recovery. These themes further enhance the challenges that Africa was already facing such as unemployed youth, lack of infrastructure and challenges in climate change. Therefore, the pandemic has forced African leaders to realise that the best way of addressing the effects of Covid-19, is through promotion of healthy economic growth (Bhorat, 2021).

Despite these challenges to African growth and development, there are reasons to be cautiously optimistic for the future of Africa. regional powerhouses such as South Africa, Nigeria, Egypt and Ethiopia may continue to struggle in the year ahead, there is the forecast by the International Monetary Fund (IMF) on string economic growth of Sub-Saharan Africa in which projections are of 3.8% growth in 2022 (Bh orat, 2021). Medium-sized economies such as Ghana, Ivory Coast, Kenya and the likes are projected to have 6% growth rate as high commodity process and government reforms improves financial stability. Smaller economies such as Seychelles, Mauritius and Niger will also improve and reach growth in 2022. This is also perceived from the now-operational African Continental Free Trade Area (AfCFTA) as well as the increase in entrepreneurial and technological savvy populations (Muchenje, 2021).

South Africa is at war with the on-going novel coronavirus disease which has adversely affected all areas of production within the economy causing many businesses (both small and large) to close permanently, and leaving many South Africans without employment, with loss of income and food security concerns. According to ILO (2020), the coronavirus affected the health, daily life, and psychological wellbeing of the South African population.

There have been efforts by governments in the world to deal with the effects of the pandemic. According to Masters, Shish and Bukoff (2020) such measures taken by governments include relief programmes to business organisations, capital injections to boost importing of raw materials, cash injection to citizens, delayed tax and loan payments to mention just but a few.

According to Garidzirai (2020) the South African government mitigated the demographic and economic effects of Covid-19 by imposing some forms of lockdowns to reduce the spread of the virus challenged on conventional socio-economic forms of contact. The ultimate effect of lockdown was a loss of income and the laying -off of some workers, leading to an increase in the unemployment rate. According to Statistics South Africa (2020), currently, the unemployment rate in South Africa is at 35.3%, which is significantly high. According to Dzomonda and Masocha (2019), most companies in South Africa operate on credit basis where they borrow capital and the pandemic meant that these organisations were not able to repay the loans and even operate.

Although there are now a sizeable number of studies undertaken on the impact assessment of the pandemic, it is imperative to note that such studies were mostly carried out before a lot had been known about coronavirus. The cause of the pandemic has greatly evolved, with various variants observed and studied; it necessitates another study to look into the impact of the Covid-19 on South Africa – a lacuna this study aims to fill. As the South African economy is still ailing, an investigation into the government's response to the pandemic; and the ways and strategies available for the country to come out of the doldrums cannot be overemphasised.

Against this backdrop, the study aims to assess the impact of the Covid-19 Pandemic in South Africa and the effectiveness of the South African government response to Covid-19. It is also the aim of the study to present measures taken by the government to address economic challenges presented by the pandemic and in the process, protect the citizens and enhance economic development. This study therefore provides a storyline detailing the impact of the pandemic, survival strategies and rebuilding strategies that can be implemented for economic recovery.

This study is unique in that it assesses the impact of the pandemic on the South African economy at a time when it has evolved, and a lot of information is now known about the virus than before. As the study further attempts to unmask the recovery strategies, it is expected that the results of this study are valuable to the policy makers in South Africa to help fight the virus and devise speedy rebuilding mechanisms. The study is organised into five sections. Section 2 reviews literature while Section 3 details the methodology, leaving Sections 4 and 5 for the discussion of results and the conclusion, respectively.

2 Literature review

2.1 The dynamics of Covid-19 in South Africa

An overview

The first stringent lockdown was introduced in South Africa on 23 March 2020, where the government imposed strict restrictions on movement and limited economic activities to essential services (Donthu and Gustafsson, 2020). The lockdown measures lasted for over 5 weeks and this only allowed 40% of the workforce in South Africa to work. This included those who had jobs that allowed them to work from virtual offices and from home (Kerr and Thornton, 2020).

Businesses that were deemed not essential were forced to close during lockdown, resulting in a large number of employees losing their jobs and increasing pressures on the South African economy. In response, the South African government May 2020 and June 2020 implemented level 4 and 3 lockdown respectively with the aim to open up the economy but many business organisations had failed due to the effects of the pandemic (Makoae, Tolla, Hongoro and Sekyere, 2020).

The lockdown measures affected the streams of distribution of income and employees that had low levels of education were more affected than those with skilled labour and worked in professional organisations. In other words, those with low levels of education lost their jobs as compared to those with higher levels of education. The wages earned by households with lower levels of education were reduced, affecting their ability of employees to cater for their families. From this perspective, Covid-19 led to increased poverty in the country (Arndt et al., 2020).

Covid-19 and the South African economy

South Africa was at war with the on-going novel coronavirus disease (COVID-19) which has negatively affected almost all sectors of the economy, causing many businesses (both small and large) to close permanently, and leaving many South Africans without employment, with loss of income and food security concerns. The coronavirus affected the health, daily life, and psychological wellbeing of the South African population. (South African Chamber of Commerce and Industry, 2020:5).

According to South Africa Economic Update (2021), the pandemic recorded the worst decline in the South African economy after independence as there was the contraction of the economy by 7%. This was more than any other emerging economies across the globe. In addressing this effect, the government injected a sizeable relief package which saw the increase in GDP to 12.9% and public debt to 78.8% of the GDP (South Africa Economic Update, 2021). This, however, has led

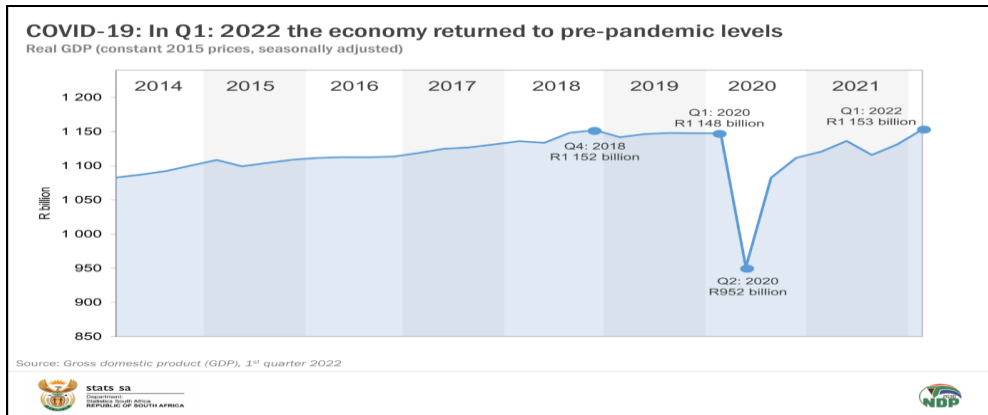
South Africa to face a high debt cost as its service debt burden is at 5% of the GDP, thus lack of servicing debt at low interest cost. South Africa also entered the Covid-19 pandemic with a fragile fiscal framework, economic challenges of lack of employment, collapsed industry and liabilities from state-owned enterprises, including those in power utility, Eskom. The South African Country Report (2021) mentions that Covid-19 triggered crisis in the tourism industry in South Africa which is one of the most critical sectors for economic growth. This was further enhanced when there was the closing of the border on 18 March 2020 for high risk countries and cancelling of international flights by March 27, 2020. The level 3 and 4 lockdown restrictions saw hotels and accommodation agencies; restaurants (except takeaways), tourist destinations and others could not trade. Muchenje (2021) noted that there was spending less by households on fast foods in the second quarter of 2020.

In addition, the lockdown affected the poor as they lost their jobs as compared to others who were better off. In addition, the wages of those remaining at work reduced drastically and there was increased inequality in the country. At the start of Covid-19, unemployment rate in South Africa reached 29% and the number of people who were not in employment, training or education reached 24% of the population (South Africa Country Report, 2021).

The South African government mitigated the demographic and economic challenges brought by the pandemic through restriction of movements and imposing a strict lockdown. The ultimate effect of lockdown was a loss of income and the laying -off of some workers, leading to an increase in the unemployment rate (Garidzirai, 2020). Currently, the unemployment rate in South Africa is at 35.3%, which is significantly high (Statistics South Africa, 2022). Most companies in South Africa operate on credit basis and the conditions of the pandemic meant that these organisations were not able to operate and also repay the loans they had accessed (Dzomonda and Masocha, 2019).

Figure 1 presents the real GDP of South Africa between 2014 and 2021.

Figure 1: South Africa's (GDP) growth rate from 2014 to 2021



Source: Statistics South Africa (2022)

The GDP refers to the total sum of all goods and services that a country produces by each year and this is an important indicator of the strength of the country's economy (Bhorat, 2021). Real GDP is adjusted for price changes and it is therefore perceived as a key indicator for economic growth (Stats SA, 2022). The economic activity in South Africa thus recovered from the impact of the pandemic as real GDP increased by 1.9% between January and March 2022 following a revised 1.4% growth between October and November 2021. The level of real GDP exceeded the average 2019 level, before the beginning of the Covid-19 pandemic, for the first time in the first quarter of 2022.

South African government response to Covid-19 pandemic

In terms of governance, a pandemic such as Covid-19 requires that the government of South Africa present regulatory and fiscal measures aimed at addressing the effects of the pandemic. The government therefore responded to the pandemic through a plethora of avenues in which the main aims however was stabilising the economy. Other measures included addressing the decline in supply and demand of the economic activities and protection of the economy from the rising unemployment rate as well as protecting life (The Presidency, 2020).

The South African Reserve Bank responded to the pandemic through offering lending facilities to private organisations. This was welcomed as a positive measure to address the effects of the pandemic as it allowed organisations to access capital and reduced liquidity from 100% to 80%. These measures also saw relaxed

capital charges and a general boost in business operations amidst the pandemic. The government also ensured that there was financial relief as R20 billion in additional health relief. In addition, another R20 billion was also given to local government to ensure service delivery (The Presidency, 2020).

The government also deployed various health resources through partnership between the public and private sector. There was also support from civil society organisations and non-governmental entities as well as advice from those in the academic sector. The South African government also called out to private sector into the pandemic battlefield. According to the Global Compact Network South Africa (2021) the private sector, with government backing, responded to Covid-19 in various ways, including the following:

South Africa's rebuilding strategies

The South Africa Reserve Bank introduced expansionary monetary policies aimed at making borrowing cheaper, increasing consumer spending, and boosting economic growth through the multiplier process. The borrowing rate was lowered from 6.25 to 5.25% (Reserve Bank of South Africa, 2020a). The fiscal authorities increased government spending to support small businesses and vulnerable people in the society (National Treasury, 2020a). President Cyril Ramaphosa announced a R502 billion stimulus package in April 2020, in which R50 billion was aimed at social assistance in direct financial transfers to support economical vulnerable households (National Treasury, 2020). There was also a temporary increase in all existing financial grants where 18 million people were beneficial. There was also the introduction of the new grant where R350 Covid-19 Social Relief of Distress Grant was given to the unemployed who had no access to government assistance (The Presidency, 2020).

According to the Presidency (2020), the South African government mobilised a social protection system that was aimed at addressing the negative economic impacts of the pandemic to the most vulnerable in communities, households and even organisations through grants, Covid-19 relief fund, and expansion of Unemployment Insurance Fund. There was also the introduction of Temporary Employee/Employer Relief Scheme (TERS)

According to South Africa country report (2021), government also provided the bridging of liquidity aimed at sustaining organisations to facilitate a post lockdown recovery, provide wage support and mitigate lay-offs. The Reserve Bank of South Africa reduced the repo rate by 3.25% in 2020. In addition, there was the granting by banking and financial institutions of loans to individuals. In addition, the President also launched the Economic Reconstruction and Recovery Plan that was

aimed at stimulating the economy and boosting the ailing infrastructure, summarised in Table 1 (The Presidency, 2020).

Table 1: COVID-19 support package, as announced on 21 April 2020

Intervention	R (billion)	% of Total
Additional Health Support	20	3.98
Municipal Assistance (water and sanitation)	20	3.98
Wage Protection (UIF)	40	7.97
Job Protection and Creation	10	19.92
SMME Support	2	0.40
Tax Relief	70	13.94
Credit Guarantee Scheme	20	39.84
Social Assistance (Grants)	50	9.96
Total Allocation	50	100.0

Source: National Treasury (2020)

According to Table 1 there is the breakdown of the support by the state to Covid-19. The government spent R20 billion in additional health and this amounted to 4% of the total intervention to curb the pandemic. Another R20 billion was allocated to municipalities to provide for basic services. The bulk of the spending by the state was based on worker support measures which added up to 82% of the total Covid-19 relief intervention. There was also the allocation of R40 for low-income earners in the formal sector, R100 billion was spent on job creation and protection, covering wage subsidies for those in low-wage formal sector; R2billion was allocated to SMMEs; R70 billion allocated in corporate tax relief and a R200 billion loan facility (National Treasury, 2020).

Challenges and opportunities presented by Covid-19 to South Africa

The pandemic had an impact on food security, education and exposed the healthcare of the country as many communities were facing challenges. This showed a system of inequality in South Africa. There were further drops in employment as people could not access employment and the virus led to serious socio-economic challenges. As noted by Donthu and Gustafsson (2020), the

pandemic led to the close of air traffic, reduced road traffic and lack of tourism challenged cities that were accustomed to such.

A lockdown was declared, leading to the closure of schools and tertiary institutions. Student's educational progress was challenged and lecturers and teaching had to revert to remote teaching online Teachers and learners in poor communities could not access online teaching and learning due to lack of resources. Ajam (2020) is of the view that the education system of South Africa was exposed as the poor communities were not able to access education as compared to rich communities.

The Covid-19 pandemic created an opportunity to reduce greenhouse gasses, air, water, and land polluting outputs. Human resources management in all sectors has an opportunity to ensure investments in acquiring skills and training and development of employees (Ajam, 2020).

The technological development of a polity was also perceived in the era of the pandemic (Berger and Reupert, 2020). This is because an economy that is technologically advanced is able to ensure that there is access to resources, capital and jobs as innovation and entrepreneurship is enhanced. The Covid-19 pandemic therefore ensured that countries in Africa that were not investing in technological developments are able to ensure that there is access to technology and investment in such (Sharma and Shukla, 2018).

2.2 Covid-19 impact, response strategies and rebuilding, strategies: Theoretical literature review

The impact of Covid-19

The coronavirus pandemic broke out at the beginning of 2020 and became a global pandemic. One hundred and sixty million cases and 3.3 million deaths were reported worldwide by May 16, 2021. This significantly affected the economic operations and import and export trade of all countries in the world.

According to the Masters *et al.* (2022), the pandemic affected global economic and trade activities from the following perspectives: closing of business organisations, reduced consumption by households, strict custom regulations due to restrictions in movement and increased costs in logistics. The pandemic caused a slowdown of world trade, loss of income, high unemployment, depreciation of the local currency and stagnant economic growth (Department of Small Business and Enterprise, 2020).

The virus also saw the decrease in merchandise trade by 10% and there was also decrease in commercial services by 21% in 2020. There was a different impact of

the pandemic on goods and services in which services were mostly affected. Services declined by 30% between March and June 2020, compared to 23% decrease in goods. There was decrease in movement, travel, tourism, recreation facilities due to lockdowns and this affected operation of business organisations and economies (Department of Small Business and Enterprise, 2020).

Most schools of thought argue that the pandemic had wide effects in Sub-Saharan Africa as this part had agriculture and tourism as major economic players, and these were affected by the pandemic. Aspects that were affected also included remittances, markets and financial sectors. The pandemic exposed the region to existing challenges such as poverty, inequality, health challenges and increased unemployment Muchenje (2021).

Tourism declined drastically in Comoros, Seychelles, Cape Verde, The Gambia, Sao Tome and Prince and Mauritius due to the imposed global travel restrictions (IMF, 2020). Other countries in the region that suffered from the pandemic include Ethiopia, Tanzania, Kenya, and South Africa (Lone and Ahmad, 2020). Ethiopian Airlines radically cut their flights across the region and by April 2020 reported USD550 million lost in revenues and 90% drop in flights (Desta, 2020).

Sub-Saharan African countries experienced a decline in earnings from a range of export primary products including agricultural products, minerals, and oil. The International Monetary Fund (2020c) predicted that oil-exporting economies will shrink by -4.0% – Nigerian and Angolan economies alone by -4.3% and -4.0%, respectively, in 2020.

The decline in economic activities and shutdown of factories and plants in the industrial countries leads to lower external mineral demand, which adversely affected the mining industry in South Africa (Lone and Ahmad, 2020). The imposition of lockdowns and work restrictions reduced the income of those who send some of their earned money back to their families and relatives for support. Remittance reflects strong family connections and dependency in many parts of Africa. The IMF projected that the pandemic would result in the remittances to SA falling by around 20% (IMF, 2020b)

The World Bank (2020) concluded that in sub-Saharan Africa, the pandemic pushed about 26 million more people into extreme poverty in 2020 and up to 39 million in case downside risks to growth materialize (Donthu and Gustafsson, 2020; Republic of South Africa, 2020a). Income inequality increased as lockdowns disproportionately affected informal sector workers and small and medium sized companies in the services sectors (IMF, 2020b). Almost 90% of women employed in Africa are in a bad position because they work in the informal sector with no

social protections. Female headed households are particularly at risk (United Nations, 2020).

The squeezing of global financial conditions had great repercussions on SA. Capital outflows caused interest rate spreads which restricted the regions borrowing capability from the international capital markets. The consequences of lockdowns and reduced economic activities are lower levels of revenues, specifically tax revenues (Ataguba, 2020; Lone and Ahmad, 2020).

Response strategies to the covid-19 pandemic

The World Health Organization initiated the Covid-19 solidarity response fund aimed at raising funds for the emerging and developing economies and provide support for the development of business organisations. In the United States for example, there were laws passed to ensure fiscal support for entities in the economy. There were direct payments to individuals who were made worse off by the pandemic and funds such as Covid-19 aid, economic security and the others were aimed at economic revival. Nations, worldwide, responded by introducing national aid schemes to improve access to health and ensure that people were able to afford basic commodities.

The following key strategic interventions were implemented by governments with the aim of enhancing socio-economic recovery amidst the pandemic: cooperation and trust between government and non-state actors, financial relief plans, harmonisation between all levels of government, trade facilitation, resumption of all economic activities, environmental relief programmes amongst others. Governments in Africa also responded through monetary and relief programmes and measures aimed at economic recovery. Such measures saw capital injections to households, business revival strategies and defaulting tax and loan repayments (Chowdhury, 2020).

Many governments in the Southern African region were able to put in place crisis management on areas affected by the pandemic and the creation of quarantine zones to manage the spread of the virus. There was the adoption of the unusual monetary and fiscal expansion policies with the aim of addressing the effects of global supply and demand that were caused by the virus (Benmelech, 2020). The Central Bank of Madagascar injected US\$111 million beginning of March and US\$53 million at the end of March 2020. Morocco Bank Al-Maghrib implemented the integrated business support and financing program (Bhorat, 2021). The government of Ivory Coast ensured that US\$200 million was channelled to efforts aimed at mitigating the spread of the virus. The central bank

was also able to cut cash reserves and more than USD 130 million was injected to fund businesses that were struggling (Benmelech, 2020).

The cause of the pandemic required that special means had to be introduced by governments to address the effects of the pandemic. This came through monetary and fiscal measures aimed at keeping the economy afloat and these missions were characterised by the ability of the government to recognise potential areas that needed to be addressed (The Presidency, 2020). In efforts aimed at mitigating the socio-economic impacts of Covid-19, a set of measures were adopted by the South African government such as wage support through UIF, supporting business organisations, releasing disaster funds and tax relief for organisations and partnership with various stakeholders (The Presidency 2020a).

Bhorat (2021) argues that the response by the South African government to the pandemic was through fiscal stimulus package which has seen an increased number of funding on key economic sectors such as the tourism sector and agriculture sector. Furthermore, the fiscal mandate has also seen spending on individual and business organisations and this has added up to 6.5% of GDP. The government also injected financial capital in curbing the virus in which R20 billion was injected into the health department aimed at enhancing access to healthcare of communities, especially those that were most vulnerable. In addition, the government also ensured that support was given to households in forms of grants and relief packages. The Presidency (2020a) further postulate that the National Treasury took upon itself to ensure that hospitals and other medical facilities had access to protective clothing, masks and other instruments critical in fighting the pandemic.

The central bank of South Africa also played its part in addressing the effects of the pandemic as it reduced the repo rate by 250 bases points so as to ensure that debtors are able to repay the loans at most affordable terms.

Rebuilding Strategies

Muchenje (2021) is of the view that global recovery strategies amidst the effects of the pandemic required that governments come up with flexible and supportive policies aimed at enhancing economic development and improving all aspect of sustainable and inclusive growth. The pathway towards this was the government support and effectiveness in rolling out vaccinations, meaning that the economy would be able to function (Muchenje, 2021; Bhorat, 2021).

Multilateral action was introduced with the aim of sharing knowledge, financial resources, human capital and removing trade restrictions. This was perceived as a way to ensure the resuscitating of economies and sharing of resources. According to Benmelech (2020), policy makers were also able to make sure that governments

were able to understand short-term solutions to the pandemic as well as long-term projects to be implemented. The pandemic also exposed the pre-pandemic challenges that governments were facing and governments were given the opportunity to address such without political pressure (Atuguba, 2020).

Countries in the African region need robust policy responses, paired with strong support from development partners to rebuild post Covid-19. African countries would need to prioritise healthcare spending for the provision of essential personal protective equipment (PPE) and materials, acceleration of local production of medical supplies including PPE and vaccine and drug discovery. African governments were also to allocate funds for scientific, economic, and social research. Vulnerable households would need to benefit from targeted cash transfers and subsidies. Businesses should receive incentives in a form of tax relief and subsidies (Ajam, 2020). Central banks must inject liquidity into the African economies, turning to unconventional policy tools such as quantitative easing if necessary. Governments must aim at supporting private sector growth, revamping education and labour markets for the future of work (Bhorat, 2021).

Challenges and opportunities presented by Covid-19

The methods aimed at curbing the pandemic such as restrictions on travel and movement challenges trade in services which required close proximity between consumers and suppliers. The fear for the spread of the virus meant that drastic measures were put in place but however these methods had wide and diverse effects on production, distribution of goods and services (Veeramani, 2021)

In addition, the pandemic had an impact on food security, healthcare and other facets of the economy and in the process, exposed the state of affairs in economies (Ajam, 2020). There were cases of increased unemployment, loss of income as people lost their jobs, disruption in supply chains, economic turmoil and poverty was largely experienced. Industries were forced to close due to lack of markets and both air and road traffic reduced challenging on supply chain and routes critical for socio-economic development (Arndt, 2020).

According to McGrath (2022), Covid-19 presented a global opportunity of remote working to the business world. Companies that were previously sceptical about allowing employees to work remotely realized that place of work is not as important as they always thought. Companies have embraced that hybrid and remote forms of work are going to be around.

According to Ajam (2020), the Covid-19 pandemic has offered the opportunity for a much more human-focused approach to productivity and for leaders to think the way they think of work. The coronavirus pandemic also saw the introduction

and increased demand of online education as tertiary institutions as well as schools closed. However, this avenue challenged access to education of learners from poor and remote area and this is often perceived as the genesis of uneven access to education from people from poor communities (Bhorat, 2021).

The Covid-19 pandemic created an opportunity to reduce greenhouse gasses, air, water, and land polluting outputs. Human resources management in all sectors has an advantage to invest in aspects such as talent acquisition and development of skills for employees. The post Covid-19 pandemic Africa, therefore, needs to re-think on the need to utilise technology and innovations as these have the potential to drive economic development. socio-economic progress in the contemporary environment require that there is adoption of technological development in communities (Ataguba, 2020).

2.3 Covid-19 impact, response strategies and rebuilding strategies: Empirical literature review

There are a plethora of studies that have been conducted across the globe with the aim of understanding the effects of Covid-19 on the economies with focus on aspects such as changing consumer behaviours. In India, a study was conducted by Lama (2020) where a qualitative approach was conducted through interviews and the study was an exploratory research. The study discovered that people were now spending on basic commodities not on luxury. The same results were found by Goswami and Chouhan (2021) and Aday and Aday (2020).

Aday and Aday (2020) further discovered that people started to adopt and be comfortable with e-commerce as this business avenue gradually increased in the pandemic era. This is confirmed by Ataguba (2020) who discovered that online food shopping replaced the traditional form of shopping. The worst affected sectors within the pandemic were travel and tourism as restrictions in movement impacted on the sector (Muchenje, 2021; Jaipuria, 2021).

Besides India, several countries were also subjected to studies on the impact of Covid-19. Bharot (2021) found that in South Africa a large number of the workforce was not able to earn any income during the pandemic. Fairlie and Fossen (2022) through utilising the 2020 current population survey in an analysis of small businesses in the USA, discovered that small businesses declined by 22% in the first quarter of 2002 and most immigrant-owned entities were also affected.

Against the tide, there are some studies that found Covid-19 to have benefited economies. According to Veeramani (2021) Covid-19 opened the doors for many services rendered through digital networks and the internet. The pandemic pushed 'The third unbundling' as a form of globalization that affects the services sector by

changing the way services are transacted (Bhorat, 2021). Digitally enabled services capable of online delivery such as tele-health, online education, professional consulting and online advisory services grew much faster due to the changing global business scenario. Digital entertainment platforms such as Netflix, Amazon, Showmax, YouTube Premium and DSTV have seen a whopping jump in their membership subscriptions (Muchenje, 2021).

While the positive impact of the pandemic was reverberated by Srivastava (2020) in the automobile industry, from the health/medical front, it was echoed by Chatterjee (2021) and Zonke (2021). Agarwal et al. (2020) relied on synthetic control methods to investigate the effect of counterfactual mobility restriction interventions in United States. The author found that lifting severe mobility restrictions and retaining moderate mobility restrictions effectively reduced the number of deaths in United States.

Further search on empirical literature revealed the existence of studies, though just a few, that empirically investigated the rebuilding strategies employed by various economies to bring their economies back to their pre-pandemic levels, in terms of socio-economic performance (see Rasul et al., 2020 and World Bank, 202a, among others). Rasul et al., (2020) found that the Covid-19 situation in South Asia provided a unique opportunity to use the disruptive forces of the pandemic and associated policies for recovery, to accelerate the transition to more sustainable and resilient societies.

The World Bank (2020) recorded that the central bank of India rolled up an initiative aimed at increasing the GDP of the country and enhance access to capital for business organisations. This was adopted in all India as stimulus measures aimed at economic development were rolled up with the need to also enhance access to capital by small businesses. This was also conducted in Pakistan where financial support was injected with the aim of supporting SMES. There was also an initiative to reduce taxes and tariffs on importing of goods and services. Furthermore, the Bangladesh government announced the plan aimed at supporting export services (World Bank, 2020).

3. Research Methodology

3.1 Research philosophy, design, strategy and approach

There are basically two broad philosophies used in research and these are positivism and interpretivism (Creswell, 2018; Saunders, 2016). The study utilises the interpretivism philosophy. This philosophy captures on shared meanings, language and opinions of participants that critical towards generation of knowledge

towards what is being investigated (Creswell, 2014). This study further utilises the exploratory research design. This design is used in studies that seek to gather in-depth information in respect to the research problem and in the process, offer founding solutions for future studies (Creswell and Creswell, 2018). A case study strategy was used in the study in which this requires the observation of characteristics of a setting. The case study design was used as it ensures deep exploration and analysis of a plethora of perspectives that are prevalent in a social situation. The qualitative approach was used in the study as it ensures deep and insightful understanding of the research problem as smaller samples are also utilised.

3.2 Data

The study used primary data as information was collected from first hand sources. The target population of the study consisted of owners of small businesses, employees in private sector, unemployed youth and management agents of malls. The simple random sampling was applied on the selected population. The study further utilised non-probability sampling technique where each and every element in the target population does not stand an equal chance of being part of the (Babbie, 2010). Purposive sampling technique was further utilised in which participants are included in the research based on their understanding and experience with the phenomenon being investigated (Kumar, 2014). This sampling technique ensured that the researcher was able to access samples that are critical towards giving an insightful and deep perspective on the matter under investigation.

Ultimately, the sample size is comprised of four small business owners from beauty and personal care, two unemployed youth, two trade unions, one filling station, one training and skills provider and two respondents from business leadership South Africa, Brand South Africa and two managing agents of shopping malls. Therefore, the total sample size is 14. In qualitative research, a sample size has to be between eight and 15 participants for findings to be representative of the target population (Creswell, 2014). This sample size is also argued to lead to data saturation in research.

Semi-structured interviews were used as the research instrument in the study (Flick, 2016). This method allows for probing where the researcher engages with participants to effectively comprehend the research problem. The guide is structured to present the demographic details of participants as well as impact of Covid-19 on the economy, government strategies to curb the impact of the pandemic and rebuilding strategies to ensure economic growth. The collected data was analysed qualitatively using thematic analysis (Creswell, 2014).

Trustworthiness of the study was ensured through aspects such as credibility, transferability and dependability (Leedy and Ormrod, 2015). Credibility was ensured through member checking as participants who have informed understanding of the research problem were included in the sample. Transferability was ensured through enhancing that the findings from the study can be transferred to different contexts and settings. Dependability was achieved using data source triangulation. Ethical issues were abided by, ensuring that issues of confidentiality and anonymity of participants is upheld. Ethical clearance certificate was also applied for and granted before data collection commenced.

4. Empirical Results and Discussion of Findings

4.1 Response Rate, Validity and reliability

From a sample of 14, 12 participants gave their consent to be part of the study and successfully participated in the interviews. Thus, the study achieved an 86% response rate. Creswell (2014) is of the view that in qualitative research, the response rate has to be more than 60% for the findings of the study to achieve data saturation. From the study, the response rate was ideal to ensure the understanding of the research problem. Respondents comprised of four small business owners from beauty and personal care, two unemployed youths, two trade unions, one filling station, one training and skills provider and two respondents from business leadership South Africa, Brand South Africa and two managing agents of shopping malls. Therefore, the total sample size of the study was 14 participants.

4.2 Demographic profile of the respondents

The demographic details are an important element within research studies as they present the traits and characteristics of the target population and how these ensure the understanding of the research problem (Maree, 2015). The study captured demographic details such as age, gender, highest qualification, work experience, position in the organisation and employment sector. These are summarised in Table 2 (see annexure). These demographic details and their relevance in the study are presented in the following subsections.

As revealed in Table 2, participants aged below 35 years constituted 25% of the sample. In addition, those aged between 35 and 50 years comprised of 42% of the participants and those aged above 50 years constituted to 33% of the participants. This means that although participants came from a wide and diverse age backgrounds, enhancing the comprehension of the research problem from different age groups, most participants were in the middle age-group. From the study, it was

found that males constituted more in terms of gender as they comprised of 58% of the participants. This is against the 42% composition of females. The mode highest educational level was the graduate degree with 50% of the participants. Overall, the participants from the study had wide and diverse educational qualifications enhancing the effective understanding of the assessment of the Covid-19 pandemic on the South African economy, and the rebuilding strategies.

From the study, it was found that participants had a wide range of work experience, critical towards an effective comprehension of the matter under investigation. While 33% had experience of less than 10 years, 42% and 25% had 10-20 years and more than 20 years experience, respectively. About 33% of the participants were the owners of business organisations whilst 25% of the participants were part of the executive within organisations they are associated with. Those in management constituted to 17% of the participants whereas employees comprised of 25% of the participants. The spread was considered suitable for the balanced understanding of the views, opinions and experiences of individuals towards the research problem. In terms of the business sector distribution, most participants were from the beauty and spar as well as the real estate sectors.

4.3 Research Results

The section reports and discusses the results of the study. The presentation and discussion of findings is organised by study objectives.

4.3.1 Objective 1: To assess the impact of Covid-19 pandemic in South Africa

The first objective of the study sought to assess the impact of Covid-19 pandemic in South Africa. This objective was derived from the conventional understanding that the Covid-19 pandemic, ever since its emergence, and the mitigation measures to curtail the spread of the pandemic, challenged the conventional ways of life and doing business, thereby having an undeniable impact on the socio-economic and political development of South Africa. To address this objective, the study sought to identify the long-term and short-term impact of the Covid-19 pandemic on the South African economy.

(i) The study revealed that the Covid-19 pandemic has had both long-term and short-term impacts on the South African economy. These are presented and discussed in the paragraphs below.

(ii) *Loss of employment*

One of the impacts of the Covid-19 on the economy of South Africa was loss of employment to citizens. As noted by Participant One:

The Covid-19 pandemic saw increased cases of loss of employment which coupled the socio-economic challenges in South Africa for before the pandemic, there were high levels of unemployment. The pandemic saw small business organisations not being able to operate and even large organisations were forced to shut down leading to issues of loss of employment.

This was confirmed by Participant Two who noted that:

Economic impact, Covid-19 impacted the industry in a way that people had to stop working and so their salaries were reduced by 20%. That became a huge burden, although TERS grant was provided by government to reduce the burden, people had to survive with less money, and food.

From these findings, it can be noted that loss of employment is both a short-term and long-term impact of Covid-19 on the South African economy. The results were consistent with Muchenje (2021).

(iii) Contracting GDP

Another short- and long-term impact of Covid-19 on the South African economy is the GDP contraction. According to Participant Three:

The Covid-19 pandemic saw the closure of almost every economic activity, apart from essential services; and in the South African economy where tourism and small businesses are critical towards the development of the country, the pandemic challenged the operations of such businesses. This saw the contracting of the GDP, leading the country to operate on high debt platform.

This assertion was also shared by Participant Nine who noted that:

The Covid-19 saw the contraction of South Africa's GDP by 7% in 2020. This was the worst contraction of South Africa's GDP in the era of democracy and this saw the increase in public debt. The South African rand continued to fall against the dollar and even in the present economy, the South African currency is not performing well on international markets

The Covid-19 pandemic had short- and long-term impact on the economy of South Africa as the country's GDP by the end of 2020 contracted by 7%. This was due to closure of businesses including tourism and hospitality. Same sentiments were echoed by Muchenje (2021).

(iv) Low economic growth below pre-pandemic projections

One thematic area that kept popping up as a long-term impact of Covid-19 on the economy of South Africa, related to the GDP contraction, is low growth, below pre-pandemic projections. Accordingly, Participant Four noted that:

The Covid-19 pandemic have seen limited growth in South Africa as sectors and industries such as commerce and tourism are still not operating at a maximum due to issues brought about by the pandemic. In addition, people across the globe have changed their spending in which most people are no longer spending on recreational facilities as they can no longer afford such or now have different priorities.

These findings were confirmed by Participant Nine who noted that:

The economy of South Africa is projected to be growing at a slower pace than anticipated before the pandemic, where projections of economic growth in South Africa were high. There were estimations that the unemployment rate would have been halved by 2022 but in reality, the employment rate is still high.

From these findings, it can be observed that the Covid-19 pandemic impacted negatively on the economic growth of South Africa. The results find support from (Arndt et al., 2020).

(v) Lack of Organisational Performance

The Covid-19 pandemic has had short- and long-term impacts on organisations which culminated into lack of organisational performance. According to Participant Two:

Covid-19 saw the closure of non-essential business organisations, big and small, meaning that revenue was minimised especially on small business entities operating in food, retail, beauty and spar to mention other sectors. People were spending less on non-essential activities and were surviving on basic commodities. This meant that organisations were not able to operate thus lack of effectiveness and efficiency.

In addition, Participant Six noted that:

Small business entities were affected immensely by Covi-19 as they were forced to shut down due to measures aimed at mitigating the spread of the virus. For instance, organisations in clothing, beauty and construction were forced to close off as these were regarded as non-essential services. As small businesses survive on their day-to-day operations, these entities were forced to close off permanently.

In addition, Participant Ten argued that:

Less than 70% of emerging businesses survived the Covid-19 pandemic as the socio-economic conditions of Covid-19 challenged business operations of such organisations. This is also the case with established organisations who had to think of new ways and strategies to meet customer needs as they were forced to close operations. This saw large number of people losing their jobs and businesses losing their contracts and risking closure.

From these findings, it can be noted that lack of organisational performance is both a short-term and long-term factor that impacted business organisations in the Covid-19 era. This is due to economic forces that challenged the operations of businesses as they were forced to shut down and access markets. As noted by Kerr and Thornton (2020), 99% of families in the era of the pandemic were able to shun the operations of fast-food restaurants impacting negatively on organisational performance of business operations.

It is also imperative to note, however, that the impact of Covid-19 on business operations have all not been negative as some positive aspects have emerged.

(vi) New and informed ways of doing business

Another short- and long-term impact of Covid-19 on the South Africa economy was that this led to new and informed ways of doing business for businesses to survive. According to Participant Five:

The lockdown and mitigation measures to curtail the spread of the virus meant that organisations had to come up with new and informed ways of doing business amongst which included working from home, setting up virtual offices and use of technology to reach potential clients. In the present economy, some small organisations in South Africa have successfully set-up virtual offices cutting across issues to do with rentals and other office issues that can impact on their financial performance.

In addition, Participant Eight noted that:

Enterprise social media marketing was introduced effectively as a phenomenon in the Covid-19 pandemic. Since people could not access physical enterprises, social media was used as an advertisement platform where organisations were using cheap and convenient methods to reach to clients and even deliver goods and services. In the post-Covid-19 environment, social media marketing is now

being experienced and ensuring that organisations are able to reach markets and customers.

Furthermore, Participant Twelve highlighted that:

Social media marketing has seen the increased use of technology within organisations where tele-conferencing, zoom meetings and other applications are now being used at the convenience of people. This is effective as people do not need to be in one room to make decisions. This is increasing the development of organisations and helping them realise their goals and objectives.

From these findings, it can be noted that survival strategies adopted by organisations in the Covid-19 era have ensured their survival and development. The results is consistent with (Kerr and Thornton, 2020).

4.3.2 Objective Two: To assess the effectiveness of the South African government response to Covid-19

The second objective of the study sought to assess the effectiveness of the South African government's response to Covid-19. This objective was derived from the understanding of the impact of Covid-19 on the South African economy and the need to determine the methods and practises employed to mitigate such effects. To address this objective, the study sought to determine the effectiveness of South Africa government's response to Covid-19 on the country.

The results of the study revealed wide and diverse aspects in respect to the effectiveness of South Africa government's response to Covid-19 on the country. These are presented and discussed in the paragraphs below.

(i) Fiscal and monetary measures to address economic challenges

The government of South Africa introduced fiscal and monetary measures aimed at addressing economic challenges which managed to address short-term challenges but created long-term undesired effects on the South African economy. As noted by Participant One:

The fiscal and monetary measures introduced by the government were effective towards addressing the socio-economic challenges faced by communities. For instance, in the beginning of Covid-19, companies introduced the salary reductions and the TERS grant made a huge difference on salaries. The difference after receiving this grant was replaced by the transport allowance

which was not utilised during Covid-19 lock downs. Be that as it may, the government, in the long run, is facing challenges in repaying these grants taken which has challenged the effectiveness of the economy.

In addition, Participant Four perceived interventions from the business level and noted that:

The government introduced programmes aimed at supporting large businesses and small business in the Covid-19 pandemic. These monetary and non-monetary interventions helped organisations access capital and resources from both domestic and international markets which was critical for survival. However, these strategies in the long-term were not sustainable on both the government and business organisations requiring performance of the economy which is still lagging behind.

From this perspective, it can be noted that the government of South Africa introduced monetary and fiscal measures aimed at enhancing the development of people and organisations in the era of the pandemic. Sets of measures such as debt fund, aid fund, unemployment fund and social grants to communities allowed for entities and individuals to access basic needs and ensure survival amidst the challenges brought by the pandemic (The Presidency, 2020). However, the sustainability of these measures has been questioned as the South African government has to have incurred associated huge debt.

(ii) Regulations to allow credit facilities

Another intervention by the government on the economy was the introduction of regulations aimed at allowing credit facilities. As noted by Participant Three:

The government allowed the banking system to support lending to the private sector as liquidity was reduced. This allowed institutions and organisations to be able to access capital from banks and financial institutions and in the process be able to operate within the business constraints of the pandemic. However, this was a short-term policy as banks were beginning to be affected by lack of repayments of loans leading to a financial crisis.

This is confirmed by Participant Ten who noted that:

The government introduced regulatory frameworks amongst which allowed banks to offer credit facilities to individuals and organisations on much more flexible terms. The idea was to ensure that organisations have access to capital

and resources that would enhance their development; and that individuals are not defaulting on their repayments. However, the conditions of the pandemic saw challenges in lack of investment by organisations and they were facing challenges in repaying these loans.

The South African Reserve Bank provided regulatory relief to the banking system to support lending to the private sector. It allowed temporary relief of bank capital requirements reduced the liquidity coverage ratio from 100% to 80% and relaxed capital charges and provisioning requirements on Covid-19 related credit exposures. This was welcomed as an initiative to enhance the development of the country as business organisations had access to capital and resources. However, in the long run, this was a challenge towards the survival of banking institutions as there were limited business activities and organisations were not able to re-pay the loans given to them. This impacted the regulatory framework by the government as a strategy to mitigate the effects of Covid-19 on the economy. In addition, the stimulus package was also introduced which included a considerable additional and reprioritised spending, targeted at both firms and individuals, and added up to 6.5% of GDP. Concerns were raised on how easily the relief measures will be implemented and accessed by the various government departments that oversee their delivery (Bhorat et al., 2020).

(iii) Partnership with stakeholders

The government of South Africa also partnered with various stakeholders in a bid to enhance relief mechanisms to curb the spread of the pandemic and achieve development. As noted by Participant Two:

The government partnered with stakeholders in both the public and private business environment and together methods of business such as relief mechanisms to organisations and social grants to citizens were enhanced which ensured survival of businesses and organisations in the pandemic era.

This was confirmed by Participant Six who noted that:

The government and various stakeholders in the public and private sphere were able to coordinate and ensure that measures to mitigate the spread of the virus were enhanced. Organisations in the health sector funded and led research to come up with vaccines which was a positive result towards ending the lockdown and ensure that the economy was opened up.

From this perspective, it can be noted that the government was effective in responding to the pandemic and its effects on the community through partnership with various stakeholders.

The study findings reveal that although the government's response to the Covid-19 had unintended negative consequences to a certain extent, in the main, the response was effective.

However, despite the highlighted effectiveness, respondents had a few pointers on how the government's response and its effectiveness could be improved in the future. The study found that there is need for a platform in which the government can respond to future pandemics. The conditions for such as found from the study are *relief fund for public emergencies* and *research and development*.

In respect of the *relief fund for public emergencies*, the study found that there is need for relief fund for emergencies and methods of disposal for such funds have to be ensured. As noted by Participant One:

Just like how private organisations have resources that are set aside in cases of emergencies, the government has to ensure that it has at its disposal such funds that can be channelled to curtail the spread and address socio-economic challenges that come from disasters and pandemics.

This was confirmed by Participant Three who noted that:

There is need for the government to come up with a legislative framework that presents the ways in which funds can be accessed and channelled towards addressing socio-economic challenges that comes from crisis and situations such as the pandemic. The importance of such is to ensure that there is swift response towards addressing consequences that come from pandemics

In terms of *research and development*, it was felt that it needs to be enhanced so as to capture information about disasters and address these disasters. As noted by Participant Six:

Governments have to ensure that research and development is made to ensure that as much information is captured on the effects of disasters and create strategies and measurements to guarantee that disaster management strategies are put into place.

In addition, Participant Eight noted that:

Data management and capture has to be the focal point in responding to pandemics and governments have to ensure that resources are put in place to manage the spread and effects of disasters. This has to be learned from the Covid-19 pandemic where mitigation measures were put in place without effective data management.

Furthermore, Participant Twelve noted that:

There is need to ensure that research and data collection is enhanced from all levels and the process has to be integrated. This means that local communities, local authorities, organisations and provincial governments have to be included in the collection of data for effective implementation of processes and procedures to address disasters.

From this perspective, it can be argued that data collection, management and research has to be ensured to enhance those methods and practises to develop and mitigate consequences of pandemic. Lessons from the Covid-19 pandemic saw countries in the developed world coming up with responses that were based on data collected and this made their efforts to deal with the pandemic effective (Benmelech, 2020). This has to be translated to developing countries such as South Africa that are lacking in research and data management in respect of the pandemic as realised in the Covid-19 era. Therefore, research and development has to be enhanced for effective and swift methods of intervention in times of crisis.

4.3.3 Objective Three: To outline the government strategies that have been employed in an effort to rebuild the South African economy

The third objective of the study sought to outline the government strategies that have been employed in an effort to rebuild the South African economy. This objective was derived from the understanding of the impact of Covid-19 on South Africa's economy as well as the effectiveness of South African government response to Covid-19. Therefore, there is need to determine the policies and methods that have been put in place by the South African government to spearhead the efforts of rebuilding the economy. To address this objective, the study sought to identify and discuss the strategies implemented by the government in rebuilding the economy of South Africa.

The study discovered that there are numerous strategies that have been adopted by the government of South Africa in an effort to rebuild the economy. The following is a presentation and discussion of such strategies.

(i) Expansionary Monetary Policies

The study discovered that expansionary monetary strategies were implemented by the government and the Reserve Bank of South Africa with the aim of rebuilding the economy after the effects of Covid-19. As noted by Participant One:

The government of South Africa and the Reserve Bank came up with further policies aimed at ensuring that companies and business organisations have access to capital, resources and markets with the aim of surviving the effects of the pandemic. The central bank and the government had, during the pandemic, come up with monetary policies but these were expanded post-Covid-19 to boost the economy.

This was confirmed by Participant Six who noted that:

There is the realisation by the government that post-Covid-19, the economy is growing at a slower pace. The government, therefore, expanded loan facilities and access to capital to organisations that required it. In addition, state enterprise grants were enhanced to help struggling organisations, such as Eskom, which are vital towards the economic development of South Africa.

It can be noted from the findings that during the pandemic, the government through the Reserve Bank came up with policies and initiatives to enhance borrowing and access to credit for firms. From this perspective, it can be noted that the government has introduced monetary policies aimed at rebuilding the economy after the effects of Covid-19.

(ii) Specific programmes to alleviate challenges faced in key economic sectors

Another strategy implemented by the government with the aim of rebuilding the economy was the introduction of specific programmes targeting the resuscitation of key economic sectors. Accordingly, Participant Two noted that:

The government has introduced specific measures to address the challenges faced in the tourism industry which is a major contributor to the economic development of South Africa. Amongst these is the Tourism Relief Fund, the Tourist Guides Fund and the Tourism Equity Fund which are aimed at boosting the tourism sector in the country.

In addition, Participant Five noted that:

The government has introduced programmes targeting the revival of the industry that was challenged by the effects of the pandemic. The Industrial Development Corporation's Covid-19 Distressed Funding is the major aspect that has been introduced to address challenges faced in the industry and the government has even promulgated policies to ensure that the industry has access to finances, capital and raw materials.

Furthermore, Participant Seven highlighted that:

The government has noted the challenges faced by emerging small farmers in respect to Covid-19 and in the process, has come up with policies and mechanisms enhancing their access to markets and resources. Social grants to emerging farmers have also been enhanced with the aim of enhancing food security.

