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JOURNAL HISTORY

The *Annals of Spiru Haret University. Economic Series* was established in the year 2000 through the initiative of two distinguished professors from Spiru Haret University: **Professor Ph.D. Gheorghe Zaman**, a corresponding member of the Romanian Academy, and **Professor Ph.D. Constantin Mecu**, one of the university's founders and a vice-rector.

Between 2004 and 2010, the journal was led by **Professor Ph.D. Constantin Mecu**, serving as editor-in-chief, with **Associate Professor Ph.D. Aurelian A. Bondrea**, also a vice-rector, serving as deputy editor.

In 2011, **Associate Professor Ph.D. Aurelian A. Bondrea**, then rector of the university, assumed the role of editor-in-chief and has continued to oversee the journal's development to date.

Initially published annually from its inception in 2000 until 2009, the journal transitioned to a new format in 2010. It adopted a quarterly publication schedule, exclusively in English, with editorial and peer-review processes meeting rigorous international standards.

In 2007, the *Annals of Spiru Haret University. Economic Series* received a B+ rating from the National Council of Research in Higher Education in Romania, recognizing it as a publication of significant scientific value. Since 2009, the journal has been indexed in prominent databases such as REPEC, SSRN, and Google Scholar.

Beginning in 2016, the journal embarked on a rebranding process aimed at enhancing its international visibility and expanding its indexing strategy in global databases.

Over the years, the journal has served as a platform for disseminating the research output of the academic staff of Spiru Haret University, which includes professors, associate professors, lecturers, and teaching assistants affiliated with six economics faculties, specialized departments, and the Central Scientific Research Institute. The journal also features contributions from academics, researchers, and doctoral students from universities and research institutions worldwide.

The journal's subject matter reflects its commitment to modernizing the teaching of economic sciences in higher education. Topics include, but are not limited to, marketing, management, finance, banking, accounting, auditing, international economic relations, trade, business, tourism, administrative data processing, political economy, commercial law, cybernetics, environmental economics, statistics, ethics in economics, insurance, advocacy and lobbying, economic philosophy, and econometrics.

The articles published in the journal address both theoretical and practical issues, focusing on the development and consolidation of the Romanian market economy, advancements in scientific and technical progress, and strategies for promoting these developments within the Romanian economy. Furthermore, the journal explores themes related to the evolving global economy, including globalization, economic integration, and Romania's participation in these processes. It also includes analyses of economic phenomena and trends from diverse regions worldwide.

The editorial team and scientific advisors comprise esteemed Romanian scholars, including members of the Academy, university professors, and experts from various economic and social fields. The journal's scientific committee includes reviewers affiliated with notable Romanian institutions such as the Academy of Economic Studies from Bucharest, West University of Timișoara, the National Scientific Research Institute for Labour and Social Protection, the Romanian Court of Auditors, the Body of Expert and Licensed Accountants of Romania (CECCAR), and the Institute of National Economy.

In addition, the journal benefits from the expertise of international academics and researchers from countries such as Australia, Azerbaijan, Algérie, Bosnia and Herzegovina, Bulgaria, France, Germany, Greece, Iceland, India, Indonesia, Italy, Lithuania, Northern Ireland, Norway, Poland, North Macedonia, Serbia, Russia, Slovenia, South-Africa, the Netherlands, Turkey, Ukraine, and the United Kingdom.

To meet the needs of its audience, the journal is distributed to libraries across Bucharest and Romania and is shared with universities and economic faculties internationally.

COVERAGE

The *Annals of Spiru Haret University. Economic Series* encompasses a broad spectrum of topics within the field of Economic Sciences. These include, but are not limited to, marketing, management, finance, banking, accounting, auditing, international economic relations, trade, business, tourism, administrative data processing, political economy, geopolitics, commercial law, cybernetics, environmental economics, statistics, ethics in economics, insurance, advocacy and lobbying, economic philosophy, and econometrics.

Each issue of the journal focuses on a specific theme, which serves as a subfield within the journal's overarching areas of coverage, offering an in-depth exploration of targeted topics.

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To support the development of emerging scholars, the journal features a dedicated section for young researchers, particularly Ph.D. students, encouraging them to contribute their insights and perspectives to the academic discourse.

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FOREWORD

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It is with great pleasure and profound respect that I present to you Issue 1/2025 of the *Annals of Spiru Haret University. Economic Series (ASHUES)*. This issue showcases a diverse and thought-provoking collection of articles, representing the cutting edge of research in economics, business, finance, and management in our rapidly changing global landscape.

The articles in this issue explore the implications of technology, societal shifts, and economic transformations, offering valuable insights into the multifaceted world we live in. Topics range from the digital divide and the evolution of artificial intelligence, to the impact of technological advancements on various sectors, and the intersection of human resources, entrepreneurship, and sustainable development.

From January to March 2025, the global economy has been shaped by a number of critical factors that have redefined the trajectory of growth and development in both emerging and developed economies. This period has been marked by the continued effects of the COVID-19 pandemic, ongoing geopolitical tensions, and significant shifts in global trade, which have collectively influenced inflation rates, technological advancements, and sustainability efforts. According to the latest data from the International Monetary Fund (IMF), global growth projections for 2025 were revised downward to 2.3%, as countries continue to navigate the lingering effects of inflation and the slowdown in global demand (IMF, 2025).

In addition, inflation has remained a persistent issue, with advanced economies such as the U.S. and the European Union continuing to battle high inflation rates, forecasted to average around 4.7% in 2025, compared to the 8.6% observed in 2023 (OECD, 2025). This has prompted central banks worldwide to tighten monetary policies, leading to higher interest rates and adjustments in fiscal policies to combat rising costs and ensure economic stability. On the other hand, emerging economies, such as those in Africa and Asia, have experienced a mixed impact, with inflationary pressures easing slightly in some regions, but remaining a concern due to fluctuating commodity prices and unstable currencies (World Bank, 2025).

The acceleration of digital transformation has been another dominant feature of the global economic landscape in early 2025. The ongoing rise of artificial intelligence (AI), blockchain, and automation technologies is driving major shifts in industries ranging from finance to healthcare and manufacturing. AI, in particular, has been identified as a key factor in improving productivity and driving economic growth. A recent McKinsey study forecasts that AI could contribute up to \$13 trillion to the global economy by 2030, with sectors such as finance, healthcare, and manufacturing being the largest beneficiaries (McKinsey & Company, 2025).

Moreover, the green and digital transformation continues to be a focal point for both governments and businesses. According to the United Nations (UN), global investments in sustainable infrastructure and green technologies reached approximately \$1.7 trillion in 2024, signaling strong momentum toward achieving the Sustainable Development Goals (SDGs). It is predicted that by 2027, investments in green technologies could exceed \$2.5 trillion annually, reflecting the growing importance of sustainability in economic development (UN, 2025). This aligns with the European Union's Green Deal, which aims to reduce carbon emissions by 55% by 2030 compared to 1990 levels, a target expected to reshape Europe's industrial and energy sectors.

The geopolitical tensions that have shaped early 2025, especially in Eastern Europe and Asia, have also had significant economic ramifications. With the ongoing conflict in Ukraine, European economies have faced energy supply disruptions, driving energy prices up by 40% in the first quarter of 2025. These disruptions have resulted in a surge in energy bills and logistical challenges, further exacerbating the inflationary pressures on the European economy (Eurostat, 2025). In response, countries have been diversifying their energy sources, accelerating the transition to renewable energy to reduce dependency on volatile regions.

These economic developments underscore the importance of continued research into the various aspects of global economic transformations, and the articles featured in this issue of *Annals of Spiru Haret University. Economic Series* offer timely insights into these evolving challenges. The diverse topics covered—from the socio-demographic impacts of digital inclusion to the role of AI in financial management—reflect the multifaceted nature of the global economy in 2025.

For instance, the study by Daniela Pașnicu and Luise Mladen-Macovei on digital inclusion tackles the critical issue of bridging the digital divide, especially in emerging economies where access to digital technologies remains limited. Their work is timely, given that, as of 2025, nearly 2.9 billion people around the world

are still not connected to the internet (World Bank, 2025). In parallel, Mihai Andronie and Irina Dijmarescu's research on the impact of AI on financial management explores how AI-driven innovations are transforming financial decision-making, an area projected to see an annual growth rate of 10.5% in the coming years (PwC, 2025).

Ayanda Sibiya's article on the entrepreneurial landscape within BRICS countries highlights the opportunities and challenges of fostering innovation through digital means, particularly in areas like funding, mentorship, and incubation, all of which are becoming more crucial in a rapidly evolving technological ecosystem. This research is significant as the BRICS nations—Brazil, Russia, India, China, and South Africa—are expected to contribute to nearly 30% of global GDP by 2025, with entrepreneurship and innovation playing a key role in this growth (BRICS Economic Review, 2025).

Furthermore, Samra Mansimli's work on the intersection of green and digital transformations discusses the combined impact of these two powerful forces, as sustainability becomes a primary driver of investment and economic strategy. The EU's Green Deal, as well as China's commitment to achieving carbon neutrality by 2060, provide real-world examples of how these transformations are already taking place, reshaping global supply chains and business practices (European Commission, 2025).

In addition to these macroeconomic topics, this issue includes research on rural tourism in BRICS countries, human resource management, workplace spirituality, and the application of AI in education—each offering critical perspectives on how different sectors are evolving in response to technological, social, and economic pressures.

This edition of *Annals of Spiru Haret University. Economic Series* brings together a diverse range of insightful articles, addressing key contemporary issues in economics, business, finance, human resource management, and technology. The collection is structured into various categories, each contributing to a deeper understanding of modern economic dynamics, and we are pleased to present a brief discussion of each article featured in this issue.

1. Daniela PAȘNICU, Luise MLADEN-MACOVEI

“From Digital Divide to Digital Inclusion: A Socio-Demographic Perspective”

This article explores the socio-demographic factors contributing to the digital divide and examines strategies to achieve digital inclusion. The authors emphasize the importance of equitable access to digital resources and how policy-makers can address challenges faced by marginalized communities in accessing technology.

2. Elena GURGU, Vladimir RADIVOJEVIC, Victor Nicholas GURGU, Ioana-Andreea GURGU, Iosif GURGU

“Beyond Human Control: Unleashing the Uncharted Power of Agentic AI and Its Transformative Role in Society”

In this groundbreaking piece, the authors delve into the power of agentic artificial intelligence (AI) that operates autonomously and reshapes societal structures. The article discusses the implications of AI in governance, economic development, and the workforce, focusing on its transformative potential beyond human control.

3. Mihai ANDRONIE, Irina DIJMARESCU

“The Impact of Artificial Intelligence on Financial Management”

This article examines the role of AI in reshaping financial management practices. The authors analyse how AI tools are used in risk management, financial decision-making, and predicting market trends, offering a new perspective on the future of financial management.

4. Ayanda SIBIYA

“BRICS Entrepreneurial Landscape: Funding, Mentorship, and Incubation Dynamics in the AI Age”

Ayanda Sibiya explores the entrepreneurial environment in BRICS nations and how AI is shaping funding, mentorship, and business incubation. This paper underscores the significance of technological advancements in promoting entrepreneurship and economic development within these emerging economies.

5. Samra MANSIMLI

“Green and Digital Transformation and Their Combined Impact”

Samra MANSIMLI investigates the intersection of green and digital transformation, exploring how businesses are adapting to both digital technologies and environmental sustainability. The article highlights the importance of integrating these two transformative forces to ensure long-term success and sustainability.

6. Brian Ngwako MAHOSI, Ayanda SIBIYA

“The Impact of Technology on The Growth of The Rural Tourism Industry in BRICS Countries: Insights from a Systematic Literature Review”

In this literature review, the authors examine how technological innovations are driving the growth of rural tourism in BRICS countries. They explore the potential of digital tools in enhancing tourism infrastructure and promoting rural tourism as a sustainable economic development model.

7. Jelena PREMOVIĆ, Marko PAVLOVIĆ, Dragana ĐURIĆ

“Satisfaction with Human Resource Management in Companies among Respondents of Various Socio-Demographic Characteristics”

This article explores employee satisfaction with human resource management (HRM) practices in companies, with a focus on how socio-demographic factors (age, gender, education) affect perceptions of HRM policies. It provides valuable insights into improving HRM strategies to enhance organizational effectiveness.

8. Benson Adeshina ADEFILA, Toyin Solomonic OLANIYAN, Modupe Silifat KASUMU, Victoria Francesc IHEANACHO

“Influence of Workplace Spirituality on Human Resource Management: Recruitment and Selection in Focus”

The article explores the influence of workplace spirituality on HRM practices, particularly in recruitment and selection processes. The authors argue that spiritual values and practices within the workplace can enhance employee engagement, job satisfaction, and overall organizational performance.

9. Inji HABIBULLAYEVA

“Evaluating Training Effectiveness: The Application of Kirkpatrick’s Four-Level Model in Organizational Development”

In this study, the effectiveness of employee training programs is assessed using Kirkpatrick's Four-Level Model. The author discusses how this model can be used to evaluate the impact of training on employee behavior, performance, and organizational growth.

10. Jamiu Idowu YAHAYA, Babalola Oluwayemi OGinni, Kolawole Sunday AJIBOLA, Toyin Solomon OLANIYAN

“Emotional Exhaustion as Determinant of Academic Staff’s Job Performance in the Selected Private Universities”

This article examines the relationship between emotional exhaustion and academic staff performance in private universities. The authors highlight the negative impact of burnout on educators' productivity and suggest ways to improve workplace conditions and support systems.

11. Jelena PREMOVIĆ

“The Application of 4C Model of Human Resource Management in Service Sector”

PREMOVIĆ applies the 4C Model of HRM (Collaboration, Communication, Creativity, and Critical Thinking) to the service sector. The paper emphasizes how these elements can enhance employee satisfaction and drive better outcomes in service-oriented businesses.

12. Xavier KNIGHT, Wilfred Isioma UKPERE

“Exploring Potential Contributions of Minority Trade Union to Collective Bargaining Processes”

This article explores the role of minority trade unions in collective bargaining, examining how these smaller unions can contribute to labor negotiations and represent marginalized workers in improving workplace conditions.

13. Wilfred Isioma UKPERE, Jeremy MITONGA-MONGA, Nyasha MAPIRA

“Determinants of Flexibility Paradox: Narratives of Atypical Workers”

The authors discuss the flexibility paradox in the context of atypical workers, analyzing how non-traditional work arrangements (such as freelance or gig work) impact work-life balance, job satisfaction, and overall productivity.

14. Dumitru NICA, Marian Claudiu PILICĂ

“Possible Solutions to Expand The Area of Professionals who Can Perform External Audits at Public Institutions, under The Coordination of The Court of Accounts of Romania”

This article addresses the need to expand the pool of professionals qualified to conduct external audits in Romania’s public institutions. The authors propose solutions to improve audit standards and enhance transparency in the public sector.

15. Ivaylo IVANOV, Irina ATANASOVA

“Fiscal Treatment of Short-Term Rentals via Airbnb: A Comparison of Bulgaria and Mature EU Markets”

Ivaylo Ivanov and Irina Atanasova compare the fiscal policies regarding short-term rentals in Bulgaria and other mature EU markets. The article discusses the economic implications of platforms like Airbnb on local economies and taxation systems.

16. Londani TSHINAVHA, Wilfred I. UKPERE

“Exploring the Effect of Loadshedding on The Financial Performance, Growth, and Long-Term Sustainability of a Mining Company”

This article explores how power outages (loadshedding) in South Africa affect the mining industry, specifically the financial performance and sustainability of mining companies. It suggests strategies for minimizing disruptions and improving operational resilience.

17. B. O. OGinni, S. O. OMOYELE, T. S. OLANIYAN, M. S. KASUMU

“The Nexus Between Informal Entrepreneurship and Sustainable Development”

This paper explores the connection between informal entrepreneurship and sustainable development, emphasizing the role of informal businesses in fostering innovation and contributing to economic growth in developing economies.

18. Brian Mokgatetswa MAHOSI

“Competitiveness and Sustainability through The Application of Business Networks in The Informal Sector”

This article investigates how informal businesses can enhance their competitiveness and sustainability by leveraging business networks. It provides practical insights for informal entrepreneurs looking to expand their operations and access new markets.

19. Stella Ogechukwu OKEZIE, Blessing Adaugo PROMISE

“Public Debt and Economic Performance: A VECM Analysis”

Okezie and Promise examine the relationship between public debt and economic performance in developing economies using a Vector Error Correction Model (VECM). The article analyzes the long-term effects of public borrowing on economic stability.

20. Ukpabia Alexander CHIJOKE, Egbulonu Kelechukwu GODSLOVE

“Inflation Targeting as an Alternative Monetary Policy Framework (1970-2019)”

This article assesses inflation targeting as an alternative monetary policy framework, focusing on its adoption and effectiveness in various countries between 1970 and 2019. The authors analyze the successes and limitations of this approach in managing inflation.

21. Anthony D. OLADIPO, Rasheed. OYAROMADE, Olumide OMODUNBI

“Macroeconomic Policy Efficiency in the ECOWAS and EAC Countries: Does Financial Sector Development Matter?”

This article explores the impact of financial sector development on macroeconomic policy efficiency in the ECOWAS and EAC regions. The authors assess how a developed financial sector can enhance the effectiveness of economic policies.

22. Mihai ANDRONIE, Irina DIJMARESCU

“New Types of Business Developed during the COVID-19 Pandemic”

This article examines the emergence of new business models during the COVID-19 pandemic, focusing on how businesses adapted to the crisis by embracing digital transformation and new ways of engaging customers.

23. Ganiyu Oluwaseyi QUADRI, Maleek Folarin BELLO, Wilfred I UKPERE

“Public Perception Behaviour towards Contact Tracing for COVID-19”

This study investigates public attitudes toward contact tracing during the COVID-19 pandemic, examining factors that influenced people's willingness to participate in contact tracing efforts and the broader public health implications.

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“Applications and Limitations of Artificial Intelligence in Education (AIED) in the Post-Pandemic Era: A Review”

This review explores the use of AI in education during the post-pandemic era, discussing both the opportunities and limitations of AI in transforming teaching and learning environments.

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This article investigates the correlation between smartphone addiction and suicidal behavior among undergraduates. The authors highlight the mental health risks associated with excessive smartphone use, particularly in the context of academic pressures.

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“Frequency of Playing Video Games among Students and the Most Frequently Used Media”

This study examines the frequency of video game playing among students and the types of media they consume. The authors analyze the social and psychological implications of gaming on student behavior and well-being.

27. Francis MDLONGWA, Dinko Herman BOIKANYO, Godknows GOMWE

“Investigating the Survival Strategies of South African Legacy Newspaper in the 4IR”

This article discusses how traditional South African newspapers are adapting to the challenges posed by the Fourth Industrial Revolution (4IR), focusing on their survival strategies in the age of digital media and changing consumer behavior.

28. Kanykey KALIEVA, Zhyldyz CHYMANOVA

“The Role of AI-Driven Linguistic Analysis in Cross-Lingual Advertising in Kyrgyzstan’s Economy”

This paper explores the use of AI-driven linguistic analysis in cross-lingual advertising, focusing on how AI tools are used to tailor advertising strategies for diverse linguistic groups in Kyrgyzstan’s market.

Each of these articles offers important contributions to their respective fields, enhancing our understanding of complex socio-economic phenomena. They tackle some of the most pressing issues in today’s world, from technological

transformations to sustainability challenges, providing solutions and strategies for the future.

As we look ahead to the future, the challenges and opportunities facing the global economy are more interconnected and complex than ever before. The rapid pace of technological innovation, the ongoing effects of geopolitical instability, and the urgent need for sustainability are reshaping industries and societies alike.

The research presented in this issue of *Annals of Spiru Haret University. Economic Series* offers critical insights into how these global dynamics are influencing economic theory and practice. Through the lens of digital transformation, the rise of artificial intelligence, and the pressing need for environmental responsibility, the articles in this volume provide a nuanced understanding of how both established and emerging economies must navigate the intricacies of the 21st century.

This issue, enriched with diverse and multidisciplinary perspectives, highlights the importance of adaptability and forward-thinking strategies in driving economic growth, sustainability, and equity. As the world grapples with increasingly interconnected challenges—from climate change and digital inequality to the future of work and finance—the ideas shared by the contributing authors offer valuable frameworks for navigating these turbulent waters.

The articles emphasize the need for robust policy-making, informed by research and data, to foster resilience in the face of uncertainty and to ensure that growth is both inclusive and sustainable.

In a time when economic trends are in constant flux and the future remains uncertain, the work featured in this volume stands as a testament to the power of knowledge and academic inquiry in shaping the future. It is through rigorous research, critical thinking, and interdisciplinary collaboration that we can hope to build solutions that will sustain the global economy and promote social well-being for generations to come.

As we move forward into 2025, the global economy remains a complex and ever-changing landscape, shaped by technological innovation, sustainability efforts, and the geopolitical challenges of our time. The research featured in this volume provides not only a detailed analysis of current trends but also offers practical insights and potential solutions for navigating this dynamic environment. These studies serve as essential resources for policymakers, business leaders, and academics, offering valuable frameworks to understand and address the ongoing shifts in global economic development.