From this understanding, it can be noted that the government has introduced various policies and frameworks aimed at enhancing the development of key sectors in the economy.

(iii) Investment in social media marketing

In an effort to rebuild the country, one of the South African government's strategies was to encourage the businesses to adapt to the new environment presented by Covid-19 and embrace the use of social media platforms as marketing and sales order avenues achieve productivity and satisfy the demands of their customers. As noted by Participant Four:

The government has encouraged organisations and businesses to invest in social media marketing which is perceived as a cheap, convenient and flexible method of conducting business. Social media marketing ensures that there is interaction between the brand and customers, there is data and research on the trends and processes to determine customer demands and that these platforms have high engagement rates

In conformity, Participant Ten noted that:

Social media is being used as a method of conducting businesses as organisations are utilising small budgets on marketing in trying to survive in the economy. Social media marketing requires the use of minimum resources in engaging with customers and responding to customers and organisations are increasing in their use on these platforms.

In addition, Participant Eleven argued that:

Social media marketing has a high response rate and organisations in the contemporary business environment have started using these approaches to market their products and communicate with clients. Social media marketing ensures that organisations have the ability to interact with target audiences as the increase in the use of social media doubled in the Covid-19 era.

Statistics South Africa (2021) acknowledges that ever since the pandemic began, there has been increased use of social media by people and organisations; and that those with social media presence are able to interact and achieve organisational efficiency through these platforms. Social media is cheap and easy to use, thus organisations have found it effective to conduct their business through social media. Therefore, in terms of profitability, organisations are leveraging social media marketing as a method to engage with customers, as the national rebuilding process takes place.

5. Conclusion

The focus of the study was an assessment of the Covid-19 Pandemic in South Africa: From its impact on the economy to the rebuilding strategy. The study was motivated by the need to establish and document the impact the Covid-19 pandemic has had on the economy of South Africa and the need to come up with interventions to ensure that these impacts are addressed, where needed. The first objective of the study was to assess the impact of the Covid-19 Pandemic in South Africa while the second objective of the study sought to assess the effectiveness of the South African government response to Covid-19. The third objective of the study sought to outline the government strategies that have been employed in an effort to rebuild the South African economy.

In order to realise its objectives, the study utilised the qualitative research approach due to its ability to lead to in-depth understanding of the research problem. Within this approach, a purposive sample was selected, for this method allows for selection of a sample that has an understanding and experience with the phenomenon being studied. Primary data was collected through semi-structured interviews and thematic analysis was used for the analysis.

The overall findings of the study have revealed that loss of employment, the contraction of the South African GDP, limited growth in South Africa as sectoral activities shrank are some of the short- and long-term effects of Covid-19 on South

African economy. On a positive note, another short and long-term impact of Covid-19 on the South African economy was that it led to new and informed ways of doing business for these organisations to survive. Further, the results show that In terms of assessing the effectiveness of the of the South African government response to Covid-19, the government of South Africa introduced fiscal and monetary measures aimed at addressing economic challenges which managed to address short-term challenges but created long-terms effects on South Africa's economy. The government of South Africa also partnered with various stakeholders in a bid to enhance relief mechanisms to curb the spread of the pandemic and achieve development. The results of the study, this, indicate that the government's response to the pandemic was largely effective.

Regarding the third research question, which sought the government strategies that have been employed in an effort to rebuild the South African economy, it was revealed that in an effort to rebuild the economy, following the devastating effects on Covid-19 – a pandemic that was still unfolding – the South African government adopted expansionary monetary and fiscal strategies. Social media centric approach to business was also one of the rebuilding strategies the government adopted to ensure the effectiveness of entities in doing business in a constrained environment.

Based on the results of the study, the South African government is recommended to build a buffer of resources in preparation of devastating pandemics such as Covid-19, such that when the country is hit by the pandemic, the immediate government response is not crippling to the economy. Through financial and human support to individuals and to businesses, in general, and to SMEs, in particular, the government can ensure that key players in the economy are playing their part in concerted efforts towards economic development in a pandemic period. The study also recommends that an avenue that can be exploited by governments in the future is to ensure that research and development is prioritised so as to capture information about disasters and address these in real time or as soon as possible. Data management and capture has to be the focal point in responding to pandemics. This has to be learned from the Covid-19 pandemic where mitigation measures were put in place without effective data management.

6. Declarations of interest

None

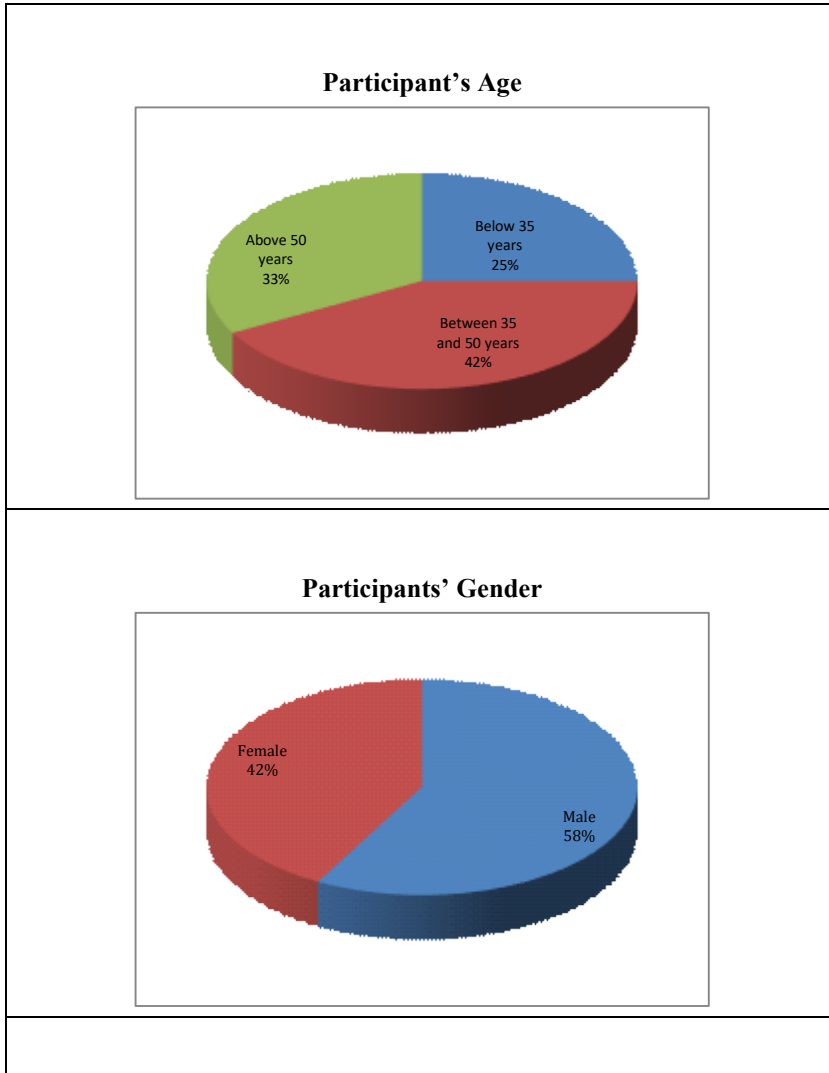
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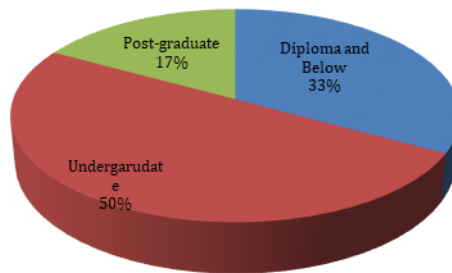
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Table 2: A Summary of the Demographical Information of Participants – Itemised

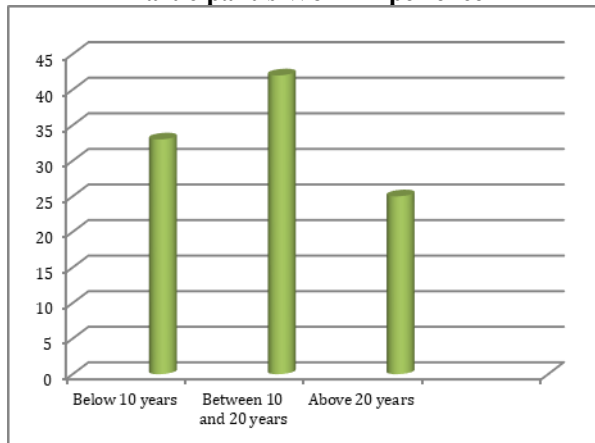




Highest Qualifications of Participants

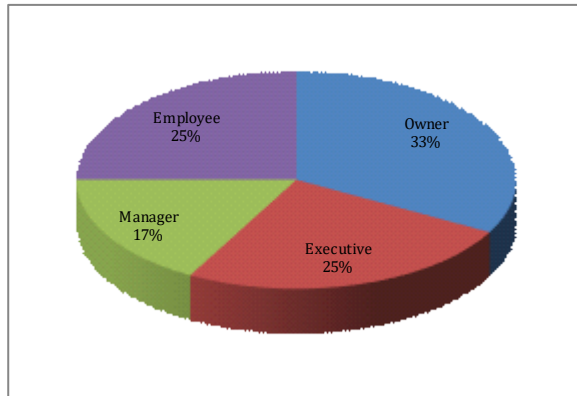


Participant's Work Experience

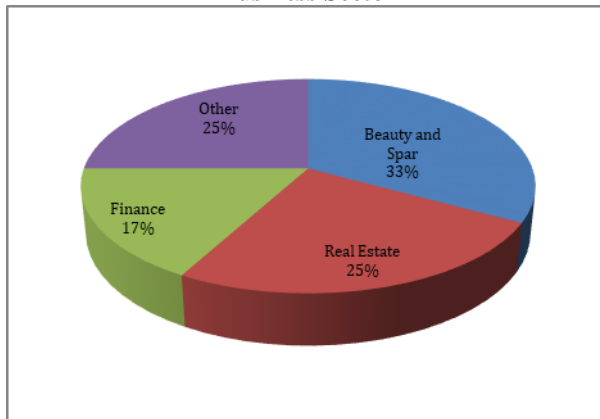




Participant's Position in the Organisation



Business Sector



THE IMPACT OF COVID-19 PANDEMIC ON THE VALUE RELEVANCE OF ACCOUNTING INFORMATION

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Abstract

Value relevance is defined as a statistically significant relationship between the accounting information presented in financial statements and the corresponding stock prices in the capital market. The objective of this study is to examine the effects of the COVID-19 pandemic on the value relevance of accounting information within the Bulgarian capital market. We analyze the impact of the COVID-19 pandemic on the value relevance of accounting information using panel unit root tests, descriptive statistics, and panel regression models. The results obtained indicate that the COVID-19 pandemic has had a positive impact on the value relevance of accounting information in the Bulgarian capital market. We prove that the book value per share and the sales revenue per share gain value relevance, and these accounting variables influence stock prices after the spread of COVID-19. The financial accounting indicator, dividend per share (DPS), demonstrates increased value relevance in the period after COVID-19 compared to the period before COVID-19. As a result, the period after COVID-19 is characterized by higher levels of value relevance compared to the period before COVID-19.

Keywords: *value relevance, accounting information, Bulgarian capital market, panel data, COVID-19.*

JEL Classification: C23, G15, M40, M41

Introduction

The COVID-19 pandemic has significantly increased uncertainty in the global economy and has led to heightened volatility in financial markets. After China officially announced several confirmed cases of COVID-19 in late December 2019, which was later identified as a new type of coronavirus (SARS-CoV-2), global stock markets were among the first to be affected by the pandemic. This pandemic has had a significant impact on the entire economy (Arfah et al., 2020; Sun et al., 2021). Undoubtedly, almost every enterprise from different sectors, including tourism, transportation, energy, and manufacturing, has suffered the consequences of the COVID-19 pandemic. These consequences include rapidly deteriorating business performance, increasing economic uncertainty, currency exchange rate and oil price fluctuations, and a sharp decline in stock prices (Carracedo, Puertas & Marti, 2021). Thus the degree of sustainability of different organizations has been greatly affected, companies being forced to find different new sources for their sustainable strategy on a long run (Gârdan et al, 2022; Baicu et al, 2022). What is more, investment activity is highly dependent on such phenomena as the COVID - 19 pandemic (Simeonov & Lyubenov, 2022).

Additionally, COVID-19 has affected not only stock prices and investors but also the importance of financial statements, particularly the value relevance of accounting information. In the same time, the pandemic has been affected the perceptions of different stakeholders (financial services customers included) about the reliability of different businesses which may go into the direction of supplementary financial information needed in order to make decisions. (Baicu et al, 2020). Value relevance can be defined as the ability of accounting information contained in the financial statements to explain firm value (Beaver, 1968). According to Gu (2002) the value relevance is the ability to explain accounting information to stock prices. The value relevance of accounting information can be described as the extent to which the elements of the financial statements interact with stock prices.

The main objective of this study is to analyze the impact of the COVID-19 pandemic on the value relevance of accounting information on the Bulgarian Stock Exchange.

Literature review

Several studies have focused on examining the value relevance of accounting information (André, Dionysiou & Tsalavoutas, 2018; Ahmadi & Bouri, 2018; Indrayono, 2019; Oppong & Bruce-Amartey, 2022).

Belesis et al. (2022) analyze the impact of COVID-19 on the value relevance of accounting information for companies listed on the stock exchanges of France, Germany, the Netherlands, Italy, Spain, and the United Kingdom. The study covers the period from 2010 to 2020 and applies the Olsen model and linear regression analysis. The results presented in the study indicate that the explanatory power of financial statements is nearly equal across all countries, with the exception of Germany, where it is significantly higher. It has also been proven that the explanatory power of financial statements decreased in all countries after the onset of the pandemic. In most analyzed countries, earnings become less relevant compared to the increasing relevance of book value due to the financial crisis.

Janros et al. (2022) demonstrate that the spread of COVID-19 has led to a deterioration in the financial condition and performance of companies, as well as a decrease in stock prices on the Indonesian Stock Exchange. This decrease in stock prices reflects the implementation of an effective earnings management mechanism by managers of these companies. Apriwandi et al. (2021) analyze companies that listed their shares on the Indonesian Stock Exchange during the COVID-19 pandemic and demonstrate that accounting data is more valuable and dependable than financial data. Consequently, it is imperative for investors to use accounting data when making significant economic decisions. Liu and Sun (2022) empirically find that the relevance of earnings decreased in 2020 compared to 2019 in the United States due to COVID-19. Aljawaheri et al. (2021) prove that the relevance of accounting information, such as earnings per share, book value per share, and net operating cash flows per share, decreases as a result of the ongoing COVID-19 pandemic and the subsequent economic lockdown in Iraq.

Methodology and data

Data

Panel data on an annual basis were used. The analyzed period is January 1, 2018 - December 31, 2021, with the first two registered cases in Bulgaria being from March 8, 2020 (Stoykova, 2022). In this study, two sub-periods are distinguished:

1. Period 1 (2018-2019) - the period before COVID-19;

2. Period 2 (2020-2021) - the period after COVID-19.

When analyzing the impact of the COVID-19 pandemic on the value relevance of accounting information in the Bulgarian capital market, the analyzed period is divided into two separate sub-periods: the period before COVID-19 (2018-2019) and the period after COVID-19 (2020-2021). Panel regression models are applied for both sub-periods, and a comparison is made between the obtained results to determine the extent to which the COVID-19 pandemic has affected the value relevance of accounting information. The empirical analysis utilizes the financial and accounting variables presented in Table 1.

Table 1: Variables used in the empirical analysis

Variable	Type of variable	Abbreviation	Equation
Stock price	Dependent	SP	Stock price at the end of the year (December 31st)
Earnings per share	Independent	EPS	$\frac{\textit{Profit after taxes}}{\textit{Weighted average number of shares}}$
Sales per share	Independent	SPS	$\frac{\textit{Sales revenue}}{\textit{Number of shares outstanding}}$
Book value per share	Independent	BVS	$\frac{\textit{Shareholders' equity}}{\textit{Number of shares outstanding}}$
Net operating cash Flow per share	Independent	CFS	$\frac{\textit{Net cash flows from operating activities}}{\textit{Number of shares outstanding}}$
Dividend per share	Independent	DPS	$\frac{\textit{Total amount of dividends paid}}{\textit{Number of shares outstanding}}$

Source: The author's systematization is based on previous scientific research.

Information on the stock prices of the analyzed Bulgarian public companies was collected from the website of Infostock AD - <https://www.infostock.bg/infostock/control/home>.

The study uses the following accounting variables: earnings per share, sales per share, book value per share, net operating cash flow per share, and dividend per share. These indicators were selected based on previous scientific research and the availability of data for their calculation. The accounting information was collected and processed from the individual annual financial statements of the companies being analyzed. In addition, the Bulgarian capital market requires registered issuers

to disclose detailed quarterly and annual financial statements. Thus, all accounting data were collected from the website of the Bulgarian Stock Exchange (BSE).

Table 2 presents the explanatory (factor) variables used in the regression equation, as well as the expected sign for each of them.

Table 2: Independent variables and their expected signs:

<i>Independent variables</i>	<i>Expected sign</i>
Earnings per share (EPS)	Positive +
Sales per share (SPS)	Positive +
Book value per share (BVS)	Positive +
Net cash flows per share (CFS)	Positive +
Dividend per share (DPS)	Positive +

Source: Author's systematization based on previous scientific research

The sample includes twenty individual joint-stock companies from various industries in Bulgaria. All the companies included are public enterprises that list their shares on the Bulgarian Stock Exchange (BSE). The stock indices SOFIX, BGBX40, BGTR30, and BGREIT are based on the market capitalization of the ordinary share issuances of the selected Bulgarian public companies. The public companies on which these stock indices are calculated must meet certain minimum criteria for liquidity, market capitalization, number of shareholders, and other factors.

The study focuses on companies from various sectors of the Bulgarian economy, namely: the manufacturing industry, professional activities and scientific research, transportation, storage, postal services, real estate operations, hospitality and restaurants, the mining industry, construction, etc. In addition, these twenty companies were selected because all the necessary accounting information is available for the entire analyzed period - 2016-2021, and these are all non-financial public companies registered on the Bulgarian Stock Exchange (BSE) at the time of data collection and processing (as of September 15, 2022). The analyzed companies are public, and the BSE requires all registered issuer companies to prepare and publish their quarterly and annual financial statements. The accounting data used in this study is from the individual annual financial statements of the companies. The analyzed public companies prepare and present their financial statements in accordance with International Financial Reporting Standards (IFRS) (Accounting Act, 2021). Table 3 presents the information for all public companies included in the sample. The specific sector, subsector of all surveyed companies, as well as their stock code, are also presented.

Table 3: Analyzed companies included in the sample

<i>N^o</i>	<i>Company name</i>	<i>Sector</i>	<i>Subsector</i>	<i>Kod</i>
1	TCHAIKAPHARMA HIGH QUALITY MEDICINES AD-SOFIA	Manufacturing	Manufacture of pharmaceutical preparations	THQM
2	SOPHARMA AD-SOFIA	Manufacturing	Manufacture of pharmaceutical preparations	SFA
3	NEOCHIM AD-DIMITROVGRAD	Manufacturing	Manufacture of fertilizers and nitrogen compounds	NEOH
4	SIRMA GROUP HOLDING AD-SOFIA	Professional, scientific and technical activities	Activities of head offices	SGH
5	SPEEDY AD-SOFIA	Transportation and storage	Other postal and courier activities	SPDY
6	MONBAT AD-SOFIA	Manufacturing	Manufacture of batteries and accumulators	MONB
7	VELGRAF ASSET MANAGEMENT AD-SOFIA	Real estate activities	Renting and operating of own or leased real estate	VAM
8	SOPHARMA TRADING AD-SOFIA	Wholesale and retail trade; repair of motor vehicles and motorcycles	Wholesale of pharmaceutical goods	SFT
9	AGRIA GROUP HOLDING AD-VARNA	Professional, scientific and technical activities	Business and other management consultancy activities	AGH
10	ALBENA AD-ALBENA	Accommodation and food service activities	Restaurants and mobile food service activities	ALB
11	KORADO BULGARIA AD-STRAZHITSA	Manufacturing	Manufacture of central heating	KBG

<i>Nº</i>	<i>Company name</i>	<i>Sector</i>	<i>Subsector</i>	<i>Kod</i>
			radiators and boilers	
12	OIL AND GAS EXPLORATION AND PRODUCTION AD-SOFIA	Mining and quarrying	Extraction of crude petroleum	NGAZ
13	ALCOMET AD-SHUMEN	Manufacturing	Aluminium production	ALCM
14	TRACE GROUP HOLD AD-SOFIA	Construction	Construction of roads and motorways	T57
15	EMKA AD-SEVLIEVO	Manufacturing	Manufacture of other electronic and electric wires and cables	EMKA
16	ZARNENI HRANI BULGARIA AD-SOFIA	Wholesale and retail trade; repair of motor vehicles and motorcycles	Wholesale of grain, unmanufactured tobacco, seeds and animal feeds	ZHBG
17	GALATA INVESTMENT COMPANY AD-VARNA	Real estate activities	Buying and selling of own real estate	GTH
18	BALKAN AND SEA PROPERTIES REIT-VARNA	Real estate activities	Buying and selling of own real estate	BSP
19	HIMSNAB BULGARIA AD-SOFIA	Real estate activities	Renting and operating of own or leased real estate	CHSB
20	PETROL AD	Wholesale and retail trade; repair of motor vehicles and motorcycles	Retail sale of automotive fuel in specialized stores	PET

Source: Author's systematization.

Note: The table presents the names, sectors, and subsectors of all public companies included in the sample, along with their stock codes (as of September 15, 2022).

Panel unit root test

Before proceeding to the empirical analysis of the impact of accounting information on stock prices, it is necessary to apply the Panel Unit Root Test. This panel unit root test summarizes the results of all five unit root tests (when applicable). This test is used to assess the stationarity of the panel data we are analyzing, i.e. whether the panel is stationary or non-stationary.

The main mathematical formula of the equation is presented as follows:

$$\Delta y_{it} = \alpha y_{it-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{it-j} + X'_{it} \delta + \epsilon_{it} \quad (1)$$

The null and alternative hypotheses can be presented as follows:

$$H_0: \alpha = 0 \quad (2)$$

$$H_1: \alpha < 0 \quad (3)$$

The null hypothesis states that there is a unit root, i.e. the data is non-stationary, while the alternative hypothesis states that there is no unit root and the data is stationary. If the test results indicate that we should accept the null hypothesis for the presence of a unit root (i.e., reject the alternative hypothesis), it is necessary to transform the series. This transformation is done by calculating the first and/or second difference. As a result, the data is integrated in the first or second order.

Panel regression

Regression analysis is widely used to establish the presence and direction of the relationship between two or more variables. The regression model is a suitable method for analyzing the impact of the COVID-19 pandemic on the value relevance of accounting information. For the purpose of empirical analysis, the following three regression models have been applied:

1) Pooled Ordinary Least Squares (POLS) represents a simple panel regression that combines cross-sectional and time series data. This model lacks individual spatial and specific time effects, assuming that the dynamics of the data are the same across different periods. This panel regression can be represented by the following formula:

$$y_{it} = \alpha + \beta X_{it} + \epsilon_{it} \quad (4)$$

2) Fixed Effects Panel Regression - In fixed effects panel regression, the constant is specific to each group and remains constant over time. In fixed effects panel regression, each analyzed economic unit is considered "unique" and cannot

be attributed to random selection from a specific general population (Nenova, 2020). The following equation is applied to calculate fixed effects panel regression:

$$y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it} \quad (5)$$

3) Random Effects Panel Regression - In random effects panel regression, the objects are randomly selected from a large population. The main advantage of applying random effects panel regression is the elimination of heteroscedasticity. The model can be represented by the following mathematical equation:

$$y_{it} = \alpha + \beta X_{it} + u_i + \varepsilon_{it} \quad (6)$$

The following explanatory legend applies to equations (4), (5), and (6):

For $i = 1, 2, \dots, N$ and $t = 1, 2, \dots, T$.

Where:

y - dependent variable;

x - independent variables;

t - reflects the time range;

T - number of periods;

i - reflects the spatial range;

N - number of individual or spatial data;

α - intercept of the model;

β - unknown parameter subject to calculation;

u - specific individual effects;

ε - error.

To determine which of the two models - fixed effects or random effects is more suitable, the Hausman test has been applied.

Results and Discussion

The results of the panel unit root test indicate that all the analyzed panel time series are stationary at the zero-order (level) with a significance level of 5%. Therefore, there is sufficient evidence to reject the null hypothesis of non-stationarity (at level (0)) for the accounting and financial variables.

The results of the Hausman test for Period 1 are presented in Table 4, while the results of the Hausman test for Period 2 are shown in Table 5. The results indicate that the fixed effects panel regression model is the most suitable for both Period 1 and Period 2. For both subperiods, the panel model with fixed effects by firms has been applied, as this is the most appropriate model for the purposes of the present study.

Table 4. Results from the Hausman test (in panel regression for the impact of COVID-19 on the value relevance of accounting information) for Period 1

Correlated Random Effects - Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test Summary				
		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		36.655771	5	0.0000
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
SPS	-0.947696	0.099197	0.304871	0.0580
EPS	1.758416	0.780302	2.202626	0.5099
DPS	11.432689	12.931739	1.829523	0.2677
CFS	-0.583287	-1.244003	0.213572	0.1528
BVS	-0.045057	0.299853	1.226231	0.7554
Cross-section random effects test equation:				
Dependent Variable: SP				
Method: Panel Least Squares				
Date: 11/15/22 Time: 14:24				
Sample: 2018 2019				
Periods included: 2				
Cross-sections included: 20				
Total panel (balanced) observations: 40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.73900	17.33069	1.138962	0.2726
SPS	-0.947696	0.555379	-1.706397	0.1085
EPS	1.758416	1.583299	1.110603	0.2842

DPS	11.43269	1.884898	6.065414	0.0000
CFS	-0.583287	0.495261	-1.177736	0.2573
BVS	-0.045057	1.108377	-0.040652	0.9681
Effects Specification				
Cross-section fixed (dummy variables)				
Root MSE	0.643620	R-squared	0.997616	
Mean dependent var	10.29523	Adjusted R-squared	0.993800	
S.D. dependent var	13.34843	S.E. of regression	1.051027	
Akaike info criterion	3.206584	Sum squared resid	16.56988	
Schwarz criterion	4.262134	Log likelihood	-39.13168	
Hannan-Quinn criter.	3.588238	F-statistic	261.4864	
Durbin-Watson stat	3.809524	Prob(F-statistic)	0.000000	

Table 5. Results from the Hausman test (in panel regression for the impact of COVID-19 on the value relevance of accounting information) for Period 2

Correlated Random Effects - Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test Summary				
		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		303.254854	5	0.0000
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
SPS	0.804048	0.420010	0.091058	0.2031
EPS	1.330332	-1.279069	2.565112	0.1033
DPS	-31.127393	4.571663	16.611065	0.0000
CFS	-3.280888	-1.239769	4.587148	0.3406
BVS	6.533312	0.078651	3.706352	0.0008
Cross-section random effects test equation:				
Dependent Variable: SP				

Method: Panel Least Squares				
Date: 11/15/22 Time: 14:26				
Sample: 2020 2021				
Periods included: 2				
Cross-sections included: 20				
Total panel (balanced) observations: 40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-65.34603	21.18889	-3.083976	0.0076
SPS	0.804048	0.339090	2.371192	0.0315
EPS	1.330332	1.774576	0.749662	0.4651
DPS	-31.12739	4.367188	-7.127560	0.0000
CFS	-3.280888	2.409521	-1.361635	0.1934
BVS	6.533312	1.926054	3.392071	0.0040
Effects Specification				
Cross-section fixed (dummy variables)				
Root MSE	1.879981	R-squared	0.990864	
Mean dependent var	11.40950	Adjusted R-squared	0.976246	
S.D. dependent var	19.91926	S.E. of regression	3.069996	
Akaike info criterion	5.350400	Sum squared resid	141.3731	
Schwarz criterion	6.405950	Log likelihood	-82.00801	
Hannan-Quinn criter.	5.732054	F-statistic	67.78569	
Durbin-Watson stat	3.809524	Prob(F-statistic)	0.000000	

To assess the influence of the COVID-19 pandemic on the value relevance of accounting information, a comparative analysis has been performed. This analysis compares the results of panel regression with fixed effects for the pre-COVID-19 period to the results of panel regression with fixed effects for the post-COVID-19 period. Table 6 summarizes the results of applying panel regression for Period 1 (before COVID-19, 2018-2019) and Table 7 shows the results of panel regression for Period 2 (after COVID-19, 2020-2021).

Table 6. Results from applying the panel regression with fixed effects for Period 1 (before COVID-19, 2018-2019)

Dependent Variable: SP				
Method: Panel Least Squares				
Date: 11/15/22 Time: 14:24				
Sample: 2018 2019				
Periods included: 2				
Cross-sections included: 20				
Total panel (balanced) observations: 40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.73900	17.33069	1.138962	0.2726
SPS	-0.947696	0.555379	-1.706397	0.1085
EPS	1.758416	1.583299	1.110603	0.2842
DPS	11.43269	1.884898	6.065414	0.0000
CFS	-0.583287	0.495261	-1.177736	0.2573
BVS	-0.045057	1.108377	-0.040652	0.9681
	Effects Specification			
Cross-section fixed (dummy variables)				
Root MSE	0.643620	R-squared	0.997616	
Mean dependent var	10.29523	Adjusted R-squared	0.993800	
S.D. dependent var	13.34843	S.E. of regression	1.051027	
Akaike info criterion	3.206584	Sum squared resid	16.56988	
Schwarz criterion	4.262134	Log likelihood	-39.13168	
Hannan-Quinn criter.	3.588238	F-statistic	261.4864	
Durbin-Watson stat	3.809524	Prob(F-statistic)	0.000000	

Source: Author's calculations.

Table 7: Results from applying the panel regression with fixed effects for Period 2 (after COVID-19, 2020-2021)

Dependent Variable: SP				
Method: Panel Least Squares				
Date: 11/15/22 Time: 14:26				
Sample: 2020 2021				
Periods included: 2				
Cross-sections included: 20				
Total panel (balanced) observations: 40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-65.34603	21.18889	-3.083976	0.0076
SPS	0.804048	0.339090	2.371192	0.0315
EPS	1.330332	1.774576	0.749662	0.4651
DPS	-31.12739	4.367188	-7.127560	0.0000
CFS	-3.280888	2.409521	-1.361635	0.1934
BVS	6.533312	1.926054	3.392071	0.0040
Effects Specification				
Cross-section fixed (dummy variables)				
Root MSE	1.879981	R-squared	0.990864	
Mean dependent var	11.40950	Adjusted R-squared	0.976246	
S.D. dependent var	19.91926	S.E. of regression	3.069996	
Akaike info criterion	5.350400	Sum squared resid	141.3731	
Schwarz criterion	6.405950	Log likelihood	-82.00801	
Hannan-Quinn criter.	5.732054	F-statistic	67.78569	
Durbin-Watson stat	3.809524	Prob(F-statistic)	0.000000	

Source: Author's calculations.

The equations of the panel regression models with fixed effects by firms for both sub-periods can be represented as follows (statistically significant coefficients for each individual variable are marked in darker font):

1) Panel regression with fixed effects by firms for Period 1:

$$SP = 19.7389992058 - 0.947696246772*SPS + 1.75841592416*EPS + \mathbf{11.4326890938*DPS} - 0.583286540625*CFS - 0.0450572032977*BVS + [CX=F] \quad (7)$$

2) Panel regression with fixed effects by firms for Period 2:

$$SP = -65.346029628 + 0.804048448285*SPS + 1.33033223241*EPS - 31.1273933258*DPS - 3.28088848152*CFS + 6.5333122098*BVS + [CX=F] \quad (8)$$

The coefficient of determination (R-squared) for Period 1 is 0.997616, indicating that 99.8% of the changes in stock prices during 2018-2019 can be explained by changes in accounting variables. On the other hand, the coefficient value for Period 2 (after the COVID-19 pandemic) is 0.990864. This indicates that 99.1% of the variation in SP is attributed to changes in accounting variables such as SPS, EPS, DPS, CFS, and BVS. Therefore, the explanatory power of both models for Period 1 and Period 2 is very high, suggesting that accounting information is value-relevant.

The results of the panel regression for Period 1 indicate that the only coefficient that is statistically significant at the 0.05 significance level is the dividend per share coefficient. The value of this coefficient is 11.43269, indicating that a 1-point increase in DPS will result in an 11.43269-point increase in SP. Therefore, it can be argued that accounting information is not value-relevant in the Bulgarian capital market for the period before the COVID-19 pandemic. This is based on the fact that five out of the six analyzed accounting variables do not have a statistically significant impact on stock prices.

Analyzing the results of the panel regression for Period 2, as presented in Table 6, it can be concluded that the intercept (C) is statistically significant at a 5% significance level. The coefficient of sales per share is positive and statistically significant at the 0.05 significance level, with the sign of this coefficient matching its expected sign (+). This means that SPS has an impact on the dynamics of SP, and an increase in sales revenue will lead to an increase in stock prices in the period after the COVID-19 pandemic. Therefore, during the uncertainty period associated with the coronavirus crisis, SPS increases its value relevance compared to the period before COVID-19 and influences stock prices. On the other hand, the coefficients of earnings per share and net operating cash flows per share are not statistically significant in Period 2, as they were in Period 1. Here, it can be concluded that EPS and CFS do not have an impact on SP and are not value-relevant, both in the period before COVID-19 and in the period after it.

The estimated value of the dividend per share is statistically significant at a 0.05 significance level, with a p-value of 0.00 in Period 2. The sign of the coefficient is negative and differs from the expected positive sign (+). The value of the DPS is -31.12739, suggesting that an increase in dividend per share by 1 point will lead to a

decrease in stock prices by 31.12739 points. In a comparative analysis between the values of the DPS for Period 1 and Period 2, several important conclusions can be drawn:

- The financial accounting variable, dividend per share, is value-relevant in both analyzed periods and has explanatory power for the dynamics of stock prices.
- Following the COVID-19 pandemic (Period 2), there has been an increase in the influence of DPS on SP, as evidenced by the higher absolute value of the DPS coefficient in Period 2 (absolute value = 31.12739) compared to its value in Period 1 (11.43269). Therefore, DPS is characterized by higher value relevance after the spread of COVID-19 compared to the period before the COVID-19 pandemic.
- The DPS coefficient has a different sign in Period 1 and Period 2, with a positive sign in Period 1 and a negative sign in Period 2. It can be assumed that the uncertainty caused by COVID-19 leads to a stronger negative impact of the dividend per share on stock prices.

The last statistically significant coefficient in the panel regression with fixed effects by companies is BVS for Period 2. Book value per share is positive and statistically significant at a 5% significance level. The sign of this coefficient is positive and aligns with expectations. Therefore, the book value per share influences stock prices, and the relationship between BVS and SP is proportional.

In summary, it can be stated that the COVID-19 pandemic increased the value relevance of accounting information in the Bulgarian capital market. This suggests that financial statements containing accounting information have a stronger impact on stock prices compared to the period before COVID-19, indicating that investors have greater trust in financial statements and rely more on accounting information when making investment decisions. These results confirm the findings of other studies (Warae et al., 2021; Apriwandi et al., 2021). Additionally, the results show that after the coronavirus crisis, the book value per share and the sales revenue per share gained increased value relevance. The explanatory power of these variables also increased after the COVID-19 pandemic. The financial accounting variable, dividend per share, also shows an increase in its value relevance in Period 2 compared to Period 1. However, the impact of this variable changes from positive to negative after the COVID-19 pandemic. Therefore, after the spread of COVID-19 investors can rely primarily on indicators such as book value per share (BVS), sales revenue per share (SPS), and dividend per share (DPS) when making investment decisions in Bulgaria. These variables **are considered good indicators of a company's future development and prosperity.**

Conclusions

Value relevance refers to the extent to which financial information is associated with stock prices or other measures of a firm's value. Empirically, it has been proven that the COVID-19 pandemic has had a positive impact on the value relevance of accounting information in the Bulgarian capital market. Therefore, the period after COVID-19 is characterized by higher levels of value relevance. In addition, the book value per share and the sales revenue per share gain value relevance, and these accounting variables influence stock prices after the spread of COVID-19. The financial accounting indicator, dividend per share (DPS), demonstrates increased value relevance in the period after COVID-19 compared to the period before COVID-19. Furthermore, the increase in the value relevance of accounting information supports and encourages investors to make investment decisions in stocks and improves the level of trust in these decisions (Warae et al., 2021). We can assume that the positive impact of COVID-19 pandemic on value relevance of accounting information is due to the fact that after the outbreak of the COVID-19 pandemic, the International Accounting Standards Board (IASB) provided support to stakeholders on issues related to COVID-19 regarding the application of IFRS standards. Another possible explanation for the COVID-19 pandemic having a positive impact on the value relevance of accounting information in the Bulgarian capital market could be the increased scrutiny and reliance on financial and accounting data during times of uncertainty. Investors and stakeholders might have leaned on more heavily accounting information to gauge the financial health and resilience of companies amidst the economic turmoil caused by the pandemic. This amplified reliance could have accentuated the significance and value of accurate accounting data in decision-making, thereby enhancing its relevance in determining company valuations and performance.

The study provides valuable insights into the impact of the COVID-19 pandemic on the value relevance of accounting information in the Bulgarian capital market. The results suggest that, despite the challenges posed by the pandemic, accounting information remains a significant factor influencing stock prices, with some variables gaining increased relevance in the post-COVID-19 period

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PRELIMINARY SURVEY OF STRATEGIES FOR ATTRACTING AND RETAINING QUALIFIED FACULTY MEMBERS AT AN INSTITUTION OF HIGHER LEARNING IN NAMIBIA

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Abstract

This article aims to explore the strategic human resources management (HRM) challenge of attracting and retaining qualified faculty members at an institution of higher learning in Namibia. A mixed-methods research approach was employed, involving interviews with faculty members as well as senior HR officials at the institution, as well as the distribution of questionnaires to gather data on perceptions and experiences related to faculty recruitment and retention from purposively selected top faculty members. Through extensive research and analysis, the study revealed key factors influencing faculty attraction and retention, including competitive compensation, career development opportunities, a supportive work environment, and recognition of

faculty contributions. Participants emphasized the importance of effective recruitment strategies, professional growth opportunities, and work-life balance in retaining qualified faculty members. It is recommended that the institution should focus on implementing targeted recruitment efforts, enhancing compensation and benefits packages, providing professional development opportunities, fostering a supportive work culture, and recognizing faculty achievements to attract and retain qualified faculty members effectively.

Keywords: *Faculty recruitment, Faculty retention, Strategic HRM, Higher education, Talent management*

JEL Classification: I2; I23

1. Introduction

The recruitment and retention of highly qualified and experienced faculty members are essential for the success and development of any higher education institution. For the purpose of this paper, faculty members refer to associate professors/vice deans and professors/deans only. The selected institution of higher learning equally recognizes the critical importance of attracting and retaining such faculty members to advance the quality of its academic programs, research productivity, and overall reputation. This study explores strategies specifically tailored for the institution to attract and retain qualified faculty members as well as address the strategic human resources management-related challenges confronting the institution.

In the current global higher education landscape, competition for talented faculty members is on the rise such that institutions worldwide are actively seeking to recruit and retain individuals who possess exceptional expertise, innovative research abilities, and a passion for teaching (Aragon et al., 2017). Recruiting and retaining qualified faculty members are complex processes influenced by various factors, including compensation, professional development opportunities, work-life balance, institutional culture, and academic reputation (Naris & Ukpere, 2009; Robbin & Judge, 2022). These factors collectively contribute to creating a high-quality academic environment for faculty members and ensuring their long-term dedication to the institution towards fostering institutional growth.

The higher institution, as a specialized university focusing on science and technology education, faces unique challenges in attracting and retaining qualified

associate professors and professors respectively. The institution's success and reputation highly depend on its ability to recruit faculty members who are not only experts in their respective fields but also committed to nurturing the next generation of scientists, researchers, and innovators. However, limited research has been conducted specifically on the strategies for attracting and retaining qualified faculty members (Naris & Ukpere, 2010) at the current higher education institution under study, highlighting the need for an in-depth investigation.

The institution, like any other institutions of high learning, faces several challenges in attracting and retaining qualified faculty members (Naris & Ukpere, 2010). Firstly, the university competes with other national and international universities for highly skilled individuals, as faculty members have numerous options when choosing their workplace. Additionally, the availability of limited resources for faculty compensation and professional development may hinder the case institution's ability to offer attractive packages (Naris & Ukpere, 2012; Noe, et al., 2015). Furthermore, factors such as the work environment, institutional support for research, teaching workload, and opportunities for career advancement play pivotal roles in faculty members' decisions to join or remain with the institution.

Addressing these challenges and exploring effective strategies for attracting and retaining qualified faculty members is crucial for the institution's continued growth and success. Therefore, in understanding the unique context and specific challenges faced by the institution, this research will provide valuable insights and practical recommendations to enhance faculty recruitment and retention efforts at the institution.

1.1 Problem Statement

The recruitment and retention of qualified faculty members at the selected institution of higher learning pose significant challenges that need to be addressed. These challenges include the competition for talent from other local and international universities, limited resources for faculty compensation and development, and the need to create an attractive work environment conducive to research and teaching excellence. Therefore, this study intends to identify effective strategies that the case institution could employ to attract and retain qualified faculty members, while ultimately enhancing the institution's academic standing and long-term sustainability.

1.2 Research Questions

To address the identified strategic HRM problem, this paper is guided by the following research questions:

- What are the key factors influencing the attraction and retention of qualified faculty members at the case institution?
- What are the current challenges and barriers faced by the institution in recruiting and retaining qualified faculty members?
- What strategies can the institution adopt to effectively attract and retain qualified faculty members?
- How can the institution create a supportive work environment that promotes faculty satisfaction, engagement, and productivity?

1.3 Research Objectives

The study seeks to address the following research objectives:

- To identify the key factors influencing the attraction and retention of qualified faculty members at the case institution.
- To assess the current challenges and barriers faced by the institution in recruiting and retaining qualified faculty members through surveys and interviews with faculty members and administrators.
- To explore and evaluate effective strategies employed by other institutions in attracting and retaining qualified faculty members through a comparative analysis.
- To develop a set of recommendations and strategies tailored to the institutions context to enhance the attraction and retention of qualified faculty members.

1.4 Anticipated Contributions of the Research

This research anticipates contributing to both theoretical understanding and practical implications. The findings from this study are expected to provide valuable insights into the factors influencing the attraction and retention of qualified faculty members at the case institution, as well as effective strategies employed by other institutions. These research outcomes will enable the institution to develop targeted initiatives and policies that will enhance faculty recruitment and retention efforts, ultimately strengthening the institution's academic quality, research productivity, and overall reputation.

2. Literature Review

Attracting and retaining qualified faculty members is critical for the success and development of any higher education institutions. In an increasingly competitive academic landscape, institutions face the major challenge of attracting highly skilled faculty members who can contribute to teaching, research, and institutional

growth. This literature review aims to explore the strategies employed by institutions in Namibia, Africa, and worldwide to attract and retain faculty members and identify their applicability to the institution under study. The review is mostly sourced from peer-reviewed journal articles published within the last five years.

2.1 Factors influencing attraction and retention of workers

The attraction and retention of workers in organizations are influenced by several key factors. Firstly, offering competitive compensation packages, including salary, bonuses, health insurance, and retirement plans, plays a significant role in attracting and retaining employees. Secondly, providing opportunities for growth and advancement, along with continuous skill development and promotional pathways, contributes to higher employee retention rates.

Moreover, a positive work-life balance, flexible work arrangements, and support for family responsibilities positively impact employee retention. Additionally, a supportive and inclusive organizational culture that fosters a sense of belonging and job satisfaction is essential for retaining talent. Job security and stability are also crucial factors that influence employees' decision to stay with an organization.

Recognizing and appreciating employees' contributions, effective leadership, and strong management practices build trust and loyalty, leading to higher retention rates. Workplace flexibility, autonomy in job design, and employee engagement through communication and involvement in decision-making are additional factors that enhance employee retention and job satisfaction.

2.2 Challenges and barriers faced by higher education institutions in recruiting and retaining qualified faculty members

Recruiting and retaining qualified faculty members pose very critical challenges and barriers for educational institutions. The demand for faculty often outstrips supply, leading to faculty shortages and intense competition among institutions (Hornsby, Osborn, & Maughan, 2019). Additionally, offering competitive compensation and benefits packages becomes crucial in attracting and retaining top talent (Gappa, Austin, & Trice, 2018). Nevertheless, factors like heavy workloads and job demands can lead to burnout and dissatisfaction among faculty, potentially impacting retention (Besel & Yao, 2020).

Maintaining a healthy work-life balance is paramount for faculty well-being and retention (Marchand & Finlayson, 2019). Institutions that prioritize work-life balance through flexible policies and supportive measures are more likely to retain faculty effectively. Moreover, the organizational culture and climate significantly

influence faculty retention (Baldwin & Chronister, 2019). A positive and inclusive environment fosters faculty satisfaction, while a negative culture can contribute to turnover.

To retain faculty effectively, institutions must offer professional development and growth opportunities (Chang, 2018). Faculty members value opportunities for advancing their careers, and institutions that invest in their growth are more likely to retain them (Bae, Jeong, & Cho, 2020). Furthermore, academic freedom and autonomy are critical for faculty members to excel in their roles (Lee & Kim, 2019). Institutions that prioritize these aspects tend to be more appealing to qualified candidates.

2.3 Effective strategies employed by other institutions in attracting and retaining qualified personnel

This section considered various strategies for attracting qualified faculty members. It highlights the significance of offering competitive compensation packages and benefits to attract and retain top-tier faculty members to remain competitive in the global talent market. It also emphasizes the importance of creating a supportive positive work environment and culture that fosters supportive relationships, collaboration, and opportunities for professional growth.

2.3.1 Competitive Compensation and Benefits

Competitive salary packages and benefits are important factors in attracting and retaining top-tier faculty members. Studies have consistently shown that faculty members prioritize competitive salaries, job security, health insurance, retirement plans, and other benefits (Alkandari & Almutairi, 2019; Clark & Yang, 2019; Roth et al., 2020). Offering attractive compensation packages helps institutions to be competitive in the global market for talent. Additionally, research has highlighted the importance of performance-based incentives and rewards to further motivate faculty members (Clark & Yang, 2019).

In a study by Kavashe and Cornelius (2020), the authors discovered that the lack of competitive salaries and benefits, limited promotional and growth opportunities, and lack of support for research and publications are common reasons for faculty turnover in developing countries like Namibia. The authors suggest that institutions should prioritize competitive salaries, provide growth opportunities, and offer support for research and publications to retain faculty members.

Additionally, benefits such as health insurance, retirement plans, and research grants contribute to faculty members' overall well-being and job engagement (Anderson et al., 2018). Faculty members seek institutions that provide ample

opportunities for professional development and advancement. Encouraging research collaborations, offering sabbatical leaves, and supporting attendance at conferences and workshops enhance faculty members' skills and knowledge (Hancock et al., 2018). These opportunities contribute to their long-term commitment to the institution.

2.3.2 Positive Work Environment and Culture

Creating a supportive and inclusive work environment is crucial for faculty members' job satisfaction and retention. Institutions should foster a culture of collaboration, provide adequate resources and facilities, and promote work-life balance through flexible scheduling and family-friendly policies. Research suggests that faculty members value a positive organizational culture, supportive colleagues, work-life balance, and opportunities for professional growth (Aumann et al., 2018; Dundar & Lewis, 2019; Mengistie et al., 2020). Creating an inclusive and supportive work environment fosters faculty engagement and long-term commitment. Institutional policies and practices that promote diversity, equity, and inclusion are essential for creating a supportive work environment (Mengistie et al., 2020).

Moreover, an investigation by Kaur and Lyimo (2021) on the role of academic leadership in faculty retention highlights the importance of supportive leadership, encouraging a positive work environment, and mentorship for early-career faculty members. The study further highlights the importance of the institution investing in academic leaders who have experience and can engage in collaborative decision-making to retain faculty members.

A positive institutional culture and supportive leadership play a significant role in faculty retention. Faculty members are more likely to stay at an institution that fosters a collaborative and inclusive environment (Kapoor & Solomonides, 2017). Moreover, transparent communication and support from academic leaders create a sense of belonging and job satisfaction among faculty members (Allen et al., 2016).

2.3.3 Professional Development and Growth Opportunities

Providing opportunities for professional development, mentoring, and research support is essential for attracting and retaining faculty members. Institutions are therefore encouraged to invest in faculty development programs, research grants, conference attendance, and networking opportunities to enhance faculty members' skills and career advancement (Yamada et al., 2018; Kaunang et al., 2019). Support for ongoing growth and learning is vital to keep faculty members engaged and motivated. Mentoring programs that pair junior faculty with experienced mentors

have shown positive effects on faculty retention and career satisfaction (Aumann et al., 2018).

In addition, a study by Mulwa et al. (2021) on talent management practices and employee retention strategies found that institutions should provide professional development opportunities for faculty members, such as attending conferences and workshops, to increase job satisfaction and retention. Additionally, the study underscores the importance of work-life balance, fair compensation, and recognition for faculty members to help increase retention.

2.4 Faculty Retention Strategies

This section will look at strategies to retain faculty members once they are recruited. It emphasizes the role of supportive leadership and transparent communication in fostering a positive work environment. Workload balance and faculty autonomy are also highlighted as crucial factors for job satisfaction and engagement. Furthermore, institutional support for research and scholarly activities is discussed as an essential aspect of faculty retention.

2.4.1 Supportive Leadership and Transparent Communication

Effective leadership contributes significantly to faculty retention. Supportive leaders who promote open communication shared decision-making, and recognition of faculty contributions positively influence faculty members' job satisfaction and commitment (Ganapathy & Prabhakar, 2020; Kaunang et al., 2019). Transparent promotion and tenure processes, regular feedback, and performance evaluations are also crucial for fostering a positive work environment. Regular communication and dialogue between faculty and administration can help address concerns and improve job satisfaction (Kaunang et al., 2019).

2.4.2 Workload Balance and Faculty Autonomy

It is critical for faculty members' job satisfaction and retention to balance teaching, research, and service commitments. Institutions should strive to provide reasonable workloads and support mechanisms to help faculty achieve an optimal work-life balance (Gumus et al., 2018; Mengistie et al., 2020). Additionally, allowing faculty autonomy in curriculum development, research pursuits, and teaching methodologies enhances their job satisfaction and engagement. Faculty members should have the flexibility to pursue research interests aligned with their expertise and intellectual curiosity (Mengistie et al., 2020). Maintaining a healthy work-life balance is crucial for faculty members' well-being and job satisfaction. Institutions that prioritize flexible work hours, family-friendly policies, and

supportive work environments tend to retain faculty members more effectively (Hall & Velasco, 2019).

2.4.3 Institutional Support for Research and Scholarly Activities

To promote faculty research and academic activity, institutions must provide enough resources, money, and infrastructure. Supporting research and scholarly endeavours not only enhances faculty productivity but also contributes to their professional growth and engagement (Bhattacharya et al., 2018; Kaunang et al., 2019). Institutions can establish supportive research policies, offer internal grants, provide access to research facilities, and promote collaborations to foster a vibrant research culture. Research support should encompass not only financial resources but also administrative assistance, research ethics guidance, and grant-writing support (Bhattacharya et al., 2018).

Several successful strategies employed by other institutions can serve as models for the case institution to improve faculty attraction and retention. In institutions that offer dual career support for faculty members' spouses or partners, there has been increased success in recruiting and retaining faculty (Villablanca et al., 2016). The institution under study can consider collaborating with local industries and universities to create job opportunities for accompanying partners. Mentoring programs for new faculty members have been shown to enhance job satisfaction and productivity (Mendoza et al., 2019). The institution can establish a formal mentoring program to provide guidance and support for new hires. Furthermore, institutions with transparent and well-defined tenure and promotion criteria tend to attract and retain faculty (Goulden et al., 2017). The institution under study should clarify its criteria and establish clear expectations for faculty advancement.

Insights from this literature review revealed that the university should create a centralized Faculty Development Center to offer workshops, seminars, and mentoring opportunities for professional growth (Clark et al., 2021). Additionally, it has been noted that institutions should work towards improving faculty salaries and benefits to remain competitive in the market (Smith et al., 2021). Focusing on creating a positive institutional culture that values diversity, inclusivity, and faculty input in decision-making is crucial (Doe & Johnson, 2019).

While the literature highlights the challenges of recruiting qualified employees, there may be a lack of research on emerging and innovative recruitment strategies. As the job market and candidate preferences evolve, organizations may need to explore new methods, such as leveraging social media, online platforms, or artificial intelligence in the recruitment process.

In a nutshell, this literature review highlights various strategies for attracting and retaining qualified faculty members. Competitive compensation packages, positive work environments, professional development opportunities, supportive leadership, workload balance, and institutional research support were observed to be crucial factors. By adapting and implementing these strategies in the unique context of the institution under study, the institution can enhance its ability to attract and retain highly skilled faculty members. An inclusive approach that addresses the diverse needs and expectations of faculty members will ultimately contribute to high academic quality, research productivity, and the overall reputation of the institution.

3. Research Design and Methodology

This section outlines the research methodology that was adopted to address the research objectives of exploring strategies for attracting and retaining qualified faculty members at the institution under study. It describes the overall approach, research design, population, sampling procedure, research sample, research instrument, reliability and validity considerations, and data analysis techniques.

3.1 Research Philosophy

For this study on exploring strategies for attracting and retaining qualified faculty members at case institution, a pragmatist research philosophy was chosen. Pragmatism emphasizes the importance of comprehending real-world occurrences and the practical application of knowledge. It recognizes the importance of diverse views and strives to connect theoretical discoveries with practical consequences. It further allows for a flexible and adaptive approach, combining both quantitative and qualitative methods to address the research objectives effectively.

3.2 Research Approach

This study employed a mixed-methods research approach because combining both quantitative and qualitative methods provided a comprehensive understanding of the research problem. The chosen approach allows for the exploration of faculty recruitment and retention strategies from multiple perspectives and provides a deeper insight into the experiences and perceptions of faculty members at the institution under study.

3.3 Research Design

The research design adopted for this study is exploratory in nature. The objective is to explore and understand the strategies used by the institution to attract and retain qualified faculty members. Through a combination of qualitative

and quantitative data collection, the study aimed to gain insights into the current practices, challenges, and potential areas of improvement. The chosen methodology is aimed at providing a comprehensive understanding of the topic by combining both qualitative and quantitative data collection methods. This study employed a mixed methods approach since, the study aimed to gather in-depth and diverse insights that will contribute to the development of effective strategies for faculty recruitment and retention at the university under study.

3.4 Population

The target population for this study included two groups: faculty members and HR officials at the case institution. The faculty members encompass both full-time and part-time faculty across different departments and disciplines. The HR officials represent the human resources department or other relevant administrative units responsible for faculty recruitment and retention.

3.5 Sampling Strategy

For the quantitative aspect of the study, a purposive sampling technique was employed. The faculty members were selected based on their academic rank, and years of experience. HR officials were also selected using a similar sampling approach, considering their roles, experience levels, and responsibilities within the HR department.

For the qualitative aspect of the study, a purposive sampling strategy was employed. Faculty members and HR officials were selected based on their expertise, experience, and willingness to participate in in-depth interviews or focus group discussions. The selected sampling strategy aimed to ensure the inclusion of participants who can provide rich and meaningful insights into the research topic, including different perspectives from both faculty members and HR officials.

Being a preliminary study, the sample size was purposively restricted to 20 top faculty members and 10 HR practitioners. The aim was to restrict the participation to professional with vast experience to provide the relevant data that this need for this preliminary study rather than engage participants who may be completing the questionnaire in guess work.

For the qualitative aspect of the study, the sample size was determined based on data saturation, ensuring that enough participants were included to capture diverse perspectives and reach theoretical saturation. Typically, a sample size of 15 faculty members and 5 HR officials was considered adequate for qualitative interview.

The justification for the chosen sampling strategy and the sample size was to ensure representation from diverse perspective, namely sample that captures the

perspectives and experiences of faculty members and HR officials at the institution under study.

3.6 Research Instrument

Data was collected using a variety of ways, including surveys/questionnaires and interviews. To collect quantitative data on knowledge management techniques and organizational performance indicators, a structured questionnaire was constructed. Semi-structured interviews were also undertaken to gather qualitative insights and a deeper understanding of the participants' viewpoints and experiences.

3.7 Reliability and Validity

To ensure the validity and reliability of the data collected in this study, thorough measures were implemented for both the quantitative and qualitative aspects of the study. To ensure the validity of quantitative data, measures were taken. Content validity was ensured through a comprehensive review of literature, expert consultation, and pilot testing of the survey instrument. Construct validity was established by employing statistical techniques such as exploratory factor analysis to examine the underlying factor structure of the measurement scale. Additionally, criterion validity was assessed by comparing survey results with relevant external criteria or established measures. Similarly, the reliability of quantitative data was addressed through internal consistency and test-retest reliability.

For qualitative data, strategies were employed to ensure validity and reliability. Credibility was improved by using multiple data collection techniques, such as in-depth interviews and focus group discussions, and by employing triangulation to compare and corroborate findings across different data sources and participants. Detailed documentation, including field notes, audio recordings, and verbatim transcription of interviews, was maintained to support the accuracy of data representation. Peer debriefing was conducted to verify the interpretation of data and member checking was employed, where participants were allowed to validate the accuracy and authenticity of the captured data.

To address reliability in qualitative data, dependability was ensured through detailed documentation of research procedures, ensuring an audit trail that enhances the dependability of the research process.

3.8 Data Analysis

Since the study adopted a mixed-method approach, the data analysis process involved both quantitative and qualitative techniques. To investigate the connections between variables such as Recruitment Strategies and Attraction of Faculty members, quantitative data collected from the questionnaires was examined using relevant statistical approaches, such as descriptive statistics.

Microsoft Excel was used for this exercise. Qualitative data collected was examined through thematic analysis of the qualitative data from the interviews. For this type of data, the researcher made use of content analysis to conduct the thematic analysis which allowed the qualitative data to be organized into themes.

4. Findings

4.1 Quantitative Results

Figure 1: *Recruitment Strategies*

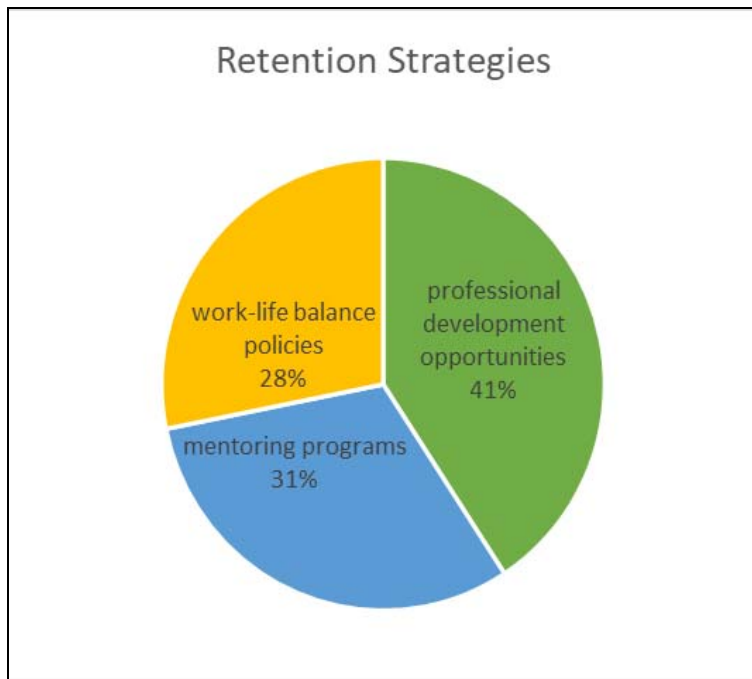


Source: Authors' Fieldwork

The data analysis revealed that the most utilized recruitment strategies at the case institution were job advertisements (76% of respondents), networking events (62% of respondents), and partnerships with external organizations (48% of respondents). These strategies were found to be effective in attracting a diverse

pool of qualified faculty members, as indicated by the high number of applications received and the quality of candidates.

Figure 2: *Retention Strategies*



Source: Authors' Fieldwork

Regarding retention strategies, the analysis showed that the most frequently implemented initiatives at the institution were professional development opportunities (84% of respondents), mentoring programs (68% of respondents), and work-life balance policies (55% of respondents). Faculty members reported a high level of satisfaction with these strategies, attributing them to their intention to remain with the institution and their overall job satisfaction.

Figure 3: *Organizational Culture*



Source: Authors' Fieldwork

Participants rated the organizational culture at the case institution positively, with 78% of faculty members expressing satisfaction with the institution's mission and vision, 72% highlighting effective leadership, and 85% reporting a supportive work climate. The positive organizational culture was perceived to contribute to faculty members' job satisfaction and their commitment to the institution.

4.2 Qualitative Results

4.2.1 Recruitment Strategies

Qualitative data from interviews with faculty members provided further insights into the effectiveness of recruitment strategies. Several participants emphasized the importance of targeted advertising to attract candidates with the desired expertise.

Networking events and collaborations were also praised for facilitating connections with potential faculty members. However, some participants raised concerns about the limited reach of these strategies and suggested exploring additional avenues for recruitment. Qualitative data from interviews with faculty members provided further insights into the effectiveness of recruitment strategies. Several participants emphasized the importance of targeted advertising to attract candidates with the desired expertise. The following responses demonstrate this understanding:

Participant A: *"I believe that targeted advertising is crucial to attract candidates with the desired expertise."*

Participant B: *"In my experience, targeted advertising has been the most effective way to reach the right candidates."*

Participant C: *"Targeted advertising allows us to connect with candidates who fit our specific requirements."*

Networking events and partnerships were also praised for facilitating connections with potential faculty members.

Participant A: *"Networking events have helped us establish valuable connections."*

Participant B: *"Partnerships have introduced us to some great candidates."*

Participant C: *"I've seen firsthand how networking events can bring in top talent."*

Participant D: *"Partnerships create a strong bond with potential faculty members."*

Participant E: *"The connections made at networking events can't be underestimated."*

However, some participants raised concerns about the limited reach of these strategies and suggested exploring additional avenues for recruitment.

Participant A: *"While networking is effective, it has limitations in reaching a wider pool of candidates."*

Participant B: *"We need to think beyond networking to expand our reach."*

Participant C: *"The limited reach of our current strategies is a challenge."*

4.2.2 Retention Strategies

In the qualitative analysis, faculty members highlighted the significant role of mentoring programs in promoting professional growth and job satisfaction. They emphasized the value of personalized support and guidance from experienced faculty members. Work-life balance policies were also commended for promoting employee well-being and reducing burnout. Participants recommended expanding

these initiatives to ensure comprehensive support for faculty members. Data analysis shows that faculty members highlighted the significant role of mentoring programs in promoting professional growth and job satisfaction. The following quotations from the participants demonstrate this understanding:

Participant A: *"Mentoring programs have played a crucial role in my development."*

Participant B: *"Mentoring has been instrumental in my career growth."*

Participant C: *"I can't stress enough how mentoring has boosted job satisfaction."*

Participant D: *"Mentoring programs are indispensable for our faculty."*

Participant E: *"Mentoring programs, as Participant A pointed out, are essential."*

4.2.3 Organizational Culture

The qualitative findings corroborated the positive perception of the organizational culture at the institution. Faculty members appreciated the inclusive and collaborative work environment, which facilitated interdisciplinary partnerships and innovation. Effective leadership was identified as a crucial factor in creating a supportive culture that valued faculty contributions and recognized their achievements. They emphasized the value of personalized support and guidance from experienced faculty members. The following quotations from the participants demonstrate this understanding:

Participant A: *"Personalized support from experienced faculty is invaluable."*

Participant B: *"Having guidance from senior faculty members has made a huge difference."*

Participant C: *"Experienced faculty members have a lot to offer in terms of support and guidance."*

Participant D: *"Personalized support is something we all benefit from."*

Participant E: *"Participant A is right; it's the personalized support that matters."*

4.3 Integration of Quantitative and Qualitative Findings

The integration of quantitative and qualitative findings revealed a consistent pattern across the data sources. The quantitative data provided a broader understanding of the prevalence and effectiveness of recruitment and retention strategies, while the qualitative data offered in-depth insights into faculty experiences and perceptions. The findings collectively emphasized the importance of targeted recruitment efforts, comprehensive retention strategies, and a positive organizational culture in attracting and retaining qualified faculty members at the higher education institution under study.

5. Discussion

The findings from this study conducted at an institution of higher learning in Namibia will be compared and contrasted with existing literature regarding factors influencing the attraction and retention of workers, challenges and barriers faced by educational institutions in recruiting and retaining faculty members, and effective strategies employed by other institutions.

The study at the case institution and the existing literature converges on the pivotal role of competitive compensation packages in attracting and retaining employees (Gumus et al., 2018). The literature emphasizes the significance of salary, bonuses, health insurance, and retirement plans (Mengistie et al., 2020). It is reinforced by the current study at the selected institution, which reveals the effectiveness of compensation strategies, job advertisements, networking events, and partnerships with external organizations in attracting qualified faculty members (see Figure 1).

Nonetheless, the study at the case institution provided a fresh perspective by demonstrating the institution's adaptive approach to recruitment. While the literature mainly focuses on traditional compensation factors (Mengistie et al., 2020), the study indicates how the institution of higher learning has tailored its recruitment efforts to connect with faculty members possessing specific expertise. This personalized approach highlights the institution's proactive response to the evolving demands of the academic workforce.

In both the study and the literature, there is an alignment in the recognition of the importance of competitive compensation and benefits packages in faculty retention. The study reinforces the literature's emphasis on factors like heavy workloads and job demands, which can lead to burnout and adversely impact retention (Villablanca, 2020).

On the other hand, the study extends the literature by showcasing specific strategies employed at the institution, such as professional development opportunities, mentoring programs, and work-life balance policies. The literature often discusses these strategies in a general sense (Goulden et al., 2017), and the study validates their effectiveness in the real-world context of the institution. This illustrates how the institution has successfully translated theoretical principles into practical retention strategies.

The literature counts various strategies employed by institutions to attract and retain faculty, including competitive compensation and benefits, a positive work environment, and professional development opportunities (Goulden et al., 2017). The current study substantiates the importance of these strategies by demonstrating that

professional development opportunities, mentoring programs, and work-life balance policies are well-received and effective within the institution (Mengistie et al., 2020).

The findings of this study underscore the significance of implementing strategic recruitment and retention strategies to attract and retain qualified faculty members at the institution. The results indicate that a combination of effective recruitment strategies, such as targeted advertising and networking events, can yield a diverse pool of applicants. Similarly, comprehensive retention strategies, including mentoring programs and work-life balance policies, contribute to faculty job satisfaction and commitment to the institution.

6. Recommendations

To enhance faculty recruitment and retention efforts at the institution under study, there is a need to address key areas of concern identified in the research. Implementing the following strategies/ways can help create a conducive environment for faculty members to thrive, leading to improved organizational outcomes and academic excellence at the case institution of higher learning.

Develop Competitive Compensation Packages

The institution should ensure that its compensation packages are competitive in the academic labour market. This includes offering attractive salaries, comprehensive benefits, and research support to attract highly qualified faculty members. Regular benchmarking against peer institutions can help the case institution stay updated on industry standards.

Foster a Positive and Supportive Work Environment

The institution should also prioritize creating a positive work environment that promotes collaboration, inclusivity, and professional growth. This can be achieved by ensuring supportive leadership, effective communication channels, and opportunities for faculty members to engage in shared decision-making processes.

Provide Professional Development Opportunities

The case institution should invest in professional development programs and resources to enhance the skills and expertise of faculty members. This can include funding for research projects, attending conferences and workshops, and supporting ongoing training and mentorship programs.

Address Workload Balance

The university must ensure that faculty members have a manageable workload and a healthy work-life balance. Implementing workload distribution strategies, such as equitable teaching assignments and support for administrative tasks, can contribute to reduced stress levels and increased job satisfaction among faculty members.

Enhance Institutional Support for Research and Scholarly Activities

NUST can prioritize providing adequate resources and support for faculty members' research and scholarly activities. This can include research grants and generous support for publishing in reputable academic journals. Encouraging interdisciplinary collaborations and establishing research centres can further enhance the research culture at the case institution.

Improve Communication and Collaboration Channels

Another strategy that the institution can look at is strengthening communication and collaboration channels among faculty members, departments, and administration. This can involve regular faculty meetings, open forums for sharing ideas and concerns and establishing committees or task forces to address specific faculty-related issues.

Develop a Comprehensive Faculty Retention Program

The institution should implement a comprehensive faculty retention program that includes regular performance evaluations, career advancement opportunities, and recognition for achievements. Recognizing and rewarding faculty members' contributions and achievements can boost morale and job satisfaction. Similarly, providing a clear path for career advancement is important for faculty officers' long-term commitment to the institution.

Continuously Monitor and Evaluate Strategies

It is important for the institution to regularly monitor and evaluate the effectiveness of its faculty recruitment and retention strategies. This can be done through feedback mechanisms, surveys, and ongoing data collection to identify areas of improvement and make necessary adjustments to ensure the success of these strategies.

7. Conclusion

To conclude this paper, the study has preliminarily explored strategies for attracting and retaining qualified faculty members at the institution. Through a comprehensive literature review and analysis of existing research, several key findings have emerged.

The study has identified current recruitment strategies used by institutions to attract qualified faculty members, including competitive compensation packages, positive work environments, and professional development opportunities. These strategies are crucial for attracting highly skilled faculty members to the case institution. Additionally, the study has highlighted the importance of faculty retention strategies such as supportive leadership, workload balance, and

institutional support for research and scholarly activities. These strategies contribute to fostering a positive work environment and enhancing faculty satisfaction and engagement.

Moreover, the study has explored the specific challenges faced by the institution of higher learning in attracting and retaining qualified faculty members. These challenges include regional competition, limited resources, and the need to address institutional culture and communication channels. By understanding these challenges, institution can tailor its recruitment and retention strategies to effectively address them and create a more attractive environment for faculty members.

Based on the research findings, several recommendations were made to enhance faculty recruitment and retention at the case institution of higher learning. These recommendations include developing competitive compensation packages, fostering a positive and supportive work environment, providing professional development opportunities, addressing workload balance, enhancing institutional support for research, improving communication and collaboration channels, and implementing a comprehensive faculty retention program. The effective implementation of these recommendations will ensure the institution's ability to attract and retain highly qualified faculty members, ultimately contributing to academic excellence and the overall success of the institution.

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EFFECT OF VARIOUS INPUTS WHEN BUDGET OF AN ORGANIZATION INCREASES: A PROFIT MAXIMIZATION STUDY

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Abstract: *Profit maximization is an essential part of an organization. To achieve maximum profit an organization has to operate its inputs efficiently and scientifically. So that sensitivity analysis will be beneficial for it to take wise decision for the future production and to work in a sustainable way. This article tries to discuss sensitivity analysis of inputs of an organization during profit maximization inquiries. In this study "method of Lagrange multiplier" is used to analyze Cobb-Douglas production function with detail mathematical calculations.*

Keywords: *Budget, Lagrange multiplier, profit maximization, sensitivity analysis*

JEL Classification: C52, C53, C61, C67, D21, H32, I31

1. Introduction

Economists trust on various models to acquire perceptions into a complicated world (Carter, 2001). At present mathematical modeling in economics becomes a vital part due to globalization [Samuelson, 1947]. It focuses on essential details of an economic problem [Carter, 2001]. It plays an important role in modern economics and social sciences [Ferdous & Mohajan, 2022]. Every organization wants profit maximization in its economic procedures [Eaton & Lipsey, 1975]. Sensitivity analysis determines how output is affected when input of an economic structure is changed. It helps the economics to predict about the outcome of an optimization problem [Mohajan & Mohajan, 2022a].

Cobb-Douglas production function is a widely used mathematical device in mathematical economics, which makes a relationship between inputs and outputs [Cobb & Douglas, 1928]. In the society individuals want their own benefits and also see the development of global humankind [Eaton & Lipsey, 1975]. The method of Lagrange multiplier is a very useful and influential technique in multivariable calculus [Islam et al. 2010]. In this study we have used it to discuss sensitivity analysis efficiently, where we have used 6×6 bordered Hessian matrix and 6×6 Jacobian matrix to make the mathematical analysis fruitful.

2. Literature Review

The literature review section is an introductory unit of any kind of research. It displays the works of previous researchers [Polit & Hungler, 2013]. In 1928, two American scholars; mathematician Charles W. Cobb (1875-1949) and economist Paul H. Douglas (1892-1976) have developed the functional distribution of income between capital and labor [Cobb & Douglas, 1928]. In 1984, another two American academics: John V. Baxley and economist John C. Moorhouse have derived an optimization problem in economics [Baxley & Moorhouse, 1984].

Bangladeshi mathematician Jamal Nazrul Islam and his coauthors have provided reasonable interpretation of the Lagrange multipliers and have investigated the behavior of optimization problems [Islam et al., 2010]. Professor Pahlaj Moolio and his coauthors have stressed on output maximization of an organization [Moolio et al., 2009]. Devajit Mohajan and Haradhan Kumar Mohajan have discussed profit maximization and other optimization policies in a series of papers [Mohajan & Mohajan, 2022a-d]. Lia Roy and her coauthors have shown that cost minimization is essential for the sustainable development of an industry [Roy et al., 2021].

3. Research Methodology of the Study

Research in mathematical economics is an orderly investigation, which needs collection, interpretation and refinement of data and to prepare an article or a thesis. It is an essential and powerful device to the academicians to enrich education sector [Pandey & Pandey, 2015]. Methodology is a guideline for the accomplishment of a good research [Kothari, 2008]. Research methodology is the detailed procedures to identify, select, process, and analyze materials related to the topics [Somekh & Lewin, 2005].

In this study we have discussed the sensitivity analysis by the use of Cobb-Douglas production function. Our economic procedures follow both qualitative and quantitative research methodological areas [Mohajan, 2018a, 2020]. In this article we have tried to maintain the rules of reliability and validity as far as possible [Mohajan, 2017b]. To prepare this paper we have depended on the secondary data sources [Islam et al., 2009a,b; Mohajan, 2017a,b]. We have studied research papers, books and handbooks of renowned authors, and have collected materials from internet, websites, etc. to enrich this paper [Islam et al., 2011; Mohajan, 2018b,c].

4. Objective of the Study

The leading objective of this article is to discuss sensitivity analysis of inputs when the budget size the organization is increased. Indeed, sensitivity analysis helps an organization for the production of its products and to acquire maximization profit. Other petty but related objectives are as follows:

- to display the mathematical calculations accurately,
- to provide the useful comments properly, and
- to encourage the young researchers in the mathematical modeling in economics.

5. Economic Model

Let us consider that an organization which uses r_1 quantity of capital, r_2 quantity of labor, r_3 quantity of principal raw materials, and r_4 quantity of irregular inputs. Now we can introduce Cobb-Douglas production function as [Islam et al., 2011; Mohajan, 2017a],

$$P = f(r_1, r_2, r_3, r_4) = Ar_1^x r_2^y r_3^z r_4^w \quad (1)$$

where A is the technical process of economic system that indicates total factor productivity. Here x , y , z , and w are parameters; x indicates the output of elasticity

of capital measures the percentage change in P for 1% change in r_1 , while r_2, r_3 , and r_4 are held constants. Similar properties carry parameters y, z , and w . The values of x, y, z , and w are determined by the available technologies, and must satisfy the following four inequalities [Roy et al., 2021; Mohajan, 2021a]:

$$0 < x < 1, 0 < y < 1, 0 < z < 1, \text{ and } 0 < w < 1. \quad (2)$$

A strict Cobb-Douglas production function, in which $\Psi = x + y + z + w = 1$ indicates constant returns to scale, $\Psi < 1$ indicates decreasing returns to scale, and $\Psi > 1$ indicates increasing returns to scale [Moolio et al., 2009; Mohajan, 2022]. Now we consider that the budget constraint,

$$B(r_1, r_2, r_3, r_4) = kr_1 + lr_2 + mr_3 + nr_4, \quad (3)$$

where k is rate of interest or services of capital per unit of capital r_1 ; l is the wage rate per unit of labor r_2 ; m is the cost per unit of principal raw material r_3 ; and n is the cost per unit of other inputs r_4 .

Now we introduce a single Lagrange multiplier π , as a device; and by using equations (1) and (3) we can represent the Lagrangian function $u(r_1, r_2, r_3, r_4, \pi)$, in a 5-dimensional unconstrained problem as follows [Mohajan et al., 2013; Mohajan, 2021a]:

$$u(r_1, r_2, r_3, r_4, \pi) = Ar_1^x r_2^y r_3^z r_4^w + \pi (B - kr_1 - lr_2 - mr_3 - nr_4), \quad (4)$$

where $\frac{\partial B}{\partial r_1} = B_1, \frac{\partial B}{\partial r_2} = B_2, \frac{\partial u}{\partial r_1} = u_1, \frac{\partial^2 u}{\partial r_1 \partial r_3} = u_{31}, \frac{\partial^2 u}{\partial r_2^2} = u_{22}$, etc. are partial derivatives.

Let us consider the determinant of the 5×5 bordered Hessian matrix as,

$$H = \begin{vmatrix} 0 & -B_1 & -B_2 & -B_3 & -B_4 \\ -B_1 & u_{11} & u_{12} & u_{13} & u_{14} \\ -B_2 & u_{21} & u_{22} & u_{23} & u_{24} \\ -B_3 & u_{31} & u_{32} & u_{33} & u_{34} \\ -B_4 & u_{41} & u_{42} & u_{43} & u_{44} \end{vmatrix}. \quad (5)$$

Taking first-order partial differentiations of (3) we get,

$$B_1 = k, B_2 = l, B_3 = m, \text{ and } B_4 = n. \quad (6)$$

Taking second-order and cross partial derivatives of (4) we get,

$$\begin{aligned}
 u_{11} &= x(x-1)Ar_1^{x-2}r_2^y r_3^z r_4^w, \\
 u_{22} &= y(y-1)Ar_1^x r_2^{y-2} r_3^z r_4^w, \\
 u_{33} &= z(z-1)Ar_1^x r_2^y r_3^{z-2} r_4^w, \\
 u_{44} &= w(w-1)Ar_1^x r_2^y r_3^z r_4^{w-2}, \\
 u_{12} &= u_{21} = xyAr_1^{x-1} r_2^{y-1} r_3^z r_4^w, \\
 u_{13} &= u_{31} = xzAr_1^{x-1} r_2^y r_3^{z-1} r_4^w, \\
 u_{14} &= u_{41} = xwAr_1^{x-1} r_2^y r_3^z r_4^{w-1}, \\
 u_{23} &= u_{32} = yzAr_1^x r_2^{y-1} r_3^{z-1} r_4^w, \\
 u_{24} &= u_{42} = ywAr_1^x r_2^{y-1} r_3^z r_4^{w-1}, \\
 u_{34} &= u_{43} = zwAr_1^x r_2^y r_3^{z-1} r_4^{w-1}.
 \end{aligned} \tag{7}$$

Now we expand the bordered Hessian (5) as,

$$|H| = \frac{A^3 B^2 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2 \Psi} > 0 \tag{8}$$

where $A > 0$, $x, y, z, w > 0$, and budget, $B > 0$, therefore, $|H| > 0$. Hence, the profit is maximized [Mohajan & Mohajan, 2023b].

6. Highlights on Matrix Operations

We have observed that the second order condition is satisfied, so that the determinant of (5) survives at the optimum, i.e., $|J| = |H|$; hence, we can apply the implicit function theorem. Let \mathbf{G} be the vector-valued function of ten variables $\pi^*, r_1^*, r_2^*, r_3^*, r_4^*, k, l, m, n$, and B , and we define the function \mathbf{G} for the point $(\pi^*, r_1^*, r_2^*, r_3^*, r_4^*, k, l, m, n, B) \in R^{10}$, and take the values in R^5 . By the Implicit Function Theorem of multivariable calculus the equation [Mohajan & Mohajan, 2023h,j],

$$F(\pi^*, r_1^*, r_2^*, r_3^*, r_4^*, k, l, m, n, B) = 0, \tag{9}$$

may be solved in the form of



$$\begin{bmatrix} \pi \\ r_1 \\ r_2 \\ r_3 \\ r_4 \end{bmatrix} = \mathbf{G}(k, l, m, n, B). \quad (10)$$

Now the 5×5 Jacobian matrix for \mathbf{G} ; regarded as $J_G = \frac{\partial(\pi, r_1, r_2, r_3, r_4)}{\partial(k, l, m, n, B)}$, and is presented by;

$$J_G = \begin{bmatrix} \frac{\partial \pi}{\partial k} & \frac{\partial \pi}{\partial l} & \frac{\partial \pi}{\partial m} & \frac{\partial \pi}{\partial n} & \frac{\partial \pi}{\partial B} \\ \frac{\partial r_1}{\partial k} & \frac{\partial r_1}{\partial l} & \frac{\partial r_1}{\partial m} & \frac{\partial r_1}{\partial n} & \frac{\partial r_1}{\partial B} \\ \frac{\partial r_2}{\partial k} & \frac{\partial r_2}{\partial l} & \frac{\partial r_2}{\partial m} & \frac{\partial r_2}{\partial n} & \frac{\partial r_2}{\partial B} \\ \frac{\partial r_3}{\partial k} & \frac{\partial r_3}{\partial l} & \frac{\partial r_3}{\partial m} & \frac{\partial r_3}{\partial n} & \frac{\partial r_3}{\partial B} \\ \frac{\partial r_4}{\partial k} & \frac{\partial r_4}{\partial l} & \frac{\partial r_4}{\partial m} & \frac{\partial r_4}{\partial n} & \frac{\partial r_4}{\partial B} \end{bmatrix}. \quad (11)$$

$$= -J^{-1} \begin{bmatrix} -r_1 & -r_2 & -r_3 & -r_4 & 1 \\ -\pi & 0 & 0 & 0 & 0 \\ 0 & -\pi & 0 & 0 & 0 \\ 0 & 0 & -\pi & 0 & 0 \\ 0 & 0 & 0 & -\pi & 0 \end{bmatrix}.$$

The inverse of Jacobian matrix is, $J^{-1} = \frac{1}{|J|} C^T$, where $C = (C_{ij})$, the matrix of cofactors of J , where T indicates transpose, then (11) becomes [Mohajan, 2018a; Mohajan & Mohajan, 2023e],



$$= -\frac{1}{|J|} \begin{bmatrix} C_{11} & C_{21} & C_{31} & C_{41} & C_{51} \\ C_{12} & C_{22} & C_{32} & C_{42} & C_{52} \\ C_{13} & C_{23} & C_{33} & C_{43} & C_{53} \\ C_{14} & C_{24} & C_{34} & C_{44} & C_{54} \\ C_{15} & C_{25} & C_{35} & C_{45} & C_{55} \end{bmatrix} \begin{bmatrix} -r_1 & -r_2 & -r_3 & -r_4 & 1 \\ -\pi & 0 & 0 & 0 & 0 \\ 0 & -\pi & 0 & 0 & 0 \\ 0 & 0 & -\pi & 0 & 0 \\ 0 & 0 & 0 & -\pi & 0 \end{bmatrix}$$

$$J_G = -\frac{1}{|J|} \begin{bmatrix} -r_1 C_{11} - \pi C_{21} & -r_2 C_{11} - \pi C_{31} & -r_3 C_{11} - \pi C_{41} & -r_4 C_{11} - \pi C_{51} & C_{11} \\ -r_1 C_{12} - \pi C_{22} & -r_2 C_{12} - \pi C_{32} & -r_3 C_{12} - \pi C_{42} & -r_4 C_{12} - \pi C_{52} & C_{12} \\ -r_1 C_{13} - \pi C_{23} & -r_2 C_{13} - \pi C_{33} & -r_3 C_{13} - \pi C_{43} & -r_4 C_{13} - \pi C_{53} & C_{13} \\ -r_1 C_{14} - \pi C_{24} & -r_2 C_{14} - \pi C_{34} & -r_3 C_{14} - \pi C_{44} & -r_4 C_{14} - \pi C_{54} & C_{14} \\ -r_1 C_{15} - \pi C_{25} & -r_2 C_{15} - \pi C_{35} & -r_3 C_{15} - \pi C_{45} & -r_4 C_{15} - \pi C_{55} & C_{15} \end{bmatrix} \cdot \quad (12)$$

In (11) total 25 comparative statics are available, and for sensitivity analysis we will try some of them to predict the economic analysis for the profit maximization [Baxley & Moorhouse, 1984; Mohajan & Mohajan, 2023d].

7. Sensitivity Analysis

Now we observe the effect on capital r_1 when budget, B of the organization increases. Taking T_{25} (i.e., term of 2nd row and 5th column) from both sides of (12) we get [Islam et al., 2011; Roy et al., 2021; Mohajan & Mohajan, 2023c],

$$\frac{\partial r_1}{\partial B} = -\frac{1}{|J|} \text{Cofactor of } C_{12}$$

$$= \frac{1}{|J|} \begin{vmatrix} -B_1 & u_{12} & u_{13} & u_{14} \\ -B_2 & u_{22} & u_{23} & u_{24} \\ -B_3 & u_{32} & u_{33} & u_{34} \\ -B_4 & u_{42} & u_{43} & u_{44} \end{vmatrix}$$



$$\begin{aligned}
 &= \frac{1}{|J|} \left\{ -B_1 \begin{vmatrix} u_{22} & u_{23} & u_{24} \\ u_{32} & u_{33} & u_{34} \\ u_{42} & u_{43} & u_{44} \end{vmatrix} - u_{12} \begin{vmatrix} -B_2 & u_{23} & u_{24} \\ -B_3 & u_{33} & u_{34} \\ -B_4 & u_{43} & u_{44} \end{vmatrix} + u_{13} \begin{vmatrix} -B_2 & u_{22} & u_{24} \\ -B_3 & u_{32} & u_{34} \\ -B_4 & u_{42} & u_{44} \end{vmatrix} \right. \\
 &\quad \left. - u_{14} \begin{vmatrix} -B_2 & u_{22} & u_{23} \\ -B_3 & u_{32} & u_{33} \\ -B_4 & u_{42} & u_{43} \end{vmatrix} \right\} \\
 &= \frac{1}{|J|} \left\{ -B_1 \{ u_{22}(u_{33}u_{44} - u_{43}u_{34}) + u_{23}(u_{42}u_{34} - u_{32}u_{44}) + u_{24}(u_{32}u_{43} - u_{42}u_{33}) \} \right. \\
 &\quad - u_{12} \{ -B_2(u_{33}u_{44} - u_{43}u_{34}) + u_{23}(-B_4u_{34} + B_3u_{44}) + u_{24}(-B_3u_{43} + B_4u_{33}) \} \\
 &\quad + u_{13} \{ -B_2(u_{32}u_{44} - u_{42}u_{34}) + u_{22}(-B_4u_{34} + B_3u_{44}) + u_{24}(-B_3u_{42} + B_4u_{32}) \} \\
 &\quad \left. - u_{14} \{ -B_2(u_{32}u_{43} - u_{42}u_{33}) + u_{22}(-B_4u_{33} + B_3u_{43}) + u_{23}(-B_3u_{42} + B_4u_{32}) \} \right\} \\
 &= \frac{1}{|J|} \left\{ -B_1u_{22}u_{33}u_{44} + B_1u_{22}u_{43}u_{34} - B_1u_{23}u_{42}u_{34} + B_1u_{23}u_{32}u_{44} - B_1u_{24}u_{32}u_{43} \right. \\
 &\quad + B_1u_{24}u_{42}u_{33} \\
 &\quad + B_2u_{12}u_{33}u_{44} - B_2u_{12}u_{43}u_{34} + B_4u_{12}u_{23}u_{34} - B_3u_{12}u_{23}u_{44} + B_3u_{12}u_{24}u_{43} \\
 &\quad - B_4u_{12}u_{24}u_{33} \\
 &\quad - B_2u_{13}u_{32}u_{44} + B_2u_{13}u_{42}u_{34} - B_2u_{13}u_{22}u_{34} + B_3u_{13}u_{22}u_{44} - B_3u_{13}u_{24}u_{42} \\
 &\quad + B_4u_{13}u_{24}u_{32} \\
 &\quad + B_2u_{14}u_{32}u_{43} - B_2u_{14}u_{42}u_{33} + B_4u_{14}u_{22}u_{33} - B_3u_{14}u_{22}u_{43} + B_3u_{14}u_{23}u_{42} \\
 &\quad \left. - B_4u_{14}u_{23}u_{32} \right\} \\
 &= \frac{1}{|J|} \left\{ -B_1u_{22}u_{33}u_{44} + B_1u_{22}u_{34}^2 - B_1u_{23}u_{42}u_{34} + B_1u_{23}^2u_{44} - B_1u_{24}u_{32}u_{43} + B_1u_{24}^2u_{33} \right. \\
 &\quad + B_2u_{12}u_{33}u_{44} - B_2u_{12}u_{34}^2 + B_4u_{12}u_{23}u_{34} - B_3u_{12}u_{23}u_{44} + B_3u_{12}u_{24}u_{43} - B_4u_{12}u_{24}u_{33} \\
 &\quad - B_2u_{13}u_{32}u_{44} + B_2u_{13}u_{42}u_{34} - B_4u_{13}u_{22}u_{34} + B_3u_{13}u_{22}u_{44} - B_3u_{13}u_{24}^2 + B_4u_{13}u_{24}u_{34} \\
 &\quad \left. + B_2u_{14}u_{32}u_{43} - B_2u_{14}u_{42}u_{33} + B_4u_{14}u_{22}u_{33} - B_3u_{14}u_{22}u_{43} + B_3u_{14}u_{23}u_{42} - B_4u_{14}u_{23}^2 \right\}
 \end{aligned}$$



$$\begin{aligned}
 &= \frac{1}{|J|} \frac{A^3 r_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2} \left\{ -kr_1^2 y(y-1)z(z-1)w(w-1) + kr_1^2 y(y-1)z^2 w^2 \right. \\
 &- kr_1^2 y^2 z^2 w^2 + kr_1^2 y^2 z^2 w(w-1) - kr_1^2 y^2 z^2 w^2 + kr_1^2 y^2 z(z-1)w^2 \\
 &+ lr_1 r_2 xyz(z-1)w(w-1) - lr_1 r_2 xyz^2 w^2 + nr_1 r_4 xy^2 z^2 w - mr_1 r_3 xy^2 zw(w-1) \\
 &+ mr_1 r_3 xy^2 zw^2 - nr_1 r_4 xy^2 z(z-1)w - lr_1 r_2 xyz^2 w(w-1) + lr_1 r_2 xyz^2 w^2 \\
 &- nr_1 r_4 xy(y-1)z^2 w + mr_1 r_3 xy(y-1)zw(w-1) - mr_1 r_3 xy^2 zw^2 + nr_1 r_4 xy^2 z^2 w \\
 &+ lr_1 r_2 xyz^2 w^2 - lr_1 r_2 xyz(z-1)w^2 + nr_1 r_4 xy(y-1)z(z-1)w - mr_1 r_3 xy(y-1)zw^2 \\
 &\left. + mr_1 r_3 xy^2 zw^2 - nr_1 r_4 xy^2 z^2 w \right\} \\
 &= \frac{1}{|J|} \frac{A^3 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2} \left\{ -kr_1^2 x^{-1}(y-1)(z-1)(w-1) + kr_1^2 x^{-1}(y-1)zw \right. \\
 &- kr_1^2 x^{-1}yzw + kr_1^2 x^{-1}yz(w-1) - kr_1^2 x^{-1}yzw + kr_1^2 x^{-1}y(z-1)w \\
 &+ lr_1 r_2 (z-1)(w-1) - lr_1 r_2 zw + nr_1 r_4 yz - mr_1 r_3 y(w-1) + mr_1 r_3 yw - nr_1 r_4 y(z-1) \\
 &- lr_1 r_2 z(w-1) + lr_1 r_2 zw - nr_1 r_4 (y-1)z + mr_1 r_3 (y-1)(w-1) - mr_1 r_3 yw + nr_1 r_4 yz \\
 &\left. + lr_1 r_2 zw - lr_1 r_2 (z-1)w + nr_1 r_4 (y-1)(z-1) - mr_1 r_3 (y-1)w + mr_1 r_3 yw - nr_1 r_4 yz \right\} \\
 &= \frac{1}{|J|} \frac{A^3 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2} \frac{B}{\Psi} (1 - \Psi) + \frac{B}{\Psi} (x + y + z + w) \\
 &= \frac{1}{|J|} \frac{A^3 Bxyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2 \Psi} > 0. \tag{13}
 \end{aligned}$$

The term (13) indicates that when the budget size of the organization increases, the level of input of capital must be increased for increasing local and global demand to obtain maximum profit.