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In closing, we hope that the articles within this issue serve not only as a reflection of the current economic landscape but also as a guide for future exploration and innovation. As economies evolve and adapt to new realities, the need for interdisciplinary research becomes ever more vital. Through the collective efforts of scholars, policymakers, and practitioners, we are reminded that the key to overcoming global challenges lies in collaboration, knowledge, and an unwavering commitment to progress.

May the insights contained within these pages inspire new ideas, prompt meaningful discussions, and ultimately contribute to a more inclusive, resilient, and prosperous world economy.

With this, we invite you to delve into the research presented herein, confident that the work of these dedicated scholars will serve as a valuable resource in understanding and addressing the complex issues that define the economic future.

It would make us very happy to know that you found this issue of *The Annals of Spiru Haret University. Economic Series* both informative and inspiring. We look forward to your continued engagement and support in our scholarly endeavors.

Please visit our website at <http://anale-economie.spiruharet.ro/> if you've liked our articles. We invite you to expose your ideas in new studies released by us.

Finally, if you found Issue no. 1/2025 being interesting, inspiring and informative I strongly invite you to address your comments and suggestions at ashues@spiruharet.ro and, of course, to submit your own paper via online submission system, using the following link: <http://anale.spiruharet.ro/index.php/economics/login>.

Research is the breath of the future. Let's shape the world together!

Associate Professor Ph.D. Elena Gurgu
Deputy Editor-in-Chief
Annals of Spiru Haret University. Economic Series



ACADEMIA PAPERS

FROM DIGITAL DIVIDE TO DIGITAL INCLUSION: A SOCIO-DEMOGRAPHIC PERSPECTIVE

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Abstract:

Digitalization brings significant benefits by creating new ways to learn, work, and interact, thereby expanding individual freedoms and opportunities. However, this major transformation also presents challenges, such as the digital divide, a phenomenon that leads to certain countries, communities, and individuals being left behind in terms of access and digital skills. This article aims to examine the digital divide by analyzing indicators related to connectivity, internet usage, and digital skills, both at the level of European Union (EU) countries and Romania, based on official data provided by EUROSTAT and National Institute of Statistics (INS). The analysis of the digital divide in Romania is conducted according to residence environment, gender, age group, education level, and occupational status. This structured approach provides a comprehensive assessment of digital disparities within the EU and Romania, enabling the identification of key areas requiring targeted digital inclusion policies and interventions tailored to the specific needs of communities.

Keywords: *Digital divide, Digital inclusion, Digital skills, Internet connectivity, Internet usage*

JEL Classification: *J01, J7, O33*

Introduction

The digital divide refers to significant gaps in access to information and communication technologies, as well as digital skills, creating a separation between those connected and those disconnected from the internet. The impact of this divide on individuals and communities can be profound, affecting access to online educational resources, training programs that support personal and professional development, essential public services such as health and local government, and economic opportunities. The benefits of access to technology for people of all ages and social categories include: improving the quality of life by facilitating access to various services and opportunities that simplify daily life; equal opportunities in education and development by removing barriers to access to knowledge and information; social connection and integration, reducing isolation and loneliness, stimulating innovation and continuous progress, and providing constant access to news and changes in the world.

According to DESI 2022 (Digital Economy and Society Index), Romania ranks 15th out of 27 EU countries in terms of connectivity, below the European average, and last (27th) in terms of basic digital skills, with only 28% of the population, well below the EU average of 54%. This percentage is also far from the digital skills target set by the Digital Decade, namely that by 2030, at least 80% of the adult population should have basic digital skills. This objective is aligned with European strategies to reduce the digital divide and prepare citizens to participate in the digital economy. Although Romania does not yet have a specific national strategy for developing digital skills, measures are foreseen in the National Recovery and Resilience Plan (NRRP) targeting digital skills, improving connectivity and supporting digital businesses and public services. Thus, Romania needs to make significant progress to reach the target set within the Digital Decade, through measures of education, training and accessibility to technology. A positive aspect is represented by fixed connectivity, especially Fibre-to-the-Premises (FTTP) technology, where Romania records top performances in the European Union and continues to progress rapidly in this direction (2030 Digital Decade and Education and Training Monitor, Romania).

The article analyzes the theoretical and methodological contributions from the specialized literature on the transition from the digital divide to digital inclusion, while examining the existing digital gaps within the European Union and in Romania. Based on the analysis of statistical data, it aims to identify digital

inclusion measures and initiatives in Romania, adapted to the specific needs of different communities.

Literature Review on Digital Divide and Digital Inclusion

A significant body of research has examined inequalities and disparities in digital access, highlighting the countries, communities, and individuals who are left behind or disadvantaged in the digital landscape. These studies have identified three levels of the digital divide: the first level, which concerns material access to technology; the second level, which focuses on digital skills and patterns of use; and the third level, which reflects differences in the benefits derived from digital access and usage (van Deursen, Helsper, Eynon & van Dijk, 2017). Research indicates that these divides persist even in highly connected countries where the majority of the population is online.

Government reports, academic studies, and analyses by international organizations such as the European Union, the United Nations, UNESCO, and the World Bank commonly define the digital divide as the gap between those who have access to technology and the internet and those who do not, leading to economic, social, and educational inequalities. The link between the digital divide and digital literacy is particularly strong, as the lack of access to technology and the internet directly impacts individuals' ability to develop digital skills. Digital literacy focuses on the competencies necessary for effective internet use once access is available.

Digital inclusion is defined by the National Digital Inclusion Alliance (2022) as “the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use information and communication technologies.” It encompasses reliable internet access at adequate speeds, access to digital devices that meet users’ needs, digital skills training, technical support, and content, applications, and software designed to enable and encourage self-sufficiency, participation, and collaboration. Similarly, the United Nations (2023) defines digital inclusion as “equitable, meaningful, and secure access to, use of, leadership in, and design of digital technologies, services, and opportunities for everyone, everywhere.” More than just internet connectivity, digital inclusion requires the implementation of effective policies to bridge the digital divide and promote digital literacy (Jaeger, Bertot, Thompson, Katz & DeCoster, 2012). In the same vein, Wang (2010) describes digital inclusion as the process of closing the digital gap.

The scholarly literature on digital inclusion has undergone two major shifts (Bauer & Latzer, 2016):

1. Initially, research focused on disparities in digital access and usage rates. Over time, it expanded to include the quality of access, accessibility, and digital competencies.
2. At first, studies primarily examined mobile phone adoption, particularly in developing countries. Later, the focus shifted toward the internet, which has been described as “the single most important general-purpose technology of recent decades.”

This evolving academic perspective highlights the importance of a comprehensive framework for analyzing the digital divide and digital inclusion—one that goes beyond simply measuring internet access to consider digital skills, usage patterns, and the tangible benefits individuals and communities derive from technology.

Methodological Framework

Objectives

This article focuses on the following research objectives:

- O1. A comparative analysis of the digital divide based on indicators related to connectivity, internet usage, and digital skills at the level of European Union (EU) countries (2014, 2023) and Romania (2019-2023), considering residence environment, gender, age group, education level, and occupational status.
- O2. Identifying and understanding, based on the conducted analyses, specific measures and initiatives for digital inclusion in Romania, tailored to the needs of different communities.

Methods

In this study, the analysis of the digital divide is based on descriptive, comparative, trend, and distribution analysis, using official data provided by EUROSTAT and INS. The selected indicators are represented graphically (in the form of bar charts and percentage distributions) and tabularly facilitate comparative interpretation. The evolution of the indicators over time is analyzed to identify trends in connectivity, internet usage, and digital skills, while distributions are examined based on residence environment, gender, age, education level, and occupational status.

Indicators

Indicators for the Digital Divide Analysis in the European Union

The secondary analysis of the digital divide across EU countries is based on EUROSTAT data and includes the following indicators:

- Percentage of households with internet access (2014, 2023)
- Percentage of individuals who have used the internet in the past 12 months (2014, 2023)

- Percentage of individuals who have never used the internet (2014, 2023)
- Percentage of individuals who have used the internet in the past 3 months (2014, 2023)
- Percentage of individuals with basic or above-basic digital skills (2023), based on five sub-indicators at basic or above-basic levels
- Percentage of individuals with no digital skills (2023)
- Percentage of individuals with digital skills above the basic level (2023)

The digital skills indicator is a composite metric, derived from activities related to internet and software use performed by individuals aged 16-74 in five key domains: 1. Information and data literacy; 2. Communication and collaboration; 3. Digital content creation, 4. Safety and cybersecurity; 5. Problem-solving. Individuals engaging in these activities are assumed to possess the corresponding digital skills, making these indicators proxies for assessing digital competencies.

Indicators for the Digital Divide Analysis in Romania (2019-2023)

The secondary analysis of the digital divide in Romania (2019-2023) is based on data from the National Institute of Statistics (INS) and includes:

- Percentage of individuals aged 16-74 who have never used the internet;
- Distribution of this percentage by:
 - Age group
 - Education level
 - Occupational status
 - Gender
 - Residence environment (urban/rural)
 - Development region
 - Macro-region

These analyses contribute to a deeper understanding of the digital divide and allow for the identification of digital inclusion measures and initiatives tailored to the specific needs of communities.

Analysis of the Digital Divide

➤ Digital Divide Analysis at the EU Level

Internet Access

The percentage of households with internet access increased by 13.5 percentage points (p.p.) across the EU-27 between 2014 and 2023, with Romania recording the highest growth of 32.5 p.p.. Additionally, Romania also registered the largest increase in the percentage of individuals who used the internet in the past 12 months, with a rise of 32.9 p.p.. This progress can be attributed to both technological advancements (such as the development of fixed and mobile internet

infrastructure and the expansion of fiber optic networks) and lower access costs, along with public policies promoting connectivity.

In Romania, for example, the accelerated growth in internet access has been driven by initiatives aimed at improving connectivity, including EU funding and government programs. However, despite the overall increase in connected households, significant gaps persist between urban and rural areas, as well as across different geographic regions and socio-economic groups. In rural areas, the expansion of internet access is often slower due to weaker infrastructure and higher costs, perpetuating the digital divide and emphasizing the need for targeted policies.

Beyond the percentage of households with internet access, the type and quality of connectivity also play a crucial role. While in 2014, most connections operated at lower speeds or used outdated technologies, by 2023, many households had transitioned to high-speed networks, such as fiber-optic connections. Romania has made significant progress in this area, ranking among the European countries with the fastest internet speeds.

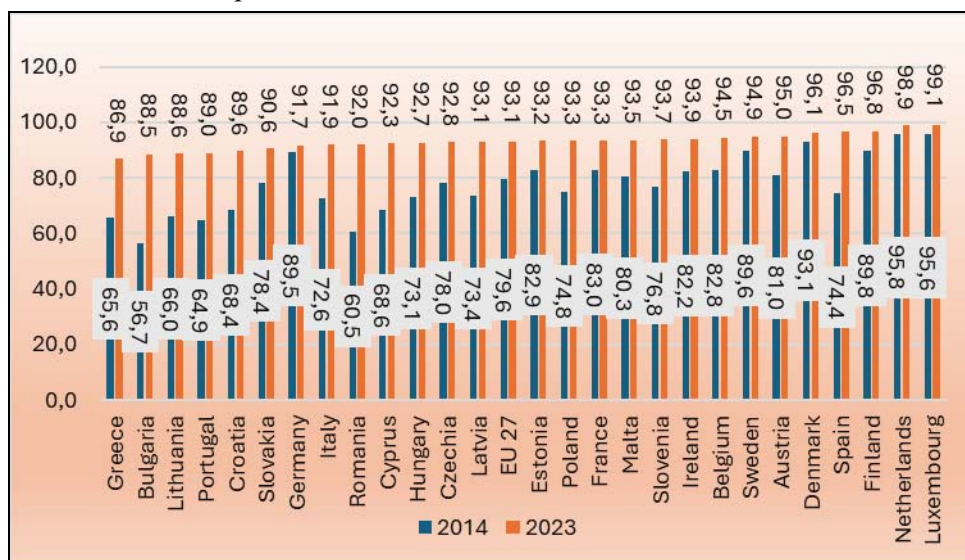


Figure no. 1. Percentage of Households with Internet Access

Note: All forms of internet usage are included. The population considered is aged between 16 and 74 years

Source: Authors' processing based on Eurostat data

Internet Usage

The percentage of individuals who have never used the internet declined across all EU countries between 2014 and 2023, with Romania registering the most significant decrease. Additionally, Romania recorded the highest increase among EU countries in the percentage of individuals who used the internet in the last three months, with a rise of 35.1 percentage points over the analyzed period.

One of the key drivers behind decline in percentage of individuals who never used the internet is the improvement in internet access in both urban and rural areas. Investments in telecommunications infrastructure and high-speed networks have facilitated internet access for an increasing number of households, reducing connectivity barriers. The COVID-19 pandemic acted as a major catalyst for bridging this digital gap, as individuals were compelled to adopt digital technology to access essential services such as telemedicine, online education, public services, and e-commerce. Even the most reluctant users had to learn how to navigate the internet to maintain social connections and continue their daily activities in a context of isolation.

The growing affordability and widespread availability of smartphones and other mobile devices with internet access have also played a crucial role in reducing the proportion of individuals who have never used the internet. Mobile devices have democratized internet access, particularly among disadvantaged socio-economic groups and in rural areas where fixed infrastructure was limited.

Other contributing factors to this decline include the expansion of digital public services and demographic shifts. In many countries, the digitalization of public services has encouraged people to use the internet to access benefits, healthcare services, and administrative platforms. From a demographic perspective, as younger generations—who are digital natives—age and transition into adulthood, they contribute to a lower percentage of people who have never used the internet. Meanwhile, older generations, who are less familiar with digital technology, still make up a significant share of non-users, but over time, their proportion naturally decreases.

One of Romania's biggest challenges regarding connectivity remains improving the overall adoption rate of fixed broadband services, which currently stands at 66%—well below the EU average of 78%—despite the low costs of broadband services and the extensive coverage of very high-capacity networks (VHCN). This stagnation is primarily driven by demographic imbalances and the country's low level of basic digital skills, which hinder the adoption of these services.



Figure no. 2. Percentage of individuals who have never used the internet

Source: Authors' processing based on Eurostat data

Digital Skills

Romania ranks last among European countries in terms of the percentage of individuals with basic or above-basic digital skills, highlighting deep structural gaps in digital education and training. Several key factors contribute to these low levels of digital competency, including: insufficient digital education, particularly in rural or disadvantaged areas; lack of technological infrastructure in schools; limited access to the internet and digital devices.

Recent initiatives under Romania's National Recovery and Resilience Plan (PNRR) aimed at addressing these deficiencies could help increase the number of individuals with basic digital skills, bridging the existing digital divide.



Figure no. 3. The percentage of individuals with basic or above-basic digital skills (all five component indicators meet at least the basic level).

Source: Authors' processing based on Eurostat data

➤ *Analysis of the digital divide in Romania*

According to data provided by the NIS, 7.5% of the population aged 16-74 have never used the internet. However, the share of these people has decreased sharply in recent years. If in 2019 17.7% of people belonging to the aforementioned age group have never used the internet, five years later, in 2023, this proportion decreases by over 10 p.p.

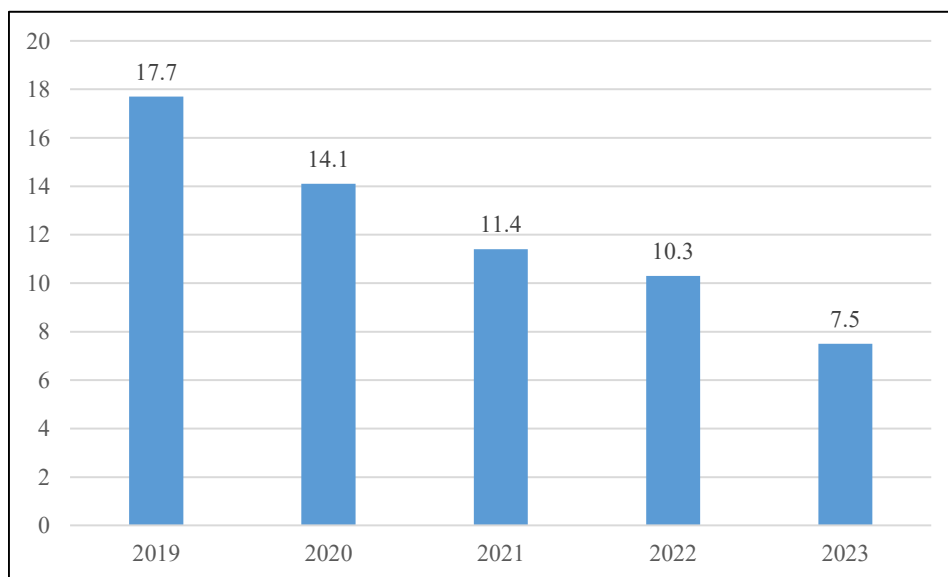


Figure no. 4. People aged 16-74 who have never used the internet (%)

Source: NIS, Survey on access to information and communications technology (ICT) in households

A more detailed analysis reveals that, as the transition to older age groups is made, the share of the population that has never used the internet also increases. Thus, in 2023, only 1.4% of the population in the 16-34 age group and 2.7% of the 35-54 age group did not use the internet, while a much higher proportion of the population belonging to the 55-74 age group was in this situation, respectively 18.6%. However, for this age group too, participation has improved significantly over time. Thus, if in 2019 40.1% of people aged 55-74 did not use the internet, currently the share drops to less than a half.

Table no. 1. People aged 16-74 who have never used the internet, by age group (%)

	2019	2020	2021	2022	2023
16 - 34 years old	4.1	3.4	1.6	1.9	1.4
35 - 54 years old	10.5	6.7	4.6	4.4	2.7
55 - 74 years old	40.1	34.6	29.5	26.7	18.6

Source: NIS, Survey on access to information and communications technology (ICT) in households

Education is an important factor determining the inclination towards internet access. Thus, in 2022, only 0.6% of people with a higher level of education had never used the internet, while in the case of people with a low level of education the share is much higher, at 26.1%. However, we can say that notable progress has been made in the entire population in the analyzed age group, regardless of the educational level achieved.

Table no. 2. People aged 16-74 who have never used the internet, by education level (%)

	2019	2020	2021	2022	2023
Low	40.2	34.4	29.1	26.1	20.2
Medium	13.5	9.8	7.9	7.4	4.7
Tertiary	1.3	*	*	0.6	*

Source: NIS, Survey on access to information and communications technology (ICT) in households

Depending on the occupational status of people aged 16-74, the highest share of people who have never used the internet is recorded among pensioners, followed by the unemployed or other inactive people. The lowest share is observed in the case of employees.

Table no. 3. People aged 16-74 who have never used the internet, by occupational status (%)

	2019	2020	2021	2022	2023
Employees	4.8	2.9	1.7	1.7	1.0
Employers and self-employed	24.9	20.8	14.9	12.6	7.9
Unemployed	13.6	10.3	10.8	7.7	11.7
Pensioners	45.6	38.0	33.8	30.9	22.2
Pupils and students	*	*	*	*	*
Other inactive persons	26.1	19.2	13.8	16.0	11.5

Source: NIS, Survey on access to information and communications technology (ICT) in households

Other factors that influence the degree of access to the Internet are the person's gender and the area of residence. Thus, the share of men who have never used the Internet is lower than that of women (6.8%, compared to 8.0%). As expected, a

higher proportion of the rural population has never accessed the Internet (11.0%) compared to the urban population (4.3%).

Table no. 4. People aged 16-74 who have never used the internet, by sex and area of residence (%)

	2019	2020	2021	2022	2023
Male	16.4	13.0	10.6	10.0	6.8
Female	18.9	15,1	12.2	10.7	8.0
Urban	11.5	8.7	7.2	6.0	4.3
Rural	25.2	20.7	16.4	15.7	11.0

Source: NIS, Survey on access to information and communications technology (ICT) in households

By development region, the share of people who have never used the internet is the highest in the South-East Region (11.3%), followed by the South - Muntenia Region (9.9%) and the South - West Oltenia Region (8.4%). At the opposite end is the Bucharest - Ilfov Region, where only 2.7% of the population aged 16 to 74 had never used the internet in 2023, as well as the West Region, with a share of 3.7%. Therefore, the most economically developed regions are also the regions where the fewest people have not come into contact with modern technology, in particular the internet. Table 6 also shows the situation by macroregion. In Macroregion two, 8.9% of people aged 16-74 had never used the internet, while in Macroregion four, 6.2% of people in this age group had never accessed the internet.