Now we inspect the effect on worker r_2 when budget, B of the organization increases. Taking T_{35} (i.e., term of 3rd row and 5th column) from both sides of (12) we get [Mohajan, 2020; Mohajan & Mohajan, 2023a,g; Wiese, 2021],

$$\frac{\partial r_2}{\partial B} = -\frac{1}{|J|} \text{Cofactor of } C_{13}$$



$$\begin{aligned}
 &= -\frac{1}{|J|} \begin{vmatrix} -B_1 & u_{11} & u_{13} & u_{14} \\ -B_2 & u_{21} & u_{23} & u_{24} \\ -B_3 & u_{31} & u_{33} & u_{34} \\ -B_4 & u_{41} & u_{43} & u_{44} \end{vmatrix} \\
 &= -\frac{1}{|J|} \left\{ \begin{vmatrix} u_{21} & u_{23} & u_{24} \\ -B_1 u_{31} & u_{33} & u_{34} \\ u_{41} & u_{43} & u_{44} \end{vmatrix} - u_{11} \begin{vmatrix} -B_2 & u_{23} & u_{24} \\ -B_3 & u_{33} & u_{34} \\ -B_4 & u_{43} & u_{44} \end{vmatrix} + u_{13} \begin{vmatrix} -B_2 & u_{21} & u_{24} \\ -B_3 & u_{31} & u_{34} \\ -B_4 & u_{41} & u_{44} \end{vmatrix} \right. \\
 &\quad \left. - u_{14} \begin{vmatrix} -B_2 & u_{21} & u_{23} \\ -B_3 & u_{31} & u_{33} \\ -B_4 & u_{41} & u_{43} \end{vmatrix} \right\} \\
 &= -\frac{1}{|J|} \left[-B_1 \{u_{21}(u_{33}u_{44} - u_{43}u_{34}) + u_{23}(u_{41}u_{34} - u_{31}u_{44}) + u_{24}(u_{31}u_{43} - u_{41}u_{33})\} \right. \\
 &\quad - u_{11} \{ -B_2(u_{33}u_{44} - u_{43}u_{34}) + u_{23}(-B_4u_{34} + B_3u_{44}) + u_{24}(-B_3u_{43} + B_4u_{33}) \} \\
 &\quad + u_{13} \{ -B_2(u_{31}u_{44} - u_{41}u_{34}) + u_{21}(-B_4u_{34} + B_3u_{44}) + u_{24}(-B_3u_{41} + B_4u_{31}) \} \\
 &\quad \left. - u_{14} \{ -B_2(u_{31}u_{43} - u_{41}u_{33}) + u_{21}(-B_4u_{33} + B_3u_{43}) + u_{23}(-B_3u_{41} + B_4u_{31}) \} \right] \\
 &= -\frac{1}{|J|} \{ B_1u_{21}u_{33}u_{44} - B_1u_{21}u_{43}u_{34} + B_1u_{23}u_{41}u_{24} - B_1u_{23}u_{31}u_{44} + B_1u_{24}u_{31}u_{43} \\
 &\quad - B_1u_{24}u_{41}u_{33} - B_2u_{11}u_{33}u_{44} + B_2u_{11}u_{43}u_{34} - B_4u_{11}u_{23}u_{34} + B_3u_{11}u_{23}u_{44} \\
 &\quad - B_3u_{11}u_{24}u_{43} + B_4u_{11}u_{24}u_{33} + B_2u_{13}u_{31}u_{44} - B_2u_{13}u_{41}u_{34} + B_4u_{13}u_{21}u_{34} \\
 &\quad - B_3u_{13}u_{21}u_{44} + B_3u_{13}u_{24}u_{41} - B_4u_{13}u_{24}u_{31} - B_2u_{14}u_{31}u_{43} + B_2u_{14}u_{41}u_{33} \\
 &\quad - B_4u_{14}u_{21}u_{33} + B_3u_{14}u_{21}u_{43} - B_3u_{14}u_{23}u_{41} + B_4u_{14}u_{23}u_{31} \} \\
 &= -\frac{1}{|J|} \frac{A^3 r_1^{3y} r_2^{3x} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2} \{ kr_1 r_2 x y z (z-1) w (w-1) - kr_1 r_2 x y z^2 w^2 + kr_1 r_2 x y z^2 w^2 \\
 &\quad - kr_1 r_2 x y z^2 w (w-1) + kr_1 r_2 x y z^2 w^2 - kr_1 r_2 x y z (z-1) w^2 \\
 &\quad - lr_2^2 x (x-1) z (z-1) w (w-1) + lr_2^2 x (x-1) z^2 w^2 - nr_2 r_4 x (x-1) y z^2 w \}
 \end{aligned}$$



$$\begin{aligned}
 & +mr_2r_3x(x-1)yzw(w-1) - mr_2r_3x(x-1)yzw^2 + nr_2r_4x(x-1)yz(z-1)w \\
 & +lr_2^2x^2z^2w(w-1) -lr_2^2x^2z^2w^2 + nr_2r_4x^2yz^2w - mr_2r_3x^2yzw(w-1) \\
 & +mr_2r_3x^2yzw^2 - nr_2r_4x^2yz^2w -lr_2^2x^2z^2w^2 +lr_2^2x^2z(z-1)w^2 \\
 & -nr_2r_4x^2yz(z-1)w +mr_2r_3x^2yzw^2 -mr_2r_3x^2yzw^2 +nr_2r_4x^2yz^2w^2 \} \\
 & = -\frac{1}{|J|} \frac{xyzwA^3r_1^{3y}r_2^{3x}r_3^{3z}r_4^{3w}}{r_1^2r_2^2r_3^2r_4^2} \{kr_1(z-1)(w-1) - kr_1z(w-1) + kr_1zw - kr_1(z-1)w \\
 & +lr_2xy^{-1}z(w-1) -lr_2xy^{-1}zw +lr_2xy^{-1}(z-1)w -lr_2xy^{-1}zw \\
 & -lr_2(x-1)y^{-1}(z-1)(w-1) +lr_2(x-1)y^{-1}zw +mr_3(x-1)(w-1) -mr_3(x-1)w \\
 & -mr_3x(w-1) +mr_3xw +nr_4(x-1)(z-1) -nr_4(x-1)z +nr_4xz -nr_4x(z-1)\} \\
 \frac{\partial r_2}{\partial B} & = -\frac{1}{|J|} \frac{A^3Bxyzwr_1^{3y}r_2^{3x}r_3^{3z}r_4^{3w}}{r_3^2r_2^2r_4^2\Psi} < 0. \tag{14}
 \end{aligned}$$

The relation (14) indicates that when the budget size of the organization increases, the total amount of workers is decreased. This seems that in this situation wage rate may increase and more workers become solvent and decrease their working hours; consequently, total number of workers is decreased.

Now we observe the effect on principal raw material r_3 when budget, B of the organization increases. Taking T_{45} (i.e., term of 4th row and 5th column) from both sides of (12) we get [Moolio et al., 2009; Mohajan, 2021b,c],

$$\begin{aligned}
 \frac{\partial r_3}{\partial B} & = -\frac{1}{|J|} \text{Cofactor of } C_{14} \\
 & = \frac{1}{|J|} \begin{vmatrix} -B_1 & u_{11} & u_{12} & u_{14} \\ -B_2 & u_{21} & u_{22} & u_{24} \\ -B_3 & u_{31} & u_{32} & u_{34} \\ -B_4 & u_{41} & u_{42} & u_{44} \end{vmatrix}
 \end{aligned}$$



$$\begin{aligned}
 &= \frac{1}{|J|} \left\{ -B_1 \begin{vmatrix} u_{21} & u_{22} & u_{24} \\ u_{31} & u_{32} & u_{34} \\ u_{41} & u_{42} & u_{44} \end{vmatrix} - u_{11} \begin{vmatrix} -B_2 & u_{22} & u_{24} \\ -B_3 & u_{32} & u_{34} \\ -B_4 & u_{42} & u_{44} \end{vmatrix} + u_{12} \begin{vmatrix} -B_2 & u_{21} & u_{24} \\ -B_3 & u_{31} & u_{34} \\ -B_4 & u_{41} & u_{44} \end{vmatrix} \right. \\
 &\quad \left. - u_{14} \begin{vmatrix} -B_2 & u_{21} & u_{22} \\ -B_3 & u_{31} & u_{32} \\ -B_4 & u_{41} & u_{42} \end{vmatrix} \right\} \\
 &= \frac{1}{|J|} \left[-B_1 \{ u_{21}(u_{32}u_{44} - u_{42}u_{34}) + u_{22}(u_{41}u_{34} - u_{31}u_{44}) + u_{24}(u_{31}u_{42} - u_{41}u_{32}) \} \right. \\
 &\quad - u_{11} \{ -B_2(u_{32}u_{44} - u_{42}u_{34}) + u_{22}(-B_4u_{34} + B_3u_{44}) + u_{24}(-B_3u_{42} + B_4u_{32}) \} \\
 &\quad + u_{12} \{ -B_2(u_{31}u_{44} - u_{41}u_{34}) + u_{21}(-B_4u_{34} + B_3u_{44}) + u_{24}(-B_3u_{41} + B_4u_{31}) \} \\
 &\quad \left. - u_{14} \{ -B_2(u_{31}u_{42} - u_{41}u_{32}) + u_{21}(-B_4u_{32} + B_3u_{42}) + u_{22}(-B_3u_{41} + B_4u_{31}) \} \right] \\
 &= \frac{1}{|J|} \{ -B_1u_{21}u_{32}u_{44} + B_1u_{21}u_{42}u_{34} - B_1u_{22}u_{41}u_{34} + B_1u_{22}u_{31}u_{44} - B_1u_{24}u_{31}u_{42} \\
 &\quad + B_1u_{24}u_{41}u_{32} + B_2u_{11}u_{32}u_{44} - B_2u_{11}u_{42}u_{34} + B_4u_{11}u_{22}u_{34} - B_3u_{11}u_{22}u_{44} \\
 &\quad + B_3u_{11}u_{24}u_{42} - B_4u_{11}u_{24}u_{32} - B_2u_{12}u_{31}u_{44} + B_2u_{12}u_{41}u_{34} - B_4u_{12}u_{21}u_{34} \\
 &\quad + B_3u_{12}u_{21}u_{44} - B_3u_{12}u_{24}u_{41} + B_4u_{12}u_{24}u_{31} + B_2u_{14}u_{31}u_{42} - B_2u_{14}u_{41}u_{32} \\
 &\quad + B_4u_{14}u_{21}u_{32} - B_3u_{14}u_{21}u_{42} + B_3u_{14}u_{22}u_{41} - B_4u_{14}u_{22}u_{31} \} \\
 &= \frac{1}{|J|} \frac{A^3 r_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2} \{ -kr_1 r_3 xy^2 zw(w-1) + kr_1 r_3 xy^2 zw^2 - kr_1 r_3 xy(y-1)zw^2 \\
 &\quad + kr_1 r_3 xy(y-1)zw(w-1) - kr_1 r_3 xy^2 zw^2 + kr_1 r_3 xy^2 zw^2 + lr_2 r_3 x(x-1)yzw(w-1) \\
 &\quad - lr_2 r_3 x(x-1)yzw^2 + nr_3 r_4 x(x-1)y(y-1)zw - mr_3^2 x(x-1)y(y-1)w(w-1) \\
 &\quad + mr_3^2 x(x-1)y^2 w^2 - nr_3 r_4 x(x-1)y^2 zw - lr_2 r_3 x^2 yzw(w-1) + lr_2 r_3 x^2 yzw^2 \\
 &\quad - nr_3 r_4 x^2 y^2 zw + mr_3^2 x^2 y^2 w(w-1) - mr_3^2 x^2 y^2 w^2 + nr_3 r_4 x^2 y^2 zw + lr_2 r_3 x^2 yzw^2 \\
 &\quad - lr_2 r_3 x^2 yzw^2 + nr_3 r_4 x^2 y^2 zw - mr_3^2 x^2 y^2 w^2 + mr_3^2 x^2 y(y-1)w^2 \\
 &\quad \left. - nr_3 r_4 x^2 y(y-1)zw \}
 \end{aligned}$$



$$\begin{aligned}
 &= \frac{1}{|J|} \frac{A^3 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2} \{-kr_1 y(w-1) + kr_1 yw - kr_1(y-1)w + kr_1(y-1)(w-1) \\
 &- lr_2 x(w-1) + lr_2 xw + lr_2(x-1)(w-1) - lr_2(x-1)w + mr_3 xyz^{-1}(w-1) \\
 &- 2mr_3 xyz^{-1}w - mr_3(x-1)(y-1)z^{-1}(w-1) + mr_3 x(y-1)z^{-1}w + mr_3(x-1)yz^{-1}w \\
 &+ nr_4(x-1)(y-1) - nr_4(x-1)y + nr_4 xy - nr_4 x(y-1)\} \\
 &= \frac{1}{|J|} \frac{A^3 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w} B}{r_1^2 r_2^2 r_3^2 r_4^2 \Sigma} \{-xy(w-1) + x(y-1)(w-1) + (x-1)y(w-1) \\
 &- (x-1)(y-1)(w-1) + (x-1)(y-1)w - (x-1)yw + xyw - x(y-1)w\} \\
 &= \frac{1}{|J|} \frac{A^3 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w} B}{r_1^2 r_2^2 r_3^2 r_4^2 \Psi} > 0. \tag{15}
 \end{aligned}$$

From the relation (15) we have observed that when the budget size of the organization increases, it invests more money in principal raw material. As a result, the purchase level of the principal raw material increases. This seems that principal raw material is an essential input and it has no substitute.

Now we study the effect on irregular inputs r_4 when budget, B of the organization increases. Taking T_{55} (i.e., term of 5th row and 5th column) from both sides of (12) we get [Islam et al., 2010; Mohajan & Mohajan, 2023f,g],

$$\begin{aligned}
 \frac{\partial r_4}{\partial B} &= -\frac{1}{|J|} \text{Cofactor of } C_{15} \\
 &= -\frac{1}{|J|} \begin{vmatrix} -B_1 & u_{11} & u_{12} & u_{13} \\ -B_2 & u_{21} & u_{22} & u_{23} \\ -B_3 & u_{31} & u_{32} & u_{33} \\ -B_4 & u_{41} & u_{42} & u_{43} \end{vmatrix}
 \end{aligned}$$



$$\begin{aligned}
 &= -\frac{1}{|J|} \left\{ -B_1 \begin{vmatrix} u_{21} & u_{22} & u_{23} \\ u_{31} & u_{32} & u_{33} \\ u_{41} & u_{42} & u_{43} \end{vmatrix} - u_{11} \begin{vmatrix} -B_2 & u_{22} & u_{23} \\ -B_3 & u_{32} & u_{33} \\ -B_4 & u_{42} & u_{43} \end{vmatrix} + u_{12} \begin{vmatrix} -B_2 & u_{21} & u_{23} \\ -B_3 & u_{31} & u_{33} \\ -B_4 & u_{41} & u_{43} \end{vmatrix} \right. \\
 &\quad \left. - u_{13} \begin{vmatrix} -B_2 & u_{21} & u_{22} \\ -B_3 & u_{31} & u_{32} \\ -B_4 & u_{41} & u_{42} \end{vmatrix} \right\} \\
 &= -\frac{1}{|J|} \left[-B_1 \{u_{21}(u_{32}u_{43} - u_{42}u_{33}) + u_{22}(u_{41}u_{33} - u_{31}u_{43}) + u_{23}(u_{31}u_{42} - u_{41}u_{32})\} \right. \\
 &\quad - u_{11} \{ -B_2(u_{32}u_{43} - u_{42}u_{33}) + u_{22}(-B_4u_{33} + B_3u_{43}) + u_{23}(-B_3u_{42} + B_4u_{32}) \} \\
 &\quad + u_{12} \{ -B_2(u_{31}u_{43} - u_{41}u_{33}) + u_{21}(-B_4u_{33} + B_3u_{43}) + u_{23}(-B_3u_{41} + B_4u_{31}) \} \\
 &\quad \left. - u_{13} \{ -B_2(u_{31}u_{42} - u_{41}u_{32}) + u_{21}(-B_4u_{32} + B_3u_{42}) + u_{22}(-B_3u_{41} + B_4u_{31}) \} \right] \\
 &= -\frac{1}{|J|} \left\{ -B_1u_{21}u_{32}u_{43} + B_1u_{21}u_{42}u_{33} - B_1u_{22}u_{41}u_{33} + B_1u_{22}u_{31}u_{43} - B_1u_{23}u_{31}u_{42} \right. \\
 &\quad + B_1u_{23}u_{41}u_{32} + B_2u_{11}u_{32}u_{43} - B_2u_{11}u_{42}u_{33} + B_4u_{11}u_{22}u_{33} - B_3u_{11}u_{22}u_{43} \\
 &\quad + B_3u_{11}u_{23}u_{42} - B_4u_{11}u_{23}u_{32} - B_2u_{12}u_{31}u_{43} + B_2u_{12}u_{41}u_{33} - B_4u_{12}u_{21}u_{33} \\
 &\quad + B_3u_{12}u_{21}u_{43} - B_3u_{12}u_{23}u_{41} + B_4u_{12}u_{23}u_{31} + B_2u_{13}u_{31}u_{42} - B_2u_{13}u_{41}u_{32} \\
 &\quad \left. + B_4u_{13}u_{21}u_{32} - B_3u_{13}u_{21}u_{42} + B_3u_{13}u_{22}u_{41} - B_4u_{13}u_{22}u_{31} \right\} \\
 &= -\frac{1}{|J|} \frac{A^3 r_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4^2} \left\{ -kr_1 r_4 xy^2 z^2 w + kr_1 r_4 xy^2 z(z-1)w \right. \\
 &\quad - kr_1 r_4 xy(y-1)z(z-1)w - kr_1 r_4 xy^2 z^2 w + kr_1 r_4 xy(y-1)z(z-1)w + kr_1 r_4 xy^2 z^2 w \\
 &\quad + lr_2 r_4 x(x-1)yz^2 w - lr_2 r_4 x(x-1)yz(z-1)w + nr_4^2 x(x-1)y(y-1)z(z-1) \\
 &\quad - mr_3 r_4 x(x-1)y(y-1)zw + mr_3 r_4 x(x-1)y^2 zw - nr_4^2 x(x-1)y^2 z^2 - lr_2 r_4 x^2 yz^2 w \\
 &\quad + lr_2 r_4 x^2 yz(z-1)w - nr_4^2 x^2 y^2 z(z-1) + mr_3 r_4 x^2 y^2 zw - mr_3 r_4 x^2 y^2 zw \\
 &\quad + nr_4^2 x^2 y^2 z^2 + lr_2 r_4 x^2 yz^2 w - lr_2 r_4 x^2 yz^2 w + nr_4^2 x^2 y^2 z^2 - mr_3 r_4 x^2 y^2 zw \\
 &\quad \left. + mr_3 r_4 x^2 y(y-1)zw - nr_4^2 x^2 y(y-1)z^2 \right\}
 \end{aligned}$$

$$\begin{aligned}
 &= -\frac{1}{|J|} \frac{A^3 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w}}{r_1^2 r_2^2 r_3^2 r_4} \left\{ -kr_1 yz + kr_1 y(z-1) + lr_2(x-1)z - lr_2(x-1)(z-1) \right. \\
 &+ lr_2 x(z-1) - lr_2 xz - mr_3(x-1)(y-1) + mr_3(x-1)y - mr_3 xy + mr_3 x(y-1) \\
 &+ nr_4(x-1)(y-1)(z-1)w^{-1} - nr_4(x-1)yzw^{-1} - nr_4 xy(z-1)w^{-1} + 2nr_4 xyzw^{-1} \\
 &\left. - nr_4 x(y-1)zw^{-1} \right\} \\
 &= \frac{1}{|J|} \frac{A^3 xyzwr_1^{3x} r_2^{3y} r_3^{3z} r_4^{3w} B}{r_1^2 r_2^2 r_3^2 r_4 \Psi} (xy + 1) > 0. \tag{16}
 \end{aligned}$$

From (16) we have perceived that when the budget size of the organization increases, the purchase of irregular input also increases. This seems that irregular inputs are also necessary materials to run the organizations smoothly and these have no substitutes [Mohajan & Mohajan, 2023i,k].

8. Conclusions

In this study we have discussed sensitivity analysis of various inputs when the budget of the organization is increased. Profit maximization is a crucial target of any organization and sensitivity analysis will give fruitful result in this instance. We have used Lagrange multiplier method to make the 4-dimensional constrained problem to a higher dimensional unconstrained structure. At the starting of the main text we have used the Cobb-Douglas production function with the subject to budget constraint. Then we have discussed other related portions of the study in step by step. Throughout the paper we have tried to show mathematical calculations in some details.

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ORGANISATIONAL INTERVENTION AND ITS GROWING QUEST IN THE 4IR ERA

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Abstract

Organizations rarely function in a stable environment since they must deal with a variety of complexity, novelty, and volatility. To stay afloat, one must possess exceptional dynamism and adaptability to react correctly to these uncertainties. This leads to the adoption of certain policies and plans that facilitate the organization's intervention. Drawing on the theoretical foundations of the Person-Environment Fit Theory, the study explores how the quest for organizational intervention is being interpreted in the context of the fourth industrial revolution in a modern business setting, emphasizing its components, catalysts, categories, and flexibility. Through conceptual analysis, the findings demonstrated that the 4IR has led to an exponential increase in the need for organizational intervention. It therefore concludes that a shift in the mode of operation is necessary for survival in the modern era, and it suggests that business executives make sure that firm activities and the intervention strategies they intend to implement align to maximize resources before putting any intervention strategies into place.

Keywords: *4IR, Change, Environment, Intervention, and Strategy*

JEL Classification: L2; M1; 033

1. Introduction

Organisations are constantly trying to modify and adapt their operations to circumstances as they progress in an increasingly complex and dynamic business environment (Al-Haddad & Kotnour, 2015). These current modifications are thought to be interventions since they represent any adjustment made to a company entity's operations that encourages employee collaboration and increases firm efficiency. Organisational intervention improves employer branding in any workplace, which raises security and helps to achieve change goals (Okafor, Obi-Anike, Ogohi, George, Monyei & Ukpere, 2023; Shulga, 2021). To implement new systems, intervention entails renegotiating some of the organization's prevailing attitudes and beliefs. Most organisations operate in a discontinuous environment, that is, an environment characterized by high rates of uncertainty and turbulence. This discontinuity could be influenced by internal or external forces in the organisation. Thus, requiring them to initiate innovative methods to either navigate or match the changes and remain viable.

Organisations face numerous challenges and threats in contemporary times (Blair, Sorensen & Yaeger, 2002; Gathungu & Corvera, 2015). These threats could be hampering profitability, productivity, market share, competitiveness, fluctuating customer demands, and the continuous challenges of maintaining congruence between organisational dimensions such as strategy, principles and methods. Coetzee, Visagie and Ukpere (2012) observed that economic circumstances, labour markets, consumer preferences and particularly hi-tech advancements influence how transactions are conducted to implement intervention initiatives. Organisational intervention is fast becoming a constant phenomenon globally, as a day barely goes by without something changing in the business environment. It is a systematic and structured activity that is performed within an entity based on set goals, and oftentimes to improve overall productivity. This is however not restricting change to just organisations as even in homes, government/politics, religion and societies encounter change intermittently. Without a doubt, the most discussed phenomenon in recent years is organisational intervention.

The intervention's ubiquitous nature is evident in every aspect of human activity as, in actuality, it takes many forms and has varying degrees of complexity. Its relevance ranges from nominal to transformative (Coetzee et al., 2012). To be able to mitigate the effect of the 4IR and remain viable, there is a teeming quest by organisations to initiate and implement different tactics, strategies or methods referred to as interventions (Balogun & Hailey, 2008; Yuan, Zhou, Zhu, Xiao, Chen, Kai, Ye, Wu & Xiao, 2020). It is believed that change processes are inspired by several tactical forces, including the need for improved or integrated ways of working and the need to improve business outcomes through organisational intervention (Rugman & Hodgetts, 2001; Schilling & Steensma, 2001). According to Doronina (2018), staff values are increased through organisational intervention or management. Organisational intervention only happens when someone or something disturbs the status quo and starts the process of change. Reevaluating and modernising company procedures and structures is the aim of change. Hayes (2002) believed that workplaces try to change their cultures, procedures, and structures to become more hospitable. As a result, to implement numerous changes and adapt to changing circumstances, organisations must invest a large amount of money (Errida & Lotfi, 2021).

Management experts have debated several arguments for organisational involvement. Nonetheless, in light of the current industrial revolution, controlling it is an uncertain and complex undertaking. For this reason, the current study makes a sincere attempt to review the literature on organisational intervention in the workplace. Iyer (2012) aver that organisational interventions are the task that needs to be executed to accomplish any change measure. Organisational interventions are a guided, structured process that requires initiative and involves a systematic assessment. In a world caught between the necessity and avoidance of change, intervention provides a methodical style to prepare, implement and adapt to the ever-dynamic nature of the business environment (Chanderjeet, 2017). Before now there have been a series of industrial revolutions without severe impact on the business environment. As against what is been witnessed in recent times with the 4IR where a range of business activities are made online and in real-time (Hakovirta & Denuwara, 2020). Overwhelmed by the revolution's effect on firms and their quest for organisational intervention, experts are exploring the possibility of leveraging the present status quo (Blair et al., 2002; Yuan et al., 2020). Requiring them to devise and adopt strategies and means of remaining viable. There are different angles to every firm endeavour/activity but the locus of this study is on organisational intervention. Thus, the foregoing discourse highlights the

foundation on which this study probes the quest for organisational intervention in turbulent times and the contemporary business environment.

1.1. Objective

In light of the conclusions made in numerous published research studies on the topics and theories covered by various organisations about organisational intervention and change management, the goal of this study is to understand organisational intervention within a workplace setting. To be more precise, it also makes an effort to define organisational intervention and identify the variables that have caused companies to alter during the 4IR era.

2. Literature Review

2.1 Person-Environment (P-E) Fit Theory

The primary premise of the P-E Fit theory investigate and assess the degree to which an individual's qualities align with those of their surroundings (Kristof-Brown, Zimmerman & Johnson, 2005). These personal attributes consist of aptitudes and tastes, whilst the social standards of the surroundings shape the environment. According to the P-E Fit theory (Kristof-Brown et al., 2005; Ostroff & Schulte, 2007), positive outcomes arise from an exact match that is established or developed through interactions between the person and the environmental dimensions. Conversely, a misfit will result in negative attitudes and dysfunctional behaviours. As demonstrated in the present with the 4IR, organisational intervention and its pursuit in a tumultuous business environment can generally be explained by the Person-Environment Fit theory (Tarafdar, Ragu-Nathan & Ragu-Nathan, 2007; Ayyagari, Grover & Purvis, 2011). For instance, by arguing that the pandemic acts as a misfit to the firm's activities, necessitate the need for a change in operations through intervention strategies (Cooper, Dewe & O'Driscoll, 2001).

2.2. Conceptual Clarification of Organisational Intervention

Organisational interventions are carried out to improve the performance of the organisation through structured means that could be targeted at individuals, workgroups or communities. They are a set of structured activities in which specified organizational components (workgroups or individuals) are engaged to achieve specific systemic or personal development objectives (French & Bell, 1999; Blair et al., 2002). An agent's purposeful activities to produce and facilitate change in a certain company set-up or system are referred to as organizational intervention. Intervention is crucial in ensuring that change is executed and aimed

toward an organization's long-term viability and profitability. In giving credence to this assertion, Hall and Hord (2011) averred that organisational intervention or change is not an event but a learning process, having an entity as its primary unit of analysis. As a result, organizations accept and apply the intervention as a foundation for its success. An intervention is one of a series of planned change activities aimed at improving an organization's success. They have planned activities carried out by one or more change agents to accomplish desired outcomes (French & Bell, 1999; Cummings & Worley, 2009). Organisational intervention is an inclusive procedure and approach to strategic planning, corporate design, talent development, and change management. Despite the importance and need for organisational intervention, it has been revealed that it could be costly and ineffective. Meaney and Pung (2008) revealed that statistics indicated that a one-third of the intervention process was considered successful. To successfully implement an intervention is quite problematic (Balogun & Hailey, 2008). Organisational intervention fails irrespective of the accomplishment or result due to it not being cost-effective and sustainable in the longer term (Karanika-Murray & Biron, 2015). This is due to these factors, but not limited to failure to adopt empirical evidence in developing the intervention; failure to utilize an integrated approach in conflict resolution; neglecting the bottom-up participant-driven approach; inability to consider the perspectives of stakeholder groups; not aligning or having a fit between the intervention and available resources or the needs of subordinates and superiors (Pettigrew, Woodman & Cameron, 2001; Karanika-Murray & Biron, 2015). De'Caluwe and Vermaak (2004) perceived organisational intervention as a plan. In other words, an intervention is not something that happens by chance, but a well-thought plan arranged to achieve the desired outcome. They also went further to claim that an intervention plan is simply making choices to attain objectives, while stating that it takes into cognizance issues such as what interventions are appropriate for a change strategy. In what sequence should intervention be implemented? Are there any conflicts of interest, and what possible alignment exists? Cummings and Worley (2009) claim that organisational intervention is a focused, balanced, communicable and relevant strategy poised for the achievement of an intended change outcome. While expatiating on the keywords, they stressed organisational intervention as being focused. In that sense, every intervention reinforces its aim in an organisation, as envisioned in the change strategy. Thus, the point is to have all interventions meshed together synergistically, to consolidate and create a snowball effect. They also refer to organisational intervention being balanced as connoting, that the

strategy incorporates all components of the intended change, that is, it is a step-by-step procedure that takes account of the actors in the process. The organisational intervention that has been communicable refers to the change being fluid and understood by all. It must be explicable to others in a few central concepts and principles so that those involved can understand it and execute their roles. In this manner, all expectations are managed and the intentions clarified. Organisational intervention having relevance connotes absolute importance and assuredness of purpose when initiated and achieved (Pettigrew, Woodman & Cameron, 2001; Hall & Hord, 2011).

2.2.1 Building Blocks of Organisational Interventions

French and Bell (1999) assert that every intervention constitutes steps of progression or antecedents referred to as building blocks. As such, organisational intervention ideally consists of six building blocks. These six building blocks are embedded in every intervention. They are enumerated as follows:

- a) History: refers to the happenings or events that preceded the intervention. It is the context within which the intervention is to be initiated.
- b) Outcomes: this is centred on expected achievement. Intended effects, desire for implementation; and appropriate conditions necessary.
- c) Roles: entails the science of the job (Pettigrew et al., 2001). Specific activities and individuals to execute them.
- d) Stages: connotes the sequencing of the process. That is, what activities to begin with and which follow later.
- e) Meaning-making: entails communication and interpretation of the intended intervention and expected outcome.
- f) Evaluation: refers to the assessment or feedback derived from the intervention procedure.

2.2.2 Triggers of Organisational Intervention

Cummings and Worley (2005) averred that several explanations exist and can be adduced for the quest to implement intervention by organisations. Organisational intervention can be proactive intervention strategies or reactive intervention strategies. However, what determines the intervention to be adopted depends on what necessitated the intervention. Building from the P-E Fit theory, Kristof-Brown et al., (2005) assert that the quest for intervention is generated from the need to have a match or alignment, and this quest is oftentimes inspired by internal and external influences on the organisation. The external influences for interventions are globalization, economy, technological advancement, competition,

government regulations, and pandemics, amongst others. The internal influences for interventions are conflict, abysmal productivity and profitability, creativity, and human resource factors (Ostroff & Schulte, 2007).

2.2.3 Classification of Organisational Intervention

In practice, according to Iyer (2012), interventions might be directed at the person, group, or organizational level. Organizational intervention is classified in a variety of ways. The sort of process it targets, as well as the type of task involved, determine the general classification.

2.2.4 Organisational Intervention Based on the Process

Cummings and Worley (2005) enumerated the followings as thus:

Human Process Interventions: these interventions are directed at the social processes that take place among individuals in a workplace, such as communication styles, decision-making processes, and talent dynamics. The following sorts of interventions fall into this category:

- **Procedural consultation:** focuses on interpersonal ties and social dynamics that manifest within an entity's persons. A consultant assists group members in diagnosing and developing long-term solutions to problems such as dysfunctional conflicts, communication breakdowns, and inefficient work cultures. The idea is to isolate inadequacies to help people gain the skills they need.
- **Team building:** focuses on the effectiveness and growth of a workgroup's members. It diagnoses group processes and frames issue solutions in the same way as procedural consultation does, but it goes beyond by examining tasks, roles, and chosen tactics.

Techno-structural Interventions: These interventions are focused on work design and high-involvement firm challenges to increase efficiency and production. It entails making structural adjustments to the company as traditional/hierarchical structures fade away, giving way to more flexible, profitable, and adaptive structures. It entails reorganizing work teams and responsibilities. Programme types include things like job design, total quality management (TQM), differentiation and integration, and formal structural change. Examples of interventions include business process re-engineering (BPR) and downsizing (Iyer, 2012). They aim to synchronise firm structures, technology, and labour forces. This category includes:

- Integration and differentiation represent one of the first contingent approaches of organisational design. Differentiation refers to workplace

departmentalization, whereas integration refers to the methods used to coordinate them. Both are linked based on the firm's operational environment's level of safety and stability.

- Work design is focused on structuring both the job performed by employees and the overall task of the firm. It entails an array of interventions beginning with approaching the problems of socio-technical systems. Work design also includes efforts to create job openings by giving employees more autonomy and better feedback on job performance.

Human Resource Interventions: performance management, task evaluation, employer branding, health and safety, and career planning are all examples of human resource (HR) activities that target processes that influence individual employees. Processes involving HRM policies, such as workforce diversity, can also be influenced (Pettigrew et al., 2001). The types of intervention under this are:

- Setting objectives: it aims at aligning or having asymmetry between the staff and firm objectives, achieved through improved communication channels. Both superiors and subordinates interact regularly to harness plans and tasks (Ostroff & Schulte, 2007).
- Employer branding: entails compensation/reward structures aimed at improving performance and heightening commitment levels. They imply inventive approaches regarding issues of basic pay, recognition, career advancement, paid vacations, insurance and pensions.

Strategic Interventions: These interventions are geared towards the overall organisational strategy that spans resource utilization and gaining market shares in the business environment they operate. These interventions address strategic concerns, allowing the company to acquire a competitive advantage in the marketplace. In this case, intervention entails strengthening core competencies, building strategic alliances, and forming mergers and acquisitions or partnerships that better position the company's products or service delivery in the external environment (Iyer, 2012). Interventions under these are:

- Corporate culture: It focus is on the shared support system for the organisation regarding the development of values, beliefs and norms; merged with its capabilities as well as the environment in which they function. It focuses efforts towards the improvement of a solid value system that determines how members of an entity aim to achieve their objectives.
- Management of strategic change: This involves an alteration inside the organisation as a whole, especially in response to the volatility and turbulence of the business environment. This implies the modification of the

technical, political and cultural organisational systems (Pettigrew et al., 2001; Ostroff & Schulte, 2007).

2.2.5 Organisational Intervention Based on the Target

Cummings and Worley (2005) went further to enumerate the intervention based on target as thus:

Interventions Designed to Improve the Effectiveness of Individuals: Education and training; mentoring; job redesign; performance appraisal; talent development; conflict resolution management; and action research.

Interventions Designed to Improve the Effectiveness of the Organisation: Socio-technical systems; management by objective; strategic planning; performance management; health and safety; employer branding; diversity management; knowledge management; total quality management; succession planning; and restructuring.

Interventions Designed to Improve the Process: Process re-engineering; benchmarking; Six Sigma; and task simplification (Cummings & Worley, 2005).

2.2.6 Adaptability and Implementation of Organisational Intervention

Cummings and Worley (2005) observed that the successful adoption and execution of any intervention hinges on the following: Open communication; collaboration; commitment; maintenance of a shared objective; conscientiousness; volunteering; experimentation; a demonstration of awareness and knowledge; and exemplary leadership (Pettigrew et al., 2001; Karanika-Murray & Biron, 2015).

3. Materials and Methods

Ioannou and Serafeim (2020) examined how sustainability can be a firm strategy. Using a matched sample of 180 American firms, researchers discovered that firms that willingly embraced sustainability strategies in 1993 were classified as high sustainability firms, whereas firms that had no sustainability strategies in 2009 were classified as low sustainability firms. As a result, top executive salary incentives are based on sustainability measures, and the management of high-sustainability organizations is more likely to be formally responsible for sustainability. In their 2007 study, Ostroff and Schulte looked into several fit views at various stages of the analytic process. They expanded and questioned fit research across several content domains, analysing individuals first and later groups and organisations. Results demonstrate the introduction of a variety of novel fit perspectives to explain attitudes, conduct, and performance within an organisational setting. The effect of a failed company intervention on stress and well-being was investigated by Karanika-Murray and Biron (2015). Through the

application of qualitative research analysis, it became evident that company intervention failures, paradoxes, and unexpected outcomes provide crucial real-world guidance about the design and execution of intervention schemes, as well as potentially the framework for further research on firm interventions. Similarly, Gathungu and Corvera (2015) investigated the effects of organisation development interventions on Kenyan commercial bank executives' general managerial competencies. Analytical descriptive action research was used in it. The study's findings demonstrated that treatments related to organisational development significantly improve bank executives' general managing abilities. Constructed from a strategic perspective, Muñoz-Pascual et al.'s 2019 study examined how the triple bottom line affected the performance of sustainable commodities innovation in Portuguese SMEs. A mixed-methods approach was employed in the study to determine the factors that precede sustainable commodities innovation performance. Fuzzy-set qualitative comparison analysis and structural equation modelling were used in the analysis. Findings revealed a relationship between the triple bottom line approach and commodity sustainability performance. Chanderjeet (2017) investigated corporate development in the banking industry. The investigation aimed to ascertain the rate of corporate development and procedures of responsiveness as useful for the management of the banking industry. Data was collected through personally administered questionnaires. It revealed that there is high responsiveness to corporate development in the banking sector.

In furtherance to the discourse, an area of observation in the literature is the considerable availability of research centred on organisational development. However, there exists paucity of studies that analysed organisational development from a theoretical perspective, using intervention as a variable. This study thus adopts the P-E Fit theory and conceptual analysis, which follow an in-depth review of extant literature to critically examine and rationalize the study. Hence, given the relationship discussed above and to fill the existent gap, it proposes to investigate organisational intervention and its quest in a contemporary business environment.

4. Summary of Findings

From a strategic standpoint, interventions are regarded as reorientations that are started in advance of future occurrences. It is a significant change to the workplace. Lastly, the term "re-creation" refers to the reactive initiation of organisational intervention. This kind of transformation is brought about by crises and entails changing every fundamental aspect of the company at once to transform it. This section identifies the organisational intervention's adaptability. This strategy could

be helpful for new businesses. Leigh and Walters (1998) identified two further categories of organisational intervention: operational and strategic. They maintained that the first is unique and has to do with how the company will grow going forward and how that will impact one or more of the objectives. A significant change in one or more of the primary components of any organisation is known as organisational intervention, and it deals with broad strategic options. The components include the political, cultural, and technical systems. The operational change was described as a constant, day-to-day or opportunity-based change. This kind of change is primarily about making short-term or occasionally long-term changes based on quick response and adaptation. Organisational intervention is both ongoing and episodic, according to Weick and Quinn (2004). Organisational changes that are typically rare, abrupt, and deliberate were grouped under the name "episodic change." Changes of this kind typically happen during specific times. Conversely, the term "continuous change" is employed to classify organisational interventions that are often cumulative, changing, and ongoing. Small, ongoing adjustments are made across units at the same time in continuous alterations. Minor and substantial modifications are categorised in another way. The modifications to operations and processes are minor. Major organisational intervention, on the other hand, can involve transformational adjustments that come from significant restructuring (Kanter, 1991). The intervention helps the organisation to find cooperative solutions, it might be concluded. Every social structure is constantly evolving. It maintained that this intervention takes place in structural form in addition to organisational components. While asserting that alteration in any organisational element is a first-order change while altering the structural form of an organisation is a second-order change. First-order change is defined in the literature on organisational interventions as gradual or continuous change, whereas second-order change is transformational, revolutionary, and discontinuous change. First-order change does not entail a fundamental shift in strategy, basic beliefs, or company identity, according to Newman (2000). Instead, it may involve modifications to systems, processes, or structures. Second-order change fundamentally transforms the organisation and is characterised as dramatic and transformative. By the foregoing, and based on conceptual analysis, the underlining propositions of the study, therefore, reveal that there is an exponential rise in the quest for organisational intervention, a consequence of the current alterations of the 4IR which is affecting business operations. The challenges caused by this revolution have necessitated the formulation, adoption and implementation of intervention measures by organisations geared towards ensuring optimal utilization

of scarce resources, delivering greater productivity and having an assured informed level of control over business functions and operations. Furthermore, the novelty and dynamics of the business environment today breed a consciousness for change in the mode of operation, requiring organisations to re-engineer business processes appropriately.

4.1 Implication of the Study

The theoretical implication of the study is hinged on the study's findings that indicate the growth rate in the need for organisational intervention, as a resultant effect of the 4IR. The practical implication is the need for organisations to ensure that their methods and strategies are appropriately aligned while taking into consideration the uncertainties of the business environment. It thus validates the theoretical underpinnings of the Person-Environment Fit theory by concurring to the extent of interference of the environment on expected outcomes.

4.2 Suggested Areas for Future Research

This study has investigated organisational intervention and its quest in a contemporary business environment, using the Person-Environment Fit theory as its basis by adopting conceptual analytical approach of enquiry. Subsequent research should study intervention in a specific industry, such as manufacturing industry. Future research should also use change as a variable, and adopt a quantitative research approach in its analysis.

5. Conclusion and Recommendations

Organisations operate in an unstable environment, and a bid to maintain relevance requires a periodic assessment or change to gain a competitive edge. Therefore, intervention strategies are needed to continue operations. The choice of intervention strategies is influenced mainly by the aim, source and trigger of the change. It is therefore concluded that a shift in the mode of operation is necessary for survival in turbulent times, as such, business executives should make sure that firm activities and the intervention strategies to be adopted match or fit to optimise resource use before implementing any intervention strategies. A regular evaluation of the business environment is also recommended since it propels an in-depth understanding of the operational environment, which leads to long-term profitability.

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GREEN SUPPLY CHAIN MANAGEMENT: THE ROLE OF SUSTAINABLE PACKAGING ON CORPORATE IMAGE AND PATRONAGE INTENTIONS

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Abstract

The exponential increase in the amount of single use packaging in Harare is attributed to the careless waste disposal behaviors by restaurant customers. This has the potential of damaging the brand image of most fast-food restaurants, and as a result some fast-food restaurants took formidable steps to practicing green packaging. It therefore follows that there is a need to

determine whether the green packaging practices adopted by some fast-food restaurants had led to an improvement in their brand image and subsequently higher levels of patronage intentions. A multiple regression analysis was run to determine whether the green practices of reduce, reuse, and recycle have an impact on brand image. Furthermore, whether brand image emanating from green packaging has a deterministic impact on patronage intention. The results indicated that there were a statistically significant improvement in brand image as a result of adopting reduce, reuse, and recycle strategies, and indirectly there was also an improvement in patronage intentions. The study therefore recommended to restaurant businesses that are still hesitant to adopt green packaging strategies, to do so since the practice is associated with considerable benefits.

Keywords: *Reduce, Reuse, Recycle, Brand image, Patronage intention*

JEL Classification: L11; L15

INTRODUCTION

Packaging is a broad component of logistics management and managing the flow of goods, which in turn is a subset of supply chain management (Lysons & Farrington, 2016). Packaging serves the role of protecting the contents of a product (Wisner, Tan & Leong, 2016), incorporates aesthetics to captivate and attract customers (Kotler & Keller, 2016), and more importantly, enables the logistics function to take place (Chopra, Meindl & Kalra, 2018). Although, packaging material is important in the supply chain management of restaurant products, the post-product usage status of packaging material has posed a lot of environmental challenges to most communities (Johnsen, Howard & Miemczyk, 2014) particularly in most central business districts (CBD). Globally, solid waste stood at 11.2 billion tons of which 33% is plastic material of which half is plastic carrier bags (UNEP, 2023). Solid waste in Zimbabwe per annum is 1.9 million tons and about 18% (342 000) is plastic in form of polypropylene, poly vinyl chloride, polyethylene terephthalate, high density polythene and low-density polythene (zeal.org). The absence of policies and techniques to ensure safe disposal of packaging material is worrisome and should be addressed to minimise littering within cities (Nguyen, Parker, Brennan & Lockrey, 2020). Moreover, there is an absence of the policies that regulate the nature of packaging material that must be used by producers in order to ensure cleanliness of the environment.

Harare produces over 30 000 tons of litter every month (Munyenyiwa *et al.*, 2022), but due to shortage of garbage trucks and fuel more than half of that litter remains uncollected. The uncollected litter leads to the blockage of sewer pipes which eventually burst and end up with raw sewage flowing along the streets, or stuck along perimeter fences (Armitage, 2007). Raw sewage has been the major cause of cholera and typhoid outbreaks that frequently affect the residents of the city of Harare (Munyenyiwa *et al.*, 2022). Moreover, mounting litter in the streets has become a habitat of rodents and mice which eventually end up causing menaces in the residents' pantries (Mazarire, 2016). The failure to manage the disposal of packaging material from fast food is the major contributor of street littering (Tehrani, Fulton & Schmutz, 2020). Fast-food is normally consumed on take-away basis (Janssen, Davies, Richardson & Stevenson, 2017). The majority of fast-food consumers eat while walking or loitering in the streets (Mazarire, 2016). Further, if the refuse bins are located at a considerable distance, consumers tend to dump and irresponsibly dispose refuse in the streets. Having been identified as the main source of litter in the streets some of the fast-food restaurants in Harare heeded to the moral duty to implement strategies related to sustainable packaging of fast-food (Mukeredzi, 2019). However, to date it has never been evaluated whether the brand images of those fast-food restaurants that had implemented sustainable packaging practices had improved. It is therefore the thrust of this study to evaluate whether sustainable packaging practice leads to improved brand image with the main purpose of trying to encourage those that are still lagging behind to catch up with the pacesetters.

The study will be organised as follows: literature review on the sustainable packaging practices of reduce, reuse, and recycle. The literature review will culminate in the formulation of the hypotheses and development of a conceptual model to be tested. Literature review shall be followed by the methodology adopted which shall present an outline of the sampling and data collection procedures, as well as the data collection instrument and data analysis procedures. The presentation of the results shall follow, and the study shall be concluded by a discussion of the results and an outline of the recommendations that are based on the empirical results obtained.

LITERATURE REVIEW

Theoretical framework

The green packaging philosophy is easily explained by the institutional theory. The institutional theory relates to the aspects of the social structure that are deeper

and resilient (DiMaggio & Powell, 1983). The social structure aspects would have over time become routines, norms, and rules that govern social behaviour (Scott, 2001). The institutions theory posits that behaviours and attitudes are a function of the environment in which an individual or an entity thrives in. The institutions theory has three mechanisms that are mimetic, coercive, and normative isomorphism. Mimetic isomorphism relates to benchmarking with the industry best practices (DiMaggio & Powell, 1983). Most restaurants are forced to practice green packaging as a result of benchmarking with international best practices from leading industry players such as McDonald's. Coercive isomorphism relates to pressure to conform. In the fast-food restaurant industry, there are legal obligations to practice sustainable packaging such as the banning of kylites in packaging food through the statutory instrument IS84 of 2012 (Mukucha, Mushanyuri & Jaravaza, 2021). Lastly, there is normative isomorphism which is pressure emanating from downstream supply chain participants such as customers (Lai, Wong & Cheng, 2011). It is through normative pressure from customers who have become environmentally conscious and who face the brunt of carbon footprints emanating from unsustainable packaging practices that the fast-food restaurant industry is facing **pressure** to conform if they are to maintain positive brand image.

Moreover, the visual cue utilization theory can also explain how the nature of a product's packaging can influence brand image. The visual cue utilisation theory states that products and services consist of several cues that portray quality to consumers (Olson, 1972), and consumers make use of these cues to assess the quality of product attributes (Rao & Monroe, 1988), such as packaging. Cues are diagnostic and non-diagnostic (Krishna, 2012; Krishna & Morrin, 2007). Diagnostic cues are those that belong to a certain category and are useful in assessing product attributes, while non-diagnostic cues belong to multiple categories and are therefore less useful in product attributes evaluation (Tal, Gvili & Amar, 2021; Krishna, 2012; Balaji, Raghavan & Jha, 2011). It is assumed that packaging material is a diagnostic cue that patrons use in formulation of a product's brand image (Nguyen *et al.*, 2020)

CONCEPTUAL FRAMEWORK

Green packaging

Traditionally packaging served the role of protection, communication, containment, and convenience (Dopico-Parada, Lopez-Miguens & Alvarez-Gonzalez, 2021). Packaging remains essential in safeguarding a wide range of products throughout their storage in warehouses, transportation to manufacturers

(in the case of raw materials), and across various intermediary channels as they make their way towards the end consumers. According to Kotler and Keller (2016) packaging also serves as a valuable source of information through labelling. Labelling is a mechanism for indicating information such as the name of a manufacturer, ingredients of the product, usage instructions, expiry dates, and warranty (Kotler & Keller, 2016). In addition, packaging aids with providing containment for products during transportation (Simmonds & Spence, 2017). Through containment a product can easily be moved from one place to another (Lysons & Farrington, 2016). Lastly, packaging provides convenience to customers in handling a product after acquiring it from the seller (Kotler & Keller, 2016).

Recently, there has been an increase in leaning towards eco-friendly packaging which is also referred to as sustainable packaging or green packaging (Prakash & Pathak, 2017). Green packaging refers to leveraging on packaging in an environmentally friendly manner for both the present and future generations sake (Wandosell, Parra-Merono, Alcayde & Banos, 2021).

Green packaging adoption has been embraced due to increasing demands for compliance of the environment friendly policies by both government agencies and pressure groups. Moreover, governments world over are putting in place pieces of legislation to enforce environmentally friendly packaging. Governments incentivise businesses through tax reductions (Wandosell *et al.*, 2021). At the same time consumer advocacy groups are also encouraging citizens to boycott products that leave high carbon footprint.

Sustainable packaging is attainable through green packaging practices such as reduce, reuse, and recycle (Steenis, van der Lans, van Herpen, Ligthart & Van Trijp, 2017).

Reduce packaging strategy

Reduce packaging strategy entails reducing the amount of packaging material especially disposable tableware where possible leading to high waste reduction. Waste reduction refers to the activities taken in order to reduce the quantity of toxicity in municipal solid waste (Zhang & Zhao, 2012). The reduce strategy involves eliminating non-biodegradable packaging material such as single-use-plastic based packaging material. Packaging material that is environmentally friendly includes, but not limited to the use compostable packaging material (Wandosell *et al.*, 2021). The strategy presupposes substituting plastics and bottles with biodegradable material such as paper, cardboard, corn starch, and bagasse-based packaging material that decompose naturally (Nguyen *et al.*, 2020).

Reuse packaging strategy

Reuse packaging strategy involved using the same packaging material after it has been previously used (Regattieri, Gamberi, Bortolini & Piano, 2018). This is common in restaurants that use reusable tableware which have been identified as having little carbon footprint (Genovesi, Aversa, Barletta, Cappiello & Gisario, 2022). This strategy involves reverse logistics where empty packaging material is returned back to the manufacturer or retailer for re-use (Wisner, Tan & Leong, 2016). It is common in the beverages industry where bottle containers are reused. Usually, customers are charged a deposit fee which is reimbursed upon returning the empty containers (Kroon & Vrijens, 1995). However, reuse is more prevalent on metal and glass material than plastic and paper because the latter is prone to residue and bacterial contamination (Patrignani, Siroli, Gardini & Lanciotti, 2016).

Recycle packaging strategy

Recycling involves either making use of recycled material or recycling a business' solid waste for the purposes of supplying the market with recycled products (Lysons & Farrington, 2016). T3s strategy is common in industries that use plastic-based packaging material (Franz & Welle, 2022). Most of the packaging material that are good candidates for recycling in the event that the option of reuse has not been preferred are the polyethylene terephthalate (PET) and High-Density Polyethylene (HDPE) narrow neck bottles (Antonopoulos, Faraca & Tonini, 2021).

Plastic material packaging is one of the least expensive packaging materials (Franz & Welle, 2022), and is common in the fast-food industry due to its ability to prolong the shelf-life of fast-food (Coles & Kirwan, 2011). Its nature and designs are suitable for reuse and recycling (Dainelli, 2014). The used plastic material is returned back to the manufacturers for recycling using the reverse logistics (Lysons & Farrington, 2016). Usually those that collect plastic materials for recycling earn a fee that incentivise them to do so.

Green packaging and brand image

Brand image is defined as a general impression that real and potential customers have towards a brand or a cognitive representation of the brand (Kotler & Keller, 2016). Businesses strive to attain favourable brand image so as to attract new customers, leverage on the brand image when introducing new products, boost confidence of existing customers, and improve customer relationships (Keller, 2008). The predictors of brand image in the extant literature have been identified as packaging, brand awareness, brand personality, perceived value, perceived quality,

price perception, satisfaction, and organizational association (Aaker, 1996). The former predictor of brand image has become of paramount importance considering its environmental impact. This resulted in most businesses adopting green packaging strategies such as reduce, reuse, and recycle. These green practices have never been assessed with regards to how they impact brand image, although previous research in the restaurant industry has already indicated numerous benefits such as customer attraction (Steenis *et al.*, 2017), financial benefits (Simmonds and Spence (2017), resource utilization efficiency (Schmidt, Langner, Hennings, Wiedmann, Karampourioti & Lischka. 2017), competitive advantage (Prakash & Pathak, 2017), and enhanced brand image (Nguyen-Viet, 2022).

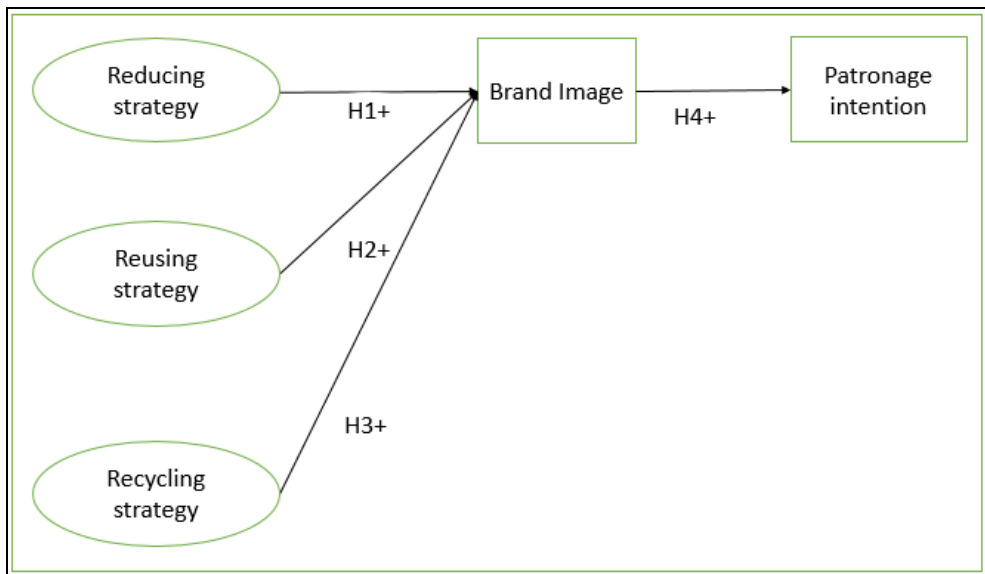


Figure 1 conceptual framework

Source: Authors (2023)

Therefore, based on the normative isomorphism dimension of the institution's theory, which is directly related to customer actions and the visual cue theory and as illustrated in the figure 1 above, it is predicted that;

H¹: Reducing strategy leads to a significant improvement in brand image.

H²: Reusing strategy leads to a significant improvement in brand image

H³: Recycling strategy leads to a significant improvement in brand image

Brand image and patronage intention

Patronage intention is the customer's desire to re-associate a service provider based on how the previous experienced impressed him/her (Soderland & Ohman, 2003). Patronage intention refers to behavioural loyalty (Khan, Aabdean, Salman, Nadeen & Rizwan, 2016), and can be viewed as a proxy of the actual behaviour. Business usually use it as a measure to reward loyal followers (Kumar & Shar, 2004). Thus, patronage intentions are likely to be correlated with actual patronage behaviour (East, Gendall, Hammond & Lomax, 2005). Indicators of Patronage intention may include repeat purchases, positive testimonies from customers, fast acceptance of new products (Liu, Guo, & Lee, 2011).

Businesses greatly benefit from customers with patronage intentions through achieving competitive edge, rising performance in sales (Reichheld, 1996), receiving ideas through constructive criticism and a minimal transactional cost, and free brand ambassador (Akbar, 2013; Han & Ryu, 2009). Patronage intention is an outcome of previously held consumer attitudes and cognitions as deduced from the theory of planned behaviour. The theory states that one's behaviour is predicted by his or her intentions (Ajzen, 1991). Since brand image is both an attitudinal and a cognitive construct that has an inclination towards intentions, and patronage intentions are a surrogate indicator of behaviour it is predicted that:

H4: Brand image leads to significant improvement in patronage intentions.

The hypotheses deduced from this review of the extant literature were tested using the procedures outlined in the next section. The next section also describes the operationalization of the variables in this study.

METHODOLOGY

Population and sampling

The population of this study was made up of the fast-food restaurants operating in the Harare metropolitan area. The chosen restaurants were those operating in the CBD because it is the geographical area where most litter is found (Ntubu & Muzenda, 2019). Due to an unavailability of a sampling frame of the fast-food restaurants operating in the CBD of Harare, and specifically 70 restaurants operating in the downtown area were targeted. Each restaurant provided its data regarding the average number of customers per day rounded to the nearest ten as shown in Table 1 below and this became the sampling frame.

Table 1: Target population for the study

customers	customers	customers	customers	customers	customers	customers
120	90	100	300	160	250	80
400	150	120	180	120	150	370
120	300	90	180	180	80	260
300	300	150	120	140	70	120
300	300	200	80	140	80	240
80	300	160	170	130	230	70
70	200	140	70	80	140	230
190	70	200	60	90	260	130
200	100	80	130	200	100	80
160	80	300	160	210	90	120
1940	1890	1540	1450	1450	1450	1700
Customers per day						11420
Target population for the study (Customers per 6 days)						68520

In terms of the Krejcie and Morgan (1970) sample determination table an approximate population of 75 000 results in sample size of 382 which applies to this study. Each restaurant had its 5 customers randomly selected and the questionnaire administered for the purposes of providing data on sustainable packaging (reduce, reuse and recycle), brand image and patronage intention translating to 350 respondents. The remaining 32 questionnaires were then administered to the first 32 restaurants in order of the size of the target population thus giving an effective sample of restaurant patrons of 382. Out of the 382 sampled questionnaires 50 were deemed not analysable giving a response rate of 86.9%.

Data collection instrument

In order to remain consistent with previous studies validated measures were adopted from past studies with the exception of green packaging variables (reduce, reuse and recycle) where the researchers established new measures. The data collection instrument was made up of the three independent variables related to the green packaging strategies that are namely reduce, reuse, and recycle. These independent variables were operationalized based on new measurement scales using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Measurement scales for dependent latent variables were adapted from the extant literature using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

Table 2: Constructs

Construct	Code	Item	Source
Brand image (BRI)	BRI1	This restaurant is a brand leader	Chen & Tseng, 2010
	BRI2	Patronizing this brand is a social status symbol	
	BRI3	This restaurant has a good reputation	
	BRI4	This restaurant is recommended by famous people I know	
Patronage intention (PAI)	PAI1	I will say positive things about this restaurant to other people.	Zeithaml, Berry & Parasuraman, 1996
	PAI2	I will recommend this restaurant to someone who seeks my advice.	
	PAI3	I will consider this restaurant my first choice.	
	PAI4	I will consider this restaurant my first choice.	
	PAI5	I will encourage friends and relatives to patronise this restaurant.	
Reducing strategy (RED)	RED1	less plastic commodities are ideal	Authors' creation
	RED2	Buying in bulk to reduce packaging	
	RED3	Paperless when shopping	
Reusing strategy (REU)	REU1	Using reusable utensils	Authors' creation
	REU2	Using reusable bags when shopping	
	REU3	Using coffee mugs rather than single use cups	
	REU4	Using a past newspaper for wiping dusty walls	
Recycling strategy (REC)	REC1	packaging written recycled material	Authors' creation
	REC2	Having a collection point for recyclable materials	
	REC3	Making product choices based on recycling ability	

As shown in Table 2 above, a four-item scale for brand image (BR1-4) was adapted from Chen & Tseng (2010), a five-item scale for patronage intention (PAI1-5) was adapted from Zeithaml, Berry & Parasuraman (1996). Regarding the three items measuring sustainable packaging, a 10-item scale was used. A three-item scale for reducing strategy (RED1-3), a four-item scale for reusing strategy (REU1-4) and a three-item scale for recycling strategy (REC1-3) were created by the authors. The items for the study constructs are shown in Table 2 above.

Data collection procedures

Data was collected from fast-food restaurant businesses operating in the city of Harare's downtown area. The respondents were customers tied to a particular

restaurant where they were dining when they were contacted. Data was collected using a structured questionnaire through a self-administering. This strategy was favoured on the basis nature of respondents who are only located when they are dining. The structured questionnaire sought their views on green packaging, specific restaurants' brand image and patronage intentions.

Data analysis procedures

The latent variable in this study were validated using Confirmatory Factor Analysis (CFA) run on the Statistical Package for Social Scientists (SPSS) software. Data analysis for the hypotheses was conducted using factorial Analysis of Covariance (ANCOVA) run on the Statistical Package for Social Scientists (SPSS).

RESULTS

Demographic profile of the respondents

The demographic profile of respondents is presented in table 3 below.

Table 3: Demographic profile

Variable		N	%
Gender	Male	95	28.6
	Female	237	71.4
Age (years)	18 - 30	158	47.6
	31 - 40	80	24.1
	41 - 50	47	14.2
	51 - 60	47	14.2
Experience/employment (years)	0 - 10	251	75.6
	11 - 20	81	24.4

Most of the customer respondents as shown in Table 3 were mainly females (71.4%), in the 18-30 age group (47.6%), and most of them were employed (75.6%).

Instrument reliability

Cronbach alpha and correlation for the constructs for the study (brand image (BRI); patronage intention (PAI); reduce (RED); reuse (REU) and recycle (REC)) are depicted in Table 4. Cronbach's alpha coefficients were used to determine instrument stability. The value range of ($\alpha = .947 - .989$), is above the standard minimum threshold of 0.7. As suggested by Linnander et al (2019) the results confirm the consistency of the instrument in collecting reliable data.

Table 4 Correlation and Cronbach alpha

Construct	N	Cronbach alpha	Brand image	Patronage intention	Reduce	Reuse	Recycle
Brand image	332	.929	1				
Patronage intention	332	.912	.608**	1			
Reducing strategy	332	.929	.787**	.535**	1		
Reusing strategy	332	.897	.552**	.317**	.331**	1	
Recycling strategy	332	.867	.634**	.297**	.432**	.392**	1

As shown in Table 4, there is a significant and positive strength of association between the constructs, where r ranges between 0.297 to 0.787 and $p < 0.01$. The correlations reveal a significant linear relationship between constructs.

Scale dimensionality

Unidimensional tests were done using PCA. The main purpose of PCA was to reduce the number of variables through generating a new set of variables known as factors without losing information, based on correlations among the manifest variables as advised by Puch and Oancea (2014), and assessing whether constructs conceptualised as unidimensional are indeed showing evidence of the claimed status. The results for dimensionality assessments are shown in Table 5

Table 5 dimensionality assessments

Reduce strategy		Reuse strategy		Recycle strategy		Brand image		Patronage intention	
RED1	.955	REU1	.910	REC1	.706	BRI1	.860	PAI1	.987
RED2	.934	REU2	.855	REC2	.888	BRI2	.882	PAI2	.988
RED3	.818	REU3	.850	REC3	.897	BRI3	.881	PAI3	.989
		REU4	.711			BRI4	.877	PAI4	.988
								PAI5	.999

Extraction Method: Principal Axis Factoring.

PCA indicated that all the study's constructs were unidimensional. This enabled the analysis process to go the next stage of assessing construct validity.

Hypotheses testing

The first three hypotheses were tested using multiple regression analysis. Prior to running the test statistical assumptions were assessed. The first assumption is

that the dependent variable must be approximately normally distributed across all the subgroups. However, this applies to small samples of less than 20. Since the sample size for the dependent variable in this study was 332 the assumption of normality was deemed to have been attained. The second assumption was homogeneity. That means that the variance of the dependent variable must be equal for all the categories of the independent variable (Field, 2018). This assessment must be conducted where there are unequal sample sizes for all the categories of the independent variable. In this study the sample sizes for all the categories of the independent variable was approximately equal for all the categories of the independent variables, and therefore the assumption was deemed to have been met due to the presence of a balanced design.

Table 6: multiple regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	-.108	.114		-.944	.346
1	Reducing strategy	.565	.029	.581	19.644	.000
	Reusing strategy	.264	.031	.248	8.534	.000
	Recycling strategy	.280	.030	.286	9.423	.000

a. Dependent Variable: Brand image

b. R Squared = .775

The results for hypotheses tested using multiple regression analysis are shown in Table 6. The first hypothesis tested the variability of brand image levels across the reducing strategy. Reducing strategy was significantly related to brand image, $B = .565$, $t = 19.644$, $p = .00$. The results rejected the null hypothesis and subsequently the research hypotheses was accepted.

The second hypothesis tested the variability of brand image levels across the reusing strategy. Reusing strategy was significantly related to corporate image, $B = .264$, $t = 8.534$, $p = .00$. The results rejected the null hypothesis and subsequently the research hypotheses was accepted.

The third hypothesis tested the variability of brand image levels across the recycling strategy. Recycling strategy was significantly related to corporate image,

$B = .280$, $t = 9.423$, $p = .00$. The results rejected the null hypothesis and subsequently the research hypotheses was accepted.

Regarding hypothesis 4, a Two-stage Least Squares Analysis was performed. In this analysis reduce, reuse and recycle (sustainable packaging) were the instrumental variables, brand image was the predictor while patronage intention was the dependent variable.

Table 7 Two-stage Least Squares Analysis

Model		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 1	(Constant)	1.402	.166		8.424	.000
	Brand image	.563	.046	.612	12.327	.000

- a. Dependent Variable: Patronage intention
- b. R Squared = .315
- c. Instrumental: reducing strategy, reusing strategy and recycling strategy

The results for the fourth hypothesis tested using a Two-stage Least Squares Analysis as shown in Table 7. The fourth hypothesis anticipated that brand image leads to higher levels of patronage intentions. The results suggests that brand image does predict a significant amount of variability in patronage intention, $B = .563$, $t = 12.327$, $p = .00$. The results failed to accept the null hypothesis and subsequently the research hypothesis was accepted.

DISCUSSION

The results indicate that the pursuance of the reducing strategy leads to an improved brand image. Previous research by Simmonds and Spence (2017) indicated that the role of packaging is not limited to protecting the main product, but influence consumer perceptions and patronage behaviour. Practically, fast food restaurants can pursue the reducing strategy through avoiding the use of non-bio-degradable material for packing fast-food. Such a strategy involves substituting plastic packaging material with paper-based packaging material (Antonopoulos *et al.*, 2021). Previous research has already revealed that the use of plastic material for packaging hot food is linked to several cancers of the stomach (e.g., Campanale, Massareli, Savino & Uriccho, 2020). Therefore, restaurant businesses should simply heed to the government’s policy of avoiding the use of plastic and kaylite material in favour of paper-based packaging material. The restaurant

industry must also organize bulk supply of beverages that are pumped directly to the restaurant's storage tanks and then served straight to the patrons using reusable water glasses. Locally this practice is common in public beer halls that serves locally brewed opaque beer.

The results in this study suggest that the brand image of fast-food restaurants is related to the reuse green packaging strategy. These findings concur with previous research. A study by Steenis *et al.* (2017) revealed that consumers respond positively to the green packaging strategies. Reusing has already been found to reduce litter in the streets thereby creating a favourable image to the consumers. The current appreciation of the reuse strategy might be attributed to rising environmental consciousness among the citizens in third world countries in recent years. Therefore, restaurant businesses must practice the reuse strategy with the view that the citizens are developing some levels of appreciation. Practically reusing in the fast-food industry can be practiced in the form of creating more dining space in the restaurants so that consumers may become seat-in patrons instead of take-away customers. Seat-in patrons can use ceramic tableware from restaurants which is washed after use and get used again for other patrons. Moreover, instead of selling beverages packed in PET bottles restaurants can use returnable glass bottles that can be returned to the manufacturers for future use. This practice is common in developed markets such as German. However, recently, it has been reported in the mainstream media that there is an acute shortage of returnable bottles leading to low order fill rates for most beer supplies in German. Moreover, there are cost implications involved in reusing which restaurant businesses must take note of (Coelho, Corona, ten Klooster & Worrell, 2020). The restaurant businesses that find reusing strategy to be viable must invest in dishwashing equipment. The equipment must be operated properly in order to avoid food contamination through improperly washed dishes.

The results in this study, furthermore, revealed that recycling strategy is significantly related to improved brand image. As has already been explained the restaurant industry need to take a current perspective and forge ahead with the recycling strategy since the patrons through habituation are ending up developing some appreciation. Therefore, practically restaurant businesses can pursue the recycling strategy after reducing and reusing has proved to be untenable through partnering with the recycling firms. This can be achieved through having the restaurant businesses playing the role of collection centres for the material to be recycled (Tehrani, Fulton & Schmutz, 2022). Restaurant businesses will have to invest in recycling material warehouses at their back yards and also encourage their

customers to dispose recyclable material in special refuse containers so that material for recycling is not mixed with other solid material such as leftover food which can also be used as a raw material for other purposes (Tehrani *et al.*, 2020).

Lastly, the study assessed the influence of brand image that emanates from green packaging on patronage intentions. It was revealed that the patronage intentions levels are influenced by brand image. These results support the accumulated body of knowledge that had empirically revealed a statistically significant relationship between brand image and patronage intention. Perhaps these findings can be explained by the nature of demand, since patronage intention is stronger indicator of demand. In some markets a brand might have a favourable image and customers have intentions to patronize the restaurant regardless lack of affordability, and proximity to the fast-food outlet.

MANAGERIAL IMPLICATIONS

The current recycling practices in frontier markets involves the use of marginalized individual waste pickers rummaging both controlled and uncontrolled landfills to collect recyclable materials such as plastic papers and aluminium tins. However, this practice though progressive is associated with health hazards to the involved residents since most of them lack protective clothing and skills for handling hazardous materials that are normally dumped together with recyclable material. Moreover, residents who try to eke a living through retrieving recyclable material from the landfills are often harassed by municipal authorities since most of them are suspected of being involved in illicit dealings. Moreover, waste pickers are associated with practicing additional littering through rummaging the bins and waste bags. Furthermore, waste pickers are accused of burning material at dumpsites in a bid to retrieve metals and wires from disposed tires.

The restaurant industry can further spruce up its image leveraging on packaging material through encouraging its patrons to use waste disposal methods that enable reusing and recycling. For instance, it can reduce the use of commercial packaging through encouraging their patrons to bring their packaging materials such as lunchboxes. This can be incentivized by reducing the price of the final product. Furthermore, the restaurant industry can raise awareness campaign that promote segregation of disposed packaging material in order to enable recycling (Tehrani *et al.*, 2020). Segregation of waste material enables plastic material to be recycled and biodegradable waste to be composited or to be dealt with using appropriate biological processes that lead to the stabilization of waste (Genovesi *et al.*, 2022). Where the use of non-biodegradable material for packaging purposes is inevitable

restaurants can boost their image through making use of on-site incinerators. This ensures that the restaurant is in control of the litter emanating from its disposable packaging material (Genovesi *et al.*, 2022). Worldwide restaurants such as McDonalds in The USA have already implemented that strategy and it would be progressive if the restaurants from the frontier markets follow suit.

Finally, considering that it has been empirically proven in this study that the implementation of green packaging practices has numerous benefits, it becomes necessary if not imperative for restaurant businesses in Harare and the rest of nation to invest in green practices. It is a fact that green practices are associated with a substantial initial capital investment, but the benefits have been empirically proved to outweigh the costs (Nguyen *et al.*, 2020). Previous research has already indicated that the substantial financial and goodwill benefits that are associated with the adoption of green practices (Tehrani *et al.*, 2020).

LIMITATIONS, AND FUTURE RESEARCH AGENDA

The study was limited to one industry that was felt to be the major contributor of litter in the streets of most urban centres in frontier markets. Future studies must be extended to other sectors of the economy that also significantly contribute to litter in the streets such as supermarkets and administrative offices. Administrative offices dispose computer paper, bond paper, newspapers, cardboard boxes, and magazines that are often dumped in the streets and can be recycled if the perpetrators are presented with empirical evidence of the recycling benefits. Therefore, a similar study needs to be replicated in those industries.

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DOWNSIZING AND AFFECTIVE COMMITMENT IN THE FREIGHT SERVICES MANAGEMENT INDUSTRY: A MIXED METHOD ANALYSIS

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Abstract

Downsizing, which is a deliberate and systematic reduction of the workforce, has become a common practice in organizations across industries. Despite its widespread use, the impact of downsizing on employee affective commitment, or emotional attachment to the organization, remains equivocal. This study explores the impact of downsizing on affective commitment in the freight services management industry using a mixed-methods approach. The quantitative phase of the study involved a survey of 250 employees from freight services management organizations in Zimbabwe. The survey measured downsizing and affective commitment. The qualitative phase involved in-depth interviews with 15 employees who had experienced downsizing in freight services management organizations. The quantitative findings revealed that downsizing had a significant negative impact on affective commitment. The qualitative findings provided insights into the mechanisms through which downsizing affects affective commitment. Employees reported feeling insecure, anxious, and betrayed following downsizing. They also expressed concerns about their workload, job security, and career prospects. These negative emotions led to a decline in affective commitment. The study's findings have several implications for organizations considering downsizing. First, organizations should be aware of the potential negative impact of downsizing

on employee affective commitment. Second, organizations should take steps to mitigate the negative impact of downsizing on employees, such as providing support and counselling and communicating openly with employees about the downsizing process. Third, organizations should consider alternative strategies to cost-cutting, such as process improvement and efficiency gains.

Keywords: *Downsizing, Affective commitment, Freight services management, Mixed-methods research*

JEL Classification: L8; L87; M12

1. Introduction

The Freight Services Management Industry operates in a dynamic and highly competitive environment characterised by ever-changing market demands and operational complexities (Mushonga & Ukpere, 2022). In response to these challenges, organisations within the freight services sector occasionally resort to downsizing as a strategic manoeuvre to streamline their operations, cut costs, or adapt to market fluctuations (Mapira, 2014). While downsizing is often viewed as a rational business decision, its consequences on employees' emotional attachments to their organisations have received limited attention. Affective commitment, one of the components of organisational commitment, is particularly pertinent in this context. According to Sikayena (2017), affective commitment reflects the extent to which employees identify with, feel emotionally attached to, and invest their personal well-being in their organisation.

This research embarks on a comprehensive examination of the multifaceted impact of downsizing on affective commitment within the unique landscape of the Freight Services Management Industry. By combining both quantitative and qualitative research methods, the study aims to provide a holistic understanding of how downsizing events interact with employees' emotional bonds to their organisations. This research seeks to address a critical knowledge gap in the field of organisational behaviour and employment relations by exploring how employees perceive, adapt to, and experience downsizing events, ultimately shaping their commitment to their organisations.

The Freight Services Management Industry's distinctive challenges demand a closer look at the interplay between downsizing and affective commitment. In this sector, where logistical precision, cost-efficiency, and employee morale are paramount, a thorough understanding of how downsizing influences the emotional

fabric of organisations is essential (Johnstone, 2018). While prior research in this area has primarily focused on single-method approaches, such as purely quantitative or qualitative analyses, this study employs a mixed-method approach to provide a deeper, more nuanced perspective.

Quantitatively, this research quantifies the overall level of affective commitment among employees post-downsizing through the administration of surveys and questionnaires. It seeks to measure the extent to which employees retain their emotional attachment to their organisations in the aftermath of downsizing events (Allen & Meyer, 1997). By doing so, it offers an empirical snapshot of affective commitment within the industry, thus laying the foundation for a more holistic analysis.

In parallel, the qualitative dimension of this study ventures into the realm of employee experiences, capturing the narratives and emotional nuances of those who have navigated downsizing events within the freight services management sector. Through in-depth interviews and focused group discussions, it delves into the subjective dimensions of affective commitment. By listening to the voices of employees, it aims to understand the intricate interplay of emotions, values, and identity in the context of organisational change.

According to Alicia and Ludwig (1999), understanding the emotional complexities of downsizing is imperative, as these experiences often transcend quantitative metrics. Mushonga and Ukpere (2022) contend that an organisation may register a certain level of commitment in numbers, but the qualitative data can reveal the deeper, often hidden, layers of how employees perceive and navigate change. Qualitative insights can shed light on employees' emotions, coping mechanisms, and their evolving sense of self within the organisation.

The anticipated contributions of this research are twofold: academic and practical. From an academic standpoint, this study introduces a novel framework for understanding the complex interplay between downsizing events and affective commitment. It goes beyond the surface-level quantitative data to unearth the emotional undercurrents that shape the employee-organization relationship (Akiyemi, 2018).

For practitioners in the Freight Services Management Industry, this research provides actionable insights into HR strategies and leadership practices. It equips organisations with a more empathetic and effective approach to downsizing, allowing them to safeguard employee commitment and well-being amidst change. Ultimately, the research seeks to foster a culture of organisational change that acknowledges and respects the emotional dimensions of downsizing, benefiting both the industry and its employees.

The Freight Services Management Industry continues to evolve, organisations must find a balance between strategic adaptability and employee well-being (Johnstone, 2019).

1.2 Research Aim

This research aims to bridge this gap by delving into the emotional landscapes of the industry, illuminating the effects of downsizing on employees' affective commitment, and offering guidance for a more resilient and emotionally intelligent approach to organisational change.

2. Literature Review

The concept of downsizing within organisations has garnered significant attention in both academic and practical circles over the past few decades. Downsizing, often initiated as a strategic response to economic pressures, shifting market dynamics, or the pursuit of organisational efficiency, has wide-ranging consequences for employees and their commitment to the organisation (Mushonga & Ukpere, 2022; Johnstone, 2019; Cascio, 2010). This literature review critically explores existing research on downsizing and its impact on affective commitment, with a particular focus on the Freight Services Management Industry. While downsizing is a common practice across industries, its implications in this sector are influenced by the industry's unique characteristics, which emphasise logistical precision, cost-efficiency, and employee morale (Mapira, 2014).

2.1 Downsizing and its Prevalence

Downsizing involves the reduction of an organisation's workforce to achieve cost savings and enhance competitiveness. It is a widespread practice, and its frequency varies with economic cycles. Scholars such as Cascio (2010) and Cameron (1994) have examined downsizing extensively and identified its patterns and drivers. Research in diverse sectors suggests that downsizing can be a response to economic recessions, mergers and acquisitions, or shifts in market demand (Mapira, 2014; Armstrong, 2008; Cascio, 2010; Sikayena, 2017). The Freight Services Management Industry, with its susceptibility to market fluctuations, has not been immune to this trend. Organisational commitment, as defined by Allen and Meyer (1997), is a multifaceted construct encompassing affective commitment, continuance commitment, and normative commitment. Affective commitment, in particular, relates to an employee's emotional attachment to the organisation, reflecting their identification with and affection for the entity (Alicia & Ludwig, 1999). It signifies the employee's willingness to remain with the organisation

because they want to. Scholars, including Meyer and Herscovitch (2001), have argued that affective commitment is the most valuable type of commitment, as it is associated with various positive outcomes, such as higher job satisfaction and performance.

2.2 Downsizing and Affective Commitment

Downsizing often has complex and varying effects on employees' affective commitment. Cascio (2010) suggested that downsizing can lead to reduced affective commitment, as employees may perceive it as a breach of the psychological contract, which may, in turn, lower their motivation and emotional attachment to the organisation. However, recent research has also indicated that under certain conditions, downsizing might not necessarily lead to a decline in affective commitment (Mushonga & Ukpere, 2022). In the context of the Freight Services Management Industry, where rapid market changes are common, it is essential to examine the specific nuances of how downsizing affects affective commitment.

The literature emphasises that employee perceptions and reactions to downsizing play a crucial role in shaping their affective commitment. Carroll and Schreper (2015) argue that the way employees perceive the fairness and transparency of the downsizing process influences their emotional responses. Additionally, positive communication and support from organisational leaders during downsizing have been found to mitigate negative effects on affective commitment (Armstrong, 2008). Understanding how employees in the Freight Services Management Industry perceive and respond to downsizing is essential for developing effective strategies for maintaining and even enhancing affective commitment. The Freight Services Management Industry presents distinct challenges that set it apart from other sectors. Intense competition, cost pressures, and a high reliance on skilled and dedicated employees characterise this industry (Mushonga & Ukpere, 2022). Downsizing within this context can lead to increased workload and stress among the remaining employees, as well as concerns about maintaining the high level of service that customers demand. Research conducted by Argyris (1999) in the context of the shipping industry suggests that such industry-specific challenges can exacerbate the negative effects of downsizing on affective commitment.

The role of human resource strategies and leadership practices in mitigating the adverse effects of downsizing on affective commitment has been a subject of interest in recent research. Scholars like Appelbaum, Bailey, Berg, and Kalleberg (2000) have advocated for the implementation of human resource practices that prioritise employee well-being and communication during downsizing. Effective

communication, employee involvement, and support from leadership have been identified as critical factors in maintaining or even enhancing affective commitment (Cameron, 1994). This literature underscores the need for organisations in the Freight Services Management Industry to consider HR strategies that align with the industry's peculiarities. Communication is a key consideration in understanding the effects of downsizing is the extent to which employees are involved in the decision-making process. Research by Johnstone (2019) has highlighted that involving employees in the planning and execution of downsizing can lead to greater acceptance of changes and reduce the negative impact on affective commitment. Given the demands of the Freight Services Management Industry, involving employees in decision-making may be a particularly relevant approach to mitigating the consequences of downsizing.

Employee turnover is a significant concern in the Freight Services Management Industry. High turnover can disrupt operations and lead to increased costs in terms of recruitment and training. Maintaining affective commitment during and after downsizing is essential to reducing employee turnover (Cascio, 2010). The impact of downsizing on turnover is an area of concern for both researchers and industry practitioners, and the literature suggests that the way organisations handle downsizing can significantly influence retention rates.

In summation, this literature review highlights the multi-faceted nature of downsizing and its impact on affective commitment, with a specific focus on the Freight Services Management Industry. The industry's unique challenges, coupled with the emotional and organisational complexities of downsizing, make this a critical area of study. It is within this context that the present research aims to contribute by examining the intricate emotional dimensions of downsizing and affective commitment within the Freight Services Management Industry. By doing so, it seeks to provide a nuanced understanding of how this industry's specific challenges interact with the complex processes of downsizing, ultimately guiding organisations in preserving and enhancing employee commitment during times of significant organisational change.

3. Research Method

In this research, a mixed-method approach was employed to comprehensively investigate the impact of downsizing on affective commitment in the Freight Services Management Industry. Quantitative data was collected through structured surveys and questionnaires distributed to a representative sample of 250 employees within the industry, allowing for the quantification of overall affective commitment

and its dimensions. Simultaneously, qualitative insights were gathered through in-depth interviews with a subset of employees who have experienced downsizing events. This dual-method strategy enables a more comprehensive understanding of the emotional dimensions of downsizing and its effects on affective commitment (Creswell, 2014; Plano Clark & Ivankova, 2016). Data analysis was statistically done for the quantitative data and thematic analysis for the qualitative data, with the aim of identifying convergences and divergences between the two data sets. This mixed-method approach provided a more holistic view of the complex interplay between downsizing and affective commitment, addressing the research objectives and shedding light on the industry-specific nuances of this relationship (DeCuir-Gunby & Schutz, 2017). Studies examining the impact of downsizing on affective commitment have predominantly employed either quantitative or qualitative methodologies with limited integration. A mixed-method approach, such as the one adopted in this study, is relatively rare in the literature. This approach enables the exploration of not only the extent of commitment but also the emotional nuances that quantitative data might not capture (Creswell & Plano Clark, 2017).

4. Data Presentation and Analysis

Table 1 Affective Commitment Scale

	Affective Commitment (AC) scale	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Rank
1	Following downsizing, I am still happy to spend the rest of my career at this organisation.	39.7%	22.4%	17.9%	12.2%	7.7%	2.26	1.304	5
2	I lost a sense of belonging to this organisation ever since the	5.1%	23.7%	19.9%	49.4%	1.9%	3.19	.991	1



	Affective Commitment (AC) scale	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Rank
	downsizing event.								
3	Following the downsizing event, I do not see myself as part of the family or a citizen of this organisation.	5.1%	29.5%	19.2%	43.6%	2.6%	3.09	1.018	3
4	Despite the downsizing event, I have an incredible feeling of personal attachment to this organisation.	7.7%	18.6%	27.6%	40.4%	5.8%	3.18	1.050	2
5	Downsizing at this organisation made me feel that the problems that the organisation faces, are my own.	4.5%	24.4%	37.8%	25.0%	8.3%	3.08	1.003	4
	Overall mean & SD score						2.9603	.44369	

Fig 1 above illustrates a statistical analysis of the Affective Commitment (AC) with items measuring the employee's willingness to stay with a downsizing organisation, sense of belonging, identification, emotional attachment, and sense of ownership of the organisation's problems after the downsizing event. A high score on the AC scale indicates that the employee is strongly committed to the organisation, feels like a part of it, and cares about its success. A low score on the AC scale indicates that the employee is considering leaving the organisation, does not feel like a part of it, and does not care about its success.

Item 1: *Following downsizing, I am still happy to spend the rest of my career at this organisation.* This item measured the employee's willingness to stay with the organisation despite the downsizing event. Item AC1 recorded the lowest mean value of 2.26 (SD=1.304), which indicates that the employees considered leaving the organisation and may not be confident with the organisation in the future.

Item 2: *I lost a sense of belonging to this organisation ever since the downsizing event.* This item measured the employee's sense of belonging to the organisation after the downsizing event. In total, the majority, 51.3%, of the participants agreed with the statement, while 28.8% disagreed and 19.9% remained neutral. Item AC2 recorded the highest mean score of 3 (SD = 0.443). A high score on this item indicates that the employee feels like an outsider and does not feel connected to the organisation.

Item 3: *Following the downsizing event, I do not see myself as part of the family or a citizen of this organisation.* This item measures the employee's identification with the organisation after the downsizing event. Item AC3 had a mean value of 3.09 (SD=1.018). A high score on this item indicates that the employee does not identify with the organisation and does not feel like a part of it.

Item 4: *Despite the downsizing event, I have an incredible feeling of personal attachment to this organisation.* This item measures the employee's emotional attachment to the organisation after the downsizing event. Surprisingly, Item AC4 had a mean value of 3.18 (SD=1.050). A high score on this item indicates that the employee feels a strong emotional attachment to the organisation and cares about its success.

Item 5: *Downsizing at this organisation made me feel that the problems that the organisation faces are my own.*

This item measures the employee's sense of ownership of the organisation's problems after the downsizing event. Item AC5 had a mean value of 3.08 (SD=1.003). These were also surprising results since a high score on this item

indicates that the employee feels like the organisation's problems are their own and that they are responsible for solving them.

To demystify the ambiguities experienced in the quantitative responses, a qualitative follow-up study was conducted and delved into the dimensions of commitment. Participants were asked whether they still had any desire to remain employed by their respective organisations after experiencing downsizing. The majority of participants expressed that they no longer felt a strong connection to their organisations and had no intention of continuing to work for them. Interestingly, they explained that their primary motivation for staying was purely to earn a salary and support their families. A participant's comment exemplified this sentiment:

"To be honest, after the downsizing, I no longer feel like I belong to the organisation. It was a difficult experience witnessing my colleagues lose their jobs, not knowing when my turn would come" (ZorinOS, pseudonym).

In most instances, the commitment expressed by participants could not be classified as affective or normative commitment. Instead, most responses indicated a form of commitment driven by necessity, which is continuance commitment. Many participants indicated that they felt compelled to remain with their organisations because they had no other viable employment options. This was reflected in the following statement from one of the participants:

"I do not have the luxury of choosing work based on my passion... Even though I wish I could find another job, I have no alternative but to continue working here to provide for my family. Job opportunities are scarce, and I have no option but to hold on to my current position" (Fedora, Pseudonym).

As alluded to earlier, most employees expressed a desire to leave their current organisations, but due to the limited availability of other job prospects, they felt compelled to stay.

5. Discussion of Findings

The quantitative analysis in Figure 1 reveals intriguing insights into the impact of downsizing on affective commitment within the Freight Services Management Industry. Item AC1, measuring the willingness to continue a career with the organisation after downsizing, recorded the lowest mean value of 2.26, indicating that many employees were contemplating leaving the organisation. This result aligns with the literature, which suggests that downsizing often leads to a decline in affective commitment as employees may perceive it as a breach of the

psychological contract (Brockner et al., 1995). The majority of participants expressed their disconnection from the organisation, which signifies a drop in their affective commitment, a sentiment corroborated by comments from participants in the qualitative follow-up study. These insights are in line with Mushonga and Ukpere (2022), who observed that downsizing has a general negative impact on employee commitment.

The results of this study depict that after downsizing, employees lost a sense of belonging to their organisations. Item AC2, assessing the sense of belonging to the organisation after downsizing, presented an interesting contrast. It recorded the highest mean score of 3, indicating that a significant portion of participants felt like outsiders and disconnected from the organisation. This result suggests that the downsizing event eroded the employees' sense of belonging, which is a common consequence noted in research (Carroll & Schnepfer, 2015; Mushonga & Ukpere, 2022). The qualitative data revealed that witnessing colleagues lose their jobs contributed to this sense of detachment, reflecting the emotional turmoil experienced by employees. This is in line with Allen and Meyers' (1997) assertion that after downsizing, survivors will remain with resentment and a sense of guilt, seeing that their colleagues were retrenched.

In the same manner, item AC3, which explored employees' identification with the organisation after downsizing, had a mean value of 3.09, indicating a relatively lower level of identification. This result supports the notion that downsizing can lead to employees feeling less like a part of the organisation, which aligns with the work of Allen and Meyer (1997). Participants' responses echoed these findings as they described no longer seeing themselves as part of the organisational "family" or "citizens" of the organisation.

In contrast to the declining affective commitment observed in some items, Item AC4, measuring emotional attachment to the organisation after downsizing, had a mean value of 3.18. This surprising result suggests that despite the challenges and uncertainty posed by downsizing, many employees still expressed a strong emotional attachment to the organisation. While prior research has often suggested a negative impact of downsizing on affective commitment, this result indicates that, in some cases, emotional bonds endure (Cascio, 2010). Qualitative comments provided further context, revealing the complexities of emotional experiences within the context of downsizing. This result is in line with Mushonga and Ukpere (2022), who argue that in situations of employment scarcity and tight job markets, organisational commitment comes with a sense of emotional necessity. Item AC5, exploring employees' sense of ownership of the organisation's problems after

downsizing, had a mean value of 3.08, indicating a moderate level of perceived responsibility for organisational challenges. This suggests that even in the face of downsizing, a considerable portion of employees still felt a sense of responsibility for addressing the organisation's problems. This finding may reflect the persistence of employees' commitment to contributing to the organisation's success despite the challenges imposed by downsizing.

The qualitative follow-up study uncovered an essential dimension of employee commitment not easily classified as affective or normative commitment. Many employees expressed a sense of commitment driven primarily by necessity, which aligns with continuance commitment. Participants indicated that they continued to work for their organisations because they had limited alternative employment opportunities. This finding underscores the delicate balance employees in the Freight Services Management Industry must strike between economic stability and their emotional connections to their organisations (Mushonga & Ukpere, 2022). The qualitative follow-up reviewed that, even when affective commitment wanes due to downsizing, continuance commitment can play a significant role in retaining employees. These nuanced insights provide a comprehensive view of the complex interplay between downsizing, employee commitment, and the unique challenges faced within this industry.

6. Conclusion and Recommendations

In conclusion, this research has shed light on the intricate relationship between downsizing and affective commitment within the unique context of the Freight Services Management Industry. The findings have highlighted the complex emotional dynamics that employees experience in the wake of downsizing events. While some employees expressed a decline in their willingness to stay with the organisation and a reduced sense of belonging and identification, it was surprising to observe that emotional attachment and a sense of ownership of organisational problems endured for a substantial portion of participants. This multifaceted picture emphasises the importance of understanding that affective commitment is not solely eroded by downsizing but is influenced by various individual and contextual factors.

The insights from the qualitative follow-up study underscored the role of continuance commitment, driven by necessity, among employees in this industry. Many employees, while expressing a desire to leave their organisations, felt compelled to stay due to limited alternative employment opportunities. This form of commitment highlights the industry's challenges in retaining employees, even when affective commitment declines. The interplay between affective and

continuance commitment signifies the delicate balance that employees in this sector must navigate in times of economic instability.

Recommendations

1. **Enhance Communication and Support:** Organizations within the Freight Services Management Industry should prioritise open and transparent communication during the downsizing process. Providing emotional and informational support to employees can help mitigate the negative emotional consequences and strengthen affective commitment (Armstrong, 2008). Timely and empathetic communication can alleviate feelings of detachment and reduce concerns about job security.
2. **Customized HR Strategies:** Given the industry-specific challenges of the Freight Services Management sector, organisations should tailor their HR strategies to address the unique demands and expectations of their employees. This may include initiatives focused on work-life balance, stress management, and skill development, which can enhance employee well-being and engagement.
3. **Skill Enhancement and Training:** Investing in skill enhancement and training programs can provide employees with more confidence in their ability to secure alternative employment opportunities. This can lessen the sense of necessity associated with continuance commitment and provide employees with more choices in their career paths.
4. **Leadership Development:** Leaders in organisations undergoing downsizing should be equipped with the skills and knowledge necessary to manage the emotional impact of these events on employees. Leadership training in areas of emotional intelligence and effective change management can help mitigate the negative emotional consequences of downsizing.
5. **Exit Strategies:** Recognizing that some employees may still choose to leave after downsizing, organisations should consider developing supportive exit strategies. This can include offering career transition support, facilitating networking opportunities, and maintaining positive relationships with departing employees. Such strategies can leave a positive impression and may lead to re-engagement in the future.
6. **Long-term Employee Engagement:** Beyond immediate downsizing events, organisations should focus on long-term employee engagement strategies. Regular feedback mechanisms, recognition programs, and career

development opportunities can help nurture and sustain affective commitment. This proactive approach can help employees maintain their emotional bonds with the organisation and enhance their sense of belonging and identification over time.