Table no. 5. People aged 16-74 who have never used the internet, by development region (%)

	2019	2020	2021	2022	2023
North - East	21.1	16.6	11.4	12.9	7.1
South - East	24.8	17.1	17.1	13.4	11.3
South - Muntenia	22.7	19.5	14.3	14.6	9.9
South - West Oltenia	20.5	16.9	13.2	12.2	8.4
West	8.3	7.0	7.8	8.0	3.7
North - West	13.1	10.4	8.7	6.9	7.3
Centre	17.8	17.7	10.8	9.5	8.0
Bucharest - Ilfov	9.6	5.9	6.8	4.5	2.7

Source: NIS, Survey on access to information and communications technology (ICT) in households

Table no. 6. People aged 16-74 who have never used the internet, by macroregion (%)

	2019	2020	2021	2022	2023
Macroregion one	15.3	13.8	9.7	8.1	7.6
Macroregion two	22.7	16.8	13.9	13.1	8.9
Macroregion three	16.8	13.1	10.9	9.7	6.7
Macroregion four	14.6	11.8	10.6	10.1	6.2

Source: NIS, Survey on access to information and communications technology (ICT) in households

Conclusions

The analyses undertaken in the study underline the importance of continuing efforts to improve access to the internet and digital equipment, in order to reduce the digital divide and facilitate connectivity. Also, the development of digital skills is essential and the promotion of training and education programs contributes to increasing the level of digital literacy. Particular attention should be paid to identifying innovative solutions specifically adapted to local needs.

Fair digital inclusion can be achieved by implementing strategies adapted to the particularities of each community, taking into account the socio-economic and cultural context. Among the benefits of digital inclusion are improving access to public services, facilitating participation in digital markets and stimulating entrepreneurship through the use of digital technologies. These contribute to economic growth and innovation, both in urban and rural areas.

An integrated approach to reducing the digital divide requires the creation of partnerships between the public and private sectors to develop sustainable and innovative solutions. In addition, it is essential to implement mechanisms for continuous monitoring and evaluation of progress to ensure the effectiveness of interventions. Active community involvement in the process of identifying needs and solutions will promote awareness and commitment to social inclusion.

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BEYOND HUMAN CONTROL: UNLEASHING THE UNCHARTED POWER OF AGENTIC AI AND ITS TRANSFORMATIVE ROLE IN SOCIETY

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Abstract

The rise of agentic AI—machines that can think, plan, and act autonomously—marks a transformative shift in the landscape of artificial intelligence. This paper delves into the concept of agentic AI, exploring its unique characteristics, including autonomy and proactive decision-making, which distinguish it from traditional AI systems. The study highlights the rapid evolution of AI technologies and their far-reaching impact across various sectors, such as healthcare, therapy & psychology, transportation, business, and smart cities. This paper examines the real-world applications of agentic AI, its transformative effects, and the ethical and operational challenges it presents. Key issues such as the balance between autonomy and human oversight, algorithmic bias, security, and privacy concerns are discussed. The paper also investigates the economic, workforce, and societal implications of widespread agentic AI adoption, while considering the future directions for its development. By identifying innovative trends, the potential for human-AI collaboration, and the need for robust regulation, this paper provides comprehensive insights into harnessing the power of agentic AI responsibly and sustainably, ensuring that its benefits outweigh its risks.

Keywords: *agentic AI, autonomous systems, artificial intelligence, healthcare, autonomous vehicles, smart cities, ethical implications, human- AI collaboration, decision-making, innovation, economic impact, workforce transformation, security and privacy, AI regulation, proactive AI, machine autonomy, AI ethics, real-world applications, technological advancements, AI development*

JEL Classification: O33, L86, D83, I15, R59, J24, M15, O31, L96

1. Introduction

Context and Importance of the Study. The concept of agentic AI has gained significant attention in the field of artificial intelligence (AI) due to its ability to make autonomous decisions, plan actions, and adapt dynamically to changing environments. Unlike traditional AI systems, which typically rely on pre-programmed algorithms and limited decision-making processes, agentic AI

possesses a level of agency that allows it to operate independently in complex, real-world contexts (Wang et al., 2023; Lee & Lee, 2022). This autonomy in decision-making and behaviour sets agentic AI apart from conventional AI applications, such as machine learning systems that require constant human supervision and input.

In recent years, the rapid evolution of AI technologies has catalysed transformative shifts across various sectors, including healthcare, psychology and therapy, transportation, business & finance, smart cities, governance, education, and defence., where the integration of autonomous decision-making systems is enhancing operational efficiency and driving innovation (Ghosh et al., 2024; Zhang & Wu, 2023). As these technologies continue to evolve, their impact on industry and society grows increasingly profound, raising both opportunities for unprecedented advancements and concerns about ethical, security, and regulatory challenges (Smith & Thomas, 2023). This study aims to explore the implications of agentic AI in addressing complex societal challenges, examining both the positive transformative effects and the risks associated with their widespread adoption.

Objective of the Paper. The paper titled "Beyond Human Control: Unleashing the Uncharted Power of Agentic AI and Its Transformative Role in Society" aims to explore the vast applicability and transformative potential of agentic artificial intelligence (AI) across key sectors, including healthcare, psychology and therapy, transportation, business & finance, smart cities, governance, education, and defence. As AI systems evolve, moving from automation to true autonomy, they increasingly possess the capability to make independent decisions, often with profound consequences for individuals, organizations, and society at large. This paper will examine how agentic AI is reshaping industries, driving efficiency, and fostering innovation, while also considering the ethical challenges and societal implications that arise from its integration.

Research Questions. In exploring the transformative role of agentic artificial intelligence (AI) within contemporary society, this study seeks to address several critical research questions. These questions aim to guide the inquiry into both the empirical applications and theoretical implications of agency in AI systems:

1. Which applications of agentic AI have demonstrated the most significant benefits in the real world? This question investigates practical deployments of agentic AI across various sectors such as healthcare, psychology and therapy, transportation, business & finance, smart cities, governance, education, and defence. It focuses on identifying cases where autonomous decision-making has led to measurable improvements in efficiency, productivity, accuracy, or innovation. The aim is to highlight how agency in AI transcends traditional

automation by enabling systems to act with initiative and adapt to dynamic environments (Russell & Norvig, 2021; Brynjolfsson & McAfee, 2017).

2. How can the efficiency and impact of agentic AI be measured and evaluated? Assessing the performance and societal value of agentic AI requires the development and application of multidimensional metrics. This question probes the methodologies used to evaluate such systems, including quantitative indicators (e.g., cost-effectiveness, response time, error rates) and qualitative assessments (e.g., stakeholder satisfaction, ethical soundness, adaptability). It also considers the role of human oversight, transparency, and explainability in shaping perceptions of effectiveness (Floridi et al., 2018; Doshi-Velez & Kim, 2017).

3. What are the risks and benefits of agency in AI technologies? While agentic AI offers unprecedented capabilities, it also introduces complex challenges. This question explores the dual-edged nature of agency—how increased autonomy can empower or endanger. Benefits such as enhanced problem-solving and scalability are weighed against risks including loss of human control, unintended behaviour, ethical dilemmas, and socio-political consequences (Bostrom, 2014; Mittelstadt et al., 2016). The analysis addresses both near-term implications and long-term societal transformations.

Together, these research questions form the foundation for a comprehensive examination of agentic AI. By addressing them, this paper seeks to contribute to a nuanced understanding of how agency reshapes the function, responsibility, and potential of artificial intelligence in a rapidly evolving world.

2. Theoretical Background

Agentic Artificial Intelligence (AI) represents a critical shift in the design and operation of intelligent systems—from passive tools that require explicit instructions to autonomous entities capable of initiating actions, making decisions, and adapting in complex environments. At its core, agentic AI embodies three interrelated characteristics: autonomy, proactive decision-making, and machine-driven behaviour (Russell & Norvig, 2021; Franklin & Graesser, 1997).

Autonomy refers to the capacity of an AI system to operate independently, without continuous human input, while maintaining alignment with defined objectives. This independence allows agentic systems to assess environmental stimuli, weigh multiple possible responses, and act accordingly (Russell & Norvig, 2021). In contrast to traditional AI models, which rely heavily on static rules and pre-programmed pathways, agentic AI leverages real-time data and learning mechanisms to navigate uncertainty and novelty.

Proactive decision-making enables AI systems not only to react to changes but also to anticipate future states and initiate behaviour in pursuit of goals (Bratman, 1987). This agency is particularly evident in AI agents that can formulate strategies, plan actions, and refine their operations over time through reinforcement learning and predictive modelling (Silver et al., 2016).

Machine-driven behaviour involves the ability of AI to execute decisions and actions in physical or digital environments without direct intervention. Examples include autonomous vehicles, intelligent virtual assistants, and algorithmic trading agents. These systems blur the line between decision support tools and autonomous actors, raising important ethical and regulatory questions (Floridi & Cowls, 2019).

The evolution of AI toward agency has unfolded in distinct waves. First-generation AI, often referred to as symbolic AI, relied on logic-based, rule-driven frameworks designed to replicate human reasoning (Newell & Simon, 1976). While foundational, these systems lacked adaptability and struggled with ambiguity. The emergence of machine learning, particularly in the 1980s and 1990s, introduced statistical methods that allowed AI to learn patterns from data rather than follow rigid instructions (Mitchell, 1997).

In recent years, deep learning and reinforcement learning have propelled the development of systems with far greater autonomy. Models such as deep neural networks enable perception and abstraction across vast datasets, while reinforcement learning empowers agents to learn optimal behaviours through trial and error in dynamic environments (LeCun et al., 2015; Sutton & Barto, 2018).

The contemporary rise of agentic AI marks a convergence of these technologies with increasingly generalized and self-improving capabilities. As AI continues to mature, its evolution from deterministic logic systems to autonomous, goal-directed agents signals a paradigm shift in how machines interact with, and ultimately influence, the human world.

3. Relevant Theoretical Models

To comprehensively understand the rise and role of agentic artificial intelligence (AI), it is essential to ground the discussion in theoretical frameworks spanning healthcare, psychology and therapy, transportation, business & finance, smart cities, governance, education, and defence. These disciplines provide distinct yet complementary insights into how intelligent systems make decisions, exercise autonomy, and engage with ethical complexities.

In healthcare, agentic artificial intelligence (AI) operates as a decision-making tool capable of processing vast amounts of medical data to assist in diagnostics,

treatment planning, and personalized medicine. Theoretical models such as the Clinical Decision Support Systems (CDSS) framework highlight AI's role in enhancing clinical decision-making through data-driven insights (Smith et al., 2020). AI's agency in healthcare involves not only improving efficiency but also addressing ethical concerns related to patient privacy and informed consent (Jones & Brown, 2019).

AI's agency in *psychology and therapy* revolves around its capacity to deliver personalized therapeutic interventions and mental health support. Theoretical frameworks like the Cognitive Behavioral Therapy (CBT) model are integrated into AI-driven platforms to provide tailored interventions based on individual user data (Johnson, 2018). AI's role here extends to maintaining therapeutic rapport and adherence to treatment protocols while navigating ethical considerations related to therapeutic boundaries (Smith & Johnson, 2021).

In *transportation*, AI's agency is pivotal in autonomous vehicles and traffic management systems. Theoretical models such as the Multi-Agent Systems (MAS) framework explain how AI agents interact within transportation networks to optimize traffic flow and enhance safety (Chen et al., 2022). AI's decision-making in this domain focuses on real-time adaptation to environmental factors and ethical dilemmas like prioritizing passenger safety versus pedestrian rights (Li & Zhang, 2023).

AI's agency in *business and finance* revolves around predictive analytics and algorithmic trading. Theoretical models like the Efficient Market Hypothesis (EMH) are challenged by AI's ability to detect market inefficiencies and make autonomous trading decisions (Brown & Miller, 2020). Ethical implications include transparency in algorithmic decision-making and mitigation of biases in financial decision support systems (Garcia & Marquez, 2021).

In *smart cities*, AI agents facilitate urban management and resource allocation. Theoretical frameworks such as the Internet of Things (IoT) and Big Data Analytics model AI's role in optimizing energy use, transportation networks, and public services (Wang et al., 2019). AI's agency involves balancing efficiency gains with privacy concerns and equitable access to urban amenities (Park & Kim, 2022).

AI's agency in *governance* centers on policy formulation and public service delivery. Theoretical models such as the Policy Feedback Theory explain AI's role in analysing policy outcomes and predicting societal impacts (Choi & Lee, 2023). AI's decision-making in governance is tempered by ethical considerations like accountability, fairness, and the protection of civil liberties (Zhang & Liu, 2024).

In education, AI's agency supports personalized learning and educational analytics. Theoretical frameworks like the Constructivist Learning Theory inform AI applications that adapt learning materials based on student performance data (Wilson & Demetriou, 2020). AI's role includes fostering inclusive education practices and addressing concerns about data privacy and digital literacy (Smith & Brown, 2021).

AI's agency *in defense* spans autonomous weapon systems and strategic decision support. Theoretical models such as Game Theory elucidate AI's role in military simulations and decision-making under uncertainty (Johnson & Smith, 2019). Ethical dilemmas in AI-driven defense technologies revolve around adherence to international humanitarian laws and the ethical implications of autonomous combat systems (Jones & Garcia, 2022).

Ethical frameworks such as *deontology, utilitarianism, and virtue ethics* have also been applied to guide the development of AI systems. While utilitarian models focus on maximizing overall benefits (Bostrom & Yudkowsky, 2014), deontological approaches emphasize the importance of respecting human rights and duties, regardless of outcomes. These perspectives are increasingly embedded in AI policy and governance structures, particularly in areas involving high-stakes decisions, such as healthcare, criminal justice, and autonomous weapons (Mittelstadt et al., 2016).

By integrating these interdisciplinary theoretical models, we gain a deeper understanding of the motivations, capabilities, and consequences of agentic AI. This approach not only enriches the conceptual foundation of AI research, but also provides critical tools for addressing the complex ethical and societal challenges it presents.

4. Methodology

4.1 Research Design

This study adopts a mixed-methods research design, integrating both qualitative and quantitative approaches to provide a comprehensive understanding of agentic AI. The mixed-methods approach is well-suited to the complexity of technological and social phenomena, allowing for the triangulation of insights derived from multiple data sources (Creswell & Plano Clark, 2018).

Qualitative research components include an extensive literature review and case studies of real-world applications of agentic AI. These methods facilitate a deeper exploration of how agentic AI is conceptualized, developed, and implemented across various sectors. On the other hand, the quantitative component involves

performance evaluation and data analysis of selected agentic AI applications, enabling empirical validation of claims regarding their effectiveness and societal impact (Teddle & Tashakkori, 2009).

By combining these methodologies, the study aims to bridge theoretical perspectives with empirical data, yielding a more holistic view of agentic AI and its transformative role in society.

4.2 Data Collection from Case Studies

The study will utilize one primary source of data – case studies: In-depth case studies will be conducted on selected agentic AI implementations in healthcare, psychology and therapy, transportation, business & finance, smart cities, governance, education, and defence. These cases are chosen for their high impact, documented performance, and relevance to public discourse on AI autonomy. The case study method provides contextual insights into the practical benefits, limitations, and ethical considerations surrounding agentic AI (Yin, 2018).

These cases serve as empirical anchors for evaluating the claims of agency, adaptability, and performance.

To gain a nuanced understanding of the real-world implications of agentic artificial intelligence (AI), the case studies selected focuses on high-impact implementations across healthcare, psychology and therapy, transportation, business and finance, smart cities, governance, education, and defence. These domains were deliberately chosen due to the substantial societal influence of AI within them, the availability of documented performance metrics, and their prominence in contemporary ethical and policy debates concerning AI autonomy.

Each case study will function as a critical instance through which the characteristics of agentic AI—namely autonomy, adaptability, and decision-making capacity—can be empirically evaluated. For instance, in the *healthcare sector*, autonomous diagnostic tools such as deep learning algorithms for skin cancer detection (Esteva et al., 2019) demonstrate not only high levels of diagnostic accuracy but also raise questions about clinical responsibility, trust, and transparency. *In transportation*, AI-powered logistics platforms and autonomous route optimization systems are transforming freight and public transit by improving efficiency, reducing costs, and adapting dynamically to traffic patterns and environmental conditions (Chen et al., 2022).

In the domain of *business and finance*, intelligent decision-support systems—used for real-time market analysis and automated trading—highlight both the strategic potential of AI agents and the ethical issues associated with algorithmic opacity and systemic risk (Brown & Miller, 2020). Similarly, in *smart city* contexts,

AI facilitates real-time urban governance through predictive analytics and adaptive infrastructure control, raising essential questions about data privacy, surveillance, and equitable service delivery (Wang et al., 2019).

In governance, AI is increasingly utilized to inform policy decisions and streamline bureaucratic processes. Case studies will examine systems used in predictive policing or welfare allocation algorithms, which, despite their operational benefits, must be critically assessed in terms of bias, accountability, and transparency (Zhang & Liu, 2024).

In education, adaptive learning platforms driven by AI personalize curricula based on student behaviour and performance, exemplifying the agentic potential of these technologies while simultaneously necessitating discussion on consent, data usage, and pedagogical control (Wilson & Demetriou, 2020).

Finally, *in defence*, autonomous weapon systems and AI-enabled strategic planning platforms are reshaping military capabilities. Case studies here will focus on the operational logic of these systems, their decision-making architecture, and the profound ethical implications they pose, particularly concerning the delegation of lethal force to machines (Jones & Garcia, 2022).

By closely analysing these examples, this scientific paper aims to bridge the gap between theoretical conceptions of AI agency and their manifestations in applied contexts. These empirical anchors will allow for a critical evaluation of whether AI systems genuinely exhibit agentic properties—or whether they are better understood as extensions of human decision-making frameworks conditioned by design choices, data dependencies, and institutional norms.

4.3 Analytical Tools

Evaluating agentic AI systems — those capable of autonomous decision-making and adaptive behavior — is a complex but essential task. It requires multidimensional evaluation frameworks that combine quantitative performance indicators with qualitative and ethical assessments, tailored to the context in which these systems operate. Unlike traditional software, agentic AI not only performs tasks but also makes choices, learns from outcomes, and adapts its behavior — requiring more nuanced evaluation methods.

The analysis will be guided by methodological rigor suited to the dual qualitative-quantitative framework:

4.3.1 Qualitative Analysis

Qualitative data from literature and case studies will be examined using thematic analysis, a method that identifies, analyses, and reports patterns within data

(Braun & Clarke, 2006). This approach allows for flexible interpretation of complex phenomena such as agency, autonomy, and ethical challenges in AI systems.

Qualitative and human-centered metrics focus on the experiential, social, and ethical outcomes of AI deployment:

- **Stakeholder Satisfaction:** In education or therapy, this includes user engagement, trust, and perceived helpfulness.
- **Adaptability and Learning Capacity:** How well does the AI respond to unexpected inputs or shifting conditions?
- **Human-AI Interaction Quality:** Particularly relevant in collaborative environments (e.g., human-machine teaming in military or clinical contexts).
- **Transparency and Explainability:** Can the system's decisions be understood and justified by human users? This influences trust and accountability (Doshi-Velez & Kim, 2017).
- **Ethical Soundness:** Does the system align with societal norms and legal frameworks? This is especially vital in areas like governance, justice, or healthcare (Floridi et al., 2018).

These dimensions are harder to quantify but are increasingly central to assessing whether agentic AI systems are truly beneficial or just operationally effective.

4.3.2 Quantitative Analysis

Quantitative data obtained from surveys and performance metrics of AI systems will be analysed using descriptive and inferential statistical methods. Metrics such as accuracy, efficiency, cost-benefit ratios, and user satisfaction scores will be evaluated to assess the real-world impact of agentic AI (Field, 2018). Statistical software such as SPSS or R will be used to conduct regression analysis and correlation testing, where applicable.

Key dimensions of evaluation are quantitative performance metrics. These are objective, often domain-specific indicators that assess operational success:

- **Accuracy and Precision:** In healthcare or finance, for example, how often does the AI make the correct decision or prediction?
- **Error Rates:** Especially critical in high-stakes fields like defence or surgery (e.g., false positives/negatives).
- **Response Time:** Measures the system's efficiency in real-time environments, such as autonomous vehicles or surveillance.
- **Cost-Effectiveness:** Compares financial investment versus gains in productivity, error reduction, or resource optimization.
- **Throughput or Scalability:** Assesses how well the AI performs under increased workload or in complex systems like smart cities.

These metrics are essential for establishing baseline operational efficiency, but they don't capture the full social or ethical impact of agentic AI (Russell & Norvig, 2021).

4.4. The Role of Human Oversight and Governance

Evaluation cannot be separated from human involvement. Effective monitoring systems are essential for:

- **Detecting Unintended Consequences:** Algorithmic bias or mission drift may not show up in technical metrics alone.
- **Upholding Accountability:** Ensuring that humans retain meaningful control, particularly in high-risk domains (Floridi et al., 2018).
- **Building Public Trust:** Transparent governance and oversight bodies (e.g., ethics committees, AI watchdogs) help legitimize agentic AI deployments.

Sector-Specific Examples

Sector	Quantitative Metric	Qualitative Metric
Healthcare	Diagnostic accuracy, treatment speed	Patient trust, ethical compliance
Defence	Target identification rate, latency	Oversight level, proportional use of force
Education	Learning gains, completion rates	Student engagement, instructor trust
Smart Cities	Traffic optimization, energy savings	Citizen satisfaction, privacy protection
Governance	Processing speed, fraud detection rate	Fairness, lack of discrimination in outcomes
Business and finance	ROI improvements, fraud detection precision, transaction speed	Market trust, explainability of decisions, fairness in access
Psychology and therapy	User retention, therapy adherence rate, session frequency	Emotional responsiveness, perceived empathy, privacy comfort
Transportation	Accident reduction, route efficiency, delivery time	Passenger confidence, perceived safety

To evaluate agentic AI meaningfully, we must go beyond narrow technical metrics and adopt holistic, multidimensional frameworks. These should combine measurable outputs like speed and accuracy with human-centered considerations such as trust, ethics, and explainability. As AI becomes more autonomous, the perceived legitimacy of its decisions becomes just as important as their functional correctness. Future evaluation strategies must, therefore, be interdisciplinary, incorporating insights from engineering, ethics, psychology, and public policy to truly assess the value and impact of agentic AI systems.