In sum, this research calls for a comprehensive understanding of the interplay between different dimensions of commitment, the emotional complexities of downsizing, and the industry-specific challenges faced by employees in the Freight Services Management Industry. By implementing the recommendations outlined, organisations can better navigate the complexities of downsizing, retain valuable talent, and enhance the well-being and commitment of their workforce, ultimately contributing to their long-term success.

Future Research Directions

In light of the complexity and industry-specific nature of downsizing in the Freight Services Management Industry, future research should focus on several key areas. These include examining the role of leadership and communication in shaping employee perceptions of downsizing, exploring the moderating effect of industry-specific challenges, and investigating the long-term effects of downsizing on affective commitment and employee retention. Additionally, research should explore how affective commitment impacts other organisational outcomes, such as job performance and customer satisfaction.

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EFFECT OF FINANCIAL STABILITY ON NIGERIAN ECONOMIC GROWTH: AN EMPIRICAL INVESTIGATION

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Abstract

Economic growth is one of the most extensively alluded economic indicators. This study focused on the effect of financial stability on economic growth of Nigeria. An ex-post facto research design was adopted for the study. The study adopted secondary data. Annual reports data gathered on Return on assets and non-performing loans of eight (8) banks with international authorization to represent all deposit money banks in Nigeria covering the period of 2002 to 2021. Purposive sampling was employed to choose data from Nigeria. Annual data covering the entire study period was collected and analyzed using the E-Views 9 statistical package. Findings revealed that Return on asset (ROA) has a negative relationship with Nigerian economic growth and the effect is statistically significant ($\beta = -0.051184$; $P\text{-Value} = 0.0390$). Non-performing loan (NPL) has a negative correlation with Nigerian economic growth and the effect is statistically insignificant ($\beta = -0.016001$; $P\text{-Value} = 0.4983$). The study concluded that financial stability when managed appropriately hold potential to enhancing Nigerian economic growth. Based on the findings, the study recommended that government should establish a steady exchange rate regime capable of encouraging capital inflows into the country and boost Nigeria's financial stability. In addition, the current efforts designed at checkmating loan defaults in the banking system through the

application of the global standing instruction (GSI) regulations should be improved upon, sustained, and extended to non-individual customers of financial institutions. Furthermore, the cash reserve requirements (CRR) should be reduced to give room for more resources for lending to investors where banks could also make more profits. The current high lending rates in the banking industry are unfavorable to support the real sector economy and, therefore, incapable of motivating economic growth, therefore, the CBN should reduce monetary policy rate (MPR).

Keywords: *Economic growth, Financial stability, Non-performing loan, Return on asset*

JEL Classification: G01, G18, G28, E44, E58, O11, O16, C22, C52, O55

Introduction

Economic growth means a rise in production in an economy over time. It could be short run or long run. In the short term, growth signifies a rise in real production, typically noticed from changes in real gross domestic product (RGDP). Meanwhile, in the long time, growth symbolizes a rise in the potential production that can be manufactured by an economy. Economic growth is one of the most extensively alluded economic indicators. When the economy expands, the quantity of goods and services improves. As a result, we can access an array of products and services to meet needs. Consequently, because of economic growth, our standard of living will be enhanced. As the economy develops, customer and enterprise demand grow. Competitive pressure is also likely to fall in line with high demand. Organizations utilize additional workers to expand production and generate additional profits. For the household segment, this is a time where their income expectations are brighter. On the other hand, when there is economic contraction, demand for goods and services declines.

The company started to lower production and started to reduce operating costs. If demand drops further, they might lay off employees. Consequently, throughout this period, the unemployment level was high. Also, due to minimal demand, inflationary pressures tend to disappear (Nasrudin, 2022).

Financial and monetary stability are of critical significance to the effective and efficient implementation of a market-based economy as they provide the justification for planning and distribution of scarce resources in the real sector. In recent times, policy concerns and emphasis on investigations related to financial

stability took an intensified measurement following the outcome of the 2007/08 global financial disaster. The disaster confirmed the significance of ongoing evaluation of the indicators of financial stability by the authorities, while also elevating the cruciality of the functions of liquidity and resource quality in ensuring financial stability (Olawale & Ifedayo, 2015; Orenuga, & Oyedokun, 2022). Over the years, financial authorities gave importance to micro-prudential indicators of financial stability. According to Udom, Eze and Inim (2018), the objective of this consideration was directed towards preventing bankruptcy of personal financial firms within the financial arrangement. The narrative was financial instability/crisis happened due to unstable and bad financial organizations. The bank consolidation exercise in 2004/2005 was designed at improving the stability of the financial structure by increasing the paid-up capital for banks from N2billion to N25billion (Soludo, 2004). The reform had enormous improvement on the Nigerian financial system as it amounted to a more diversified financial segment and increased the role and contribution of other non-bank financial organizations (Oyedokun, & Adeyemi, 2019; Njang, Omini, Bekun & Adedoyin, 2020). At this point, given the complicated nature of capital flight, financial stability, and its effects on Nigerian economic growth, this study was undertaken to determine the influence of financial stability on the economic growth in Nigeria. The specific objectives are to:

1. Assess the effect of return on asset on Nigeria's Real Gross Domestic Product.
2. Evaluate the effect of non-performing loan on Nigeria's Real Gross Domestic Product.

Literature Review

Financial Instability

Although financial instability was partially an outcome of fiscal deficits and exchange rate policies, in several countries it was also a by-product of financial authoritarianism, that is interest rate fixed below inflation rates, high lawful reserve requirements of banks and other financial institutions, and stiffnesses imposed on the financial systems. According to Okonkwo, Ojima and Manasseh (2020), financial repression encouraged capital flight both by lessening returns on domestic investments and sustaining overall financial instability for example through its possible effect on financial disintermediation when inflation rises.

Domestic firms that took advantage of comparatively inexpensive foreign credit suffered financial instability after remedial devaluations were implemented. Financial instability also activates what can be considered as a secondary source of

capital flight – the stock of assets/resources held by people abroad (Ajose, & Oyedokun, 2018). Financial instability induced foreign asset holders to re-invest abroad the proceeds on their assets/resources such as dividends, interest, and capital gains. While policy misrepresentations tend to have an instantaneous impact on capital flight, reversing them could only have encouraging consequences in the long run (Ogbonna, Ejem, & Oyedokun, (2017). In the short-run, fiscal reforms and trade might encourage instead of reversing capital flight as they pose a danger to heavily protected segments, privileged tax loopholes and tax evasion. However, a significant reduction of fiscal inequality could quicken the beneficial impacts of removing other policy misrepresentations. Return on assets and non-performing loan are sub-measures of financial stability.

Determinants of Financial Stability

Return on Assets

Return on Asset (ROA) is a profitability ratio that indicates how good an organization is producing from its total assets in an efficient and effective manner. An organization with a high return on assets (ROA) would be better off. Return on Assets (ROA) is a financial ratio utilized to determine the extent to which the resources of a company have been employed to generate profits (Boyte-White, 2022).

Non-performing Loan

A non-performing loan (NPL) is a credit in which the borrower is in default and has not repaid the monthly principal and interest repayments for a specific period. According to CFI (2020), non-performing loans happen when borrowers run out of money to make repayments or get into circumstances that make it challenging for them to continue making repayments towards the loan. Usually, non-performing loans are deemed bad debts because the possibilities of recouping the defaulted loan repayments are slight.

Real Gross Domestic Products

Real gross domestic product is a macroeconomic indicator that measures the value of goods and services produced and manufactured by an economy in a certain period, adjusted for inflation. Fundamentally, it measures a country's total economic output, adjusted for price variations (Ganti, 2023). To ascertain "real" gross domestic product, its nominal value must be adjusted to reflect price changes to permit us to see whether the values of output have gone up because more goods and services are being produced or merely because prices have increased (Ogwuche, Abdullahi, & Oyedokun, 2019; Callen, 2020).

Theoretical Review

This study is anchored on Debt Overhang Theory. Myers introduced this theory in 1977 (Myers, 1977). He concentrated on corporate finance and the theory was first utilized to development economics by Krugman (1988) and Sachs (1989) after the Latin American debt crisis in 1980s (Krugman, 1989; Sachs, 1989). When external debt surpasses the predictable present value of the possible future payments to the creditors, the country no longer has any inducement to implement the essential financial and macro-economic changes to enhance its economic growth and refund the creditors (Freytag, Pettersson, & Schmied, 2016).

The debt overhang theory postulates that there is a likelihood that in time to come, external debt will be greater than the country's repayment ability and the estimated debt servicing payments will dissuade both the domestic and overseas investments. According to Ngugi, Ngugi and Njaramba (2016), the theory demonstrates that the stock of public debt as well as the debt payments influence economic growth and modifies the significances of public expenditure by this means preventing investment in the country.

This study is anchored on the Purchasing Power Parity (PPP) Theory. Professor Gustav Cassel of Sweden propounded this theory in 1918 and suggested that the nominal foreign exchange rate should consider the purchasing power of one currency compared to another (Stephen & Sanmi, 2011). Each time a nation saves a dollar of revenue, it can utilize it to finance domestic capital or an overseas asset or resources and stimulate its economic growth (Suranovic, 2012). This theory shows that the transactions or operations of a country in the form of capital outflows directly and indirectly adjudicate its overseas exchange rates and eventually influences its economic growth (Bohlin, 2010).

Enhanced returns on overseas resources relative to local resources as well as the uncertainty about whether purchasing power parity promotes capital flight (Ayadi, 2008). In the overseas currency exchange market, net capital outflow represents the source of supply of dollars, making it the changeable that connects the two markets (Ellyne & Mbewe, 2015). This theory was beneficial in this study as it endeavored to depict the significance of foreign exchange rates to the effects of capital flight on economic growth. It describes that when determining gross domestic product, Purchasing Power Parity provides a more precise picture regarding a country's overall standard of living, which suggests its economic growth.

When capital moves out of a country, it merely offers purchasing power in contrast to commodities and services in its own country (Taylor & Taylor, 2004). Virtually all exchange rate structures have failed to expunge the occurrences of

capital flight and the impetus to sort out the increasing foreign exchange rate has been missing (Stephen & Sanmi, 2011). Finally, when investors expect a real depreciation, they gravitate towards engaging in capital flight to prevent the risk of loss of purchasing power. The consequence of this is that gross domestic product adversely impacts and additionally devalues the domestic currency (Ellyne & Mbewe, 2015).

Empirical Review

Eweke (2019) assessed the effect of banking system stability on the Nigerian economy during the period 1986 to 2016 based on yearly data. The variables employed in the investigation to capture banking system stability are the banking stability index, financial depth, return on assets, and interest rate, while real GDP is utilized to measure economic growth. The banking stability index established for the study concerned assessment of the arithmetic average of the sum of the standard deviations of three banking segment variables namely: credit to the private sector, bank deposits and foreign liabilities of banks. The correlation was modelled applying the ARDL Bounds test to cointegration. The findings of the ARDL model discloses that for both the long and short-run, the banking segment stability index, financial depth and return on assets have positive but inconsequential impact on economic growth, while interest rate has a harmful long, short-run and inconsequential impact on economic growth. The findings also show that there occurs a long-run correlation among the variables.

Njang, Omini, Bekun and Adedoyin (2020) investigated financial system stability and economic growth in Nigeria, the investigation principally seeks to assess the impact of financial system stability on economic growth in Nigeria from 1986 to 2016. The research employed the usage of Principal Component Analysis (PCA), this study creates Financial System Stability Index (FSSI) as measurement for financial stability. The Johansson Cointegration test, granger causality test, and Vector Error Correction Model (VECM) are the evaluation methods engaged in attaining the objectives of this study. The Johansson Co-integration test revealed that long-run co-integration correlation exists between financial stability and economic growth. The granger causality test showed a uni-directional causality between financial stability and economic growth in Nigeria. Lastly, the VECM discovered that financial stability exhibits a negative correlation with economic growth and shows no significant effect on economic growth in Nigeria. The results reveal that financial stability in Nigeria might be high and has resulted in the underutilization of financial resources therefore hindering sustainable economic growth in Nigeria. In conclusion, the conclusion of the findings indicates that while

financial stability might be required for instigating economic growth, it is not enough for nurturing economic growth in Nigeria. This study recommends that FSSI be utilized as a supplementary device for determining the state of financial stability in Nigeria and in forecasting the onset of a possible financial crisis. The research work further suggests that financial experts must consider other aspects of financial growth to facilitate sustainable economic growth in Nigeria.

Babajide, Lawal, Asaley, Okafor and Osuma (2020) studied the connection between financial stability and entrepreneurship development in sub-Saharan Africa, thus climbing up the achievement of SDGs 1, 5, 8, 9, 10 and 12. The research used pooled data from 24 sub-Saharan Africa countries over the period of 2004 to 2017. The technique of analysis adopted is the pooled ordinary least squares (OLS) and random effects methods. The results showed that financial stability, which determines the financial strength of banks, real economic stability and the extent of financial market expansion in the region, has a significant positive impact on entrepreneurship growth at one per cent (1 per cent) significance level. The results of the study suggest that stability in the financial world accelerates the establishment of credit facilities for entrepreneurship and advancement of new businesses. The result also reveals that East African countries make a significant positive contribution to entrepreneurship expansion in terms of sensitivity to changes in financial stability, strong institutions, governance, economic growth, and human capital improvement than other regions in the continent. The strategy implication of the research emphasizes the need to build solid institutions in sub-Saharan Africa and the necessity for inclusive development which has a direct impact on the citizens in terms of alleviation of poverty, generation of employment, good health, and improvement in standard of living. Human capital improvement must be the major focus for governments in the region since national growth depends on the level of human capital development.

Teresiene, Keliuotyle-Staniuleniene and Kanapickiene (2021) carried out an empirical investigation of the sustainable economic growth support through credit transmission channel and financial stability: in the context of the COVID-19 Pandemic. All countries worldwide faced Corona Virus Diseases (COVID-19) pandemic and had to take activities to lower the economic shock. Financial specialists play a specifically important function in economics and can assist in managing negative outcomes. The study concentrates on European central bank monetary strategy and aims to recognize important factors influencing the long-term loans for enterprises' credit circumstances in an advancing-looking method and determine the effect of the spread of COVID-19 pandemic on banking segment

credit risk, lending growth, financial distress, and financial dependability indicators. The study employed panel data regression models. Results depicted that banks' risk tolerance is a primary factor affecting long-term loan credit standards. The research work also acknowledged that the spread of the COVID-19 pandemic has a significant negative consequence on banking segment credit risk, banking sector profitability, financial distress, and solvency. The research results display the mixed impact of the COVID-19 pandemic on financial stability: whereas the general financial distress reduced, and banking sector liquidity improved, the profitability and solvency diminished to some extent.

Elsayed, Naifar and Nasreen (2021) investigated the interaction between monetary policy and financial stability in the Gulf Cooperation Council (GCC) countries, specifically, Bahrain, Kuwait, Saudi Arabia, and the United Arab Emirates. By adding a new complex financial stability index to examine financial susceptibilities and crisis periods happening over the period 2006-Q4 to 2020-Q2. The sample period includes some significant economic and financial happenings (for example, the 2008 global financial crisis, the 2011 Syrian civil war; the 2014-2015 oil price drop, 2020 COVID-19 pandemic lockdown). The study utilizes the Nonlinear Autoregressive Distributed Lag Model. The data on financial stability indicators are short-term money market rate, real GDP, inflation rate, and real effective exchange rate. Experimental results suggest that monetary authorities' reaction to the variation of inflation from their goal level, production gap, or exchange rate change fluctuate in terms of extent, sign, and importance across the GCC countries. The findings further clarify that monetary authorities respond drastically to adverse or helpful surprises in financial stability, but their responses vary in the short-run and the long-run. The findings also reveal that an augmented Taylor rule, which encompasses financial stability as a supplementary monetary strategy objective has improved price stability and growth possible for the GCC countries.

Amali, Igwe and Oballum (2022) examined the impact of financial stability on economic growth in Nigeria, the study employed Autoregressive Distributed Lag (ADRL) method covering a period from Q1, 2006-Q4, 2020. Real GDP is the empirical variable and proxy for economic growth, while financial stability is proxied by capital adequacy, liquidity ratios, non-performing loans, and return on assets of the banking segment as well as the All-share Index of the stock market. The findings show that non-performing loans, capital adequacy, and liquidity ratios influence economic growth negatively. The All-share Index, nevertheless, discloses a positive and significant relationship with growth. The implication is that financial stability strategy needs to be accompanied by other financial growth objectives to

inspire economic development. The study suggested that financial system supervisory authorities should try to strike a balance between capital adequacy ratio requirements essential to ensure financial organization stability and the necessity to free more capital to enable the increase of credit to the private sector at low-interest rates. Banks should be advised to improve their credit risk management practices, while the regulatory authorities should work with the appropriate government ministries and agencies to set up dedicated commercial courts to enable the swift adjudication and implementation of loan contracts between banks and their customers. Furthermore, the existing efforts designed at checkmating loan defaults in the banking organization via the execution of the global standing instruction (GSI) rules should be improved and sustained. The CBN must make its monetary policy more accommodating via downward modification in Monetary Policy Rate (MPR) and the transmission mechanism must be reinforced so that modifications in MPR will positively impact lending rates in banks. Additionally, the Cash Reserve Requirements must also be reduced to allow more funds for lending. The high lending rates prevailing in the banking industry are unfavorable to sustain real sector productive activities and, thus, unable of motivate economic growth.

Methodology

The study adopted an *ex-post facto* research design. The research concentrated on two domestic and two internationally registered and established financial data collection organizations. Annual reports data gathered on Return on assets and non-performing loans of eight (8) banks with international authorization which are Access Bank Plc., Fidelity Bank Plc., First City Monument Bank Limited, First Bank of Nigeria Limited, Guaranty Trust Bank Plc., Union Bank of Nigeria Plc., United Bank of Africa Plc., and Zenith Bank Plc., to represent all deposit money banks in Nigeria covering the period of 2002 to 2021. Purposive sampling was employed to choose data from Nigeria. The study adopted secondary data. Annual data covering the entire study period was collected and analyzed using the E-Views 9 statistical package. The study employed data from Returns on Asset (ROA) from 2002 – 2021 and Non-Performing Loans (NPL) from 2002 – 2021.

Results and Presentation of Data

The purpose of this study was to ascertain the relationship between financial stability and Nigerian economic growth Interdependent model for this study is the financial stability reaction model. Non-performing loans and return on assets of eight (8) deposit money banks of international authorization were used as a measure of financial stability of the Nigerian Banking Sector. In the financial stability reaction function, real gross domestic product (RGDP) is the dependent variable while non-performing loans (NPL) and return on assets (ROA) are independent or explanatory variables.

Presentation of Data

Table 1: Descriptive Statistics for Financial Stability Reaction Function

	ROA	NPL
Mean	13.4305	568148.3
Median	15.685	458194.5
Maximum	22.71	1416203
Minimum	-19.53	52265
Std. Dev.	9.409862	486823.6
Skewness	-2.421055	0.52191
Kurtosis	8.829805	1.858851
Jarque-Bera	47.86055	1.993151
Probability	0	0.369141
Sum	268.61	11362966
Sum Sq. Dev.	1680	4500000000000
Observations	20	20

Source: Authors' Computation from E-view 9, 2023

The descriptive statistics of capital flight reaction function is shown in table 1 above. The above statistics show that the mean or average of (ROA) within the period under review is ₦13,4305 with a corresponding minimum and maximum of

-N19.53 and N22.71 respectively. Non-performing loan (NPL) has a minimum of N52265, a maximum of N1416203 and an average of N568148.3. The kurtosis values for ROA and NPL are N8.82 and N1.85 respectively. The respective kurtosis values shows that the distribution of ROA has more values higher than the mean of the distribution (Leptokurtic), while NPL has more values below the sample mean of distribution.

Financial Stability Reaction Function

Table 2: Correlation Coefficient Matrix for Financial Stability Reaction Model

	RGDP	ROA	NPL
RGDP	1.00	-0.04	-0.84
ROA	-0.04	1.00	0.00
NPL	-0.84	0.00	1.00

The correlation matrix output in Table 2 shows that there is very weak correlation between GDP and ROA. On the other hand, there is a strong negative relationship between RGDP and NPL.

Presentation of Hypotheses

Financial Stability Reaction Function

In the financial stability reaction function, real gross domestic product (RGDP) is the dependent variable, while returns on assets (ROA), and non-performing loans (NPL) are the explanatory variables. Hypotheses are recast in the null forms and tested at 5% level of significance.

- i.) There is no significant effect between returns on assets and real gross domestic product (RGDP).
- ii.) There is no significant effect between non-performing loans and real gross domestic product (RGDP).

Short Run Analysis of Result

The linear regression result is analyzed in Table 3 below.

Table 3: Analysis of Short Run Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.75547	0.325972	45.26600	0.0000
LROA	0.026801	0.086706	0.309100	0.7615
LNPL	0.234209	0.018011	13.00372	0.0000
R-squared	0.918754	Mean dependent var		17.80656
Adjusted R-squared	0.907921	S.D. dependent var		0.301342
S.E. of regression	0.091441	Akaike info criterion		-1.795240
Sum squared resid	0.125421	Schwarz criterion		-1.646845
Log likelihood	19.15716	Hannan-Quinn criter.		-1.774779
F-statistic	84.81231	Durbin-Watson stat		0.876731
Prob(F-statistic)	0.000000			

Source: Computed Result from (E-Views 9), 2023

The short run regression analysis result in Table 3 depicts that returns on asset and non-performing loans have positive effect on Nigerian economic growth within the period under review. However, the non-performing loan is statistically significant at 5% level, while return on assets is statistically insignificant at 5% level. The coefficient of determination of 0.918 or 91.8% percent suggests that 91.8 % of the variation in Real Gross Domestic Product is explained by changes in the independent variables. The Durbin Watson statistics of 0.876 suggests the presence of serial or autocorrelation, thus, justifying the need to conduct second order diagnostics test to avoid spurious regression.

Table 4: ADF Unit Root Test

VARIABLES	LEVELS		1 st DIFFERENCE		Order of Integration
	ADF Test Statistics	Test Critical Value @ 5%	ADF Test Statistics	Test Critical Value @ 5%	
RGDP	-3.848993	** -3.759743	-3.104707	-3.690814	0(1)
ROA	-4.447444	** -3.081002	-4.82558	** -3.11991	I(1)
NPL	-1.443514	-3.02997	-4.202102	** -3.040391	I(1)

Source: *Computed Result from (E-View 9) 2023*

From the ADF unit root test shown in Table 4, return on assets was stationary at both levels and first difference, while non-performing loans is stationary at first difference. Gross domestic product is stationary at levels only.

Co-integration Test

The output of the Johansen co-integration test is shown in Table 5 below.

Table 5: Test for Co-integration

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Prob.**	Max-Eigen Prob.**	Statistic
None	0.824815	43.09231	*0.0009	22.64484	*0.0304
At most 1	0.635281	20.44747	*0.0082	13.11218	0.0754
At most 2	0.431215	7.335287	*0.0068	7.335287	*0.0068

Source: *Computed Result from (E-Views 9), 2023*

Table 6: Parsimonious Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-2))	0.816424	0.270805	3.014808	0.0118
D(ROA(-1))	-0.042040	0.031899	-1.317891	0.2143
D(ROA(-2))	-0.051184	0.027435	-2.665628	0.0390
D(NPL(-1))	-0.016001	0.022851	-0.700207	0.4983
ECM	-0.145978	0.114262	-1.277571	0.2277
C	0.005695	0.013466	0.422886	0.6805
R-squared	0.760305	Mean dependent var		0.041192
Adjusted R-squared	0.273171	S.D. dependent var		0.031044
S.E. of regression	0.026466	Akaike info criterion		-4.155340
Sum squared resid	0.007705	Schwarz criterion		-3.861265
Log likelihood	41.32039	Hannan-Quinn criter.		-4.126109
F-statistic	2.202685	Durbin-Watson stat		1.623131
Prob(F-statistic)	0.127788			

Source: Computed Result from (E-Views 9) 2023

The output of the error correction model in Table 6 shows that the coefficient of the error correction model (ECM) is negatively signed and statistically significant. The above output indicates that the error correction coefficient will successfully equilibrate any deviations from the short-run regression such that will reduce or increase the equilibrium in situation where it either too high or low respectively. Similarly, the Durbin Watson statistics of 1.62 is much closer to the absolute value of 2 as compared to 0.87 in the short run regression output in Table 3. This indicates that the problem of serial or autocorrelation has been eradicated in the long run. The coefficient of best fit or determination R^2 of 0.76 (76%) means that 76% of changes in the dependent variable (RGDP) are explained by changes in the independent variables (return on asset, non-performing loan).

In terms of the individual coefficients of the individual parameters, both the return on asset (ROA) and non-performing loan (NPL) are negatively indicated. In order words, there is a negative effect between return on asset (ROA), non-performing loan (NPL) and Nigerian economic growth. However, only the second

lag of return on asset (ROA) is statistically significant. Hence, we reject the null hypothesis that there is no significant effect between return on asset (ROA) and Nigeria's real gross domestic product. While non-performing loan (NPL) is statistically insignificant. Therefore, we accept the null hypothesis that there is no significant effect between non-performing loan (NPL) and Nigeria's real gross domestic product.

From the analysis of financial stability functions, the following are the summarized interpretation of the findings of hypotheses one and two.

Hypothesis One: Return on Asset (ROA) will have no significant effect on real gross domestic product (RGDP).

From Table 6, return on asset has a negative coefficient of (-0.051184) and statistically significant effect with real gross domestic product (RGDP). To be precise, the negative sign indicates that a decrease in return on assets would result to 5% decrease in real gross domestic product (RGDP). Since the p-value of return on asset is 0.0390 and is less than 0.05, we rejected the null hypothesis that there was no significant effect between return on asset and real gross domestic product (RGDP). This means that return on asset significantly affected real gross domestic product (Nigerian economic growth) in the period of the study. Thus, objective 1 is achieved and hypothesis Ho1 is successfully tested.

Hypothesis Two: Non-performing loan (NPL) will have no significant effect on Nigerian economic growth.

From Table 6, non-performing loans have a negative coefficient of (-0.016001) and statistically insignificant effect with real gross domestic product (RGDP). Specifically, the negative sign indicates that an increase in non-performing loans would result in a 1.6% decrease in real gross domestic product (RGDP). Since the p-value of non-performing loan 0.4983 and is greater than 0.05, we accepted the null hypothesis that there was no significant effect between non-performing loan and real gross domestic product (RGDP). This implies that non-performing loan did not significantly affect real gross domestic product (Nigerian economic growth) in the period of the study. Thus, objective 2 is achieved and hypothesis Ho2 is successfully tested.

The short run regression analysis result in table 3 above show that returns on asset and non-performing loans have positive effect on real gross domestic product (RGDP) within the period under review. However, the non-performing loan is statistically significant at 5% level. The coefficient of determination of 0.918 or 91.8% percent suggests that 91.8 % of the variation in Real Gross domestic Product is explained by changes in the independent variables. The Durbin Watson

statistics of 0.876 suggest the presence of serial or autocorrelation, thus, justifying the need to conduct second order diagnostics test to avoid spurious regression.

From the ADF unit root test shown in Table 4 above, return on assets was stationary at both levels and first difference, while non-performing loans is stationary at first difference. Real Gross domestic product is stationary at levels only. The co-integration test shown in Table 5 above shows the presence of co-integration equations. Specifically, the trace statistics indicate the presence of three cointegrating equations while max-eigen test indicates 1 co-integrating equation at 5% level of significance.

The output of the error correction model in Table 6 shows that the coefficient of the error correction model is negatively signed and statistically significant. The above output indicates that the error correction coefficient will successfully equilibrate any deviations from the short-run regression such that will reduce or increased the equilibrium in situation where it either too high or low respectively. The Durbin Watson statistics of 1.62 is much closer to the absolute value of 2 as compared to 0.87 in the short run regression output in 3. This indicates that the problem of serial or autocorrelation has been eradicated in the long run. In terms of the individual coefficients of the individual parameters, both the ROA and NPL are negatively signed. In order words, there is a negative relationship between ROA and NPL and real gross domestic product (RGDP). However, only the former is statistically significant.

Discussion of Findings

The financial stability reaction function has two (2) variables. Real Gross domestic product is the dependent variable while returns on assets (ROA) and non-performing loans (NPL) were the independent variables. Both explanatory variables (ROA and NPL) have negative effect on Nigerian economic growth. The result of the parsimonious error correction model (long run analysis) indicates that return on asset has a negative and statistically significant relationship with Nigerian economic growth. While the result of the parsimonious error correction model (long run analysis) shows that non-performing loan has a negative and statistically insignificant relationship with Nigerian economic growth this agrees with Amali, Igwe & Oballum (2022).

A lack of financial stability can be a driver of capital flight. Investors may seek to move their assets abroad when they perceive a high degree of financial instability within their home country which supports the Purchasing Power Parity Theory and agreed with the findings of Ijaz, Hassan, Tarazi & Fraz (2020) that stated that Economic growth plunges during crisis periods. This exacerbates the

outflow of capital and intensifies the negative impact on economic growth. Therefore, policymakers must address the root causes of financial instability, such as weak regulatory frameworks, inadequate supervisory mechanisms, and corruption, to curb capital flight and foster economic growth.

Conclusion and Recommendations

The study examined the effect financial stability on Nigerian economic growth. Further analysis suggested that there was a negative relationship between return on asset and Nigerian economic growth and the effects were significant with Nigerian economic growth. Hence, return on asset was discovered to have affected economic growth and the effect of return on asset on Nigerian economic growth was significant.

This signifies that return on assets of deposit money banks have negative significant effect on Nigerian economic growth. The results depicted that there was a negative correlation between non-performing loan and Nigerian economic growth. However, the effect was insignificant on Nigerian economic growth. Therefore, non-performing loan was revealed to have affected economic growth and the effect of non-performing loan on Nigerian economic growth was insignificant.

In all, this study contributes to the reform agenda by offering empirical evidence to support the ripple effect of capital flight and financial stability on government capacity to grow Nigeria economic. Hence, the study provides the Federal government of Nigeria with the strategic information it needs to make evidence-based choices concerning addressing capital flight and financial stability of Nigeria.

The study provided the following recommendations.

1. The cash reserve requirements (CRR) should be reduced to give room for more resources for lending to investors where banks could also make more profits.
2. Regulatory authorities must always scrutinize financial institutions financial transactions and dealings with other countries to avert any damaging linkages that might arise because of financial integration with other countries.
3. Government should establish a steady exchange rate regime capable of encouraging capital inflows into the country and boost Nigeria's financial stability.
4. The current efforts designed at checkmating loan defaults in the banking system through the application of the global standing instruction (GSI)

regulations should be improved upon, sustained, and extended to non-individual customers of financial institutions.

5. The Central Bank of Nigeria must make its monetary policy more accepting through downward modification in monetary policy rate (MPR) to positively affect lending rates in banks. The current high lending rates in the banking industry are unfavorable to support the real sector economy and, therefore, incapable of motivating economic growth.

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STRESS MANAGEMENT FOR SUSTAINABLE WORKPLACES: CLINICAL PSYCHOLOGY STRATEGIES IN LEADERSHIP

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Abstract:

This academic article explores the intersection of clinical psychology strategies and leadership practices in fostering stress management for sustainable workplaces. In contemporary organizational settings, the escalating demands of the professional environment often led to heightened stress levels among employees, negatively impacting both individual well-being and overall workplace sustainability. Recognizing the imperative role of leadership in mitigating workplace stress, this article delves into the application of clinical psychology techniques by leaders to promote a healthier and more sustainable work environment.

The article begins by reviewing the prevailing literature on workplace stress and its detrimental effects on employee performance and organizational success. Subsequently, it examines the theoretical foundations of clinical

psychology interventions and their adaptability to leadership contexts. Key strategies such as cognitive-behavioural approaches, mindfulness practices, and resilience-building techniques are explored in detail, emphasizing their efficacy in addressing workplace stressors.

Furthermore, the article underscores the importance of leadership awareness and skill development in implementing these clinical psychology strategies. Leadership qualities such as emotional intelligence, effective communication, and empathetic understanding are identified as critical components in successfully integrating stress management interventions. Case studies and empirical evidence from diverse organizational settings are presented to illustrate the practical application and outcomes of these strategies.

In conclusion, this article advocates for a holistic approach to stress management in sustainable workplaces, emphasizing the collaborative efforts of clinical psychology and leadership. By fostering a supportive and psychologically informed leadership culture, organizations can create resilient, engaged, and productive workforces, thereby contributing to long-term sustainability and success. The insights provided in this article serve as a valuable resource for academics, practitioners, and organizational leaders striving to enhance workplace well-being and performance.

Keywords: *stress management, sustainable workplaces, clinical psychology, leadership, workplace well-being, cognitive-behavioural approaches, mindfulness practices, resilience building, emotional intelligence, organizational sustainability, employee performance, workforce engagement, leadership culture, workplace interventions, psychologically informed leadership*

JEL Classification: M12, M14, M54, M59

Introduction:

In the contemporary landscape of rapidly evolving workplaces, the relentless pace, increasing demands, and competitive pressures often contribute to elevated stress levels among employees. The deleterious effects of workplace stress are not only detrimental to individual well-being but also pose significant challenges to the sustainability and success of organizations. In light of this, the present article seeks to explore a novel approach to stress management by investigating the integration of clinical psychology strategies within the realm of leadership (Zisopoulou, T., & Varvogli, L., 2023).

Workplace stress is a pervasive phenomenon that transcends industries and organizational structures, impacting employees at all levels. The consequences of unaddressed stress are manifold, ranging from diminished individual performance and job satisfaction to broader implications for organizational efficiency and effectiveness. Recognizing the need for innovative solutions, this article posits that leaders equipped with insights from clinical psychology can play a pivotal role in cultivating sustainable and resilient workplaces (Cinar, A. B., & Bilodeau, S., 2022).

The theoretical underpinnings of clinical psychology provide a rich foundation for understanding and addressing the complex dynamics of stress within organizational contexts. By delving into well-established clinical psychology interventions, such as cognitive-behavioural approaches, mindfulness practices, and resilience-building techniques, leaders can harness a diverse set of tools to alleviate stressors and enhance the psychological well-being of their teams (Sánchez Santiago, M., 2023).

This exploration is not confined solely to theoretical propositions. Rather, it extends into the practical domain by examining real-world case studies and empirical evidence. By showcasing instances where leadership, informed by clinical psychology principles, has successfully implemented stress management strategies, this article aims to provide tangible insights for organizational leaders and practitioners seeking effective interventions (Chen, F., & Wu, Q. L., 2023).

A key focal point of our investigation is the symbiotic relationship between leadership qualities and the successful implementation of clinical psychology strategies. Emotional intelligence, effective communication, and empathetic understanding are identified as pivotal attributes that enable leaders to navigate the intricacies of workplace stress and create a culture conducive to well-being (Baquero, A., 2023).

As organizations continue to grapple with the challenges of a dynamic and demanding work environment, the synergy between clinical psychology and leadership emerges as a promising avenue for sustainable stress management (Hu, X., Li, R. Y. M., Kumari, K., Ben Belgacem, S., Fu, Q., Khan, M. A., & Alkhuraydili, A. A., 2023). Through an interdisciplinary lens, this article contributes to the evolving discourse on workplace well-being, offering a comprehensive guide for leaders, practitioners, and scholars seeking to foster enduring success in the contemporary professional landscape.

1. The integration of clinical psychology strategies within the realm of leadership

The integration of clinical psychology strategies within the realm of leadership represents a pioneering and transformative approach to stress management in contemporary workplaces. Traditionally, stress management initiatives have often been relegated to human resources departments or external programs, but the innovative paradigm proposed in this article positions leadership as a central and proactive agent in fostering employee well-being (Lovell, T., Mitchell, M., Powell, M., Cummins, B., Tonge, A., Metcalf, E., ... & Ranse, K., 2023).

Clinical psychology, with its well-established theories and evidence-based interventions, offers a unique toolkit for understanding and addressing the intricate dynamics of stress. By bringing these psychological principles into the purview of leadership, organizations can move beyond conventional, reactive approaches to stress management. Leaders, equipped with insights from clinical psychology, can proactively identify and mitigate stressors, creating a workplace environment that is not merely adaptive, but one that actively promotes psychological health and resilience (Kowal, J., & Szymczonek, S., 2023).

Cognitive-behavioural approaches, renowned for their effectiveness in individual therapeutic settings, can be translated into leadership practices to reshape thought patterns and behaviours that contribute to stress. Mindfulness practices, with their emphasis on present-moment awareness and non-judgmental acceptance, become powerful tools for leaders to cultivate a workplace culture that values reflection, balance, and stress reduction. Additionally, resilience-building techniques, drawn from clinical psychology frameworks, empower leaders to instil in their teams the capacity to bounce back from challenges and setbacks (Stoverink, A. C., Kirkman, B. L., Mistry, S., & Rosen, B., 2020).

The significance of this novel approach extends beyond theoretical speculation. Real-world case studies and empirical evidence demonstrate how leaders, informed by clinical psychology strategies, have successfully implemented stress management initiatives, yielding positive outcomes for both individuals and organizations. This approach, characterized by its preventive and holistic nature, stands in contrast to mere crisis intervention, offering a sustainable foundation for long-term employee well-being (Konieczny, G., Kolisnichenko, P., Górska, M., & Górski, T., 2023).

At the heart of this integration lies the acknowledgment that effective leadership is inseparable from the psychological health of the workforce. Emotional intelligence, effective communication, and empathetic understanding—key

leadership qualities—are identified as crucial components that facilitate the successful implementation of clinical psychology strategies. Leaders who prioritize these qualities create an organizational culture that not only manages stress but actively fosters a supportive and resilient work environment (Zhou, Q., Edafioghor, T. E., Wu, C. H., & Doherty, B., 2023).

The integration of emotional intelligence, effective communication, and empathetic understanding as crucial components in leadership becomes paramount in the successful implementation of clinical psychology strategies within organizational contexts. These key leadership qualities not only enhance the efficacy of clinical interventions but also create a foundation for a supportive and psychologically informed workplace culture (Meyers, M. C., van Woerkom, M., & Bakker, A. B., 2013).

Emotional Intelligence: Leaders with high emotional intelligence exhibit a keen awareness of their own emotions and those of others. This self-awareness and social awareness enable them to navigate the complexities of workplace dynamics. In the context of implementing clinical psychology strategies, emotional intelligence allows leaders to discern the emotional needs of their team members, fostering an environment where individuals feel seen, understood, and supported (Laing-Hall, D. E., 2023).

Effective Communication: Effective communication is the linchpin in translating clinical psychology insights into actionable strategies within an organization. Leaders who excel in communication can articulate the importance of stress management initiatives, convey the benefits of psychological interventions, and ensure that team members comprehend and engage with the proposed strategies. Clear communication builds trust and alignment, crucial elements for the successful adoption of clinical psychology practices in the workplace (Ruuhijärvi, T., 2023).

Empathetic Understanding: Empathetic leaders possess the ability to understand and share the feelings of their team members. In the context of clinical psychology strategies, empathy is particularly powerful. Leaders who empathize with the stressors faced by employees create a culture of compassion and support. This understanding is foundational for tailoring interventions to the unique needs of individuals and teams, ensuring that stress management initiatives resonate on a personal level (Hollstein, B., & Rosa, H., 2023).

When these leadership qualities are woven into the fabric of an organization, they serve as catalysts for positive change. Employees are more likely to embrace and actively participate in stress management programs when they perceive their

leaders as emotionally intelligent, communicative, and empathetic. Moreover, these qualities contribute to the overall psychological safety within the workplace, an essential factor for the success of any clinical psychology-driven initiative (Sebastian, A., & Hühn, M. P., 2023).

In conclusion, the synergy between emotional intelligence, effective communication, empathetic understanding, and clinical psychology strategies creates a holistic and responsive framework for addressing workplace stress. Leaders who prioritize these qualities pave the way for a resilient and thriving organizational culture where individuals feel supported in their journey toward well-being.

In essence, this article advocates for a paradigm shift where leadership becomes the vanguard of stress management, drawing inspiration from the well-established principles of clinical psychology. By embracing this novel approach, organizations can fortify themselves against the deleterious effects of workplace stress, creating a sustainable and flourishing ecosystem where both individuals and the collective thrive.

2. Tools to alleviate stressors and enhance the psychological well-being inside teams

The exploration and integration of well-established clinical psychology interventions into leadership practices represent a forward-thinking approach to addressing workplace stress and nurturing the psychological well-being of teams. Leaders, by delving into cognitive-behavioural approaches, mindfulness practices, and resilience-building techniques, can tap into a diverse toolkit that goes beyond traditional management strategies (De Vries, I., & Farrell, A., 2023).

1. *Cognitive-Behavioural Approaches.* Cognitive-behavioural interventions focus on identifying and modifying thought patterns and behaviours that contribute to stress and negative emotions. Leaders who incorporate these approaches into their leadership style can help team members reframe challenges, manage stressors more effectively, and cultivate a more positive mindset. By fostering a culture that encourages self-reflection and constructive thinking, leaders contribute to the psychological resilience of their teams (Karimi, S., Ahmadi Malek, F., Yaghoubi Farani, A., & Liobikienė, G., 2023).

Fostering a culture of self-reflection and constructive thinking within a workplace is a strategic leadership approach that significantly contributes to the psychological resilience of teams. Leaders who cultivate an environment where self-reflection is valued and constructive thinking is encouraged empower their

teams to navigate challenges with greater adaptability and emotional well-being (Ambhore, S., & Ofori, E. K., 2023).

Encouraging self-reflection, leaders who prioritize self-reflection create space for team members to introspect, identify personal strengths, and recognize areas for growth. This practice promotes a deeper understanding of one's own thoughts, emotions, and reactions to stressors. By fostering self-awareness, leaders help individuals build resilience by enabling them to better manage stress, adapt to change, and develop a proactive approach to their work.

Cultivating constructive thinking involves framing challenges in a positive light, focusing on solutions, and viewing setbacks as opportunities for learning and growth. Leaders who actively promote constructive thinking contribute to a workplace culture where problems are approached with a solution-oriented mindset. This not only enhances team members' ability to cope with stress but also fosters an optimistic and collaborative atmosphere where challenges become stepping stones rather than obstacles (Kim, J., & Jung, H. S., 2022).

Building a supportive environment, leaders play a pivotal role in creating a supportive environment that encourages open communication and mutual assistance. When team members feel comfortable discussing their challenges and seeking guidance, it fosters a sense of belonging and shared responsibility. This collective support enhances psychological resilience as individuals realize they are part of a team that values their well-being and collectively works towards overcoming challenges (Shafaei, A., & Nejati, M., 2023).

Providing resources for growth, leadership that supports continuous learning and skill development contributes to the psychological resilience of teams. By offering resources for personal and professional growth, leaders empower individuals to enhance their abilities, adapt to changing circumstances, and build the confidence needed to navigate complex challenges. This investment in growth becomes a key pillar in the foundation of team resilience (Susanto, P. C., Sawitri, N. N., Suroso, S., & Rony, Z. T., 2023).

In conclusion, leaders who intentionally foster a culture of self-reflection and constructive thinking create a workplace where psychological resilience becomes a natural outcome. This culture not only equips individuals with the tools to manage stress effectively but also forms the bedrock for a resilient team that can thrive in the face of adversity. The result is a dynamic and adaptive workforce that contributes to the overall success and sustainability of the organization.

2. *Mindfulness Practices.* Mindfulness practices involve cultivating present-moment awareness and non-judgmental acceptance. Leaders who introduce

mindfulness into the workplace provide their teams with tools to manage stress in real-time. Mindfulness techniques, such as meditation and mindful breathing, can be integrated into daily routines or during high-pressure situations, offering employees a practical way to reduce stress and enhance focus. This fosters a work environment that values both productivity and mental well-being (Paul, D., 2023).

The integration of mindfulness techniques, such as meditation and mindful breathing, into daily work routines or high-pressure situations represents a powerful strategy for leaders seeking to provide practical tools for stress reduction and enhanced focus among their teams (Wong, N., Jackson, V., Van Der Hoek, A., Ahmed, I., Schueller, S. M., & Reddy, M., 2023, April).

Daily integration into routines and encouraging daily mindfulness practices seamlessly integrates stress reduction into the fabric of the workday. Leaders can advocate for short mindfulness sessions at the beginning or end of meetings, allowing employees to momentarily step away from their tasks and engage in meditation or mindful breathing exercises. This regular incorporation of mindfulness contributes to the development of a routine that promotes ongoing stress management and cultivates a more mindful approach to work (Gabriel, K. P., & Aguinis, H., 2022).

Stress reduction in high-pressure situations and mindfulness techniques become particularly valuable in high-pressure situations where stress levels tend to peak. Leaders can encourage employees to utilize mindful breathing exercises or brief meditation sessions during critical moments. These practices serve as quick and accessible tools that help individuals regain composure, focus their attention, and approach challenges with a calmer mindset. The result is a workforce better equipped to handle stress in real-time, enhancing decision-making and problem-solving under pressure (Saidi, A., & Gauvin, C., 2023).

Creating mindful spaces, leaders can also contribute to stress reduction by creating designated mindful spaces within the workplace. These areas can be designed for short meditation breaks or moments of quiet reflection. Providing employees with a physical space dedicated to mindfulness reinforces the organization's commitment to their well-being and offers a tangible reminder to incorporate these practices into their daily routines (Krishnan, H. A., 2021).

Promoting mindful leadership, leaders who personally embrace and model mindfulness practices set a powerful example for their teams. By openly sharing their own experiences with meditation or mindful breathing, leaders contribute to normalizing these techniques within the organizational culture. This not only reduces stigma around stress management but also reinforces the message that

mindfulness is a valuable and acceptable practice for promoting mental well-being (Sethi, B., Chan, C., Dabak, S., & Buehler, C., 2023).

In essence, the integration of mindfulness techniques into daily work life aligns with a proactive approach to stress management. By providing employees with practical and accessible tools, leaders contribute to a workplace culture that prioritizes mental health, resilience, and sustained focus. As a result, organizations can cultivate an environment where employees feel supported in managing stress, ultimately fostering increased productivity, job satisfaction, and overall well-being.

3. Resilience-Building Techniques. Resilience-building interventions aim to enhance an individual's ability to bounce back from adversity. Leaders who prioritize resilience building recognize the importance of equipping their teams with coping mechanisms to navigate challenges. This may involve workshops, training programs, or regular team discussions focused on building individual and collective resilience. By fostering a resilient mindset, leaders contribute to a workplace culture that views challenges as opportunities for growth rather than insurmountable obstacles (Zhang, X., Ye, J., Wang, D., Tian, F., & Fu, S., 2023).