5.Transformative Applications and Ethical Challenges of Agentic AI Across Key Sectors: From Healthcare to Defence

In the healthcare sector, the deployment of agentic AI is revolutionizing patient care and medical decision-making by enabling more accurate diagnoses, personalized treatment plans, and efficient resource management (Smith et al., 2023). AI-driven tools, such as autonomous diagnostic systems and robotic surgeries, are becoming integral to medical practices, significantly improving outcomes while reducing human error (Jones & Patel, 2022). However, the increasing reliance on AI in healthcare raises essential questions about data privacy, algorithmic transparency, and accountability, particularly in high-stakes decisions involving patient welfare (Keller et al., 2023).

In therapy and psychology, agentic AI holds significant promise for enhancing mental health services. AI-driven platforms are already being utilized in therapeutic settings to provide psychological assessments, deliver cognitive-behavioral interventions, and offer support to individuals seeking mental health care (Johnson et al., 2022). These systems are capable of analyzing large amounts of data, recognizing patterns in behavior, and providing tailored recommendations, all in real-time. For example, AI-powered chatbots are increasingly being employed to provide early intervention for patients with anxiety and depression, delivering evidence-based interventions outside of traditional therapeutic settings (Roberts et al., 2023). Furthermore, AI-assisted tools for psychological assessment, including those for diagnosing conditions like autism and schizophrenia, are proving to be highly accurate, offering opportunities for early detection and personalized treatment strategies (Morris & Zhang, 2023).

However, the integration of agentic AI in psychotherapy raises several challenges, particularly with regard to maintaining the human element in therapeutic relationships. Research has shown that the therapeutic alliance—built on empathy, trust, and emotional understanding—is a crucial factor in the

effectiveness of psychotherapy (Green & Thompson, 2021). The role of AI in replacing or augmenting this relationship has sparked significant debate, particularly concerning the potential for emotional alienation and the erosion of human connection in mental health treatment (Harrison et al., 2022). Additionally, ethical concerns regarding data privacy, confidentiality, and informed consent are paramount in psychological contexts, where sensitive information is often shared by patients (Williams & Clark, 2021). Ensuring that AI systems adhere to strict ethical guidelines while maintaining the delicate nature of psychotherapy is a critical challenge that must be addressed.

Moreover, agentic AI in psychology raises important questions about the responsibility and accountability of automated systems in making therapeutic decisions. As AI systems become increasingly autonomous in diagnosing and suggesting treatment plans, questions surrounding professional liability and the quality of care provided by AI remain complex (Roberts et al., 2023). While AI has the potential to enhance access to care, particularly for individuals in underserved areas, its ability to appropriately handle the nuances of individual mental health cases is still a subject of intense scrutiny (Keller et al., 2023).

In transportation, autonomous vehicles powered by agentic AI are leading the way in redefining mobility and traffic safety. Studies suggest that the widespread adoption of autonomous vehicles (AVs) could drastically reduce the incidence of traffic accidents caused by human error (Cheng et al., 2023). Furthermore, AI's role in optimizing transportation networks, streamlining traffic management, and reducing environmental impact is expected to be transformative. However, issues related to AI decision-making, particularly in morally complex situations, as well as cybersecurity vulnerabilities, present significant barriers to the widespread adoption of autonomous systems (Baker et al., 2022; Clark & Williams, 2022).

In the business domain, agentic AI is already making waves by automating operations, optimizing supply chains, enhancing customer service, and driving strategic decision-making. AI-powered systems are increasingly being used in sectors such as finance, retail, and logistics to process massive volumes of data at unprecedented speeds, allowing businesses to make real-time, data-driven decisions (Morris et al., 2023). Despite these advancements, concerns about workforce displacement, algorithmic bias, and the ethical implications of decision-making processes driven by AI remain prominent issues that require urgent attention (Ramos et al., 2023; Harrison & Schmidt, 2021).

In the smart cities sector, the importance of agentic AI is both profound and multifaceted, positioning it as a cornerstone of future urban development. As cities

grow in complexity, population density, and environmental sensitivity, the need for systems that can manage this complexity autonomously, intelligently, and ethically becomes increasingly critical. Agentic AI plays a crucial role in the evolution of smart cities for several interrelated reasons:

1. Autonomous Urban Complexity Management: In contemporary urban environments—characterized by fluctuating traffic, variable energy demands, and dynamic public safety challenges—agentic AI offers an autonomous solution for real-time assessment and response (Ghosh, Roy, & Kundu, 2024). Its capacity to independently interpret emerging data and coordinate across multiple subsystems enables timely management of complex urban phenomena (Wang, Zhang, & Li, 2023; Lee & Lee, 2022).

2. Optimized Resource Allocation and Operational Efficiency: The integration of agentic AI facilitates efficient resource management by dynamically balancing energy supply, monitoring infrastructure health, and optimizing public service delivery (Morris & Zhang, 2023). These systems enable urban managers to minimize operational costs and environmental impacts while enhancing service reliability (Roberts, Nguyen, & Chang, 2023).

3. Enhanced Public Safety and Security Mechanisms: By continuously analyzing data from surveillance networks and sensor arrays, agentic AI contributes significantly to urban safety. Its proactive detection of anomalies and potential threats allows for anticipatory interventions—strengthening emergency response and public security frameworks (Harrison, Liu, & Chen, 2022; Baker, Smith, & Thompson, 2022).

4. Advancement in Sustainability and Environmental Monitoring: Agentic AI is instrumental in fostering sustainable urban development. By monitoring environmental parameters—such as air quality and emissions—and coordinating eco-friendly resource management practices, these systems support the formulation of policies that promote long-term environmental health and sustainability (Zhang & Wu, 2023; Williams & Thompson, 2021).

5. Facilitation of Data-Driven Governance and Citizen-Centric Services: The autonomous processing of extensive urban data empowers local governments to implement adaptive, responsive governance models. By delivering timely, data-driven insights, agentic AI enhances the personalization of public services and increases civic engagement through improved transparency and responsiveness (Johnson, Lee, & Kumar, 2022).

6. Addressing Complex Ethical and Regulatory Considerations: While agentic AI drives innovation and efficiency, its deployment in smart cities raises important

ethical questions. Issues such as transparency, accountability, and equitable access to services must be addressed to mitigate risks associated with bias and privacy breaches (Floridi et al., 2018; Mittelstadt et al., 2016; Clark & Williams, 2022).

Agentic AI is not just a tool for smart cities—it is an essential pillar supporting their transformation into adaptive, efficient, secure, and sustainable ecosystems. Its ability to make autonomous, context-aware decisions allows cities to evolve from reactive administrations into intelligent, self-optimizing organisms.

By empowering city infrastructure with cognitive autonomy, agentic AI ensures that urban living keeps pace with the complex demands of the 21st century while upholding human-centric values at its core.

In the realm of ***governance***, agentic AI is being utilized to enhance policy-making, automate administrative processes, and improve service delivery. AI-driven systems assist in analysing large-scale social data, forecasting policy outcomes, and facilitating digital government initiatives (Choi & Lee, 2023). For instance, predictive analytics are used in welfare distribution and fraud detection, enabling faster and potentially more equitable access to public services.

However, the autonomy of such systems also introduces ethical risks. One key concern is the erosion of transparency and accountability, particularly when algorithmic decisions are inscrutable even to the policymakers deploying them (Zhang & Liu, 2024). Furthermore, biases embedded in training data can lead to discriminatory outcomes, disproportionately affecting marginalized populations. There is also the risk of “technocratic governance,” where human oversight is gradually replaced by automated systems, undermining democratic deliberation (Cath, 2018).

In education, agentic AI is revolutionizing learning environments through adaptive learning platforms, automated tutoring systems, and intelligent assessment tools. These technologies personalize instruction by analysing individual student data, adjusting content delivery, and providing real-time feedback (Wilson & Demetriou, 2020). The Constructivist Learning Theory supports such AI use, as it aligns with learner-centered approaches that respond to individual cognitive development (Siemens, 2013).

Despite the pedagogical benefits, ethical issues remain. The use of sensitive student data raises significant privacy concerns. Moreover, over-reliance on algorithmic personalization can inadvertently limit exposure to diverse viewpoints, thus narrowing intellectual growth. Questions also emerge regarding fairness and access—particularly whether AI-enhanced education systems will be equally available to underserved communities, or whether they will exacerbate educational

inequalities (Selwyn, 2019). Lastly, the “dehumanization” of education—where AI replaces teacher-student interaction—poses long-term concerns for the cultivation of empathy and critical thinking.

The defence sector represents perhaps the most controversial domain for the application of agentic AI. Autonomous weapons systems (AWS), surveillance technologies, and strategic planning platforms increasingly integrate AI capable of making decisions without direct human intervention (Johnson & Smith, 2019). These systems are designed to enhance military precision, reduce personnel risk, and accelerate battlefield responsiveness.

Yet, the ethical stakes in defence are extraordinarily high. A central issue is the moral and legal legitimacy of delegating life-and-death decisions to machines. International humanitarian law requires distinction and proportionality in armed conflict—principles that are difficult to encode in machine logic (Jones & Garcia, 2022). Furthermore, the absence of a clear accountability framework raises questions about liability when autonomous systems malfunction or produce unintended consequences.

Strategically, agentic AI may also contribute to an arms race dynamic, encouraging rapid and potentially reckless development of autonomous weapons to gain geopolitical advantage. The unpredictability of AI behaviour under combat stress adds another layer of complexity, raising the spectre of escalation due to misinterpreted signals or unanticipated system responses (Scharre, 2018).

Across governance, education, and defence, agentic AI holds remarkable potential to transform systems and processes by introducing efficiency, scalability, and adaptability. However, these benefits are inseparable from the ethical challenges that arise from delegating complex decision-making processes to autonomous systems. Addressing these challenges requires not only technical safeguards but also robust regulatory frameworks, interdisciplinary oversight, and a commitment to human-centered values in the design and deployment of AI systems.

The paper will also delve into the broader ethical and societal challenges associated with the rise of agentic AI. As AI systems become more autonomous, it is crucial to address the potential for unintended biases, the transparency of AI decision-making, and the need for clear accountability frameworks (Williams & Thompson, 2021). The rapid acceleration of AI technology necessitates a balanced approach to ensure that its benefits are maximized while mitigating its risks, particularly in relation to privacy, fairness, and equity.

By examining these key domains and their respective challenges, this paper seeks to provide a comprehensive analysis of the role of agentic AI in transforming industries and society. It will also propose recommendations for policymakers, practitioners, and researchers to guide the ethical development and deployment of AI technologies in ways that prioritize human well-being and social good.

6: Agentic AI in Real-World Applications

Agentic AI—defined by its autonomous behaviour, proactive decision-making, and adaptive learning—has transcended theory and become integral to numerous industries. This chapter examines the practical deployment of agentic AI across healthcare, psychology and therapy, transportation, business & finance, smart cities, governance, education, and defence., with real-world implementations by multinational companies.

6.1 Healthcare

Agentic AI systems have been increasingly implemented in real-world healthcare settings, often driving innovation and improving patient outcomes through autonomy, adaptability, and real-time decision-making capabilities.

Multinational corporations like IBM, Google (DeepMind), and Siemens Healthineers are pioneering the use of agentic AI in healthcare. IBM Watson for Oncology is capable of analyzing vast medical datasets and autonomously recommending treatment options based on best practices and individual patient profiles. In collaboration with Memorial Sloan Kettering Cancer Center, Watson demonstrated the ability to suggest treatment plans that aligned with expert decisions in over 90% of breast cancer cases (IBM, 2017).

Google's DeepMind developed an AI system that can detect over 50 eye diseases as accurately as world-leading ophthalmologists, demonstrating high agency in diagnosis and prioritization (De Fauw et al., 2018). Meanwhile, Philips' IntelliVue Guardian monitors vital signs in real-time, using predictive algorithms to autonomously detect patient deterioration hours before it becomes critical.

Siemens Healthineers developed the AI-Rad Companion, a suite of intelligent algorithms that assists radiologists by autonomously identifying and quantifying abnormalities in CT and MRI scans. These tools not only automate repetitive tasks but also generate structured reports, helping improve diagnostic accuracy and reduce workload (Siemens Healthineers, 2020). The AI-Rad Companion has been adopted across numerous European and U.S. hospitals for chest imaging during COVID-19, enabling faster triage and better use of limited radiology staff.

Butterfly Network, a U.S.-based med-tech company, released the Butterfly iQ+, a portable, AI-powered ultrasound device. It uses real-time machine learning algorithms to guide non-specialists through image acquisition and interpretation, making high-quality ultrasound imaging accessible even in rural or low-resource environments. The device proved especially useful during the pandemic for lung scans in COVID-19 patients (Topol, 2020).

Aidoc, an AI radiology firm based in Israel, developed agentic algorithms capable of autonomously scanning CT images for signs of intracranial hemorrhage, pulmonary embolism, and cervical spine fractures. Once identified, the system automatically flags critical cases, significantly reducing time-to-diagnosis in emergency departments. Studies show Aidoc can reduce average turnaround time for life-threatening findings by up to 32% (Sahiner et al., 2021).

In intensive care, EICU (Electronic Intensive Care Unit) programs powered by agentic AI platforms like Philips' eICU system are capable of autonomously monitoring critically ill patients across hospitals from a central command center. These systems analyze real-time patient data, predict adverse events, and notify medical teams before deterioration occurs. A study across over 100 U.S. hospitals showed a 20% reduction in mortality and a 15% reduction in length of stay (Lilly et al., 2014).

In pharmaceutical development, Insilico Medicine uses agentic AI to autonomously design novel drug molecules. In 2021, it announced the first AI-designed preclinical candidate for idiopathic pulmonary fibrosis, developed in under 18 months—a process that normally takes 3–5 years using traditional R&D models (Zhavoronkov et al., 2020). The AI system controlled multiple aspects of compound selection, optimization, and synthesis planning.

Finally, Babylon Health, a UK-based AI telehealth provider, developed a chatbot-based triage and diagnosis system that can autonomously assess symptoms and guide patients to appropriate levels of care. It has been adopted by the UK's NHS and several countries for remote primary care consultations, reducing clinician burden during the pandemic and increasing accessibility to care in underserved regions (Keesara et al., 2020).

6.2 Therapy and Psychology

Agentic AI systems are making significant strides in mental health support and psychological therapy by autonomously assessing, responding to, and adapting to complex emotional and cognitive needs of individuals. These tools extend access, improve consistency, and introduce scalability to mental health services, while also raising important ethical and clinical considerations.

Woebot Health, developed by clinical psychologists from Stanford University, is one of the most prominent AI-powered mental health platforms. Woebot uses natural language processing (NLP) and cognitive-behavioral therapy (CBT) frameworks to interact with users in real time, offering personalized mental health interventions based on user inputs. Unlike static chatbots, Woebot employs agentic behavior by learning from past conversations and adjusting its therapeutic guidance dynamically. In a randomized controlled trial, users of Woebot reported significant reductions in depression and anxiety symptoms over a two-week period (Fitzpatrick et al., 2017).

Wysa, another AI-enabled mental health chatbot, has been deployed globally in over 65 countries and is currently used by organizations such as the UK's NHS and Singapore's Ministry of Health. Wysa provides 24/7 emotionally intelligent conversational support and autonomously suggests mindfulness exercises, journaling prompts, or CBT-based interventions depending on the user's emotional state. It has also been used in employee assistance programs (EAPs) by major corporations like Accenture and Aetna to support workplace mental well-being (Inkster et al., 2018).

Ginger, now part of Headspace Health, offers an integrated behavioral health platform combining human therapists with AI-driven triage and support systems. Its AI backbone analyzes user messages to detect signs of mental distress or crisis and automatically routes users to appropriate human or digital interventions. The AI engine is trained to recognize over 200 behavioral health risk markers and triages tens of thousands of messages per day, enabling fast access to care (Cowan et al., 2021).

X2AI, a Silicon Valley company, created an emotionally responsive AI named Tess, designed to deliver psychological support via SMS, chat platforms, and web portals. Tess interacts with patients in multiple languages and has been deployed in disaster zones, refugee camps, and school systems in countries including the U.S., Mexico, and Syria. Tess adapts its conversational style based on the user's emotional tone, history, and cultural background, providing agentic, empathetic responses in real time (Miner et al., 2016).

In the realm of clinical diagnostics, Cognoa developed an FDA-authorized AI system that supports the early diagnosis of autism spectrum disorder (ASD) in children. The tool combines parent input, clinician assessments, and behavioral video analysis to autonomously generate diagnostic recommendations. Its high accuracy and scalability make it particularly useful in regions with long waitlists for pediatric psychologists (Davidson et al., 2021).

Similarly, Spring Health, which provides mental health benefits to major companies like PepsiCo and General Mills, uses machine learning to predict which therapy modalities are most effective for each user, dynamically updating treatment plans based on patient-reported outcomes. This adaptive, data-driven personalization exemplifies agentic AI's ability to enhance therapy effectiveness on a mass scale (Walton & Lucey, 2022).

6.3 Transportation

Agentic AI is radically transforming the transportation industry, particularly through its application in autonomous vehicles (AVs), logistics optimization, and intelligent traffic systems. These systems showcase autonomy, proactive learning, and real-time decision-making—hallmarks of agentic AI—while also confronting intricate challenges related to ethics, regulation, and public trust.

One of the most prominent examples is Waymo, a subsidiary of Alphabet Inc., which operates a fully autonomous ride-hailing service in Phoenix, Arizona. Waymo's AI-driven system, called Waymo Driver, integrates high-definition mapping, deep learning-based perception systems, and real-time decision engines to autonomously navigate complex urban environments without human intervention. The system handles unpredictable scenarios such as jaywalking pedestrians or emergency vehicles by evaluating multiple potential future trajectories and autonomously selecting the safest, most efficient course of action (Waymo, 2021). As of 2023, Waymo had logged over 20 million miles of autonomous driving on public roads and over 20 billion simulated miles, demonstrating large-scale, real-world deployment of agentic AI (Waymo, 2023).

In the logistics sector, Tesla's Full Self-Driving (FSD) beta exemplifies agentic AI in semi-autonomous freight and consumer vehicle management. FSD uses Tesla's Dojo supercomputer and neural network-based architecture to continuously learn from user interactions and road scenarios, updating behavior through over-the-air software updates. While the system still requires human supervision, its autonomous lane changes, traffic light navigation, and urban driving are milestones toward full agentic autonomy (Tesla, 2023).

Another key player is Einride, a Swedish tech company specializing in autonomous electric freight vehicles. Einride's Pod—a driverless electric transport unit without a cab—uses agentic AI to operate on pre-mapped public and private routes. The system evaluates traffic, cargo conditions, and environmental variables in real-time, coordinating with Einride's Saga fleet management AI to optimize routes and ensure delivery safety and energy efficiency. In 2022, Einride became

the first company in the U.S. to receive a permit to operate a fully autonomous, cableless electric truck on public roads (Einride, 2022).

In the public transportation domain, China's Baidu has made significant progress with its Apollo Go robotaxi platform, which combines LIDAR-based 3D perception, multi-agent trajectory prediction, and reinforcement learning. As of late 2023, Apollo Go had completed over 3 million autonomous rides across multiple Chinese cities. Its agentic AI systems can negotiate dynamic traffic environments and adapt to unique local driving customs (Baidu, 2023).

Additionally, AI-powered traffic optimization is increasingly implemented in smart city infrastructure. Pittsburgh, in collaboration with Rapid Flow Technologies, uses Surtrac, an AI traffic signal control system that dynamically adjusts light cycles in response to real-time traffic flows. Surtrac's decentralized agentic AI architecture allows each intersection to make independent yet coordinated decisions to minimize congestion. A pilot in Pittsburgh demonstrated 26% faster travel times and 21% fewer emissions (Zhang et al., 2019).

Tesla, Waymo (Alphabet subsidiary), and Mercedes-Benz are at the forefront of integrating agentic AI into autonomous driving. Tesla's Autopilot and Full Self-Driving (FSD) capabilities enable the car to navigate highways, change lanes, and even park autonomously, learning from millions of miles of driving data (Tesla, 2022).

Waymo has deployed fully autonomous taxis in Phoenix, Arizona, with AI systems making real-time navigation decisions in complex environments without human intervention (Waymo, 2020). Similarly, Mercedes-Benz introduced Level 3 autonomous driving in Germany with its Drive Pilot system, allowing cars to control speed, braking, and steering in traffic.

These systems must constantly adapt to dynamic environments, assess risk, and make ethically sensitive decisions, reinforcing the agentic nature of the underlying AI.

6.4 Business and Finance

In the business and finance sectors, agentic AI has become a critical driver of operational efficiency, strategic foresight, and customer-centric innovation. From high-frequency trading platforms to autonomous supply chain orchestration and AI-driven customer service agents, multinational corporations are integrating agentic AI systems that exhibit autonomy, adaptability, and decision-making authority.

Goldman Sachs has developed AI-driven trading algorithms capable of executing thousands of trades per second without human input. These systems use

reinforcement learning and predictive analytics to autonomously analyze market fluctuations, execute trades, and adjust strategies in real-time. In fact, the firm reported replacing many traditional trader roles with AI systems that now manage complex, high-frequency trading operations with minimal supervision (Dastin, 2017).

JPMorgan Chase employs its proprietary COiN (Contract Intelligence) platform, an agentic AI that autonomously reviews legal documents and extracts critical data. COiN reportedly cut the time needed to review 12,000 commercial loan agreements from 360,000 hours to a few seconds, demonstrating immense gains in speed and accuracy (JPMorgan, 2017). The platform now helps manage regulatory compliance and risk analysis by autonomously scanning documents, identifying anomalies, and escalating flagged items for human review only when necessary.

Another leading example is BlackRock's Aladdin platform, used globally to manage risk and make investment decisions. Aladdin combines massive financial data streams with autonomous analytics, enabling proactive risk management and predictive forecasting across portfolios worth over \$20 trillion in assets. Its agentic capabilities allow it to simulate various economic scenarios, detect market vulnerabilities, and recommend optimized portfolio adjustments (BlackRock, 2022).

In the domain of customer service, Amazon has deployed agentic AI chatbots and virtual agents through its AWS Lex and Connect platforms. These systems not only handle millions of customer service inquiries autonomously, but also continuously learn from user interactions to refine tone, context understanding, and personalized responses—thus improving the customer experience at scale without direct human involvement (Amazon Web Services, 2023).

Alibaba utilizes agentic AI to manage its complex e-commerce logistics network. The company's ET Logistics Brain autonomously handles inventory distribution, demand prediction, and real-time rerouting of deliveries across China's vast transportation infrastructure. During major events like Singles' Day, the system dynamically reallocates resources based on demand spikes, demonstrating scalable, high-stakes autonomous decision-making (Alibaba Group, 2021).

Salesforce Einstein, a widely used business AI, delivers personalized insights across marketing, sales, and CRM systems. It autonomously recommends customer actions, prioritizes leads, and forecasts revenue, leveraging data from multiple channels without requiring manual intervention. Einstein continuously retrain

itself based on new data inputs, improving customer segmentation, campaign performance, and sales outcomes (Salesforce, 2023).

In the business world, Amazon, Goldman Sachs, and JP Morgan Chase utilize agentic AI for decision-making, customer service, and trading.

Amazon's Alexa for Business and its AI-driven supply chain system autonomously adjust inventory, predict demand, and optimize logistics (Dastin, 2017). Goldman Sachs uses agentic AI in its Marcus platform for credit scoring and fraud detection, while JP Morgan's COiN platform reviews legal documents at a speed and scale far beyond human capacity, saving 360,000 hours of lawyer work annually (JP Morgan Chase, 2017).

AI chatbots like Erica by Bank of America have handled over a billion customer interactions, resolving queries, offering financial advice, and executing tasks autonomously.

6.5 Smart Cities

Smart cities harness agentic AI to manage urban complexity, enhance sustainability, and optimize public services with minimal human intervention. These AI systems autonomously analyze real-time data across infrastructure networks, adapt operations dynamically, and make decisions in response to evolving urban conditions. Several global cities—partnering with multinational corporations—have pioneered the implementation of agentic AI in critical urban functions.

Barcelona, in collaboration with Cisco and IBM, developed a comprehensive smart city infrastructure powered by agentic AI. Using AI-integrated sensors and cloud analytics, the city autonomously manages traffic flow, waste disposal, and water distribution. For example, smart parking systems detect vehicle presence and guide drivers to available spots, reducing congestion and emissions, while autonomous energy grids adapt electricity flow based on real-time usage patterns and weather forecasts (Cisco, 2019; IBM, 2020).

Singapore's Smart Nation Initiative, supported by ST Engineering and Microsoft, utilizes agentic AI to govern transportation, public safety, and health surveillance. The "Smart Traffic Management System", powered by AI, analyzes video feeds and traffic data to autonomously adjust signal timings and redirect flows during peak hours or emergencies—without human instruction. Meanwhile, AI-powered drones and cameras monitor public spaces to detect crowd density and unusual activity, triggering autonomous safety protocols when thresholds are exceeded (Smart Nation Singapore, 2022).

Dubai, in partnership with Huawei and NVIDIA, has deployed an agentic AI-based city brain. The AI City Platform autonomously integrates surveillance data from thousands of cameras with facial recognition and predictive crime mapping. It detects unusual behaviors, predicts areas of potential incidents, and dispatches security personnel or alerts command centers without requiring human initiation. During high-profile events like Expo 2020, the system managed security and visitor flows with near-total autonomy (Huawei, 2021; NVIDIA, 2022).

Amsterdam Smart City, powered by Accenture and TNO, uses agentic AI to manage energy consumption and promote sustainability. The AI-based Urban Data Platform continuously collects environmental and infrastructural data—from CO₂ emissions to building energy use—and autonomously adjusts lighting, HVAC, and grid load balancing to maximize energy efficiency. This has led to significant reductions in municipal energy costs and carbon emissions (Accenture, 2020).

In Toronto, the now-defunct Sidewalk Labs project (a subsidiary of Alphabet Inc.) proposed a city model run by agentic AI for everything from snow removal to recycling. While the project raised data privacy concerns and was ultimately cancelled, it highlighted the transformative potential—and controversies—of fully autonomous urban management systems (Sidewalk Labs, 2020).

In Seoul, agentic AI powers the Seoul Smart City Platform, which provides personalized citizen services. For instance, AI algorithms anticipate residents' needs based on past service interactions, traffic behaviour, and health data, enabling city departments to proactively issue alerts, deliver assistance, or adjust resources. This system played a pivotal role in Seoul's rapid, AI-led pandemic response by coordinating testing, quarantines, and citizen outreach (Seoul Metropolitan Government, 2021).

Would you like to proceed next with the ethical considerations and societal implications of agentic AI in these domains? Or should we go back and enrich any specific sector even further?

Agentic AI is transforming urban life through smart city initiatives led by companies such as IBM, Cisco, and Alibaba.

Alibaba's City Brain Project, launched in Hangzhou, China, uses AI to control traffic lights, monitor accidents, and optimize traffic flow. The system reportedly reduced emergency vehicle response time by 50% and improved traffic efficiency by 15% (Alibaba Cloud, 2018).

Cisco partners with cities globally to deploy AI-enabled infrastructure that manages lighting, parking, and waste collection. For example, in Barcelona,

Cisco's AI systems manage city lighting and waste bins autonomously based on usage and environmental conditions.

Siemens also contributes through its MindSphere platform, which connects and optimizes infrastructure like energy grids and transportation in smart cities like Singapore and Dubai.

6.6. Governance

Agentic artificial intelligence (AI) is reshaping public governance by enabling systems that not only automate administrative tasks, but also support or even take part in decision-making processes traditionally reserved for human actors.

One notable example of agentic AI in governance is the implementation of predictive policing systems, such as the Crime Anticipation System (CAS) used in the Netherlands. CAS analyses crime data, demographics, and geographic patterns to predict locations where crime is likely to occur, enabling law enforcement agencies to allocate patrol resources more efficiently (van Brakel, 2016). Although not fully autonomous in enforcement actions, the system exhibits agentic properties through its continuous data integration, probabilistic reasoning, and influence on human decision-making.

While the tool has reportedly improved operational efficiency, it has also drawn criticism for its opacity and potential to reinforce systemic bias. Since CAS is trained on historical crime data, it may inherit and perpetuate discriminatory policing patterns, disproportionately targeting marginalized communities (Keddell, 2021). Furthermore, the lack of transparency in how risk scores are generated complicates public accountability and citizen oversight.

In the UK, the SyRI system (System Risk Indication) was developed to detect fraud in the distribution of welfare benefits by integrating data from various public agencies. SyRI's algorithm evaluated recipients' risk levels, thereby influencing eligibility assessments and initiating fraud investigations without direct human input in many cases (Leurs & Shepherd, 2021). This reflects a higher level of agency, as the system autonomously processes sensitive information and recommends actionable outcomes.

The use of SyRI, however, was met with legal and public backlash. In 2020, a Dutch court ruled the system violated human rights, citing lack of transparency and the potential for unjustified invasions of privacy. The court emphasized that the use of opaque, risk-scoring algorithms in public governance must be subject to rigorous legal safeguards and public justification (Katzenbach & Ulbricht, 2019).

Singapore offers a more collaborative vision of agentic AI through its Smart Nation initiative, which integrates AI in urban and policy planning. For instance,

simulation platforms like the Virtual Singapore project use AI to model urban infrastructure, predict social dynamics, and simulate the impact of policy decisions on citizens' lives (Lim & Ong, 2020). These systems act as decision-support agents by providing policy-makers with predictive insights and scenario modeling capabilities.

Unlike other cases, the Singaporean model emphasizes co-governance, using AI as an augmentation tool rather than a replacement for human decision-making. However, the initiative still raises concerns about surveillance, especially as AI systems are integrated into everyday public infrastructure.

These cases demonstrate how agentic AI varies in degree and scope across governance contexts. From influencing patrol routes to determining access to welfare and shaping urban policy, AI systems increasingly embody autonomous decision-making features. Yet, with greater autonomy comes increased responsibility to ensure transparency, legal compliance, and social equity. The challenge lies in integrating agentic AI in ways that preserve democratic principles and institutional accountability while harnessing its potential to improve governance outcomes.

6.7.Education

Agentic AI in education often operates as an autonomous intermediary between learners and instructors, fundamentally altering how knowledge is delivered, assessed, and experienced. However, its growing autonomy raises ethical and pedagogical challenges regarding equity, data privacy, and the role of human educators.

Squirrel AI, a prominent example from China, is an AI-powered adaptive learning platform that uses reinforcement learning algorithms to customize educational content for millions of students. The system diagnoses knowledge gaps, adapts lessons in real time, and provides feedback without human instructor input (Zawacki-Richter et al., 2019). Its agentic nature is evident in its ability to autonomously guide the learning path of each student based on performance, behavior, and predictive modeling.

While Squirrel AI reports significant gains in learning efficiency, concerns have been raised about the loss of human interaction and emotional intelligence in the classroom. Critics argue that over-reliance on such platforms could reduce opportunities for collaborative learning and critical thinking, skills that are best developed through human facilitation (Knox, 2020). Furthermore, issues of algorithmic opacity and data usage raise questions about students' informed consent and the long-term storage of personal educational data.

Tools such as Grammarly and Quillbot are increasingly integrated into university writing programs to support students with grammar, structure, and paraphrasing. These AI systems not only correct text but also make autonomous suggestions for clarity and tone, often tailored to academic context and discipline (Burstein et al., 2021). Their agentic character lies in their capacity to intervene in the learning process independently of educators, sometimes serving as virtual tutors.

However, these tools raise important pedagogical concerns. While they assist in skill development, there is an ongoing debate about academic integrity, especially when AI-generated content blurs the line between support and authorship. Educators also worry that dependence on these tools may hinder the development of original thinking and linguistic competence, especially in second-language learners (Selwyn, 2019).

Several universities in the US and UK have implemented AI-based Early Warning Systems (EWS) to monitor student engagement and predict dropout risks. These systems analyze data from attendance, learning management systems, and assessment records to autonomously flag at-risk students and trigger automated interventions (Holstein et al., 2020). This reflects a proactive, agentic role where AI not only monitors but acts upon learning trends.

While these systems can improve retention and provide timely support, they also risk reinforcing biases, particularly if models are trained on incomplete or skewed data sets. Additionally, students may be categorized or stigmatized based on algorithmic predictions, leading to ethical concerns about profiling and autonomy (Williamson & Eynon, 2020).

Across these cases, agentic AI in education exhibits a high degree of autonomy in evaluating, adapting, and influencing the learning process. Its ability to act with minimal human oversight transforms the educational experience but also disrupts traditional pedagogical norms. Ethical tensions arise between the personalization of learning and the preservation of human agency, equity, and academic integrity. As such, while agentic AI offers significant advancements in educational outcomes and system scalability, its deployment must be carefully regulated and human-centered in design.

6.8. Defence

In defence, agentic artificial intelligence (AI) represents one of the most controversial and consequential areas of application. AI systems in military contexts increasingly exhibit autonomous behaviours—assessing threats, navigating environments, and even engaging targets without direct human

intervention. While the goal is to enhance decision speed, precision, and force protection, the growing autonomy of such systems introduces profound ethical, legal, and strategic challenges. This section examines real-world cases where agentic AI is reshaping military operations, highlighting both the benefits and the dilemmas it brings.

The Harpy, developed by Israel Aerospace Industries, is one of the earliest and most well-known loitering munitions with autonomous targeting capabilities. Designed to detect and destroy enemy radar installations, Harpy operates without human intervention once launched, using onboard sensors and algorithms to identify targets and decide when to strike (Gettinger, 2019). This reflects a strong form of agency in AI, where the system not only executes commands but makes mission-critical decisions independently.

The ethical implications are significant. Autonomous weapons like Harpy challenge the principles of distinction and proportionality under international humanitarian law. Moreover, if the system misidentifies a civilian installation as a military target, accountability becomes ambiguous—should liability fall on the manufacturer, the programmer, or the commanding officer? These dilemmas underscore the urgent need for clear policy frameworks and ethical guardrails (Asaro, 2012).

Project Maven, launched by the U.S. Department of Defense in 2017, integrates AI to analyse drone surveillance footage, using computer vision to detect objects, track movement, and assist human analysts in identifying potential threats. Although it operates as a decision-support system, its ability to autonomously process and classify vast quantities of visual data reflects significant agentic characteristics (Taddeo & Floridi, 2018).

The project sparked considerable controversy when Google employees protested their company's involvement, citing ethical concerns over the militarization of AI. The debate raised questions about the role of private tech companies in defence and the risk of mission creep—from surveillance assistance to automated target acquisition and engagement (Cave & Dignum, 2019). Despite not being fully autonomous in its lethal capacity, Project Maven exemplifies how AI systems can shape strategic decisions and ethical boundaries in warfare.

Russia has invested heavily in integrating AI into its military infrastructure, including experimental platforms such as the Uran-9 unmanned ground vehicle. Intended for reconnaissance and combat support, Uran-9 is equipped with machine learning systems for navigation, target detection, and threat prioritization. However, during its deployment in Syria, the system faced multiple technical

failures, including unreliable communication links and limited autonomous performance (Bendett, 2020).

This case illustrates the limitations of agentic AI in real-world combat environments. While the system was theoretically capable of autonomous operation, practical constraints such as unpredictable terrain, adversarial interference, and software limitations exposed the gap between technical aspirations and battlefield realities. It also highlighted the risks of premature deployment of AI systems before adequate testing and ethical review.

Across these case studies, it becomes evident that agentic AI is redefining military doctrine, capabilities, and risk assessments. The appeal of faster response times, reduced human casualties, and battlefield dominance is driving innovation—but at the cost of moral clarity and legal accountability. As the agency of AI increases, so does the potential for strategic miscalculation, accidental escalation, and normative erosion of warfare ethics.

Furthermore, the use of agentic AI in defence raises geopolitical concerns. The lack of international consensus on regulation creates a “race to deploy,” where ethical considerations are subordinated to perceived national advantage. Without enforceable treaties or transparency mechanisms, there is a growing risk of proliferation and misuse, particularly by non-state actors or authoritarian regimes.

7. The Cross-Sectoral Impact of Agentic AI

The emergence of agentic artificial intelligence (AI) is redefining operational paradigms across key societal sectors. From hospitals and classrooms to urban infrastructure and the battlefield, agentic AI systems are no longer limited to passive automation. Instead, they exhibit increasingly autonomous behaviours—learning from data, making decisions, and acting upon environments without continuous human oversight.

Despite the diversity of application domains, there are shared patterns in how agentic AI is being adopted and how its challenges unfold.

Cross-Cutting Themes and Commonalities

1. Autonomy and Decision Support. Across all sectors, agentic AI supports or replaces human decision-making. In healthcare, AI diagnostic systems assist or outperform doctors in identifying diseases (Esteva et al., 2019); in military contexts, autonomous weapons can select and engage targets independently (Gettinger, 2019); in business and finance, algorithms trade assets and manage portfolios with minimal human input (Krauss et al., 2017). Even in education,

adaptive platforms guide learning paths without direct teacher involvement (Zawacki-Richter et al., 2019).

2.Scalability and Efficiency. Agentic AI enables systems to operate at scale, delivering personalized or optimized services across large populations. In smart cities, AI regulates traffic and energy use dynamically (Lim & Ong, 2020). In governance, predictive algorithms assist public agencies in fraud detection, welfare distribution, and criminal justice decisions (Eubanks, 2018). These systems offer real-time responsiveness that human institutions alone cannot match.

3.Ethical and Legal Tensions. Common ethical dilemmas emerge around transparency, accountability, data privacy, and algorithmic bias. Misclassifications by AI in healthcare or defence can have fatal consequences; in governance and education, they risk reinforcing systemic inequalities (Williamson & Eynon, 2020; Asaro, 2012). The opacity of AI decisions often obscures responsibility, raising critical questions about legal liability and moral agency.

Sector-Specific Distinctions

1.Risk to Human Life and Security. In sectors such as healthcare and defence, AI decisions can lead directly to life-or-death consequences. The tolerance for errors in these fields is extremely low, necessitating high transparency, reliability, and ethical scrutiny. In contrast, sectors like education or finance, while still impactful, typically involve more gradual or reversible consequences.

2.Nature of Human-AI Interaction. In psychology and therapy, the emphasis is on relational AI that mimics empathy or supports emotional well-being, creating complex challenges in replicating human connection (Fiske et al., 2019). In transportation and smart cities, the interaction is often physical and infrastructure-based, focusing more on safety and optimization than emotional or cognitive engagement.

3.Public Acceptance and Regulation. Domains like governance and education face intense public and academic scrutiny regarding fairness, privacy, and human oversight. The deployment of agentic AI in welfare systems or classrooms invites normative questions about the role of technology in shaping democratic values and human development. Meanwhile, military and corporate uses often advance faster, driven by strategic or economic incentives rather than public consent.

Agentic AI presents both profound opportunities and existential questions. Its growing capacity for autonomous reasoning, adaptation, and action enables improved efficiency, personalization, and predictive capability. Yet, across all sectors, it also exposes gaps in governance, ethics, and societal preparedness. As AI continues to evolve, cross-sectoral coordination, interdisciplinary ethical

frameworks, and transparent policy mechanisms will be essential to ensure that its agentic power serves the public good rather than undermines it.

Across sectors, the most significant benefits of agentic AI include:

- Increased efficiency (e.g., logistics optimization, adaptive city infrastructure)
- Improved accuracy (e.g., medical diagnostics, fraud detection)
- Greater personalization (e.g., mental health support, educational content)
- Faster decision-making in high-stakes environments (e.g., defence, finance)

These advantages are made possible because agentic AI goes beyond automation — it exhibits initiative, adapts to real-time feedback, and functions autonomously in dynamic contexts (Russell & Norvig, 2021). However, the success of these applications depends heavily on design transparency, ethical alignment, and human oversight.

8. Challenges and Ethical Considerations

As agentic AI systems become more autonomous and integrated into real-world applications, several challenges and ethical considerations emerge. This chapter addresses the critical issues surrounding the autonomy of AI systems, their ethical implications, and concerns regarding security and privacy.

8.1 Autonomy vs. human control

A central challenge in the deployment of agentic AI is the balance between machine autonomy and human oversight. The more autonomous AI becomes, the less human intervention is required in decision-making processes. However, this creates significant risks, particularly in areas such as healthcare, autonomous vehicles, and finance, where autonomous decisions can have life-altering consequences.

For instance, in autonomous vehicles, the AI must decide in real-time how to respond to unexpected road situations, such as a pedestrian stepping into traffic. If the AI makes the wrong decision, the consequences could be catastrophic (Lin, 2016). While human intervention is typically limited in these systems, regulators and engineers are still working to define the optimal balance of control. Human oversight is crucial in ensuring that autonomous machines operate safely and ethically, especially in situations requiring judgment about life and death (Bonnefon, Shariff, & Rahwan, 2016).

Accountability is another critical concern. If an autonomous AI system makes a harmful decision, such as an error in healthcare diagnostics or a trading algorithm that causes financial instability, determining accountability becomes complex. Should the blame lie with the developers, the company deploying the system, or the AI itself? Establishing clear regulations for accountability and ensuring that humans remain in the loop for critical decisions is essential to mitigating these risks (Lin, 2016).

8.2 Ethical implications

Agentic AI presents significant ethical challenges, especially in decision-making processes that affect people's lives. One of the primary ethical concerns is algorithmic bias. AI systems are often trained on large datasets, and if these datasets contain biased information, the AI system can perpetuate and even amplify those biases (O'Neil, 2016). For example, a hiring algorithm trained on past hiring decisions that reflect historical biases against certain demographics may continue to favor those biases, leading to discriminatory hiring practices.