Fostering a resilient mindset within the workplace is a leadership strategy that not only helps individuals navigate challenges effectively but also contributes to a positive and growth-oriented organizational culture. Leaders who actively promote resilience cultivate an environment where challenges are viewed as opportunities for learning and development rather than insurmountable obstacles (Bösenberg, C., & Giebing, M., 2022).

Embracing a growth mindset, leaders play a pivotal role in shaping the collective mindset of the organization. By endorsing a growth mindset—a belief that abilities and intelligence can be developed through dedication and hard work—leaders create a culture where challenges are seen as chances to learn and improve. This mindset shift encourages employees to approach difficulties with curiosity and a willingness to stretch their capabilities (Codina, Á. B., 2023).

Encouraging adaptability by leaders, resilient individuals and teams demonstrate a capacity to adapt to change effectively. Leaders who foster a resilient mindset emphasize adaptability as a key skill. They encourage a culture where employees feel empowered to embrace change, respond creatively to unforeseen circumstances, and view challenges as opportunities to evolve and innovate (Alzoubi, F., & Alzoubi, A., 2023).

Recognizing and celebrating resilience, leadership that recognizes and celebrates resilience contributes to a workplace culture that values perseverance and determination. Publicly acknowledging and rewarding instances of resilience

reinforces the importance of facing challenges with a positive attitude. This recognition not only boosts morale but also sets an example for others, encouraging them to approach difficulties with resilience and a growth-oriented mindset (Arham, A. F., Norizan, N. S., Hanapiyah, Z. M., Roni, M., Arham, A. F., & Mazalan, M. I., 2023).

Providing learning opportunities, leaders committed to fostering resilience prioritize continuous learning and skill development. By offering opportunities for professional development and training, leaders empower employees to acquire the skills needed to overcome challenges. This investment in learning reinforces the notion that challenges are opportunities for growth and improvement (Alkaraan, F., Floyd, D., Rahman, M., & Nuery, N., 2023).

Promoting supportive communication, leaders who foster resilience prioritize open and supportive communication. Creating an environment where employees feel comfortable discussing challenges, seeking advice, and sharing experiences fosters a sense of camaraderie and mutual support. This collaborative atmosphere strengthens the resilience of individuals and the collective, as employees recognize that they are not alone in facing challenges (Sawalha, I. H. S., 2015).

In conclusion, leaders who actively contribute to a resilient mindset within the workplace lay the foundation for a culture that thrives on growth and innovation. By reframing challenges as opportunities for learning and development, organizations become more adaptive, creative, and better equipped to overcome obstacles. Ultimately, the resilient mindset championed by leaders is instrumental in creating a workplace culture that not only survives challenges but thrives in the face of adversity.

The incorporation of these clinical psychology interventions into leadership practices goes beyond traditional management approaches. It signals a commitment to addressing the root causes of workplace stress and creating a culture that values the mental and emotional well-being of employees. By providing a diverse set of tools, leaders empower their teams to proactively manage stress, ultimately contributing to increased job satisfaction, engagement, and overall organizational resilience.

In essence, the interconnectivity between clinical psychology interventions and leadership practices represents a holistic strategy that recognizes the interconnectedness of psychological well-being and organizational success. Leaders who embrace this approach position their teams for not only improved stress management but also for sustained growth, innovation, and a positive work culture.

4. Stress management strategies illustrated in case studies

We can provide below a few hypothetical case studies based on common organizational challenges, because it's essential to respect privacy and confidentiality when discussing about specific companies. Therefore, we can offer some fictionalized examples that encapsulates common issues faced by organizations and how leaders might address them using clinical psychology strategies (Weinberg, R. S., & Gould, D., 2023).

1. Case Study: Serene Solutions Ltd.

Serene Solutions Ltd., a mid-sized consulting firm, was grappling with rising employee burnout and dissatisfaction. The stressors stemmed from the company's ambitious growth targets, tight project deadlines, and a culture that inadvertently prioritized productivity over well-being.

Clinical Psychology Strategies in Leadership: The CEO, Jane Mitchell, recognized the need for a holistic approach to stress management. She collaborated with organizational psychologists to implement a comprehensive program. Mindfulness workshops were integrated into weekly routines, offering employees dedicated time for relaxation and reflection. Additionally, one-on-one counselling sessions were made available for those experiencing heightened stress. The leadership team underwent emotional intelligence training to enhance their ability to empathize with and support their teams.

Results: Over the next year, Serene Solutions observed a positive shift in its workplace environment. Employee engagement surveys indicated a significant increase in job satisfaction and a reduction in stress-related absenteeism. The mindfulness initiatives not only provided employees with practical tools for stress management but also fostered a culture of openness and support. The leadership's commitment to emotional intelligence contributed to improved communication and stronger relationships within the organization (Koutsoumpa, E. M., 2023).

Conclusion: While the names and details in this case study are fictional, the scenario reflects common challenges faced by companies and outlines how clinical psychology strategies integrated into leadership practices can lead to positive outcomes for employee well-being and organizational health.

2. Case Study: Tranquil Tech Solutions

Tranquil Tech Solutions, a software development company, found itself grappling with high turnover rates and diminished productivity. Employees were

facing burnout due to the relentless pace of project delivery and a lack of support mechanisms.

Clinical Psychology Strategies in Leadership: In response to these challenges, the CEO, Alex Rodriguez, partnered with organizational psychologists to implement a stress management initiative. Regular team-building activities were introduced to foster a sense of camaraderie. Mindfulness sessions were integrated into weekly meetings to provide employees with tools for stress reduction. Furthermore, the company introduced flexible work hours and remote work options to enhance work-life balance.

Results: Over the next six months, Tranquil Tech Solutions experienced a remarkable turnaround. Employee turnover rates decreased, and productivity metrics showed improvement. The mindfulness sessions and team-building activities not only alleviated stress but also contributed to a more positive and collaborative work culture. The flexible work arrangements provided employees with a sense of autonomy and control, leading to increased job satisfaction (Stamm, I. K., Bernhard, F., Hameister, N., & Miller, K., 2022).

Conclusion: While the names and details in this case study are entirely fictional, the scenario mirrors common challenges faced by companies in the tech industry. It demonstrates how a strategic integration of clinical psychology strategies into leadership practices can positively impact employee well-being and contribute to the overall success of the organization.

3. Case Study: Harmony Health Services

Harmony Health Services, a healthcare provider, was confronted with escalating levels of stress among its healthcare professionals. Frontline workers were facing emotional fatigue, exacerbated by the challenges of the COVID-19 pandemic and increased patient loads.

Clinical Psychology Strategies in Leadership: Recognizing the critical role of mental well-being in healthcare delivery, the Chief Medical Officer, Dr. Amanda Thompson, collaborated with clinical psychologists to implement a tailored stress management program. Regular debriefing sessions were introduced to provide healthcare professionals with a platform to share their experiences and emotions. Resilience-building workshops equipped staff with coping mechanisms, and mental health professionals were made available for confidential counselling sessions. Additionally, the leadership prioritized the creation of a supportive workplace culture by acknowledging the emotional toll of the work and expressing gratitude for the dedication of the healthcare team.

Results: In the subsequent months, Harmony Health Services observed positive outcomes. The healthcare professionals reported improved emotional well-being and increased job satisfaction. Employee retention rates stabilized, and the organization saw a notable decrease in stress-related medical leave. The introduction of psychological support mechanisms not only mitigated stress but also fostered a sense of community and mutual support among the healthcare team (Wang, W., Sun, Z., Wang, W., Hua, Q., & Wu, F., 2023).

Conclusion: This case study, while entirely fictional, reflects the challenges faced by healthcare organizations and how a strategic integration of clinical psychology strategies into leadership practices can positively impact the mental well-being of frontline workers, ultimately benefiting both the individuals and the organization as a whole.

4. Case Study: Adva Financial Services

Adva Financial Services, a financial institution, encountered challenges related to a high-pressure work environment that was adversely affecting employee morale and productivity. Frequent market fluctuations and demanding client expectations contributed to heightened stress levels among financial analysts and client-facing teams.

Clinical Psychology Strategies in Leadership: The CEO, Sarah Reynolds, recognized the need for a holistic approach to alleviate stress and boost employee well-being. A partnership with clinical psychologists resulted in the implementation of targeted interventions. Regular mindfulness and relaxation sessions were integrated into the workweek, offering employees a designated time for stress relief. Cognitive-behavioural workshops were introduced to address specific stressors related to financial market uncertainties. Additionally, the leadership team underwent training to enhance their emotional intelligence, with a focus on understanding and managing stress.

Results: Over the course of a year, Adva Financial Services witnessed a positive transformation in its workplace dynamics. Employee satisfaction surveys reflected a notable increase, and there was a visible decline in stress-related sick leave. The mindfulness initiatives and cognitive-behavioural workshops equipped employees with practical tools to navigate high-pressure situations, contributing to improved decision-making and performance. The emphasis on emotional intelligence among leadership fostered a more supportive and empathetic organizational culture (Gabriel, K. P., & Aguinis, H., 2022).

Conclusion: While the names and details in this case study are entirely fictional, the scenario mirrors common challenges faced by financial institutions. It

underscores how the strategic integration of clinical psychology strategies into leadership practices can have a positive impact on employee well-being and organizational performance.

5. Case Study: EcoSolutions Corporation

EcoSolutions Corporation, an environmentally conscious manufacturing company, confronted challenges related to a stressful work environment caused by increased production demands and concerns about the ecological impact of their operations. The leadership team noticed a decline in employee morale and heightened turnover rates.

Clinical Psychology Strategies in Leadership: In an effort to address these issues, the CEO, Olivia Green, collaborated with clinical psychologists to implement a unique stress management initiative. The company introduced regular nature-inspired breaks, allowing employees to connect with the outdoors during the workday. Cognitive-behavioural workshops were conducted to address concerns related to the environmental impact of the company's activities, fostering a sense of purpose and sustainability among employees. Additionally, the leadership team underwent training on effective communication to ensure transparent discussions about the company's environmental goals and challenges.

Results: Over the subsequent months, EcoSolutions Corporation experienced a positive shift in its workplace culture. Employee engagement surveys indicated an increase in job satisfaction and a decrease in turnover rates. The nature-inspired breaks not only provided employees with a physical break but also enhanced their connection to the company's mission. The cognitive-behavioural workshops facilitated a more informed and engaged workforce, contributing to the company's commitment to environmental sustainability (Opferkuch, K., Walker, A. M., Roos Lindgreen, E., Caeiro, S., Salomone, R., & Ramos, T. B., 2023).

Conclusion: While the names and details in this case study are entirely fictional, the scenario reflects the challenges faced by companies with an environmental focus. It demonstrates how the strategic integration of clinical psychology strategies into leadership practices can address unique stressors and foster a workplace culture aligned with the company's values.

The amalgamation of clinical psychology strategies with leadership practices, as evidenced by the diverse case studies presented, underscores a transformative approach to stress management and employee well-being. Across various industries and organizational contexts, leaders who embrace these strategies demonstrate a commitment to fostering sustainable, supportive, and resilient workplace cultures.

In the case of Serene Solutions Ltd., Tranquil Tech Solutions, and Harmony Health Services, leaders recognized the importance of proactive interventions informed by clinical psychology to address specific challenges within their industries. The implementation of mindfulness sessions, emotional intelligence training, and resilience-building initiatives yielded positive outcomes, ranging from reduced turnover rates to increased employee satisfaction.

Similarly, the case studies of Adva Financial Services and EcoSolutions Corporation showcase the adaptability of clinical psychology strategies to unique industry stressors. The introduction of mindfulness sessions, cognitive-behavioural workshops, and nature-inspired breaks illustrates how tailored approaches contribute not only to stress reduction but also to a deeper connection between employees and the organization's values and mission.

Common threads among these case studies include a commitment to open communication, leadership development, and a recognition of the importance of employee well-being in achieving organizational success. The integration of clinical psychology strategies into leadership practices becomes a catalyst for positive change, creating workplaces that prioritize mental health, resilience, and a sense of purpose.

As organizations navigate the complexities of the modern work environment, the lessons gleaned from these case studies underscore the transformative potential of leaders who leverage clinical psychology insights. By fostering a culture of well-being, understanding, and support, organizations not only mitigate the adverse effects of stress but also lay the foundation for sustained success, innovation, and employee satisfaction in the long term. The evolution toward psychologically informed leadership represents a paradigm shift that aligns organizational goals with the holistic health and flourishing of its most valuable asset – its people.

Conclusion

This academic article investigates the integration of clinical psychology strategies into leadership practices for effective stress management in contemporary work environments. The study explores established clinical interventions, including cognitive-behavioural approaches, mindfulness practices, and resilience-building techniques, emphasizing their applicability in leadership roles. Real-world case studies from various industries illustrate how leaders, equipped with insights from clinical psychology, have successfully implemented stress management strategies, resulting in positive outcomes for both individuals and organizations.

The article begins by introducing the concept of *stress management within the framework of sustainable workplaces*. It highlights the limitations of traditional approaches and argues for a paradigm shift where leadership actively engages with clinical psychology principles to proactively address stressors. The integration of clinical psychology into leadership is portrayed as a dynamic and transformative strategy that goes beyond crisis intervention, fostering a sustainable foundation for long-term employee well-being.

The exploration of cognitive-behavioural approaches reveals their adaptability to leadership practices. Leaders are encouraged to identify and modify thought patterns and behaviours contributing to stress, fostering a proactive and preventive approach. Mindfulness practices, such as meditation and mindful breathing, are presented as practical tools that can be seamlessly integrated into daily routines or high-pressure situations, offering employees accessible means of stress reduction and enhanced focus.

The significance of key leadership qualities—emotional intelligence, effective communication, and empathetic understanding—is extensively discussed. Emotional intelligence is positioned as a foundation for successful implementation, enabling leaders to navigate the intricacies of workplace dynamics. Effective communication is highlighted as crucial for translating clinical psychology insights into actionable strategies, ensuring team comprehension and engagement. Empathetic understanding is portrayed as central to creating a workplace culture that values support, openness, and growth.

Real-world case studies illustrate how organizations across various sectors have benefited from the integration of clinical psychology strategies into leadership. Examples range from technology companies implementing mindfulness sessions to healthcare providers addressing the emotional toll on frontline workers through resilience-building programs. The diverse cases underscore the versatility and effectiveness of clinical psychology strategies in mitigating workplace stress.

In conclusion, the article advocates for a paradigm shift in stress management, with a focus on the integration of clinical psychology strategies into leadership practices. The evidence from real-world case studies demonstrates that leaders, when informed by clinical psychology principles, play a pivotal role in creating sustainable workplaces that prioritize the psychological well-being of employees.

The emphasis on cognitive-behavioural approaches, mindfulness practices, and resilience-building techniques showcases the diverse toolkit available to leaders. This integration not only addresses immediate stressors but also cultivates a workplace culture that fosters resilience and growth. The strategic use of these

clinical interventions contributes to an organizational environment where challenges are viewed as opportunities for learning and development.

The key leadership qualities highlighted—emotional intelligence, effective communication, and empathetic understanding—emerge as critical components for the successful implementation of clinical psychology strategies. Leaders who embody these qualities create environments that not only manage stress but also actively support the holistic well-being of their teams.

The article concludes by urging further research, dialogue, and practical implementation of these strategies in diverse organizational contexts. The vision of sustainable workplaces that prioritize psychological health and resilience is presented as a collective endeavour, where leaders and scholars collaboratively contribute to the evolution of work environments that thrive in the face of contemporary challenges.

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THE ROLE OF MANAGEMENT FOR THE SUSTAINABILITY AND EFFICIENCY OF ENTERPRISES

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Abstract

In the last two decades, digitization and the sustainability of enterprises have become a major focus in the economy. They received the strongest impetus during the pandemic situation related to Covid-19 and the current military situation between Russia and Ukraine. Sustainable development has various economic, environmental and social aspects that are the basis of prosperity on a global scale, namely the development of enterprises and the social situation of consumers. Talking about sustainable entrepreneurship, it is important to start with the sustainable individual actions of managers. From the choice of vehicles and energy sources to simple, everyday habits such as separate collection of waste and recycling - all this is part of the main goal, namely - the sustainability and efficiency of the business. The main purpose of the paper is to clarify the main role of management for the sustainability and efficiency of enterprises. The research methods used in the development are content analysis, method of analysis and synthesis, systematic and intuitive approach. The following main findings were established in the development:

the important role of the manager for the management of the organization towards sustainability and the main characteristics of the modern manager; as well as challenges faced by green businesses.

Keywords: *sustainability; efficiency; digitization; management; enterprises; business.*

JEL Classification: M11, O32, Q56

Introduction

The concept of sustainable development of the triad "nature - man - society" is gradually imposed and becomes a "philosophy" of the 21st century as a reasonable alternative to increase human well-being without jeopardizing the development opportunities of future generations. (Dimitrova, 2008). Adopting effective sustainability management approaches has turned from an option into a necessity as the world grapples with environmental issues and the need to conserve resources. Business efficiency is not just about mass production and financial stocks, but about more - they strive to improve operations, save costs and fulfill their corporate social responsibilities. But compliance and implementation of all eco-business initiatives is within the competence of the modern manager. It is for this reason that the role of the manager and management are at the heart of the sustainability and effectiveness of entrepreneurship.

1. Distinctive features and characteristics of the modern manager

The role of the manager in the decision management process is crucial (Filipova, 2008). Issues related to "green industry" and sustainability are of key importance for managers when making decisions in organizations. They work to minimize both the use and production of harmful chemicals, excess materials and waste by-products in the delivery of their goods and services. This mostly applies to the people implementing the company's innovation management. In addition to purely economic knowledge, the modern manager must possess cognitive competencies in the field of probability theory and statistics, mathematical modeling, mathematical optimization, game theory, decision-making theory in conflict situations, risk theory, econometrics, etc. Thus, he will be able to successfully predict the behavior of the relevant circle of competitors on the market and make justified strategic and optimal decisions for the company (Kalaydzhieva,

2023). Entrepreneurs managing organizations that are "thinking" about the environment, realize that business is an exchange of goods and services from people to people and has a growing niche market for products and symbolizes the desire to apply sustainable principles. In this regard, the entrepreneurs of the new 21st century can be identified as global entrepreneurs creating a global entrepreneurial ecosystem (Yaneva et al, 2021). In many cases, entrepreneurs arrive at their eco ideas by accident. In general, environmental management is an important means of achieving sustainability – production and consumption without disrupting or depleting natural resources.

A "green manager" is a person who seeks to change his economic activity to achieve sustainability, start a new business and link the product life cycle with sustainable development through green design. In this regard, two main types of "green managers" can be defined:

- In the first place, "Green Manager" is the one who in the process of work discovers the advantages of environmental initiatives and applies them in his activities. These are entrepreneurs motivated to start a business to increase profit.

- Secondly, „Sustainably-minded manager” starts his business initiative with the idea of creating an ecological business. It may even intend to cause change in the sector in which it operates by demonstrating a workable sustainable method of business development in environmental standards.

As green entrepreneurship involves the identification of entrepreneurial opportunities and sustainable development in accordance with the environment, it is necessary to further develop green technologies and ecological entrepreneurial thinking. Thus, entrepreneurs will face more challenges in the process of green entrepreneurship. Managers' future autonomy is also an important factor influencing entrepreneurial choice (Cai, 2022). Individuals with higher self-efficacy can accept more uncertainty during the entrepreneurial process (Zeng & Ouyang, 2020).

Entrepreneurial creativity is not only the key driver of entrepreneurial intention, but also the essential element for enterprises to improve their competitive strength (Olufunso, 2010). As a special group, green entrepreneurs should maintain environmental protection vigilance, pay attention to environmental development issues that other entrepreneurs do not realize, use innovative thinking to find and identify business opportunities, open up the entrepreneurial market and use flexible creative thinking to solve environmental problems (Cai, 2022).

For the purposes of the research, it is necessary to derive the main characteristics of "green managers":

- Ecological way of thinking - expresses in their value system, inner motives and convictions, as they often see the protection of the environment, the transition to sustainable development and the provision of the future generation as their personal goal.

- Strategic awareness – is expressed in the construction and creation of green strategies, green goals, change in conventional thinking, etc.

- Green innovations – introduction into the company's activity and, respectively, the creation of green innovations by the company, automation of certain processes, digitalization and ecological technological measures.

- Green production - ideas for self-recycling of waste products, solar park for electricity production, green cars, eco standards, etc.

Resource conservation is an important aspect of sustainability management. Energy, as a critical resource, plays a critical function as organizations can minimize their dependence on fossil fuels, reduce greenhouse gas emissions and contribute to a better future by using renewable energy sources such as solar and wind power. In addition, energy-efficient building designs, energy recovery systems and waste reduction measures contribute to long-term operational ecology.

2. The role of management for sustainable business

In the current business reality, environmental awareness, conservation and entrepreneurial sustainability are becoming increasingly attractive as business strategies. As scientists and politicians debate the truth about global warming and the depletion of natural resources, green industry practices not only enjoy public support and bring income from a lower carbon footprint, but are increasingly reporting cost reductions and increasingly - great profitability. Consumption trends point to even more green industry business opportunities in the coming years (Pavlova, 2020). Businesses can minimize operating costs, gain a competitive advantage and reduce their carbon footprint by implementing energy efficient technologies and practices.

Sustainability, which includes environmental, social and economic issues, has evolved from a catchphrase to a fundamental management principle. Today's consumers are aware of the consequences of their decisions, and stakeholders expect businesses to link their activities to sustainability goals. Nowadays many companies are socially oriented and committed to contribute sustainable development by their corporate social responsibility, often expressed in donations, charity events, employment of disabled people, etc (Yaneva & Serafimova, 2020).

One of the meaningful approaches to the implementation of sustainability is for enterprises to link their activities with sustainability goals through the knowledge, skills and competencies of personnel (Ivanova, 2023). Sustainability emphasizes business responsibility, enhances brand reputation and attracts green consumers and investors. Conservation of resources is an important aspect of sustainability and effective management. Crucial to management and sustainability can be the following strategies:

- **Comprehensive energy audits:** Conduct comprehensive energy audits to demonstrate consumption trends and inefficiencies. This data forms the basis for targeted changes.
- **Investing in technology:** Using cutting-edge technologies such as IoT devices, automation and data analytics to monitor and optimize energy consumption in real time.
- **Employee Engagement:** Inform and involve staff in energy saving efforts. It is important to give them the opportunity to present ideas and practices that will improve efficiency.
- **Strategic Sourcing:** When sourcing, it is important to choose energy efficient equipment and materials. Collaboration with suppliers who share a commitment to sustainability is important.
- **Create a culture of continuous improvement** by setting reasonable goals, tracking progress and modifying techniques as needed.
- **Education and Training:** Provide ongoing education and training to employees on energy management, sustainability practices and the importance of their input.

The increased focus on sustainability has important implications for performance management in addition to manufacturing, but also for financial metrics and accounting analytics that produce and review management information. In addition to the financial information that is traditionally measured, businesses now also need to consider the environmental and social aspects of performance. It is for this reason that they need information in these areas to be relevant and reliable and to be provided in a meaningful and comparable manner (ACCA, 2023).

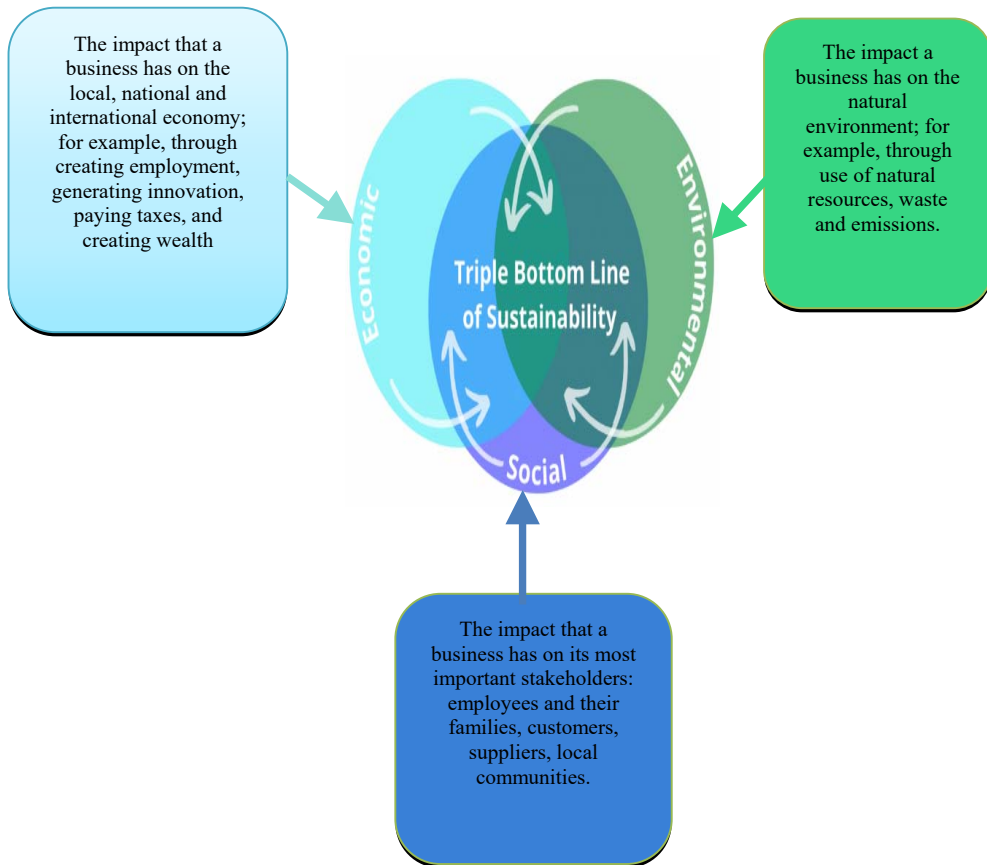


Figure 1. Triple bottom line approach

Source: adapted from ACCA - Advanced Performance Management. (2023). Sustainability and performance management, available on <https://www.accaglobal.com/gb/en/student/exam-support-resources/professional-exams-study-resources/p5/technical-articles/sustainability.html>

The triple bottom line approach (Elkington, 1998) emerges as a potential way of defining sustainable business performance (Figure 1) measuring performance not only in the economic value that the business adds, but also in the environmental and social value that it adds – or destroys.

Based on Figure 1, it is important to note that the third element 'economic' does not simply mean the financial profit the business makes. The economic impact is broader than just financial impact. Financial profit focuses on the business itself, but the economic impact of the business is on society as a whole, for example by creating jobs and paying taxes. Also we may consider a complex influence at the level of customers' perceptions that are eager to invest in the brand capital or the organization image equity. Taking into account that nowadays consumers are more and more involved in multiple channels of information, social media connections and are using multi-layered sources of information (Gârdan et al, 2022), the social value that the can asses about a certain organization becomes essential for the measurement of its sustainability. It is also important to recognize that social and environmental issues are not confined within the boundaries of normal business financial reporting, but businesses must also consider sustainability issues throughout their supply chain, as well as the social and environmental practices of their suppliers (e.g. supermarkets requiring suppliers to produce products from sustainable sources or environmentally friendly materials, or to supply 'organic' produce).

More generally, regardless of the performance measurement system it uses to improve sustainability performance, businesses must translate their overall goals into specific sustainability-related practices in each key performance area. It should then identify specific measurement indicators so that it can assess how well it is achieving its goals in each key area.

One of the particular challenges in comparing sustainability performance between companies is that while financial performance can be monitored using a number of widely accepted indicators derived from financial statements, indicators of social and environmental impacts are less clearly established and the information, used to calculate them is often not part of the main information flows.

3. Challenges for enterprises in the light of sustainable development concerns

For a business enterprise, sustainable development means adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today, while protecting, maintaining and enhancing the human and natural

resources it will need in the future. (International Institute for Sustainable Development, 1992). This definition of the concept of sustainable development, produced by the International Institute for Sustainable Development, is intended to help business managers apply the concept of sustainable development in their own organizations. The dynamic and innovative development of business organizations on a global scale presents them with new challenges that they have to deal with in the last few decades. By starting the process of integrating and applying the concept of sustainable development, it enables those who do it to deal with these challenges in a faster and more efficient way and make them more attractive to consumers and more competitive in the global and regional markets. Strategic marketing decisions are essential in creating sustainable competitive advantages and discovering strategic opportunities for company development (Yaneva, 2020). There are studies that have highlighted the fact that individuals occupying management positions responsible for sustainability, quality, or corporate social responsibility show obvious maturity regarding the concept of sustainability and concrete ways of implementing it in business models (Baicu et al, 2022).

Sustainable development is good for business in itself. It creates opportunities for suppliers to green consumers, developers of environmentally safer materials and processes, companies investing in eco-efficiency, and those committed to the social well-being of society. These businesses generally have a competitive advantage, achieve a positive reputation and prestige among the local community, and reflect their efforts in the pillars from which the concept is built (Angelov, 2016).

The European Commission emphasizes the need to develop a new integrated approach to sustainable development, taking into account the objectives of environmental protection, economic development and social development. It notes the potential of environmental policies to increase the competitiveness of industry and create employment opportunities. Based on what has been said so far, the challenges faced by business organizations and their managers can also be highlighted:

- Environmental challenge – the need to continuously improve the organization's environmental performance in order to achieve compatibility with sustainable development.
- Responsible entrepreneurship – managers can manage their operations in such a way as to increase their economic growth and increase their competitiveness, while ensuring environmental protection and promoting social responsibility.

- The concept of eco-efficiency - emerges as an innovative business strategy combining environmental protection and economic efficiency to create more value with less impact on the environment.

- New challenges - globalization, information society and changes in production and consumption models

- The other challenges - achieving sustainable industrial development can obviously only happen through open dialogue, cooperation and partnership with other stakeholders. All policy measures and decisions must be taken on the basis of close cooperation between all stakeholders, including business and the public, non-governmental organizations and all government institutions at all levels.

Environmental protection and a competitive economy can increase environmental and economic efficiency and also save resources for economic and social development, thus contributing to employment creation. Innovations in technology, production processes, products and environmental management are key to achieving this goal. Something more, innovation help to build competitive advantage and increase competitiveness, as well as to advance scientific and technical progress (Kyurova & Koyundzhiyska-Davidkova, 2020).

Some authors emphasize that in order to survive in a dynamic and highly competitive environment, business enterprises must take various measures to achieve sustainability (Kyurova & Kiryakova–Dineva, 2019). The topic of the challenges of integrating the concept of sustainable development at the micro level is gaining more and more interest over time, as the concept develops and expands and increases the interest in research from the scientific and practical-applied circles. In a 2002 study, Schaltegger and his team put forward another perspective on integrating the concept at the level of the organization, which is essentially similar to that of the European Commission, with the difference that some more specific characteristics of the challenges are brought out (Schaltegger, 2002).

They consider them in four main groups as follows:

- Ecological efficiency - all human activities affect the ecosystem, including economic activity. Broadly speaking, ecological efficiency measures the degree of absolute environmental stability, in other words, the degree to which purposeful objective minimization of environmental impact is achieved;

- Social efficiency - enterprises are placed in a social context. The social challenge to management consists in ensuring the existence and success of the enterprise while at the same time considering the diversity of social, cultural and

individual social demands. This makes it possible to preserve the social perception of the enterprise and legitimize its activities.

- Economic sustainability challenge to environmental and social governance - the traditional economic challenge consists of raising the value of shares and increasing the profitability of products and services, the economic sustainability challenge must deal with environmental and social governance.

- Corporate sustainable development – the real challenge for managing corporate sustainability is related to the integration of the concept, and this is expressed in two directions. In the first place it has to combine and simultaneously solve the three challenges described above, and for this purpose an integrated approach must be developed to solve this problem. Second we can talk about the integration of environmental management and social management into conventional economic management, with the aim of unifying not only the three aspects separately, but also the ecological-economic and socio-economic perspectives.

These and other challenges are the basis for developing and integrating a new visionary business approach in the development of business organizations. Prerequisites for this are the political measures adopted by the European Union and the European Commission, as well as the development of a strategy for sustainable industrial development, the aim of which is to achieve the integration of environmental concerns and sustainable development in industrial policy, thus promoting environmental protection environment, competitiveness, innovation and employment. In the long term, the achievement of this strategy is related to balancing the three pillars of sustainable development – economic, ecological and social (European Commission, 1999).

Challenges are not only difficulties that an enterprise faces when it wants to apply and integrate the concept of sustainable development in its operations. They are also an opportunity, when prioritized and implemented, to lead to strong competitive advantages, to improve operations and communication between the enterprise and the community as a whole, can lead to the opening of new markets, improve the working conditions of employees, to protect the environment and generate significant revenues that will allow the enterprise to develop and improve its activities and impact on its environment. Actually, in the present business environment, characterized by multiple crisis, the development of competitiveness of different organizations is depending on their capacity to find sources of competitive advantages in a sustainable manner based on the long-term relationship with customers, partners, suppliers etc (Gârdan et al, 2020).

If we take a closer look upon the very complex issue regarding the role that managers can have within the process to develop and implement sustainable principles for the organizations activities we may focus the main challenges in doing this on the following directions (Garškaitė-Milvydienė, K., 2014; Baumgartner, R. J., & Rauter, R., 2017; Imran, R., Alraja, M. N., & Khashab, B., 2021; Mathur, V. N., Price, A. D., & Austin, S., 2008; Post, J. E., & Altman, B. W., 2017; Székely, F., & Knirsch, M., 2005; Teuscher, P., Grüninger, B., & Ferdinand, N., 2006):

- Strategic Decision-Making: Effective management plays a pivotal role in setting the direction for sustainability initiatives. Strategic decisions on resource allocation, technology adoption, and long-term planning significantly impact the company's sustainability and efficiency.

- Resource Optimization: Management oversees the efficient utilization of resources, including human capital, finances, and materials. By implementing sustainable practices and optimizing resource usage, enterprises can reduce waste and environmental impact while improving efficiency.

- Culture and Leadership: Management shapes the organizational culture, fostering a mindset of sustainability and efficiency among employees. Strong leadership that values and prioritizes these aspects can inspire innovation and commitment to achieving sustainability goals at all levels.

- Risk Management: Effective management identifies and mitigates risks associated with unsustainable practices, regulatory changes, or market shifts. By proactively addressing these risks, enterprises can safeguard their long-term sustainability.

- Stakeholder Engagement: Management plays a crucial role in engaging with various stakeholders, including employees, investors, customers, and communities. Building partnerships and transparent communication about sustainability efforts can enhance reputation and support for the enterprise.

- Continuous Improvement: Management fosters a culture of continuous improvement, encouraging innovation and adaptation to changing circumstances. Constantly evaluating and refining strategies for sustainability and efficiency is essential for long-term success.

- Measurable Goals and Accountability: Establishing clear, measurable goals for sustainability and efficiency initiatives is essential. Management ensures accountability by monitoring progress and adjusting strategies as needed to achieve these objectives.

- **Adaptation to Change:** Enterprises operate in dynamic environments where market demands, regulations, and consumer preferences evolve. Management needs to be adaptable and responsive, adjusting strategies to remain competitive while staying committed to sustainable practices.
- **Long-Term Vision:** Management should adopt a long-term perspective, understanding that sustainable practices and efficient operations contribute to the resilience and longevity of the enterprise.

Conclusions

Finally, we can point out that the role of the manager for the sustainable development and efficiency of enterprises is increasing, due to the escalating need for measures related to mitigating climate change. Based on what has been said so far, we can draw the following conclusions:

Firstly, the modern manager must possess the necessary qualities to manage the organization, through which to reduce the adverse effect of the activity on the environment. Proper management contributes to efficient production and overall sustainable development of the enterprise.

Secondly, for the operation of the sustainable enterprise, it is necessary for the manager to choose the right development strategy, as well as the correct application of the triple bottom line when organizing financial analyses.

Thirdly, an important step for managers is to overcome the main challenges of sustainable development and effective management. These challenges boil down to environmental efficiency, social efficiency, the challenge of economic sustainability to the environment and social governance, and finally corporate sustainable development.

Putting everything together, we may highlight the fact that the role of management in ensuring the sustainability and efficiency of enterprises is integral. Through strategic planning, resource optimization, fostering a culture of sustainability, risk management, stakeholder engagement, and a commitment to continuous improvement, management significantly impacts the success and longevity of an organization.

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DEVELOPMENT AND SUSTAINABILITY OF SPECIALIZED ACCOUNTING SOFTWARE PRODUCTS

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Abstract

The rapid advancement of technology has permeated various sectors of the economy, and the field of accounting is no exception. This study delves into the development and sustainability of specialized accounting software products, providing a comprehensive overview of their evolution, current state, and future prospects. The research emphasizes the critical role of such software in enhancing accuracy, efficiency, and transparency in financial reporting and decision-making processes. The initial part of the study traces the historical development of accounting software, highlighting the transition from manual bookkeeping to automated solutions. It examines the driving forces behind this transformation, including the need for real-time financial data, compliance with complex regulatory requirements, and the pursuit of operational efficiency. The research also explores the integration of emerging technologies such as cloud computing, artificial intelligence, and block chain in accounting software, assessing their impact on functionality, security, and user experience. The sustainability of specialized accounting software products is

scrutinized, considering both their economic viability and environmental impact. The study evaluates the business models adopted by software providers, exploring how they balance innovation, customer satisfaction, and profitability. The research also addresses the environmental considerations of software development and deployment, emphasizing the importance of green computing practices in the accounting software industry.

Key words: *Accounting Software, Specialized Software Products, Development, Sustainability*

JEL Classification: M41

Introduction

The evolution of accounting practices has been notably influenced by technological advancements, resulting in a paradigm shift from traditional manual methods to automated and sophisticated software solutions. The development of specialized accounting software products has become integral to modern accounting, providing unprecedented accuracy, efficiency, and reliability in financial reporting and management [Astromskis, S. et al., 2014]. This research paper aims to explore the trajectory of this transformation, critically examining the development, current state, and future sustainability of specialized accounting software products. The necessity for specialized accounting software has grown exponentially with the complexity and volume of financial transactions in today's fast-paced business environment. Organizations, irrespective of their size, rely on these software products to streamline their accounting processes, ensure compliance with regulatory standards, and gain strategic insights into their financial health. The surge in demand for these tools has propelled continuous innovation and development in the sector, leading to an array of products tailored to meet the specific needs of various industries and business models [Motiee, S., Hawkey, K., & Beznosov, K., 2010]. However, as the market for accounting software becomes increasingly saturated and competitive, questions regarding the sustainability of these products come to the forefront. The introduction of emerging technologies such as cloud computing, machine learning, and block chain presents both opportunities and challenges, necessitating a critical analysis of how these innovations are integrated into accounting software and their implications for the future of the industry.

Furthermore, the sustainability of specialized accounting software products extends beyond their technological and economic aspects [Jimenez, M., et al., 2019; Jinping, L., 2015]. Environmental considerations are becoming paramount, as the industry grapples with the carbon footprint of software development and deployment and more and more layers of management across different organizations are ready to incorporate and to adapt any kind of instrument that is capable to ensure a sustainable orientation of the business processes [Gârdan D.A. et al., 2022]. Therefore becomes crucial to explore how green computing practices are being incorporated into the lifecycle of accounting software products, ensuring that their development and use align with broader sustainability goals.

In this context, the introduction sets the stage for a comprehensive examination of specialized accounting software products. It outlines the scope of the research, highlights the significance of the topic, and presents the key questions and themes that will be addressed in the subsequent sections. The aim is to provide a nuanced understanding of the development and sustainability of these vital tools, contributing to informed discourse and strategic decision-making within the accounting and software development communities.

1. Tracing the Evolution of Accounting Software

The evolution of accounting software is a testament to the remarkable journey of technological innovation and adaptation in the field of accounting. From rudimentary tools designed to simplify basic arithmetic operations to sophisticated platforms capable of handling complex financial transactions and reporting, accounting software has undergone a significant transformation over the years. Chapter 1 delves into this evolutionary process, tracing the origins, development, and maturation of accounting software products, with a special focus on specialized solutions tailored to unique industry needs. The development of accounting products can be divided into several periods:

Early Beginnings and Development: This period includes the initial stages of accounting software development, discussing early tools and systems designed to assist with financial calculations and record-keeping. During this period, accounting products emerged and were introduced into practice for performing elementary accounting operations. The creation and gradual development of accounting software has played a major role in transforming financial management and reporting practices in various industries [Handoko, B. L., Lindawati, A. S., & Mustapha, M., 2022; Hill, S. W., & Kmetz, F., 1997]. This period includes the early beginnings and development phases of accounting software, tracing its path

from simple calculation tools to complex financial management systems. The study provides a fundamental understanding of how technological advancements and evolving business needs have shaped the accounting software landscape over the years.

The history of accounting software dates back to the 1960s, when businesses began to leverage computers for handling financial transactions and record-keeping. Early accounting software was primarily focused on automating calculations and simplifying arithmetic operations to reduce manual errors and enhance efficiency [Milner, A. et al., 2008]. These rudimentary systems were typically mainframe-based and required significant computational resources.

From Basic to Advanced: Accounting software has evolved from basic, stand-alone applications to advanced, integrated solutions that serve a wide range of accounting functions. The range of performed accounting operations is expanding. They become significantly more complex and support the work of the accountant. The calculation processes performed by the accounting product are also improved [Meytova, A., & Feygel, M., 2022]. Driving forces behind the evolution of accounting products are external and internal factors that have driven the development of accounting software, including regulatory changes, technological advances, and evolving business needs. The rise of accounting software products is also due to the fact that they are becoming more specialized, serving specific industries, business sizes and functional requirements. They are suitable both for small enterprises and for large holdings, they can serve only one company or several [Meiryani, M. et al, 2022].

As technology progressed and personal computers became more accessible in the 1980s, accounting software experienced a significant transformation. Software developers started to create more user-friendly and versatile solutions, catering to a broader audience including small and medium-sized enterprises. The introduction of spreadsheet programs like Microsoft Excel further revolutionized financial data management, providing users with powerful tools for analysis and reporting. Recognizing the diverse needs of different industries, software developers began to introduce specialized accounting solutions tailored to address unique financial management challenges [Santos, R. et al., 2005]. These industry-specific products offered functionalities that went beyond general accounting, integrating features relevant to particular sectors such as retail, manufacturing, and services. This marked the beginning of a trend towards specialization in accounting software, setting the stage for the sophisticated products available today.

The development of accounting software has also been significantly influenced by the evolving regulatory landscape [Tian, Z., 2023]. The need for compliance with accounting standards and financial reporting requirements necessitated the incorporation of robust auditing and control features in accounting software. This ensured that businesses could rely on these tools not only for efficiency but also for accuracy and compliance.

Emerging Technologies and Future Prospects: The accounting software landscape is constantly evolving, driven by relentless technological advancements and changing business demands. As we enter the realm of emerging technologies, their integration into accounting software products is not only inevitable, but imperative to remain competitive and applicable. We will examine the current state of emerging technologies in accounting software and project their potential impact on the future development of these products.

An assessment of the impact of emerging technologies such as artificial intelligence, cloud computing, and block chain on the accounting software domain, and a speculative look at future trends and developments. Paperless accounting is introduced. For example, many companies issue their invoices in an electronic version, send it to the counterparty by email, and he also electronically includes it in his specialized accounting product. And the electronic documents themselves are kept in a cloud drive. Therefore, there is no need to use wood and cut down trees. There is a thought for saving the environment.

The early beginnings and development of accounting software reflect a journey marked by innovation, adaptation, and specialization. From simple calculators to comprehensive financial management systems, accounting software has transformed the way businesses manage their financial affairs. This historical context sets the foundation for understanding the current state and future prospects of specialized accounting software products [Tian, Z., 2023], emphasizing the importance of continuous innovation and responsiveness to evolving business and regulatory needs.

We can summarize from the historical journey of accounting software development, emphasizing the role of technological innovation and adaptation in shaping specialized accounting software products according to the demands of society and the needs of the companies themselves [Wu, C. E., & Horn, W. P., 2005]. We will examine the current state, challenges and sustainability of these vital tools in modern accounting practices in today's world.

2. Navigating the Current Landscape of Specialized Accounting Software

Building on the historical overview provided in the previous chapter, we focus here on the present, offering a detailed examination of the current landscape of specialized accounting software products. This chapter aims to provide a comprehensive understanding of the various aspects of these tools, including their features, user demographics, and competitive market dynamics [Velmurugan, M. S., & bte Wan Nahar, W. N., 2011]. We should note opportunities for growth and improvement of specialized accounting products. Identifying areas such as sustainability where specialized accounting software products can be further developed, exploring potential avenues for innovation and expansion. Here are some innovations that have been introduced in specialized accounting software products that lead to sustainability:

Cloud computing has revolutionized the way accounting software is delivered and utilized.

Cloud computing does not have a standard definition, but the simplified general understanding is that of storing and accessing data and programs through computer network, in particular the Internet, instead of computer's hard drive. In this context the simplified definition of cloud accounting becomes an accounting that is executed using software hosted remotely on the cloud, instead of software was, traditionally hosted locally on a desktop computer's hard drive [Bebeșelea, M., 2020].

With the advent of cloud-based solutions, businesses are able to access their financial data and accounting tools from anywhere, fostering flexibility and collaboration [Silva, F. A., et al., 2013]. Future prospects indicate a continuation of this trend, with an increasing number of software providers transitioning to cloud-native applications, ensuring scalability, security, and performance. Cloud computing has emerged as a transformative force in the realm of accounting software, revolutionizing how businesses manage their financial operations. This paradigm shift from traditional on premise solutions to cloud-based platforms has enabled unparalleled accessibility, scalability, and collaboration. We delve into the role of cloud computing in accounting software, exploring its benefits, challenges, and the implications for future financial management practices. Cloud computing provides accounting software with the capacity to scale resources up or down according to business needs. This scalability ensures that businesses only pay for the resources they use, leading to cost efficiencies and eliminating the need for significant upfront investments in IT infrastructure. Additionally, the cloud model

typically operates on a subscription basis, transforming capital expenditure into operational expenditure.

Security concerns are paramount when it comes to managing financial data. Cloud-based accounting software providers invest heavily in security measures, including data encryption, secure data centers, and regular security audits, to protect user data [Wieringa, M., 2020]. Moreover, the cloud infrastructure offers enhanced reliability through data redundancy and backup features, ensuring data integrity and availability even in the event of hardware failures or disasters. Despite its numerous benefits, cloud computing in accounting software also presents challenges, particularly in terms of data privacy, internet dependency, and potential service disruptions. Businesses need to diligently assess their cloud service providers, ensuring robust security measures, data privacy compliance, and reliable service availability.

Future development is expected to focus on improving the accuracy of predictive models, automating more complex accounting tasks, and integrating AI-driven insights throughout the financial workflow. One of the most immediate impacts of AI in accounting software is the automation of repetitive and time-consuming tasks such as data entry, invoice processing, and bank reconciliations. By automating these processes, AI frees up valuable time for accountants and financial professionals, allowing them to focus on more strategic aspects of financial management. AI algorithms are exceptionally good at identifying patterns and anomalies in large datasets. In accounting software, this capability translates to improved accuracy and a significant reduction in errors. AI systems can quickly scan through vast amounts of financial data, pinpointing discrepancies and ensuring that financial statements are accurate and compliant with relevant standards [Madden, R. L., 1972].