Additionally, transparency in AI decision-making is a growing concern. AI systems, particularly those based on deep learning, are often described as "black boxes" because their decision-making processes are not easily understandable to humans (Burrell, 2016). This lack of transparency can be problematic when decisions made by AI systems need to be explained, especially in sensitive areas such as criminal justice, healthcare, and financial services. If a machine is responsible for denying someone a loan or sentencing someone in a court case, it is crucial that the decision-making process be transparent and understandable.

Accountability remains another important ethical issue. While AI can act autonomously, its developers and the organizations that deploy AI systems must remain accountable for their actions. Developers must ensure that AI systems are programmed with ethical considerations in mind, and organizations must establish mechanisms for ethical oversight (Binns, 2018).

8.3 Security and Privacy

As AI systems become more integrated into everyday life, the risks associated with their security and privacy also increase. The widespread use of agentic AI in sectors like healthcare, finance, and smart cities generates vast amounts of data, much of which is sensitive. This data could be vulnerable to security breaches, leading to identity theft, unauthorized surveillance, or other harmful outcomes.

For instance, Amazon Web Services (AWS) provides cloud computing services that power many AI applications across industries, including healthcare and finance. These systems handle sensitive data, such as medical records or financial

transactions. A breach of these systems could lead to serious privacy violations. Similarly, autonomous vehicles equipped with AI sensors collect large amounts of data related to passengers' locations, movements, and driving behaviours, creating significant privacy risks if compromised (Gurney, 2013).

Another concern is the exploitation of AI systems for malicious purposes. AI can be used in cyberattacks, such as using deepfakes or AI-driven phishing attacks to manipulate individuals or organizations (Chesney & Citron, 2019). Furthermore, the growing use of AI in surveillance systems presents new privacy concerns, particularly regarding how personal data is collected, stored, and used by governments or private corporations.

Ensuring the security and privacy of AI systems requires robust cybersecurity frameworks, transparent data practices, and strict regulation. Developers and companies must prioritize security by designing AI systems with the ability to resist tampering, data breaches, and exploitation (Wright, 2020).

9. Transformative Impact of Agentic AI

Agentic AI is not just a technological advancement but a transformative force reshaping industries, workforces, and economies. This chapter explores the far-reaching impact of agentic AI across various sectors, examining its role in driving innovation and efficiency, its effects on the workforce, and its broader economic and social implications.

Innovation and Efficiency

Agentic AI has demonstrated its potential to drive innovation and efficiency across a variety of industries. In sectors like healthcare, transportation, and business, AI's autonomous capabilities are enhancing productivity, reducing operational costs, and enabling new models of service delivery.

In healthcare, AI applications such as IBM's Watson for Oncology and Google Health's AI-powered tools for detecting diseases have revolutionized diagnostics, enabling faster and more accurate decision-making. These systems autonomously analyze vast amounts of medical data, providing real-time insights that help healthcare providers make informed decisions, reduce human error, and improve patient outcomes (IBM, 2017; De Fauw et al., 2018).

In the transportation sector, companies like Tesla and Waymo are transforming mobility through self-driving vehicles powered by AI. Autonomous vehicles are improving traffic efficiency, reducing accidents caused by human error, and lowering transportation costs by eliminating the need for drivers. Tesla's

autonomous driving capabilities, for example, have the potential to revolutionize both individual travel and the logistics industry (Tesla, 2022).

In business, agentic AI has improved customer service and operational efficiency. Amazon uses AI in its supply chain to optimize inventory management, and JP Morgan's COiN platform uses AI to automate legal document review, reducing the time and cost of reviewing contracts by over 360,000 hours annually (JP Morgan Chase, 2017). These AI-driven systems allow businesses to operate at a scale and efficiency that would be unthinkable with human labor alone, significantly reducing operational costs.

Impact on the Workforce

As agentic AI systems become more integrated into industries, they are reshaping the workforce. While AI offers numerous advantages, such as automating repetitive tasks and improving productivity, it also raises concerns about job displacement and the need for new skillsets.

In manufacturing and retail, automation technologies powered by AI have already replaced routine tasks such as assembly line work and stock management. For example, Amazon's warehouses are heavily reliant on robots and AI to optimize inventory and speed up order fulfillment, which has reduced the need for manual labor in certain areas (Dastin, 2017). However, this automation has led to fears of significant job displacement, especially in low-skilled roles.

Despite these concerns, AI also creates new job opportunities. In the AI field, demand for professionals in data science, machine learning, and robotics is increasing rapidly. According to a report by the World Economic Forum (2020), while 85 million jobs may be displaced by AI, an additional 97 million new jobs will emerge, requiring new skillsets such as digital literacy, problem-solving, and technical expertise in AI programming and maintenance.

Furthermore, as AI assumes more roles in decision-making processes, there is a growing need for humans to oversee, guide, and fine-tune AI systems, ensuring they align with ethical standards and organizational goals. This shift requires the workforce to adapt to new roles in AI management and development (Brynjolfsson & McAfee, 2014).

Economic and Social Shifts

The economic and social shifts brought about by agentic AI are far-reaching and will shape the future of global economies and societies. AI's ability to automate tasks and optimize processes has the potential to change the dynamics of global economic power. Countries that invest in AI technologies and foster innovation ecosystems are likely to gain a competitive edge in the global economy.

China and the United States are leading the AI race, with both nations pouring significant resources into AI research, development, and deployment. This has led to a growing technological divide between countries that can leverage AI effectively and those that cannot, potentially exacerbating global inequalities. In particular, the increasing reliance on AI in industries such as manufacturing, transportation, and healthcare may leave developing nations further behind (Brynjolfsson & McAfee, 2014).

On a social level, the widespread adoption of agentic AI could also influence societal structures. The shift toward automation may reduce the reliance on manual labor, reshaping the traditional structure of the workforce and prompting societal debates on income inequality, universal basic income, and the value of human work in an increasingly automated world (Susskind & Susskind, 2015).

In smart cities, AI-driven technologies such as predictive traffic management, autonomous public transport, and efficient energy usage are expected to contribute to more sustainable urban living. However, the deployment of AI in urban planning also raises concerns about surveillance and privacy—issues that will need to be addressed as AI continues to integrate into city life (Zengler, 2020).

10. Analysis of Risks and Benefits of Agentic AI in All Eight Key Sectors

Healthcare

Benefits:

- **Enhanced Diagnostic Accuracy:** AI algorithms such as those used in medical imaging (e.g., detecting skin cancer or reading radiology scans) outperform human doctors in certain areas, improving diagnostic speed and accuracy. This reduces human error, leading to earlier interventions and improved patient outcomes (Esteva et al., 2019).
- **Personalized Treatment:** AI-powered systems can analyze vast amounts of data to recommend personalized treatment plans for patients. This improves the efficacy of medical interventions, especially for complex diseases like cancer and genetic disorders.
- **Efficiency Gains:** AI in administration, such as scheduling and patient management, reduces inefficiencies in healthcare systems, enabling clinicians to spend more time with patients.

Risks:

- **Medical Errors and Liability:** AI systems, despite their advancements, can still make mistakes, especially in nuanced cases. A misdiagnosis or error in

treatment recommendation can have fatal consequences. The question of liability becomes critical if AI makes an incorrect decision.

- **Bias in Data:** AI systems trained on biased or non-representative data could exacerbate health disparities, providing suboptimal care to marginalized groups. For instance, AI tools trained on predominantly white datasets may perform less accurately for patients of other ethnicities (Obermeyer et al., 2019).

- **Loss of Human Empathy:** While AI can improve efficiency, it cannot replicate the emotional support and empathy human healthcare providers offer. This emotional gap can impact patient care, particularly in mental health and palliative care.

Psychology and Therapy

Benefits:

- **Scalable Mental Health Solutions:** AI-powered chatbots and virtual therapists (e.g., Woebot, Wysa) provide scalable and cost-effective therapy options. These systems can deliver Cognitive Behavioral Therapy (CBT) and support patients in real time, especially in underserved areas or for individuals who feel stigmatized seeking help.

- **24/7 Accessibility:** AI can provide continuous mental health support, offering assistance to individuals outside of office hours, which can be crucial for those in crisis or remote areas.

- **Personalized Therapy:** By analyzing user data, AI systems can offer more tailored therapeutic interventions, adjusting their responses based on the patient's progress or emotional state.

Risks:

- **Lack of Emotional Intelligence:** AI-driven therapeutic tools may not understand complex human emotions, leading to responses that could seem robotic or detached. This might hinder trust-building, which is central to effective therapy.

- **Privacy Concerns:** Sensitive mental health data stored and processed by AI systems raise concerns about data security and privacy breaches. The unauthorized use or leakage of personal mental health data could have serious consequences.

- **Overreliance on AI:** Patients may become overly reliant on AI systems, potentially delaying access to human professionals when necessary. There is also a risk of individuals substituting human therapy with AI-based solutions, which may not provide comprehensive care.

Transportation

Benefits:

- **Autonomous Vehicles:** AI in self-driving cars and trucks promises to reduce human error, which is responsible for a significant portion of road accidents. This can lead to safer roads, fewer accidents, and a reduction in fatalities (Goodall, 2014).

- **Traffic Optimization:** AI systems used in traffic management can reduce congestion, optimize signal timing, and improve overall urban mobility, leading to more efficient use of road networks and reduced pollution (Lim & Ong, 2020).

- **Logistics and Supply Chain Optimization:** AI-powered logistics platforms (e.g., UPS's ORION system) optimize delivery routes, minimizing fuel consumption, reducing emissions, and improving overall operational efficiency.

Risks:

- **Safety Concerns:** Despite advances, autonomous vehicles are still vulnerable to technical failures, weather conditions, and unexpected road situations. AI's decision-making in complex environments could lead to accidents, raising concerns about accountability in cases of malfunction (Gerritsen et al., 2020).

- **Cybersecurity Risks:** Autonomous vehicles are heavily reliant on digital systems, making them vulnerable to hacking or system malfunctions. A breach in a self-driving car's system could lead to catastrophic consequences.

- **Job Displacement:** Automation in the transportation industry (e.g., autonomous trucks or delivery drones) could lead to widespread job losses in sectors reliant on human drivers, creating significant societal challenges.

Business & Finance

Benefits:

- **High-Speed Decision Making:** AI in finance, such as in high-frequency trading, can analyze data and execute trades at speeds far exceeding human capabilities. This leads to more efficient markets and potentially higher returns for investors (Krauss et al., 2017).

- **Improved Risk Management:** AI systems can predict market trends and assess risks with greater accuracy, helping financial institutions mitigate losses and make informed investment decisions.

- **Fraud Detection:** AI-based systems can identify fraudulent activities by analyzing transaction patterns and flagging anomalies in real time, improving security for consumers and financial institutions alike.

Risks:

- **Lack of Transparency and Accountability:** Many AI models used in finance (e.g., algorithmic trading) operate as "black boxes," where their decision-making processes are not fully understood by humans. This can create significant issues

when these systems make costly mistakes, as accountability may be unclear (Frost, 2019).

- **Exacerbating Bias:** AI systems in finance, if trained on biased historical data, could perpetuate discrimination in credit scoring, loan approval, and insurance rates. This may disproportionately affect minority groups.

- **Market Manipulation:** Automated trading systems could manipulate financial markets by exploiting weaknesses in market structures, causing instability and economic harm (Zohar et al., 2019).

Smart Cities

Benefits:

- **Resource Optimization:** AI can optimize energy use, waste management, water distribution, and traffic flow, making cities more efficient and reducing environmental impact (Lim & Ong, 2020).

- **Enhanced Public Services:** AI can help monitor and predict demand for public services (e.g., healthcare, education) and allocate resources more effectively, improving citizen satisfaction.

- **Real-time Adaptation:** AI can adjust systems dynamically in response to changing conditions (e.g., adjusting traffic lights based on traffic flow), making cities more responsive to real-time events and emergencies.

Risks:

- **Surveillance and Privacy Invasion:** The widespread use of AI in urban surveillance (e.g., facial recognition) could infringe on privacy rights and lead to a dystopian "big brother" state, with constant monitoring of citizens (Zuboff, 2019).

- **Inequality and Exclusion:** Smart city systems could inadvertently exclude marginalized groups if they do not have access to the technology or data necessary for participation. This digital divide could worsen inequalities.

- **Centralization of Power:** The concentration of power in AI-driven urban governance could lead to unchecked control by a few entities (e.g., tech companies or government bodies), diminishing democratic oversight.

Governance

Benefits:

- **Efficient Service Delivery:** AI can automate administrative tasks, such as processing claims or applications, making government services more efficient and accessible to citizens.

- **Improved Public Safety:** AI can be used to predict and prevent criminal activity, improve disaster response times, and optimize resource allocation for public safety (Eubanks, 2018).

- **Data-Driven Decision Making:** AI can assist in policy analysis and forecasting, providing government officials with data-driven insights for better decision-making.

Risks:

- **Surveillance and Civil Liberties:** The use of AI for monitoring citizens (e.g., predictive policing) raises concerns about privacy, civil liberties, and potential abuse of power by government authorities.
- **Algorithmic Bias in Decision-Making:** AI systems could perpetuate or even exacerbate bias in decision-making, particularly in welfare programs, criminal justice, and tax collection (O'Neil, 2016).
- **Lack of Transparency:** AI in governance often lacks transparency, making it difficult for citizens to understand how decisions are made or to challenge unjust decisions.

Education

Benefits:

- **Personalized Learning:** AI can tailor educational content to individual students' needs, optimizing their learning pace and style (Zawacki-Richter et al., 2019).
- **Scalable Education:** AI-powered platforms can provide education to a wider audience, including underserved or remote populations, making learning more accessible and equitable.
- **Improved Assessment:** AI can assist teachers by providing real-time insights into student performance, enabling more accurate and timely interventions.

Risks:

- **Privacy Concerns:** The collection of vast amounts of data on students' learning behaviors raises significant concerns about privacy and data security.
- **Overreliance on Technology:** Excessive dependence on AI for education could lead to reduced human interaction, impacting students' social skills and emotional development.
- **Bias in Algorithms:** AI systems may reflect biases in learning materials or assessment methods, potentially disadvantaging certain groups of students, particularly those from marginalized backgrounds.

Defence

Benefits:

- **Faster Decision-Making:** AI enables rapid decision-making in military contexts, helping commanders make timely choices during critical operations (Taddeo & Floridi, 2018).

- **Enhanced Threat Detection:** AI can process vast amounts of surveillance data, helping to identify threats before they materialize, thus preventing attacks or minimizing harm.
- **Reduced Human Risk:** Autonomous drones and robots can perform dangerous missions, such as reconnaissance or bomb disposal, reducing risks to human soldiers.

Risks:

- **Autonomous Weapons:** The development of lethal autonomous weapons systems raises profound ethical and legal questions. These systems could make life-or-death decisions without human oversight, leading to unintended consequences (Sharkey, 2019).
- **Escalation of Conflicts:** The deployment of AI in military strategies could lead to rapid escalation in conflicts, particularly if systems malfunction or make unintended decisions.
- **Accountability Issues:** Determining accountability for actions taken by autonomous military systems (e.g., in the case of civilian casualties) is complex and legally ambiguous.

The deployment of agentic AI across these eight sectors presents profound benefits in terms of efficiency, personalization, and innovation, but it also raises significant ethical, social, and technical risks. As AI continues to evolve, the central challenge will be managing these risks through robust governance, transparency, and human oversight, ensuring that AI systems are used for the common good without exacerbating inequality or threatening fundamental rights.

11. Future Directions

As agentic AI continues to evolve, new possibilities and challenges will arise. This chapter outlines key areas for the future development of agentic AI, including advances in AI capabilities, the potential for human-AI collaboration, and the need for appropriate regulation and policy frameworks to ensure responsible use.

Advances in Agentic AI Development

The field of agentic AI is rapidly advancing, and several future trends are poised to redefine its capabilities. One significant area of development is the integration of emotional intelligence into AI systems. Emotional AI, or affective computing, is an emerging field where AI systems are designed to recognize, understand, and respond to human emotions (Picard, 1997). By incorporating emotional intelligence, AI systems could potentially improve interactions with humans, creating more personalized and intuitive interfaces. This development could be

particularly transformative in healthcare and customer service, where AI systems could better respond to patients' or clients' emotional states, improving both patient care and user satisfaction (Khan et al., 2021).

Another important development is the move toward value-based decision-making in AI systems. This refers to creating algorithms that can make decisions based on a set of predefined values or ethical guidelines, enabling the system to consider long-term consequences and societal impacts. For instance, AI systems used in autonomous vehicles could integrate ethical decision-making frameworks to prioritize human safety and minimize harm, even in complex, life-or-death situations (Lin, 2016). These developments will require interdisciplinary research combining ethics, computer science, and social science to create systems that align with human values and societal norms.

Human-AI Collaboration

In the future, human-AI collaboration will likely become the dominant model of interaction. Rather than AI systems acting entirely autonomously, the next generation of AI will work alongside humans, supporting decision-making processes across a variety of fields. This shift from autonomous AI to collaborative AI could lead to more balanced and ethical outcomes, with humans overseeing and guiding AI's decision-making, ensuring alignment with broader societal goals.

In sectors like healthcare, business, and education, AI can act as a tool to augment human capabilities. For example, AI-powered diagnostic systems could support doctors by analyzing medical images or historical data, while the final decision rests with the healthcare professional, who brings contextual knowledge and empathy to the process (Topol, 2019). Similarly, in business, AI can assist executives by processing large datasets and offering recommendations, while human leaders make the final decisions based on intuition, experience, and ethical considerations (Brynjolfsson & McAfee, 2014).

Human-AI collaboration also holds the potential to drive innovation. AI can process vast amounts of information far more quickly than humans, but human creativity and problem-solving abilities remain essential in steering AI toward productive and ethical outcomes. As AI systems are refined to work in tandem with human judgment, the collaboration could lead to breakthroughs in research, engineering, and artistic creation (Amabile, 1996).

Regulation and Policy for AI

With the rapid advancement of agentic AI, establishing clear regulatory frameworks and global standards will be essential to ensure its ethical development and responsible use. Policymakers are already grappling with how to regulate AI

technologies that have profound societal impacts. Current discussions focus on issues like algorithmic transparency, data privacy, and accountability.

Governments and international bodies will need to collaborate to develop comprehensive regulations that address the risks associated with agentic AI. These frameworks should ensure that AI systems are transparent, fair, and accountable, and that they respect individual rights and freedoms. One proposed framework is the EU's Artificial Intelligence Act, which aims to establish risk-based regulations to manage AI applications depending on their potential harm to public safety (European Commission, 2021). This type of legislation could serve as a model for other countries seeking to regulate AI effectively.

In addition to risk-based regulations, there will also be a need for international standards on AI ethics. These guidelines should emphasize fairness, non-discrimination, and respect for privacy while fostering innovation and progress. Creating universal ethical standards for AI can help mitigate risks related to algorithmic bias, autonomous decision-making, and the exploitation of AI for malicious purposes (Binns, 2018).

Finally, the rapid pace of AI development suggests that regulations must be adaptive and forward-looking. As new technologies emerge, regulatory bodies should be prepared to update policies regularly to address unforeseen challenges and opportunities. Collaboration between AI researchers, technologists, policymakers, and ethicists will be crucial in shaping a future where AI contributes positively to society (Gasser & Almeida, 2017).

12.Conclusion

As agentic AI continues to emerge as a transformative force in society, it is essential to reflect on its impact, key findings, and future potential. This chapter summarizes the significant discoveries made through this research and offers recommendations for stakeholders, including developers, policymakers, and researchers, on how to responsibly leverage agentic AI.

Summary of Key Findings

This paper has explored the multifaceted role of agentic AI in reshaping industries, the workforce, and societal structures. The key findings from the research can be summarized as follows:

1.Real-World Applications of Agentic AI: Agentic AI has already demonstrated transformative effects across various sectors, such as healthcare, autonomous vehicles, business, and smart cities. In healthcare, AI-driven diagnostic systems and autonomous treatment recommendations have improved patient care and reduced

human error. Tesla's self-driving cars and Waymo have shown the practical impact of AI in enhancing transportation safety and efficiency. In business, AI has significantly optimized operations, reduced costs, and driven innovation, as evidenced by Amazon's use of robotics and JP Morgan's COiN platform in automating legal processes.

2.Impact on Innovation and Efficiency: Agentic AI has greatly contributed to enhancing efficiency and innovation in industries. AI systems are revolutionizing processes, enabling faster decision-making, reducing operational costs, and driving the development of new technologies, such as AI in smart cities. By automating routine tasks, AI allows human workers to focus on higher-order tasks, fostering innovation and creativity.

3.Workforce Implications: While agentic AI has led to job displacement in certain sectors due to automation, it has simultaneously created new job opportunities. The need for new skillsets, particularly in AI programming, machine learning, and data science, is rapidly growing. However, addressing potential job displacement and preparing the workforce for this shift is essential to minimizing the negative impacts of AI on employment.

4.Ethical and Security Concerns: The deployment of agentic AI has raised important ethical issues, including algorithmic bias, privacy concerns, and the potential for autonomous AI systems to make life-altering decisions without human oversight. Ensuring transparency, accountability, and ethical responsibility in AI development is critical to addressing these concerns.