Block chain has the potential to introduce unprecedented transparency and security in financial transactions. While its application in accounting is still in the nascent stages, there are promising prospects for block chain to streamline audit processes, reduce fraud, and enhance the integrity of financial records [Lopes, A. P., et al., 2023; Meiryani, M., et al., 2022; Meiryani, M., et al., 2022]. Future accounting software products may incorporate block chain technology to facilitate secure and transparent financial transactions, potentially transforming the entire financial reporting process [Parente, E. G., 2012; Rivadeneira, D. X., & Toledo, J. A., 2021].

The future of accounting software lies in its ability to seamlessly integrate with other business tools and systems. As businesses adopt a myriad of software

solutions for different aspects of their operations, the need for interoperability becomes paramount. Future accounting software products are expected to prioritize integration capabilities, ensuring that they can effortlessly connect with other software, share data, and provide a holistic view of business operations.

User experience is a critical factor in the adoption and effectiveness of accounting software. The situation is very similar in other fields specific for the online environment – e-commerce, web design etc. – in which the consumer experience is very important being an essential factor for the proper design of the entire process [Paștiu, C. A. et al, 2021]. Emerging technologies like natural language processing and voice recognition are being integrated into accounting software to enhance accessibility and ease of use [Zatsarinnaya, Y., Kovalev, G., & Gainullin, R., 2022; Zhong, H., Yi, S., & Shen, G., 2011]. Future developments are likely to focus on creating more intuitive interfaces, personalized experiences, and inclusive design, ensuring that accounting software is accessible to users with diverse needs and levels of expertise.

Conclusions

The integration of emerging technologies into accounting software products is not just a trend but a necessary evolution to meet the demands of modern businesses, which necessitated the passage from the traditional automated accounting to digital Cloud accounting.

Cloud computing, AI, block chain, integration capabilities, and a focus on user experience are shaping the future of accounting software, promising enhanced efficiency, accuracy, and accessibility. As we navigate this technological landscape, the prospects for innovation and transformation in accounting software are boundless, opening new avenues for efficiency, transparency, and strategic financial management. Artificial Intelligence has begun to play a crucial role in accounting software, driving innovation and transforming financial management practices. By automating repetitive tasks, enhancing accuracy, providing predictive insights, and assisting in fraud detection, AI empowers businesses and financial professionals to achieve greater efficiency and make more informed decisions. As AI technology continues to evolve, its integration in accounting software is expected to deepen, further revolutionizing the field of accounting and opening up new possibilities for innovation and efficiency.

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THE ROAD TO DIGITAL EXCELLENCE: ADDRESSING CHALLENGES AND EXPLORING OPPORTUNITIES IN BUSINESS

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Abstract

In contemporary circumstances, economic and societal realms encounter a multitude of issues and hurdles. The pivotal instrument for fostering enduring progress in business lies in digital transformation. The exploration of innovative business models, managerial methodologies, and reorganizational strategies amid the age of digitization presents a spectrum of prospects to enhance innovation capabilities, digital competitiveness, and corporate social responsibility. Within this framework, a study delving into the challenges of digital transformation and the potential it affords becomes imperative for strategic management decisions, fostering rapid adaptation to the emergent digital business paradigm.

Present paper explore this topic from the perspective of challenges and in the same time opportunities that are encountered related with the digital transformations of business activities. Conclusions are establishing the complex relationship between the process of digitization and challenges

specific for overcoming problems inherent for technology acceptance by certain social groups.

Key words: *digital transformation; digitalization; digital technologies; innovation capacity; digital competitiveness; corporate social responsibility*

JEL Classification: M10, M21, M31, M33

Introduction

The process of digital transformation in business is gaining relevance in the context of the search for fast and efficient ways for sustainability, profitability and competitiveness through innovative change.

For a better understanding of the issues, it is necessary to know not only the essence and evolution of the process, but also the problems and challenges faced by modern business in the conditions of dynamic digital changes. In this regard, the digital technologies need not only implementation but also research to achieve two main goals: improving the efficiency, scope and quality of the services provided to the consumers and businesses [Marikina, 2020].

The digital transformation has been the subject of increased interest by a number of authors in the scientific literature due to its application in all spheres of the social and economic life in the last decade. In this process, the digital technologies are used to change business processes, models, operations, company strategies, corporate policy, organizational structure, customer communication, consumer behavior, etc. The application of new technologies aims to stimulate future growth in various sectors, as well as increase the demand for new jobs and skill sets [BIA, 2022]. It also has a strong impact on the innovations and competitiveness. [Filipova, Yuleva-Chuchulayna, 2021b].

Defined as an organizational change caused by the rapid development and application of the digital technologies in business, the digital transformation is a prerequisite for maintaining and expanding the companies' market positions [Slavova, 2016]. This objective process corresponds to the changing business environment. Its implementation requires a clear strategy and prioritization, supported by financial resources, leadership and active participation of all the employees in the organization [Slavova, 2016].

The digital transformation has a key importance for the strategic development of the companies [Filipova, Yuleva-Chuchulayna, 2020]. Although the digital technologies and connectivity can drive the economic inclusion of all businesses

[Næss-Schmidt et al., 2020], the companies are faced with new dynamic business models and increasing competition in the markets which leads to the need to completely review their previous tactics and strategies [Yuleva-Chuchulayna, 2022]. Regardless of the different approaches to researching the digital transformation, the unifying understanding is that it can only be successful if there is a well-founded strategy and leadership [Slavova, 2016]. Important in this regard is the digital competitiveness, which is indicative of how countries in conditions of technological transformation succeed through their entrepreneurs in creating a sustainable product [Marikina, 2020].

1. Advantages and opportunities of the digital transformation

Exploring the opportunities that can be offered by the digital transformation of the business environment requires a strategic approach, commitment from leadership, continuous innovation, and a willingness to adapt to evolving technologies and market dynamics. Companies that successfully navigate this road often emerge as leaders in their industries, reaping the benefits of digital excellence and transformation.

The different perceptions about the main opportunities that digital transformation provides are of utmost importance for the business development - its policies, management and making of strategically informed decisions.

Some of the most significant benefits of the digital transformation for businesses are in terms of increased profit, productivity and competitiveness; cost reduction; creation of a more favorable sustainability profile [Lazarova, 2020]. In their research, a number of practicing economists prove that the wide range of digital tools benefits companies from all industries by creating more efficient hiring practices, reaching export markets and facilitating business development, especially in developing countries and regions [Næss-Schmidt et al., 2020]. The digital transformation leads to innovative change through reorganization of companies' models, processes, policies and strategies. In addition, it favors overcoming barriers to growth and creating new opportunities by helping companies to secure funding and improve access to information [Næss-Schmidt et al., 2020]. Improving the business information needed for analysis and control, in turn, facilitates and increases the efficiency of the business processes, improves transparency [Lazarova, 2020]. R. Yuleva clarifies that digitization is the only cost-effective way to overcome the challenges associated with the possibility of human error and at the same time is characterized by a large economic effect. It ensures a

real transparency and tracking of all administrative actions [2022]. On the other hand, it promotes the creation of better corporate social responsibility and stronger credentials [Lazarova, 2020].

The digital transformation is a key to companies' marketing activities. In this regard, a more in-depth presentation of the process has been made by S. Yordanova and Kamelia Stefanova [2019] who consider the business factors that become drivers and prerequisites for the business transformation success': developing a competitive advantage by creating unique opportunities to improve the customer satisfaction; deep understanding of customer behavior and loyalty; analyzes of data from multiple sources; conducting effective and targeted marketing campaigns; providing a consistent and personalized product range to the customers across all possible channels; reduce costs by optimizing inventory and supply chain management.

It is extremely important to link business with the higher education. Investments in the human capital, its digital knowledge and skills can stimulate competition through the development of new technologies, lifelong learning and creation of new management practices [Clark, 2021; Filipova, Yuleva-Chuchulayna, 2021a]. The role of the digital technologies as driving economic and social progress in the process of the economic inclusion which can contribute to the empowerment of historically underrepresented groups is emphasized [Næss-Schmidt et al., 2020].

Summarizing the opinion of the authors presented above gives reason to distinguish the following areas of opportunities that digital transformation provides for business: economic progress, business development and innovative growth; company prosperity, competitiveness and profitability; free and easy access to information; improvement of marketing activity; dealing with socially significant issues.

To these we can add reorganization and improvement of processes, policies and strategies; creation of new work models, organization and management; improvement of the strategic planning; enhancement of the corporate image and company climate; effective interaction and communication within the company and with stakeholders; development of the managers' and employees' potential; effective protection of the copyright and intellectual property.

If we take into consideration multiple layers that can be highlight for the digital processes we have to be aware about the importance of distinct advantages regarding elements related to [Schwertner, K., 2017; Li, F., 2020; Kraus, S., 2021; Shehadeh, M., 2023] :

- **Enhanced Efficiency:** Digital transformation streamlines processes, reduces manual efforts, and automates tasks, leading to increased efficiency and productivity across various business functions. Ultimately, enhanced efficiency through digital transformation is not just about doing things faster; it's about doing things smarter and more effectively. It frees up time and resources that can be redirected towards innovation, strategy, and further improvements, fostering a cycle of continuous enhancement within the business (Zhang, T., 2022).

- **Improved Customer Experience:** Digital technologies enable businesses to understand customer needs better, personalize interactions, and offer seamless experiences, leading to improved customer satisfaction and loyalty. In the same time the customer experience is based on personalization, omni-channel presence, accessibility and convenience, faster response times, feedback, engagement and transparency. Due to this features, improving the customer experience means also being capable to use predictive analytics in order to anticipate customer needs. It refers also to the continuous improvement - through data analysis, businesses can continuously refine and improve their offerings based on customer behavior and preferences, ensuring a better match between what they offer and what customers want. Last but not least a positive digital experience contributes to building strong brand loyalty. Satisfied customers are more likely to become repeat customers and advocates for the brand, leading to increased retention rates.

- **Data-Driven Insights:** Digital transformation allows for better data collection, analysis, and utilization. Companies can derive valuable insights from data to make informed decisions, predict trends, and identify new opportunities. The advantage of data-driven insights in the context of digital transformation empowers businesses to make smarter decisions, understand customers better, enhance operational efficiency, foster innovation, manage risks effectively, measure performance accurately, facilitate collaboration, and remain adaptable in a dynamic business environment.

- **Agility and Adaptability:** Embracing digital transformation allows companies to be more agile and adaptable in a rapidly changing business landscape. In essence, agility and adaptability through digital transformation empower businesses to respond quickly to market changes, innovate rapidly, scale operations efficiently, enhance customer experiences, adopt flexible strategies, gain a competitive edge, and effectively manage risks, positioning them for sustained success in an ever-evolving business landscape.

- **Cost Savings:** Through automation, optimized processes, and better resource allocation, businesses can often reduce operational costs, leading to increased

profitability. By leveraging digital transformation effectively, businesses can realize cost savings across various operational facets, optimize resources, enhance efficiency, and ultimately improve their bottom line while staying competitive in today's dynamic market.

- **New Business Models:** Digital transformation opens doors to new revenue streams and innovative business models. Companies can explore subscription services, digital marketplaces, and other disruptive models. Digital transformation not only optimizes existing business models but also creates opportunities for entirely new ways of conducting business, disrupting industries, and meeting evolving consumer demands in innovative ways.

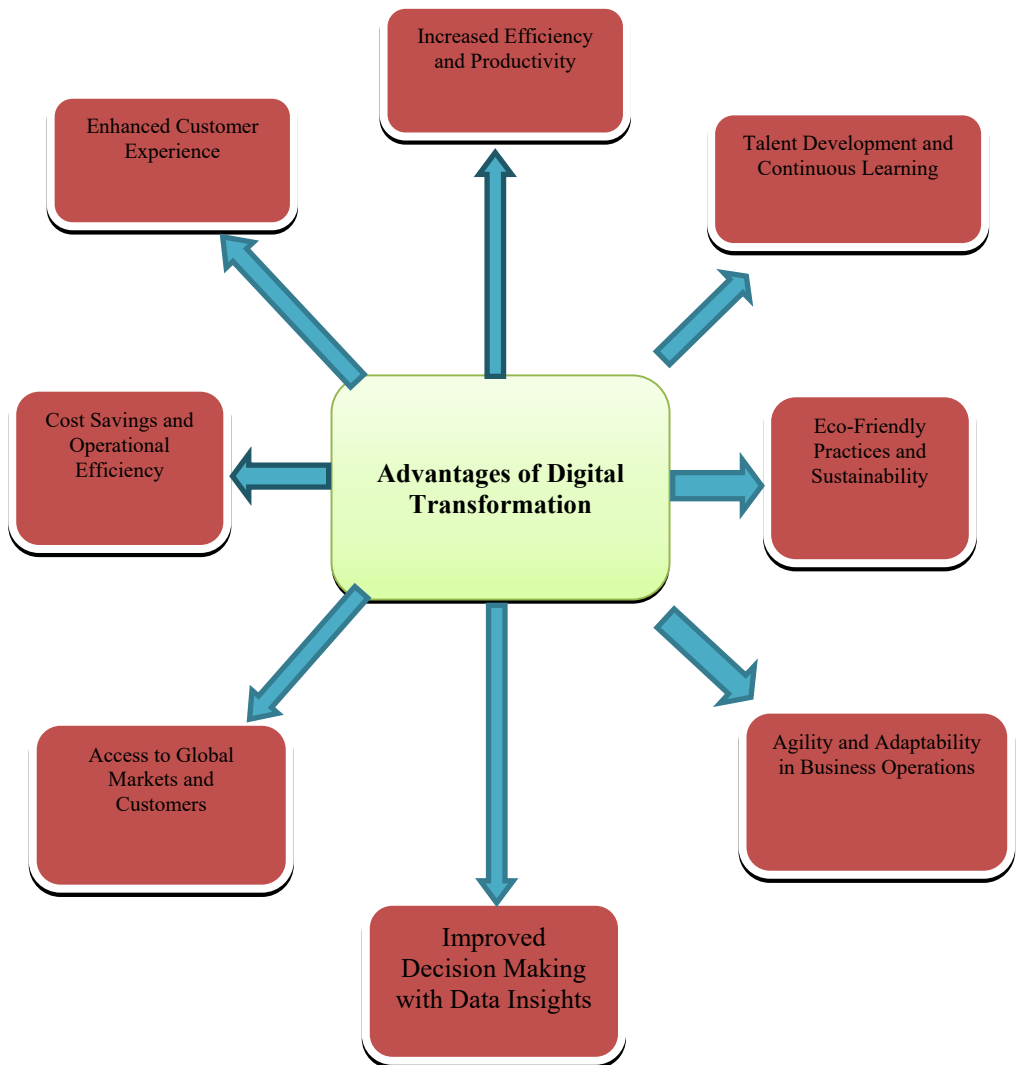
- **Global Reach:** With digitalization, geographical barriers are minimized. Businesses can expand their reach globally, accessing new markets and customer segments. In essence, digital transformation breaks down geographical barriers, allowing businesses to expand their reach globally, tap into diverse markets, establish international connections, and create opportunities for growth and innovation on a global scale.

- **Improved Decision Making:** Real-time data availability and analytics tools empower businesses to make quicker, more accurate decisions, fostering a proactive approach to problem-solving. By leveraging digital tools, technologies, and data-driven approaches, businesses enhance their decision-making capabilities, enabling them to make more accurate, strategic, and timely decisions that align with organizational goals and drive overall success.

- **Eco-Friendly Practices:** Digital transformation often leads to reduced paper usage, optimized energy consumption, and environmentally friendly practices, contributing positively to sustainability efforts. By embracing digital transformation and integrating eco-friendly practices into their operations, businesses can reduce their environmental footprint, contribute positively to sustainability efforts, and align their strategies with societal and environmental goals.

- **Talent Development:** Companies that embrace digital transformation often invest in upskilling their workforce, leading to a more skilled and adaptable team capable of handling emerging technologies. By leveraging digital tools and technologies, businesses can create a dynamic learning environment that fosters continuous growth, enhances employee skills, and cultivates a workforce capable of adapting to changing demands and technological advancements. This not only benefits individual employees but also contributes to the overall competitiveness and success of the organization.

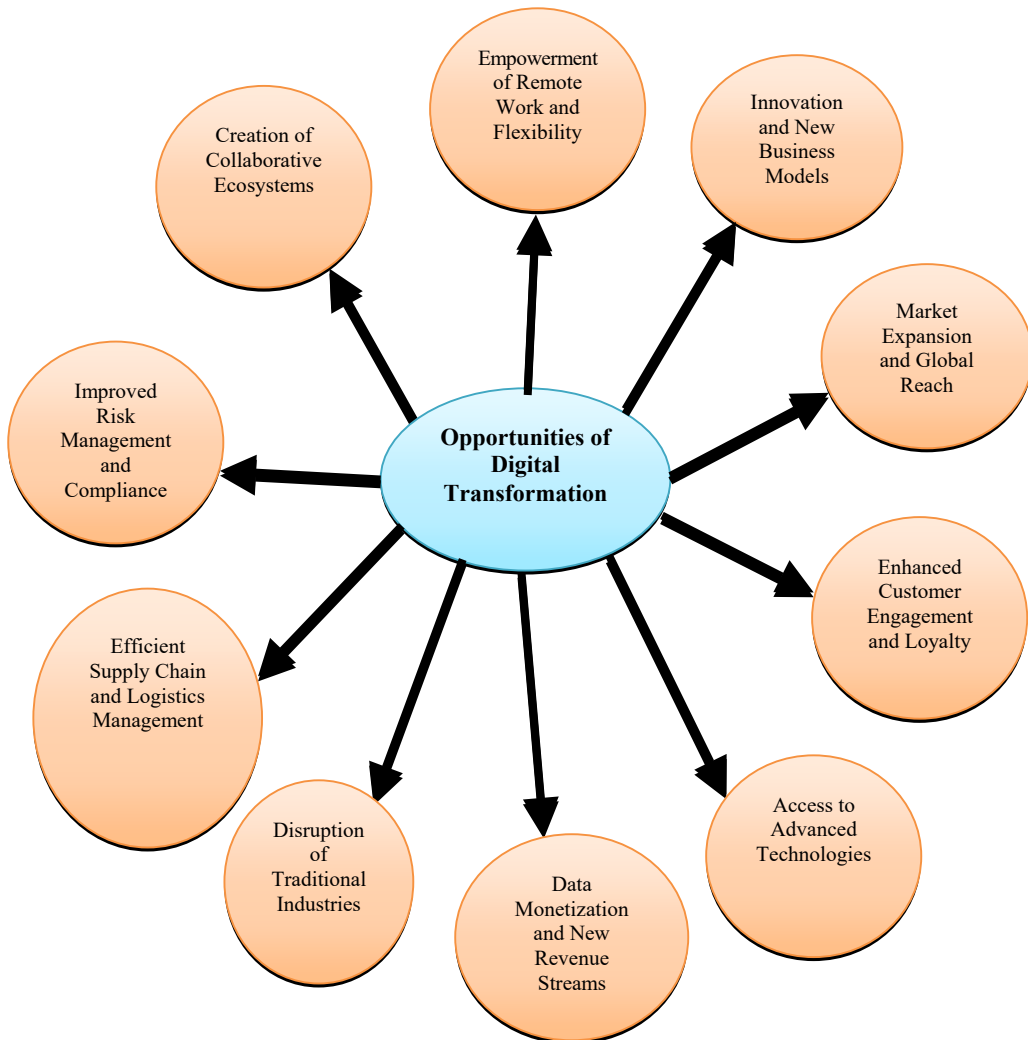
Figure 1. Advantages offered by the digital transformation in a nutshell



Source: own representation

The figure above synthesizes the main fields in which advantages of the process of digitalization for the business environment are actually highlighted as much as the digital transformation of business processes is taking place.

Figure 2. Advantages offered by the digital transformation in a nutshell



Source: own representation

In the same time, very close related with the idea of advantages, there are a couple of opportunities that are manifesting themselves in the context of digitization. They are referring mainly to possibilities offered by the processes of innovation and emergence of new business models, capability to expand markets and offer enhanced customer engagement and loyalty. In the same line of opportunities we may count also access to advanced technologies, possibilities offered by the data monetization and the identification of new revenue streams. A distinct layer of possibilities are related with the disruption of traditional industries, efficient supply chain and logistics management. Among the opportunities we have to count also a greater degree of risk management and compliance, the possibility to create collaborative ecosystems and one of the recent features related with empowerment of remote work and flexibility.

2. Problems and challenges facing the digital transformation of business

The results of the literature review outline a number of important problems and challenges facing the digital transformation of business. D. Lazarov [2020] highlights the urgent need for a radical rethinking of the way companies use technology to meet challenges. For this purpose, it is necessary to improve the business models, processes and competencies for comprehensive implementation of the digital technologies in the strategic company development. The formation of new conditions for the business functioning and new approaches in the adoption of the management decisions should favor the use of the technologies to complement the human skills.

A number of studies show that the insufficient qualification of the employees hinders further digital transformation [Siemens Bulgaria & DBIHK – AHK, 2021]. In this regard, the social economy faces a number of challenges related to a growing contradiction between the technology and social effect [Ilcheva, 2020]. Beside this, a major problem can be related with the insufficient adaptation and integration of certain layers of population within the process of digitalization. Thus, a research conducted on 394 elderly people from rural zone in China revealed the existence of the phenomena called psychological digital divide manifested also in the context of relative deprivation theory. The people from the studied sample were suffering of a kind of digital deprivation, with elements such social exclusion and technology anxiety as driver of their response in the context of digitalization requests [Wang, W., Zhang, Y., & Zhao, J., 2023]. In this context, phenomena such as manifestation of social exclusion and even digital exclusion for certain social groups become a living reality. So, we may assume that the digital

inequality, exclusion and isolation are among the main problems of the digital transformation. Increasing the digital competences, knowledge and skills would help to optimize the work process and increase the motivation of the human resources. Therefore, it is necessary to strengthen the efforts towards an equal access to quality and inclusive education for the acquisition and development of digital skills and competences.

To deal with the problems and full use of the digital technologies D. Lazarov [2020] offers the following strategic directions: training and raising the qualifications of the employees; optimization of the internal business processes; interaction with counterparties; efficiency ratio and finance.

Actually when we are talking about problems that can really affect employees in the context of digital transformation of the business environment we have to refer to different negative perceptions that employees may develop as a direct result of the process of digitalization itself. Among these we may take into account fear of job loss within the context of technology anxiety and structural changes that may appear in different working settings as a result of information technology acceptance and digitalization process. A huge question is concerning more and more employees – the real impact which all the technology behind the development of AI can have upon jobs and professional skills needed from the future employee [Ranković, M., et al, 2023]. Companies are called to develop intelligent programs of coaching and orientation for different categories of employees that are already came in close contact with the AI technology, due to their current duties of the job. Employees must perceive the AI instruments merely as modalities that can help the human people to be more productive and efficient and not as a proper replacement for the qualified workforce [Yu, X., Xu, S. and Ashton, M., 2023]. Digital transformation of the business environment is actually close related with the concept of innovation and innovation diffusion. Also, within this context we may speak about technology acceptance and off course technology anxiety. Multiple studies are highlighting a connection between individuals' communication within social groups and their attitude toward new technology acceptance. In a research made on Australian employees, the results have shown a strong impact of the social networks upon attitude towards innovation for the individuals and their intention to actually adopt new technologies based on perceptions toward what is new and their connection with the social group norms. The innovation adoption process was also directly influenced by the communication with the social groups [Talukder, M., & Quazi, A., 2011]. Other research confirm in the same way the importance of the social group norms upon individuals' attitude toward AI tools. If the general degree

of acceptance at the level of the group was high concerning the use of AI tools, also individuals that are connected with the group have the same tendency to accept this technology and to use it [Bostrom, N., & Yudkowsky, E., 2014]. It seems that people need to build trust related with a technology or other in order to feel prepared to adopt that technology or to use it. Results from other research conducted by McKnight et al. (2011), go in the same line reinforcing the idea that the willingness to explore and to try a certain technology is influenced by the level of trust that people can develop around that technology [McKnight D.H. , et al., 2011]. Organizations that are trying to invest in digitalization have to consider this outcome – the degree of trust that can be developed by the employees in technologies that are specific for the process of digitalization itself – AI development and usage being one of them. So, in order that people to accept and overcome any form of technology anxiety is essential to develop in the first place trust in the technology [Kelly, S., Kaye, S., & Oviedo-Trespalacios, O., 2022].

Taking account of all the above, it becomes clear that, for a proper management of the digitalization implementation it is needed a set of actions from organizations to familiarize employees with the new technology and to attract their social leaders into the effort to build trust and relevance regarding technologies implied by the digitalization of the businesses [Ghobakhloo, M. et al., 2011).

Conclusions

The examined advantages and problems of the digital transformation allow the following conclusions to be drawn. In order to quickly adapt to the new strategic digital business model, the companies must understand and embrace the need of reorganization of the process, structure, policies and strategies.

In a synthetic view the main points that have to be clearly differentiated about the digitalization process within the business environment will refer to:

- Holistic Reorganization: Embracing digital transformation involves more than just technology adoption. Companies need to reorganize their entire framework, encompassing processes, structures, policies, and strategies. This holistic approach ensures alignment with digital objectives and enables a seamless transition.
- Focus on Innovation and R&D: Success in the digital era demands a heightened focus on innovation and continuous research and development activities. Investing in these areas fosters the creation of novel solutions, products, and services that align with evolving market demands.

- **Creation of New Relationships:** Digital transformation prompts the establishment of new economic and social relationships. Businesses need to adapt by engaging with customers, partners, and stakeholders in innovative ways through digital platforms and channels.
- **Enhancing Digital Culture and Expertise:** Developing a strong digital culture within the organization is critical. This includes fostering a mindset that embraces technological advancements, acquiring expert knowledge, and enhancing competencies relevant to the digital landscape.
- **Integration of Digital Social Responsibility:** Weaving digital social responsibility into the corporate culture and policy is essential. Companies must align their digital initiatives with ethical practices, sustainability, and social impact considerations to ensure responsible and ethical digital transformation.
- **Digital Competitiveness for Sustainable Development:** Building digital competitiveness is crucial for enterprises. It enables them to adapt and thrive in the digital landscape by efficiently implementing innovative ideas. This, in turn, ensures sustainable business development aligned with long-term goals.
- **Efficiency through Innovation:** Successful adaptation to innovative ideas drives efficiency within organizations. By embracing digital transformation, businesses can streamline operations, improve productivity, and optimize resources, leading to increased efficiency.
- **Sustainable Business Development:** Digital transformation isn't just about immediate changes; it's about long-term sustainable growth. Embracing innovation and adapting to digital advancements ensure that businesses can sustainably evolve and remain relevant in the ever-changing market.

In essence, the conclusions drawn emphasize that embracing digital transformation involves a comprehensive overhaul of organizational aspects, focusing on innovation, responsible practices, fostering a digital culture, and building competitiveness for sustained and efficient business development in the digital age.

The digital transformation requires the stimulation of innovation activities and investments in research and development activities, the creation of new economic and social relationships, the enhancement and improvement of digital culture, expert knowledge and competences; weaving the digital social responsibility into the corporate culture and policy. The building of digital competitiveness of the

enterprises, in turn, will lead to the successful adaptation of innovative ideas, guaranteeing efficiency and sustainable business development.

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FOSTERING SUSTAINABLE DEVELOPMENT: THE CRUCIAL IMPACT OF DIGITAL TECHNOLOGIES

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Abstract

This article delves into fundamental characteristics of emerging digital technologies and explores their potential applications in both the economic and social realms. A comprehensive understanding of these technologies is deemed essential for making informed decisions concerning effective digitization processes aligned with the strategic goals of a company. The article delineates opportunities for transforming business processes and models through digitalization within the context of sustainable development, circular (green) economy, and additive manufacturing.

In addition to cognitive competencies in economics, contemporary management necessitates proficient skills for the successful application of cloud technologies, artificial intelligence (AI), and software designed for large database analysis (big data computing) in the execution of innovative projects. The primary objective of this article is to scrutinize the role of digital technologies and their interplay with sustainable development. Employing content analysis, comparative analysis, and synthesis as research methods, the article derives key findings and conclusions regarding the intricate relationship between digitalization and sustainable development.

Key words: sustainable development; circular economy; digitalization; cloud technologies; artificial intelligence (AI); large databases.

JEL Classification: O32, O33, Q56

Introduction

The notion of sustainable development, rooted in the interconnectedness of "nature - man - society," advocates for a holistic mindset that emerges as a guiding philosophy for the 21st century. It stands as a viable alternative aimed at advancing human well-being while safeguarding opportunities for the development of future generations, presenting a thoughtful and comprehensive approach to this imperative pursuit [Dimitrova, 2008].

The UN's global goals related to sustainable development cover the period 2016 - 2030 and replace the Millennium Development Goals, which expired in 2015. Economic development which is consistent with ecosystems, the fight against climate change, innovative infrastructure and ensures social justice is foreseen [United Nations, 2015]. Presumably, the EU has a leading role in the implementation of the UN 2030 Agenda together with the Paris Agreement on climate change, they shape the path and framework for international cooperation related to sustainable development and its economic, social, environmental and governance components and dimensions [Paris Agreement, 2016]. Modern digital technologies by their nature and capabilities impose a deep and comprehensive change, not only on individual business activities, but on the entire organizational structure of the company. Such an opinion is advocated by Crane [Crane, 2000], according to which the sustainable strategy of the company requires new business policies, modification of processes and products in order to overcome the scarcity of resources, the negative effects of carbon emissions, the greenhouse effect and environmental pollution.

The research question in this paper is "What is the relationship between the digital transformation of business and the realization of a green economy?"

The relevance of the topic under consideration stems from the fact that digital technologies and sustainable development are issues that affect not only individual companies or countries, but the entire European Union and the world. Digital transformation supports the realization of business efforts, offering new approaches in building strategies in the conditions of a constantly growing market [Zlateva, 2019].

This research expands knowledge and supports efforts to achieve sustainability and a green economy, and also creates opportunities for companies to identify areas in which to make digitalization-related improvements. Modern innovation management requires a good knowledge of the essential characteristics of modern digital technologies, the ways of their use and transfer, and the areas in the economic and socio-cultural sphere, in order for them to be adequately applied.

1. Sustainable development and circular economy

Brundtland Commission report, published by World Commission on Environment and Development (WCED), states that sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987).

The principle of "sustainability" requires the formation of responsible thinking and behavior, which is guided by the understanding that decisions made and actions taken today have an impact on future generations, the environment and the economy. The "responsibility" principle requires responsible behavior to become the norm of individual and organizational behavior. Another principle is the principle of transparency. It requires that the external and internal users of an organization have the same information about the actions taken by the organization [Peicheva, 2015]. In other words sustainable development is achieving a balance between social and environmental principles such as socially justifiable and ecologically sound economic development [Gechev, 2005]. Achieving sustainable development requires that it become a strategic goal not only of individual companies, but also of regions, countries and unions. As for applying the concept of sustainable development at the company level, ie. at the micro level in a study by Schaltegger and team [Schaltegger et al., 2002] clarified the main characteristics of the challenges grouped in the following main directions - ecological and social efficiency, and economic and corporate sustainability, related to fair social management and environmental protection.

Key to the goals of sustainable development is the circular (green) economy related to the recycling and reuse of products, which reduces damage to ecosystems, biodiversity, environmental pollution and greenhouse gas emissions. According to Eurostat data, due to the limited resource capabilities of European countries, the EU imports nearly half of the raw materials needed for production. That is why recycling processes are a key factor in achieving the goals of sustainable development through an effective resource policy. Already in March 2020, the EC drew up and presented a new "program to promote the circular economy", which indicates the areas for priority implementation of innovations [European Commission, 2020]. In our opinion, the following tasks to solve are a priority:

- ✓ Construction of modern recycling enterprises;
- ✓ Digitization and digitization of production processes;

- ✓ Research and analysis of opportunities for cooperation and integration with other companies;
- ✓ Researching the possibilities of participation in programs, projects and initiatives financed by the EU;
- ✓ Investment, increased requirements and control in the design of the new products;
- ✓ Production and supply of products with a longer period of use;
- ✓ Analysis of the market in order to achieve a reasonable and effective balance between production resources, profit and compliance with the applicable eco standards.

It is necessary to make a serious analysis at the national level and prepare a strategy for the development of the economy, taking into account the natural resources and human potential, which will guarantee sustainable development and a good quality of life in the country. The policy of cooperation for sustainable development is one of the pillars of the external activity of the European Union. It promotes sustainability in all its dimensions — social, environmental, economic and political. With its digital strategy and new digital partnerships, the EU seeks to promote a human-centered vision for the digital economy and society worldwide [European Commission, 2015].

2. Implementation of sustainable development through digital technologies

New technologies can be essential in solving environmental problems and challenges and facilitate the achievement of sustainability. It is particularly important to train qualified personnel in the field of information and communication technologies (ICT) [Filipova & Yuleva-Chuchulayna, 2021], increase investments for activities related to R&D and carry out continuing professional training.

Digital transformation is key to the strategic development of companies [Filipova & Yuleva-Chuchulayna, 2020]. The use of modern digital technologies requires adequate organizational changes of a structural and functional nature. It is extremely important that the company has a well-functioning IT infrastructure that fits into the overall organizational structure.

Managing innovation activities and processes based on modern digital technologies requires a good knowledge of their main essential characteristics and parameters [Epuran et al, 2016]. Knowing the nature and characteristics of digital technologies contributes to business modernization [Kyurova et al, 2023]. This

guarantees the expediency and adequacy of their use and application. We will analyze the following digital technologies of key importance in our view.

Appeared at the beginning of the century, the Internet of Things [IoT] is still widely used in everyday life, in commerce, in the design and modern design of homes and interior spaces, in the automotive industry, etc. The Internet of Things is essentially a computer network of objects and physical objects that, with the help of electronics, make contacts with each other and with the external environment, minimizing or completely excluding the participation of humans in carrying out their activities. After 2010, the concept of "Internet of Things" is filled with diverse technological content and new practical solutions are implemented, and it is considered an upward trend in information technology [LeHong & Fenn, 2012]. Cisco analysts consider the period 2008-2009 to be the "true birth" of the "Internet of Things" because according to their estimates, it was during this time period that the number of devices connected to the global network exceeded the number of the Earth's population [Evans, 2011], whereby the "internet of people" has become the "internet of things".

Modern cloud technology (Cloud Technology) uses and modifies a long-standing computing technology in which a large and powerful computing machine provides its computing capabilities and services to various clients. The "mother" machine in cloud technologies has been replaced by multiple servers, ensuring data processing and fast and secure execution of client requests. The replacement of modem and telephone connections with the Internet gives incredibly great opportunities and advantages for connection between customers and the "cloud" at any time and regardless of the location of the "customer" (phone, computer, TV, car and etc. devices). Efficiency, flexibility and new opportunities for timely design and decision-making are a serious positive for entities using cloud technologies, which provide them with competitive advantages. Maintaining competitive advantages and using intellectual capital in order to do so, embedded in information technology instruments is a must in the present conditions [Gârdan et al, 2018]. Cloud technologies provide as many resources as needed in the minimum time at the required time, while all regulatory requirements and standards for security and data protection are met. At the same time the quality and security of this protection are at a level that individual companies cannot afford and implement either technically or financially [Gârdan et al, 2022]. Another important feature of cloud technologies is the ability to rapidly prototype, providing companies with a platform where applications can be built, tested and deployed. Through the cloud,

companies save serious financial resources needed to purchase and maintain hardware and software.

High-speed digital networks of the fifth generation 5G are the basis of digital transformation. In the National Program Digital Bulgaria 2025, in addition to the already mentioned technologies, high-speed digital networks of the fifth generation (5G) are rightly defined as the basis of the digital transformation. In our opinion, building a digital single market is impossible without them. "They will build the core infrastructure of an entire ecosystem of fully connected smart sensors and devices capable of reimagining economic and business processes and transcending geographic and cultural boundaries. 5G will be the means to connect billions of devices and sensors ushering in the Internet of Things. It is a technology that will revolutionize the lives of consumers by transforming core industries and enabling future services such as smart cities/homes, connected cars, virtual reality, robotics, tele surgery and more. Used in combination, these technologies will accelerate innovation and transform all economic and social sectors" [National Program Digital Bulgaria 2025, 2019].

Industry 4.0 is a program that projects the modern development of industry in the conditions of new technologies and modern information channels for data exchange and communication. The fourth industrial revolution includes cyber-physical systems, the Internet of Things (IoT) and cloud computing [Hermann, Pentek & Otto, 2016], [Jasperneite, 2012], [Kagermann, Wahlster & Helbig, 2013]. As a basic research platform, Industry 4.0 analyzes the impact of new industrial technologies on the political, social and cultural spheres and changes in people's lives.

Block chain technology is serious modern innovation in the field on financial and digital sector. With it, the data is not stored on central server accessible to users. In block chain the records are stored on the user's computers, i.e. in different locations around the world, which means it is inherently a distributed database and lacks a center where a master copy of the data is kept. This technology exceeds away the maintenance of the crypto-currencies with which usually everything identifies, because it is also about the exchange of data related to legal agreements and contracts. Information can be encrypted and this enables fast and secure financial transactions, where the record of data and transactions is public but secure, and is also permanent and verifiable.

With the development of artificial intelligence (AI), not only individual machines, but entire production units function autonomously. The main advantages are speed, efficiency, quality, minimization of costs and personnel, flexibility, and

this leads to an increase in income, new market niches, new customers, security in the operation of production facilities, improvement of logistics and supplies, better communication with customers and partners. The application of digital technologies creates opportunities for building profitable business models, as a consequence of the constructive and creative thinking of modern entrepreneurs [Zlateva & Vladov, 2017]. In practice, it turns out that human intelligence can be described algorithmically with a high level of accuracy and can be simulated by a machine, other device or software. There are too many unresolved and debatable issues related to artificial intelligence, its application, the risks and the expediency of its use. The role of artificial intelligence is indisputable in areas such as industry, e-commerce, marketing, pharmacy, social networks and many other areas.

An expert system is a decision-making computer system that mimics the abilities of a human expert in a given field. Decisions are made by inferring from a predetermined knowledge base rather than following procedures written by a programmer, making it different from conventional traditional programming. It is a specialized software that allows automation of processes according to a predetermined algorithm. This automation is partial or complete and in trading is related to the submission of orders and the conclusion of deals. An additional positive are the possibilities for a large number of calculations at once, the absence of the subjective human factor and the strict observance of the initially set rules. Expert systems have wide applications in education, medical diagnostics, process control, interactive user guidance and many others.

Machine learning (ML) as a branch and functional part of AI is a technology where machines "learn" to improve their work from experience, i.e. self-learning takes place. Apart from social networks, Machine Learning is used and applied for personalization in online commerce and streaming services - purchase suggestions based on previous consumer behavior and attitudes, and the customer's previous purchases. ML is used to solve problems that deal with data related to a given question and are thematically aggregated.

An integral part of modern AI and solving complex tasks are so-called artificial neural networks (ANN), which are increasingly used in the banking and financial sector, in company security, in image recognition and etc. Through parallel processors, ANNs perform very often in real time analysis of huge amounts of data while being adaptive, i.e. are "self-taught" in the process of their work by providing feedback. In the business environment ANNs, in addition to image recognition and cyber security, are also successfully used in stock market forecasting, search for optimal routes for supplies and placement of goods and services, in pharmacy

when creating new medicinal products. They are also used successfully in other areas working with large flows of information as long as the processes are modeled with clear rules and subordination.

Another important technology for business and society is deep learning (DL), which is a subfield of ML and uses artificial neural networks that are multi-layered to recognize patterns and relationships in data. DL as a higher form of AI is used in analyzing images, videos and extracting information from them, in speech recognition. Modern market forecasting is related to DL technology, used together with ML allows to identify patterns and relationships in large amounts of market data, making possible the successful forecasting of stock and exchange rates, offering opportunities for future behavior of companies in the market environment and new business decisions and strategies.

The successes of virtual engineering are serious and the established 3D CAD/CAM technologies - computer aided design and computer aided manufacturing, will continue to play an essential role in the future related to scanning, tomography and more. In additive manufacturing, multiple parts can be replaced with a single 3D-printed part with improved parameters and this does not come at the expense of cost. Additive manufacturing is actually industrial 3D printing, related to the creation of prototypes, shapes, parts and details with complex geometry, which was not feasible until recently. It is a multi-billion dollar industry that connects to space, military, automotive, medicine, architecture and industrial design. It is believed that 3D technologies will be one of the main tools of the modern digital economy.

When we talk about modern virtual technologies, we must also mention virtual reality (VR), augmented reality (AR) and Mixed reality (MR) that explores the world. They are used in the creation of video clips with annotations and comments, with the ability to change images and different parts of the content. Essentially, these technologies create computer 3D models. The wide-ranging applicability of these technologies is obvious, but it is enough to mention advertising, video and film industry, architecture, optics, dentistry and many other fields. The capabilities of modern audio-visual technologies (AR and MR) to add and superimpose sound and computer images on the user's hearing and vision are a powerful tool for psychological impact and advertising.

The use of AI technologies, of course, also brings its negatives and fears due to the complexity, speed and aggressiveness with which it invades not only production, but also human life, due to the risks it provokes and is in many cases a stressful factor for the human psychology, behavior, attitudes and stereotypes.

Digitalization can successfully implement sustainable solutions in the economy and social environment. It reveals serious opportunities for the company in the use of specialized software packages, with the help of which the company's tasks are solved, related to: large flows of requests at a fixed company capacity; optimal placement of objects and search for optimal routes; optimization of stocks and warehouse availability; analysis of the relationship between resources and assortment; optimal repair and equipment schedules; organization of network flows such as volume and cost.

These and similar tasks related to "big data" characterized by high speed, huge quantitative indicators and numerous sources and users are a serious challenge for the modern business environment. The so-called big technology data computing, which can be used to successfully analyze large flows of information, is still used by a small percentage of Bulgarian companies. According to data from 2020 only 6.3% of enterprises work with "big data", and this is naturally more characteristic of large enterprises, whose relative share is 21.4%.

Bulgaria's position in the Digital Economy and Society Index (DESI) and poor indicators correlate with many of the data of the National Statistical Institute (NSI) related to digitalization.

Table 1: Enterprises that sell goods and services on the Internet

	2019	2020	2021	2022
	%	%	%	%
Total	10.9	10.9	11.8	14.9
10 - 49 employees	10.0	9.6	10.7	14.1
50 - 249 employed persons	14.9	16.2	15.8	17.9
250 and more employed persons	18.0	22.7	23.3	24.8
By types of sales				
Web sales	10.0	9.7	10.5	13.5
Through your own website or app	8.2	7.6	8.4	10.7
Through online markets	3.9	4.7	4.4	6.1
EDI sales	1.5	1.9	2.0	2.2

Note: Data refer to the calendar year prior to the survey.

Source: IS Infostat, https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=708

Table 2: Enterprises with Internet access

	2019	2020	2021	2022
	%	%	%	%
Total	93.7	95.5	96.1	96.1
10 - 49 employees	92.5	94.8	95.4	95.4
50 - 249 employed persons	98.8	99.0	99.3	99.2
250 and more employed persons	100.0	100.0	100.0	100.0

Source: IS Infostat, https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=629

The enterprises in Bulgaria with Internet access are more than 96.1%, but those that sell goods and services on the Internet vary from 14.1% to 24.8% depending on the size of the enterprise. Small enterprises have the worst values of the indicator according to data from 2022 of NSI. Web sales (through your own website or application, through online marketplaces and EDI-type sales) amount to 13.5% for 2022. The smallest percentage share is EDI-type sales - 2.2%, followed by online markets - 6.1%, and those through their own website or app amounted to 10.7%. More worrying in this case is the fact that for the period after 2019, the growth of this type of trade shows a slight increase, which suggests a continued decline in our positioning in the EU according to this type of indicators.

Table 3: Enterprises that have a website

	2018	2019	2020	2021
	%	%	%	%
Total	51.1	50.7	52.0	51.9
10 - 49 employees	45.9	45.9	47.6	47.0
50 - 249 employed persons	74.1	71.3	70.6	73.0
250 and more employed persons	88.2	84.5	86.3	87.7

Source: IS Infostat, https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=697

From Table 3 it can be seen that more than half of small enterprises ~ 53% do not have a website and this applies to ~27% of medium-sized enterprises (50-249 employees), and ~12.3% of large enterprises also do not have a website.

According to NSI data from 2021, only 12.8% of Bulgarian enterprises use paid cloud computing services, which is more typical for large enterprises - about 44.6% of them.

The enterprises that provide their employees with training in the field of information and communication technologies (ICT) for 2022 are 9.1%, which in

this case is more typical for large enterprises in Bulgaria, although 59% do not carry out such an activity

Only 15% of enterprises in Bulgaria use Internet devices and systems, the Internet of Things, and 73.7% of large enterprises do not use the Internet of Things.

The data by year on the website of the National Agency "Electronic Government" for the index of electronic participation and that for the development of electronic government for the period 2016-2022 state that according to the Index of electronic participation for 2022, Bulgaria occupies 29th place and according to Index a for the development of e-government - 52nd place out of a total of 193 countries.

The content analysis of the data gives reason to draw the following conclusion. A major change in the attitude at the company, regional and national level to the processes related to global digitalization is about to take place and what is more important is to take real measures to accelerate these processes, since the digital transformation of business and society is complex and difficult a process that has no alternative.

Conclusions

Digital innovation and the management of digitization processes will be dominant in making the structural-functional changes that are imperative in the modern business environment. New digital technologies are a key factor for the implementation of EU projects, related to a digital single market and sustainable development. In conclusion, the following main conclusions can be drawn:

First. Innovation and, in particular, those related to digital technologies are a key factor in achieving a sustainable economy and from there sustainable development on a regional, national and European scale. Digitization is a generator of innovation processes and a means of achieving a circular economy.

Second. The main areas and priorities of the EU digital strategy are: connectivity; digital value chains; eHealth; economy based on data (knowledge); artificial intelligence (AI); digital platforms. Of course, new rules should and are being introduced for: "a transparent, fair and predictable online environment"; legal and ethical regulatory and operational compensation systems; for principles when using AI; to ensure cyber security; licensing and copyright; ensuring transparency in business activity through online content [Shaping Europe's Digital Future, 2020].

Third. The digital technologies described in the article are the parameters of the modern global informatization of society. A good knowledge of their

characteristics and areas of application is a driving factor and motivation for companies to continuously carry out a systematic innovation audit over time for the development of digitalization-related projects.

Fourth. It is imperative to systematically carry out step-by-step changes in the IT infrastructure and by improving the digital skills of the staff, the digitalization of products and processes to move towards digital transformation and change of the business model.

Fifth. A new networked company structure is needed, managed by leaders who are also facilitators with strong cognitive competencies, professional skills and personal qualities and well-prepared, motivated staff who share and support the company strategy and culture.

Sixth. Bulgaria's indicators in Eurostat, in Digital Economy and Society Index (DESI), as well as in NSI, are not good and require urgent and adequate measures at company, regional and national level to overcome the lag.

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