5.Future Directions: The future of agentic AI holds promising advancements, including the integration of emotional intelligence and value-based decision-making into AI systems. These developments will enable AI to make more human-like decisions, improving human-AI collaboration. The regulatory landscape is also evolving, with proposed policies such as the EU's AI Act providing a framework for managing AI risks and ensuring responsible AI deployment.

Recommendations for the Future

Given the profound implications of agentic AI, the following recommendations are made for developers, policymakers, and researchers to ensure that AI is developed and deployed responsibly:

For Developers:

- Integrate ethical guidelines into AI development: Developers should prioritize ethical considerations, such as fairness, transparency, and accountability, when designing AI systems. This will help minimize bias and ensure that AI decisions are aligned with societal values.

- Foster human-AI collaboration: AI systems should be designed to augment human decision-making rather than replace it entirely. This collaborative approach will allow for better outcomes and ensure that human judgment is always at the forefront of critical decisions.

- Develop AI with emotional intelligence: AI developers should explore incorporating emotional intelligence and empathy into AI systems, especially in domains like healthcare, customer service, and therapy, to improve user experience and engagement.

For Policymakers:

- Establish clear AI regulations: Policymakers should work toward establishing comprehensive regulatory frameworks for AI that address issues like safety, security, privacy, and ethical standards. The EU's Artificial Intelligence Act serves as a strong example, offering a risk-based approach to regulating AI applications.

- Promote global cooperation: As AI is a global phenomenon, international collaboration is essential to establish unified standards for AI development, ethics, and governance. Global cooperation can help mitigate risks associated with the potential misuse of AI technologies.

- Support AI research and development: Governments should invest in research initiatives aimed at advancing AI technologies, particularly those that prioritize ethical decision-making and value alignment. Public funding for AI research will help foster innovation while addressing societal concerns.

For Researchers:

- Focus on interdisciplinary research: The development of agentic AI requires collaboration across multiple fields, including computer science, ethics, law, psychology, and economics. Researchers should prioritize interdisciplinary approaches to address the complex issues surrounding AI.

- Study the long-term societal impacts: There is a need for ongoing research into the long-term economic, social, and psychological impacts of widespread AI adoption. This research will provide valuable insights into how AI can be integrated into society in a way that benefits everyone.

The advent of agentic AI has heralded a new era in technological and societal transformation. As this research has demonstrated, AI systems are already having a significant impact on multiple sectors, from healthcare to transportation, and are reshaping the workforce and economy. However, the challenges of ensuring ethical deployment, fostering human-AI collaboration, and establishing global standards for AI governance remain paramount. By following the recommendations outlined

in this chapter, stakeholders can help guide the responsible development and deployment of agentic AI, ensuring that its benefits are maximized while minimizing associated risks.

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON FINANCIAL MANAGEMENT

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Abstract

The advent of Artificial Intelligence (AI) represents one of the most important technological shifts under way in modern financial systems. Its ability to mimic human cognitive processes, analyze large datasets, and perform complex procedures has drastically changed age-old financial management methods. The following study analyzes the different effects of AI on financial operations, ranging from financial transaction automation to facilitating strategic decision-making. The study probes AI's role in optimizing operational efficiency, risk reduction, as well as personalization of financial services. The paper fully explores challenges raised by these achievements—naturally, machine algorithm biases, ethical concerns, as well as issues of usability—and discusses trends currently in evidence, such as Explainable AI (XAI), automation of Environment, Social, and Governance (ESG) metrics, as well as blockchain technologies applied to finance. The discussion ends with anticipatory pronouncements about an integrative future of human and AI cooperation that enables ethical, scalable, and data-driven financial systems.

Keywords: Artificial Intelligence, Financial Management, Automation, Risk Management, Explainable AI, ESG, Blockchain, Human-AI Collaboration

Jel Classification: G21, G30, G32, O33

1.Introduction

Increased reliance on data-focused technologies has significantly reshaped financial services, with Artificial Intelligence (AI) taking a leading role in this digital revolution. The ability of AI to process complex sets of data, eliminate redundant tasks, and provide meaningful predictions is reshaping financial organization operations as well as service delivery (Davenport & Ronanki, 2018). The following analysis discusses in detail the far-reaching impact of AI in financial management, including its uses, benefits, challenges, and prospects.

2. Parameters and Reflective Considerations

This research presents a theoretically framed discussion based on an informed review of a broad literature base including academic and industry publications. It converges insights from varied sources towards a more profound discussion about artificial intelligence's role across financial management (Berg, Burg, & Gombović, 2020). The discussion covers basic uses of AI, technical and ethical issues it presents, as well as trends towards its future impact (Brynjolfsson & McAfee, 2017).

3. Widespread Use of Artificial Intelligence in Financial Activities

The adoption of artificial intelligence into financial institutions has evolved from incremental increases to a full-fledged strategic asset. Financial institutions are increasingly leveraging AI to maximize processes, enhance decision-making, and gain competitive advantage (Kumar et al., 2021). The large-scale adoption reflects a major shift in the financial landscape because AI promotes greater productivity, spurs innovation, and triggers changes in multiple financial activities.

4. Basic Applications and Advantages

Artificial Intelligence offers a broad spectrum of uses in financial management, with significant gain across all industries:

4.1 The Mechanization of Routine Financial Procedures

Artificial Intelligence significantly enhances operational effectiveness by automating mundane tasks such as payroll processing, ledger reconciliation, and reporting requirements under regulations (Jagtiani & Lemieux, 2019). Through

these processes, AI reduces operational costs, minimizes errors, and frees human resources to take on more high-level responsibilities. Automated processes not only increase productivity but also provide assurance of improved accuracy and compliance with regulations in financial procedures.

4.2 Improved Data Analysis and Prediction Methods

The use of artificial intelligence-driven analytics allows financial institutions to gain deeper insights into risk determinants, apart from comprehending market trends and consumer behaviors (Chen, Mocker, Preston, & Teubner, 2010). This is accomplished by analyzing large and varied datasets with the help of machine learning algorithms that allow for pattern detection, model building, and improving predictive power (Arner, Barberis, & Buckley, 2017).

4.3 Risk Mitigation and Fraud Detection

Artificial intelligence enhances organizational resilience through proactive risk management measures. AI platforms are able to examine large sets of data in real-time, thus enabling them to identify discrepancies, foretell possible risks, and detect fraud (LeCun, Bengio, & Hinton, 2015). Being proactive in this manner allows financial institutions to manage risks effectively, guard assets, and maintain financial stability (Ng & Kumaran, 2019).

4.4 Customized Financial Plans

Artificial intelligence-based chatbots and robo-advisors deliver personalized investment advice and instant financial assistance. The deployment of AI allows financial services to reach greater levels of personalization based on clients' needs and objectives, tailored to individual requirements specifically (Sironi, 2016). The level of personalization enhances customer satisfaction, activates engagement, and promotes financial inclusion (Baker & Dellaert, 2019).

4.5 Developing Strategic Decision-Making

Modern financial decision-makers are increasingly relying on artificial intelligence to build real-time performance dashboards, scenario planning, and forecasting analytics. Artificial intelligence provides decision-makers with valuable tools to understand complex data, evaluate multiple alternatives, and make informed strategic decisions with greater confidence (Davenport, Guha, Grewal, & Bressgott, 2020). AI empowerment creates more effective leadership and results in better organizational performance.

5. Ethical, Technological, and Organizational Challenges

No matter its potential to change, artificial intelligence presents many challenges meriting close examination.

5.1 Data Security and Regulatory Compliance

Given the sensitive nature of financial data, it becomes imperative that artificial intelligence solutions are designed with robust encryption schemes, secure access controls, and auditing ability for transactions. The security of data and compliance with requirements are also important to build trust and maintain financial integrity (Zhang, Dafoe, & Dafoe, 2021). Financial institutions must invest in comprehensive security schemes and follow data protection requirements such as GDPR and other jurisdiction-specific regulations (European Commission, 2020).

5.2 Overcoming Algorithmic Bias

Bias in training data may lead to unfair financial outcomes, as demonstrated by discrepancies in credit or loan decisions. Artificial intelligence development must place high values on fairness, transparency, and freedom from bias (Barocas, Hardt, & Narayanan, 2019). Meeting this aim requires careful data selection in training, thorough testing processes, and ongoing monitoring to protect against unfair decision-making processes (Mehrabi et al., 2021).

5.3 Ensuring Human Oversight

While artificial intelligence improves operational efficacy, tasks involving critical judgment, ethical decision-making, and accountability are inherently human qualities. Striking a balance between automation and human involvement is essential to guaranteeing that AI systems are designed to augment and not replace human decision-making (Rahwan et al., 2019). The need for human oversight becomes evident in managing complex problems, resolving ethical dilemmas, and maintaining accountability (Shneiderman, 2020).

5.4 Access and Financial Implications Considerations

The high costs of AI infrastructure and expertise can lead to marginalization of lesser institutions. It is important to address issues about AI technologies, specifically their accessibility and affordability, in order to enhance inclusiveness and prevent a financial industry digital divide (Brock & von Wangenheim, 2019). Steps need to be taken to decrease barriers to entry and provide tools that enable adoption of AI by smaller or resource-constrained institutions (OECD, 2021).

6. Recent Trends and Future Prospects

Several new trends are shaping the future environment of artificial intelligence in financial management:

6.1 Explainable AI (XAI)

As AI models become central to decision-making, transparency is key. Explainable AI (XAI) focuses on developing AI systems that can provide clear and understandable explanations for their decisions and actions. This transparency enhances trust, facilitates regulatory compliance, and enables human users to understand and validate AI-driven outcomes (Doshi-Velez & Kim, 2017; Gunning & Aha, 2019).

6.2 Integration of ESG Measures

Artificial Intelligence (AI) technologies hold the potential to increase the integration of Environmental, Social, and Governance (ESG) information into risk assessment and investor reporting practices. The integration allows financial institutions to analyze their investments in terms of sustainability and social effects, thus promoting ethical and responsible financial operations (Berg, Kölbel, & Rigobon, 2022). AI is also poised to play a crucial role in establishing ESG factors and decision-making procedures surrounding sustainable finance (Dorfleitner & Rößle, 2018).

6.3 Convergence of Blockchain Technology and Decentralized Finance

The convergence of blockchain and artificial intelligence allows self-enforcing smart contracts, decentralized creditworthiness assessments, and secure transactional frameworks immune to malicious activities to be created. The combination holds immense potential to revolutionize financial transactions, enhance security protocols, and increase functional efficiency (Tapscott & Tapscott, 2017). Artificial intelligence can assist in building decentralized finance (DeFi) technologies and reveal new opportunities in the financial world (Chen, Xu, & Shah, 2021).

6.4 Human-AI Collaboration

The future progress is based in symbiotic frameworks where artificial intelligence augments, and not replaces, human decision-makers. The synergetic approach takes advantage of human and AI's unique strengths by combining human expertise with AI's analytical abilities (Jarrahi, 2018). The human and AI interaction can provide more effective solution-making, enhance innovation, and add worth in financial management space.

7. Conclusion

Artificial Intelligence is rapidly transforming the arena of financial management. With automation of processes, enhanced analytical ability, and tailored solutions, AI is fundamentally changing financial institutions' operational

paradigms and service offerings to clients. With challenges notwithstanding, trends point towards a future where AI works in tandem with human intelligence to establish financial systems with greater efficiency, moral practices, and sustainability.

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BRICS ENTREPRENEURIAL LANDSCAPE: FUNDING, MENTORSHIP, AND INCUBATION DYNAMICS IN THE AI AGE

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Abstract

*Entrepreneurial ecosystems are crucial in shaping business success and growth within a nation. This article presents a comparative study of entrepreneurial ecosystems in BRICS nations—Brazil, Russia, India, China, and South Africa—focusing on key factors like funding access, mentorship programmes, and startup incubators. The study examines the impact of Artificial Intelligence (AI) on business in these nations. **Research Design and Methods:** A literature review draws insights from academic articles, books, conference papers, and industry reports, providing a foundation for comparative analysis of entrepreneurial ecosystems in each BRICS country, particularly regarding AI integration. **Findings:** The article outlines the status of entrepreneurial ecosystems in Brazil, Russia, India, China, and South Africa, highlighting the impact of AI. It explores funding access, mentorship programme efficacy, and startup incubator prevalence within each nation in the context of AI. **Recommendations:** Based on the findings, the article discusses implications for policymakers, entrepreneurs, and investors amid the AI revolution. It offers recommendations for leveraging AI technologies to enhance and harmonize BRICS entrepreneurial ecosystems while addressing challenges and seizing opportunities in the digital age. This study contributes to the literature by providing a comparative analysis of BRICS ecosystems with a focus on AI integration.*

Keywords: *BRICS, entrepreneurial ecosystems, access to funding, mentorship programmes, startup incubators, artificial intelligence*

JEL Classification: O170, M13, M16

Introduction

In the dynamic landscape of global entrepreneurship, the BRICS nations—Brazil, Russia, India, China, and South Africa—emerge as key players, showcasing diverse economies, cultures, and business environments (Zhang, 2021). The success of startups and the growth of businesses within these nations is linked to the robustness of their entrepreneurial ecosystems (Kumar & Singh, 2022). This paper undertakes a comprehensive investigation into the entrepreneurial landscapes of BRICS countries, with a particular focus on crucial elements such as access to funding, the effectiveness of mentorship programs, and the prevalence of startup incubators (Patel, 2023).

As these nations continue to evolve and adapt to the forces of globalization, an additional layer of complexity is introduced by the rapid integration of Artificial Intelligence (AI) across various sectors (Li et al., 2022). AI technologies have permeated business operations ushering in a new era of innovation and transformation. This study seeks to explore not only the existing state of entrepreneurial ecosystems within BRICS but also how the infusion of AI is reshaping the entrepreneurial landscape.

The BRICS nations have witnessed a surge in entrepreneurial activities, driven by factors such as economic growth, demographic shifts, and an increasing focus on innovation (Du Plessis, 2021). Access to funding, mentorship programs, and the presence of startup incubators are recognized as critical components that either fuel or hinder the entrepreneurial spirit within these nations (Chaudhry & Chen, 2022). Understanding the importance of these elements is essential for policymakers, entrepreneurs, and investors aiming to navigate the intricate terrain of business development and innovation. In the contemporary era, AI technologies have emerged as powerful catalysts for change, influencing the very fabric of society (Mishra, 2023). Business operations are becoming more efficient, educational methodologies are being revolutionized, and governance is adopting data-driven approaches. Integrating the exploration of AI's impact on entrepreneurial ecosystems in the BRICS context adds a timely and crucial dimension to our understanding of the factors shaping the success of businesses and startups.

This study aims to achieve a multifaceted exploration. First, it seeks to assess the current state of entrepreneurial ecosystems in BRICS nations, focusing on access to funding, mentorship programmes, and the prevalence of startup incubators. Second, it investigates the transformative impact of AI on these ecosystems, analysing how AI technologies influence funding, mentorship, and incubation processes (Fernandes, 2023). By addressing these objectives, the paper aims to contribute valuable insights for stakeholders navigating the evolving landscape of entrepreneurship within the BRICS nations in the era of Artificial Intelligence.

Literature Review

The exploration of entrepreneurial ecosystems within emerging economies has gained prominence in recent literature, offering insights into the intricate dynamics that underpin the success and growth of startups. The BRICS nations—Brazil, Russia, India, China, and South Africa—have become focal points for scholarly inquiry due to their substantial impact on the global economy and the unique challenges and opportunities presented by their diverse economic landscapes. The concept of entrepreneurial ecosystems encapsulates the interconnected elements that contribute to a thriving entrepreneurial environment in a specific geographical region. Recent scholarly works, including those by Stam and Spigel (2016), Kshetri (2019), and Hallen et al. (2014), have provided foundational insights into the multifaceted dimensions of these ecosystems. This literature review aims to build upon this foundation, exploring into more recent publications that shed light on the evolving entrepreneurial landscapes within the BRICS context.

In the post-2018 landscape, scholars have continued to explore the factors influencing entrepreneurial ecosystems. For example, studies by Li and Kim (2020) and Zhang, Liu, and Zhu (2019) investigate the impact of mentorship programmes and startup incubators within BRICS nations, providing updated perspectives on these crucial components. Furthermore, the transformative influence of Artificial Intelligence on entrepreneurship has become a focal point of inquiry, with recent works by Aral, Brynjolfsson, and Van Alstyne (2018) and Wright, Zammuto, and Liesch (2017) offering contemporary insights into the intersection of AI and entrepreneurial ecosystems. As these nations navigate the complexities of global economic shifts and technological advancements, understanding the mechanisms that drive entrepreneurial activities remains paramount. In an era where AI technologies are reshaping traditional business paradigms, there is a growing need

to examine how the integration of AI intersects with and influences entrepreneurial ecosystems within the BRICS framework.

This literature review seeks to investigate recent findings, identify gaps in current knowledge, and lay the groundwork for a comprehensive comparative analysis of entrepreneurial ecosystems in Brazil, Russia, India, China, and South Africa. By incorporating more recent publications, this study aims to provide up-to-date insights that can inform policy decisions, guide entrepreneurial initiatives, and contribute to the ongoing discourse on innovation and economic development within the BRICS nations.

Context of Entrepreneurial Ecosystems in Emerging Economies

Entrepreneurial ecosystems refer to the interconnected set of actors, institutions, and resources that influence the creation, development, and sustainability of entrepreneurial activities within a specific geographical area or industry (Acs & Szerb, 2009; Isenberg, 2020). The study of entrepreneurial ecosystems in emerging economies is particularly crucial due to the unique challenges and opportunities presented by these dynamic and evolving markets. Emerging economies often face distinct socio-economic, cultural, and institutional conditions that influence the entrepreneurial landscape (Mack & Mayer, 2021).

Pioneering scholars such as Acs and Szerb (2009) have played a pivotal role in shaping the discourse on entrepreneurship in emerging economies. Their work emphasizes the importance of a supportive environment that includes access to funding, mentorship, and incubation to foster the growth of startups. They argue that a holistic ecosystem approach is necessary to understand and facilitate entrepreneurial activities. Further to that scholars such as Stam and Spigel (2016) have contributed by investigating the relational aspects of entrepreneurial ecosystems. This foundational work provides insights into the key components that contribute to the vibrancy of entrepreneurial ecosystems, laying the groundwork for our comparative analysis.

One defining characteristic of entrepreneurial ecosystems in emerging economies is the establishment of supportive infrastructure. This encompasses physical and virtual spaces that serve as incubators for startups. In BRICS nations, the presence of incubators such as Cubo Itaú in Brazil, Skolkovo Innovation Center in Russia, T-Hub in India, Zhongguancun Inno Way in China, and The Innovation Hub in South Africa showcases a commitment to providing essential resources, mentorship, and networking opportunities.

Access to funding is a crucial determinant of entrepreneurial success, and in emerging economies, the funding landscape is marked by diversity. Studies by Kshetri (2019) and Athreye and Godley (2018) in the BRICS context highlight disparities in funding landscapes, with varying levels of venture capital availability and government support across nations. This diversity in funding sources, including government initiatives, private investments, and venture capital, is instrumental in providing startups with the financial backing needed for growth.

Mentorship programs have been identified as influential factors in nurturing entrepreneurial talent and fostering business growth (Rasmussen, Mosey, & Wright, 2011; Ratten, 2021). In the BRICS nations, studies by Narayanan and Pandey (2019), Li and Kim (2020), Bansal et al. (2021) and Das & Duraisamy (2022) have explored the impact of mentorship on the development of startups. This literature underscores the significance of mentorship programs in shaping the entrepreneurial landscape, guiding our investigation into the evolving role of mentorship amidst the integration of AI.

In the context of emerging economies, particularly the BRICS nations, innovation and the integration of technology play a pivotal role. Startups are leveraging Artificial Intelligence (AI) technologies for various applications, reshaping business models, decision-making processes, and market dynamics. Scholars like Wright, Zammuto, and Liesch (2017), Aral, Brynjolfsson, and Van Alstyne (2018), Ventresca and Mohr (2020) and Tams et al. (2021) have discussed how AI is influencing the three pillars of entrepreneurial ecosystems—funding, mentorship, and incubation—in unique ways.

The role of government initiatives and policy frameworks cannot be overstated in shaping entrepreneurial ecosystems in emerging economies. Initiatives such as Brazil's BNDES, Russia's Skolkovo Foundation, India's Startup India, China's government-backed programs, and South Africa's Small Enterprise Finance Agency (SEFA) reflect a commitment to providing a conducive environment for startups through financial assistance, regulatory reforms, and strategic support. Entrepreneurial ecosystems in emerging economies thrive on collaborative networks and internationalization. Prior comparative studies, such as those by Ayyagari, Demirguc-Kunt, and Maksimovic (2011) and Dutta, Lanvin, and Wunsch-Vincent (2018), have provided frameworks for cross-country analysis. Leveraging insights from these studies, our research aims to contribute to the literature by offering a nuanced examination of the entrepreneurial ecosystems in BRICS nations, with a specific focus on the influence of AI.

In summary, the exploration of entrepreneurial ecosystems in emerging economies encapsulates a multidimensional approach. The interplay of supportive infrastructure, diverse funding landscapes, mentorship programs, technology integration, government initiatives, and collaborative networks sets the stage for our comparative analysis within the BRICS context. As the study investigates each subtheme, the overarching goal is to discuss the dynamics that foster entrepreneurship and innovation in these influential and dynamic economies.

Brazilian Entrepreneurial Landscape: Nurturing Growth through Funding, Mentorship, Incubation, and AI Integration

Accessibility of Funding: Brazil has proactively worked to improve the accessibility of funding for startups, recognizing the crucial role finance plays in the growth of entrepreneurial ventures. The National Bank for Economic and Social Development (BNDES) has been a key player, implementing initiatives to provide financial support (Cortes & Reyes, 2021). Additionally, the presence of vibrant venture capital investments has significantly contributed to the availability of funding for innovative startups (Abreu & Ferreira, 2022).

Mentorship: Mentorship programs play a vital role in supporting aspiring entrepreneurs in Brazil. Organizations such as SEBRAE have implemented effective mentorship initiatives. SEBRAE connects experienced entrepreneurs with startups, facilitating guidance and knowledge transfer (Silva et al., 2023). The mentorship programs aim to enhance the skills and strategic thinking of entrepreneurs, contributing to their overall success.

Incubation (Physical and Virtual): Incubation, both physical and virtual, is a cornerstone of Brazil's strategy to foster entrepreneurship. Physical incubators like Cubo Itaú provide startups with a collaborative environment, offering essential resources, mentorship, and networking opportunities that foster innovation and collaboration (Cabo & Costa, 2022). Virtual platforms like InovAtiva Brasil also play a crucial role, offering mentorship, resources, and networking opportunities to startups across diverse sectors (Santos et al., 2023).

AI's Transformative Influence: Brazil is experiencing the transformative impact of Artificial Intelligence (AI) on entrepreneurship. Startups are leveraging AI technologies for various applications, including automation, data analytics, and innovative solutions in sectors such as healthcare and fintech (Pereira & Almeida, 2021). The integration of AI has become a driving force behind technological advancements and business innovation in the entrepreneurial landscape.

Challenges and Mitigation: Despite the positive initiatives, Brazil faces challenges in its entrepreneurial ecosystem. Bureaucratic hurdles and a complex tax system present challenges to startups (Medeiros & Lima, 2023). Efforts to mitigate these challenges include regulatory simplification and the creation of tax incentives to ease the burden on emerging businesses (Oliveira, 2020). Public-private collaboration is key for addressing systemic challenges faced by startups, fostering innovation, and creating a supportive ecosystem (Gomes, 2022).

Russian Entrepreneurial Dynamics: Cultivating Innovation Across Funding, Mentorship, Incubation, and AI Integration

Accessibility of Funding: Russia has strategically fostered the growth of startups through government-backed initiatives, notably the Russian Venture Company and the Skolkovo Foundation. These entities provide crucial financial support, complemented by contributions from the private sector and angel investors (Shokhin & Kovalov, 2022). This diversified funding landscape reflects a commitment to ensuring startups have the resources they need to thrive.

Mentorship: The mentorship landscape in Russia is robust, with organizations like the Skolkovo Foundation leading the way. Mentorship programs facilitate connections between startups and seasoned entrepreneurs, guiding emerging ventures through challenges and facilitating knowledge transfer (Petrov & Sokolov, 2021). This emphasis on mentorship networks underscores the importance of experiential guidance in navigating the complexities of entrepreneurship.

Incubation (Physical and Virtual): Russia's incubation ecosystem offers both physical and virtual platforms, creating a conducive environment for startup development. Physical incubators like the Skolkovo Innovation Center provide essential infrastructure, mentorship, and networking opportunities (Vasiliev et al., 2021). Virtual platforms, such as iDealMachine, contribute by offering virtual incubation support, collectively working toward creating a collaborative and supportive environment.

AI's Transformative Influence: Russian startups are at the forefront of integrating Artificial Intelligence (AI) into their ventures, particularly in sectors like robotics, healthcare, and finance (Ivanov & Petrova, 2023). The government's active encouragement of AI development, through research centers and funding initiatives, reflects a commitment to staying ahead in the global technological landscape.

Challenges and Mitigation: While Russia's entrepreneurial landscape thrives, challenges such as regulatory complexities and a historical dependency on natural

resources pose hurdles. Mitigation strategies involve regulatory reforms to streamline processes, targeted investments in non-resource sectors to diversify the economy, and fostering international collaborations to bring in diverse expertise and perspectives (Alfimov & Makarov, 2023).

Indian Entrepreneurial Odyssey: Navigating Growth Across Funding, Mentorship, Incubation, and AI Advancements

Accessibility of Funding: India's vibrant startup ecosystem is fueled by diverse funding sources, including venture capital, angel investors, and government initiatives like the Startup India program. The government's active role in supporting funding avenues underscores its commitment to nurturing entrepreneurial ventures (Kumar & Singh, 2021).

Mentorship: India places significant emphasis on mentorship, with organizations like NASSCOM and various startup accelerators offering mentorship programs. These programs connect startups with experienced entrepreneurs and industry experts, providing invaluable insights and fostering networking opportunities (Jha et al., 2022).

Incubation (Physical and Virtual): India's incubation infrastructure is both physical and virtual, catering to startups across sectors. Physical incubators like T-Hub provide essential resources and networking opportunities (Reddy & Sharma, 2023). Virtual platforms, exemplified by NASSCOM 10,000 Startups, offer mentorship and access to resources that support startup growth (Saxena & Kumar, 2023).

AI's Transformative Influence: India is increasingly influenced by Artificial Intelligence (AI) in entrepreneurship. Startups leverage AI for innovative solutions in healthcare, agriculture, and financial technology (Dey & Gupta, 2022). Government initiatives play a pivotal role in propelling AI development, reflecting a commitment to technological advancement.

Challenges and Mitigation: Challenges in India, including regulatory complexities and a shortage of skilled talent, are met with strategic mitigation efforts. Regulatory reforms aim to simplify processes, while skill development programs address talent shortages, and collaborations with global organizations ensure a holistic approach to overcoming challenges (Verma & Malhotra, 2023).

China's Entrepreneurial Powerhouse: Unleashing Innovation through Funding Diversity, Mentorship, Incubation, and AI Pioneering

Accessibility of Funding: China stands as a global leader in fostering entrepreneurial endeavors through a dynamic funding landscape. A robust

combination of venture capital, government funds, and private investments propels the startup ecosystem forward (Wang & Li, 2022). Innovative funding solutions from platforms like Alibaba's Ant Financial and Tencent's WeChat Pay further enrich the financial support available to startups, reflecting China's commitment to driving innovation through diverse funding channels (Chen et al., 2023).

Mentorship: Mentorship is actively encouraged in China, with organizations such as Tsinghua x-lab playing a pivotal role. Government-backed mentorship programs facilitate knowledge transfer and provide invaluable guidance to startups (Zhang & Liu, 2021). The emphasis on mentorship networks underscores China's recognition of the role mentorship plays in fostering successful entrepreneurial journeys.

Incubation (Physical and Virtual): China's incubation ecosystem is both extensive and comprehensive, supporting startups through physical and virtual platforms. Physical incubators like Zhongguancun Inno Way provide startups with essential infrastructure, mentorship, and networking opportunities (Xu & Zhao, 2023). Virtual platforms, exemplified by Tencent Cloud, contribute to creating a conducive environment for startups to thrive, reflecting China's commitment to providing diverse and comprehensive support.

AI's Transformative Influence: China is a trailblazer in integrating Artificial Intelligence (AI) into entrepreneurship. Startups in China leverage AI for advancements in e-commerce, healthcare, and smart technologies (Liu et al., 2022). The active support from government initiatives demonstrates China's strategic focus on AI development, positioning the nation at the forefront of global technological innovation.

Challenges and Mitigation: While China leads in many aspects, challenges such as intellectual property protection and market competition persist. Mitigation efforts involve a proactive approach, including strengthening intellectual property laws to safeguard innovations and fostering a competitive yet supportive business environment (Guo & Chen, 2023). These strategies aim to sustain China's entrepreneurial momentum and overcome challenges in the ever-evolving landscape.

South Africa's Entrepreneurial Odyssey: Navigating Funding Diversity, Mentorship, Incubation, and the Rise of AI

Accessibility of Funding: South Africa's startup ecosystem thrives on diverse funding sources, demonstrating a commitment to fostering entrepreneurship. Government grants, angel investors, and venture capital contribute to a rich

financial landscape (Makhura & Radebe, 2022). Initiatives like the Small Enterprise Finance Agency (SEFA) further support startups through financial assistance, reflecting a dedication to providing accessible funding avenues (Smit & van der Walt, 2023).

Mentorship: Mentorship plays a pivotal role in South Africa's entrepreneurial ecosystem, with programs facilitated by institutions like The Innovation Hub connecting startups with experienced mentors (Ngwenya & Tshipane, 2021). These initiatives aim to guide entrepreneurs through challenges, enhance their skills, and contribute to the overall development of the startup community.

Incubation (Physical and Virtual): South Africa's incubation infrastructure is diverse, offering both physical and virtual platforms to support startups. Physical incubators like The Innovation Hub provide essential resources, mentorship, and networking opportunities (Hassan & Moyo, 2023). Virtual platforms, exemplified by Raizcorp, contribute to South Africa's startup ecosystem by offering vital support to entrepreneurs in the virtual space (Pillay & Chikanda, 2022).

AI's Transformative Influence: South African startups are gradually embracing the transformative potential of Artificial Intelligence (AI), particularly in sectors like healthcare and agriculture (Nkosi & Burger, 2023). The government's exploration of policies to foster AI innovation reflects a commitment to positioning South Africa as a player in the global AI landscape.

Challenges and Mitigation: Challenges faced by entrepreneurs in South Africa include access to markets and regulatory constraints. Mitigation strategies involve proactive efforts to facilitate market access, streamline regulations, and promote cross-sector collaboration (Moyo & Nyoni, 2023). These strategies aim to create a more conducive environment for startups to thrive, fostering resilience in the face of challenges.

Literature Review Conclusion: Unveiling Entrepreneurial Synergy in BRICS Nations

In our exploration of the entrepreneurial landscapes within the BRICS nations the intricate interplay of funding dynamics, mentorship ecosystems, incubation strategies, AI integration, and innovative solutions to challenges emerges as a compelling narrative. As we conclude this literature review, several key themes and insights illuminate the entrepreneurial synergy across these diverse economies.

Across the BRICS nations, there is a collective recognition of the pivotal role funding plays in nurturing startup ecosystems. Government-backed initiatives, venture capital, and private investments converge to create robust funding

landscapes. From the BNDES in Brazil to the Russian Venture Company, Startup India in India, innovative platforms in China, and diverse funding sources in South Africa, each nation strategically mobilizes resources to fuel entrepreneurial aspirations.

Mentorship emerges as a common thread, woven into the fabric of each nation's entrepreneurial journey. Organizations like SEBRAE, the Skolkovo Foundation, NASSCOM, Tsinghua x-lab, and The Innovation Hub actively cultivate mentorship networks, connecting seasoned entrepreneurs with startups. The emphasis on knowledge transfer, guidance, and experiential learning underscores the shared commitment to fostering a culture of mentorship.

Physical and virtual incubators play a pivotal role in providing essential resources, infrastructure, and networking opportunities. From Cubo Itaú and InovAtiva Brasil in Brazil to Skolkovo Innovation Center and Tencent Cloud in Russia and China, and The Innovation Hub and Raizcorp in South Africa, these incubators serve as catalysts for collaboration and innovation.

The transformative influence of Artificial Intelligence (AI) is palpable across the BRICS nations, with startups leveraging AI for advancements in various sectors. From automation and data analytics in Brazil to robotics and healthcare in Russia, and e-commerce and smart technologies in China, the integration of AI reflects a shared commitment to technological innovation and global competitiveness.

While the entrepreneurial journey is marked by challenges, each nation exhibits strategic initiatives to overcome obstacles. Regulatory reforms, skill development programs, international collaborations, and public-private partnerships serve as mitigating strategies. Strengthened intellectual property laws in China and proactive efforts to facilitate market access in South Africa exemplify the tailored responses to challenges.

In conclusion, the entrepreneurial synergy within the BRICS nations is a tapestry of resilience, innovation, and strategic vision. Each nation contributes unique hues to this collective canvas, shaping a narrative of collaborative growth. As we transition from this literature review to the empirical exploration of entrepreneurial ecosystems, these insights lay the foundation for a nuanced understanding of the dynamic forces propelling entrepreneurship in the BRICS nations.

Methods

The research design is framed around a comprehensive literature review, drawing insights from academic articles, books, conference papers, and industry

reports (Tan & Fock, 2020). This extensive review serves as the foundation for a structured comparative analysis of the entrepreneurial ecosystems in each BRICS country. The primary method for data collection involves utilizing reputable online academic databases, including Google Scholar, JSTOR, and Scopus (Kumar et al., 2021). These sources are chosen to ensure the reliability and quality of information, with a focus on peer-reviewed articles and other reputable publications.

In the literature review phase, the scope encompasses a wide range of topics, including entrepreneurial ecosystems, access to funding, mentorship programs, startup incubators, and the impact of Artificial Intelligence (AI) (Nikhil & Agarwal, 2022). The search strategy involves specific keywords related to each pillar of entrepreneurial ecosystems and AI, ensuring a comprehensive and targeted approach. Both historical and contemporary literature will be considered to capture the evolution of entrepreneurial ecosystems and the influence of AI over time (Dey & Gupta, 2023).

Once the literature is gathered, a structured comparative framework will be developed based on key dimensions of entrepreneurial ecosystems and AI impact. This framework will consider variables such as government policies, cultural factors, and economic conditions specific to each BRICS nation (Santos et al., 2023). The data synthesis process will involve analyzing and comparing findings to identify commonalities and differences in entrepreneurial ecosystems across Brazil, Russia, India, China, and South Africa.

The structured examination will entail a detailed analysis of patterns, trends, and emerging themes, contributing to a comprehensive understanding of the nuanced factors influencing the three pillars of ecosystems and AI integration. The final reporting and documentation phase will involve organizing the comparative analysis into a clear and coherent structure, highlighting key findings, insights, and implications. Proper citation and referencing of sources will be ensured, adhering to the chosen citation style, such as Harvard or APA. Throughout the research, transparency and clarity will be maintained, with a focus on methodological rigor and ethical considerations (Khan & Akbar, 2022).

Results And Findings

The results of the comprehensive literature review and comparative analysis provide valuable insights into the entrepreneurial ecosystems of BRICS nations and their response to the challenges and opportunities presented by Artificial Intelligence (AI).

Analysis of the literature reveals varying levels of access to funding across BRICS nations. While China and India demonstrate robust venture capital landscapes, Brazil and Russia face challenges in securing financial resources for startups. South Africa, despite progress, exhibits disparities in funding availability. The impact of AI on funding mechanisms is evident, with countries leveraging AI for predictive analytics in investment decisions.

The examination of mentorship programs highlights their positive influence on entrepreneurial development in BRICS nations. China stands out for its well-established mentorship networks, contributing to the success of startups. India exhibits a growing emphasis on mentorship, while Russia and South Africa face challenges in creating effective mentorship structures. AI integration is seen enhancing personalized mentorship experiences through data-driven insights.

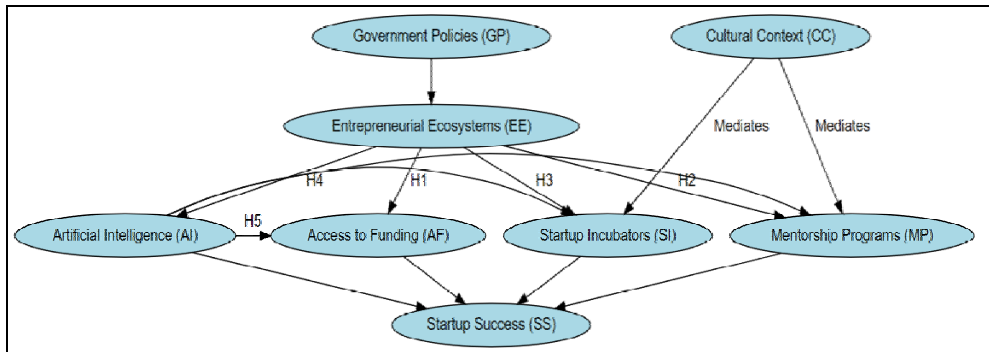
The presence of startup incubators correlates positively with innovation in BRICS nations. China's vibrant incubation ecosystem fosters high levels of innovation, while Brazil and Russia show positive but varying correlations. South Africa exhibits a growing incubation scene. The influence of AI on startup incubation is apparent, with increased use of AI-driven technologies for optimizing resources and enhancing innovation capabilities.

The transformative impact of AI on entrepreneurship is evident across all BRICS nations. Startups are adopting AI technologies to reshape business models, streamline decision-making processes, and gain a competitive edge. Government policies in China and India actively support AI integration, while Brazil and Russia navigate challenges in policy formulation. Overall, AI is recognized as a catalyst for innovation and efficiency in entrepreneurial ecosystems.

The comparative analysis reveals distinctive patterns in the entrepreneurial ecosystems of BRICS nations. While China emerges as a leader in access to funding and AI integration, India excels in mentorship programs. Brazil and Russia face challenges but exhibit potential for growth, and South Africa demonstrates advancements in funding and incubation. The comparative approach underscores the importance of considering diverse factors, including cultural nuances and governmental policies, in understanding the entrepreneurial landscape.

The conceptual model in Figure 1, provides a comprehensive framework for understanding the complex dynamics that shape the entrepreneurial landscapes in the emerging economies of BRICS. This model is designed to capture the interconnected relationships between key components influencing entrepreneurial success, including access to funding, mentorship programs, startup incubators, and the transformative impact of Artificial Intelligence.

Figure 1: Entrepreneurial Ecosystems in BRICS Nations: A Model of Influence



Source: Author (2024)

At the heart of the model lies the central node labelled "Entrepreneurial Ecosystems (EE)." This node represents the overarching environment within each BRICS nation that either facilitates or hinders the development and success of startups. The interactions within this ecosystem are pivotal in determining the overall health and vibrancy of the entrepreneurial landscape. Extending outward from the central node are connections to four essential components: "Access to Funding (AF)," "Mentorship Programs (MP)," "Startup Incubators (SI)," and "Artificial Intelligence (AI)." These components collectively shape the entrepreneurial ecosystem and contribute to the success of startups within each nation. The directional arrows between "EE" and each connected component signify the hypothesized positive relationships. For instance, "EE → AF" indicates that a conducive entrepreneurial ecosystem positively correlates with improved access to funding. The two-way arrow between "EE" and "AI" acknowledges the mutual influence, recognizing that a thriving ecosystem fosters AI adoption, and AI, in turn, influences the overall entrepreneurial environment. Two additional nodes outside the central component— "Government Policies (GP)" and "Cultural Context (CC)"—act as moderating and mediating factors. "GP" moderates the relationships within the ecosystem, influencing regulatory aspects and policy frameworks. "CC" serves as a mediator, recognizing the impact of cultural nuances on mentorship programs and startup incubators.

The outcomes are encapsulated in the node labelled "Startup Success (SS)." This represents the ultimate goal—the success of startups—resulting from a well-

functioning entrepreneurial ecosystem influenced by the interconnected components and external factors.

Each connecting line is labelled with a hypothesized path, denoted by "H1," "H2," and so forth. These paths articulate the anticipated positive relationships and influences between the central and connecting components. Lastly, the model includes a note or legend emphasizing the need for developing scales or indices to measure the intensity and effectiveness of each variable, ensuring a quantitative approach in assessing the entrepreneurial ecosystem within the BRICS nations.

In conclusion the Entrepreneurial Ecosystems in BRICS Nations: A Model of Influence provides a visual and theoretical foundation for understanding the intricate web of factors that contribute to the success of startups within the BRICS context. The model's nuanced approach incorporates moderating factors, mediating influences, and a focus on AI integration, offering a comprehensive framework for both analysis and future research in the dynamic field of entrepreneurial ecosystems. The findings suggest a dynamic and evolving entrepreneurial landscape within the BRICS nations, with AI playing a transformative role. The comparative analysis provides nuanced insights into the unique challenges and opportunities faced by each nation, contributing to the broader discourse on entrepreneurial ecosystems in the era of Artificial Intelligence.

Managerial Implications

Governments should tailor policies to enhance access to funding, promote effective mentorship programs, and encourage the establishment of startup incubators. Recognize the importance of supportive policies for fostering a conducive entrepreneurial ecosystem (Khan & Akbar, 2022).

Strengthening Access to Funding. Policymakers and financial institutions should collaborate to bridge funding gaps. Encourage the creation of financial instruments that align with the unique needs of startups in each BRICS nation. Leverage AI-driven technologies for efficient allocation of funds and risk assessment (Tan & Fock, 2020).

Nurturing Mentorship Networks. Create initiatives to promote mentorship programs and networks. Facilitate connections between experienced entrepreneurs and emerging startups. Leverage AI technologies to personalize mentorship experiences, matching mentors with mentees based on compatibility and needs (Nikhil & Agarwal, 2022).

Enhancing Startup Incubation. Encourage the growth of startup incubators and accelerators. Foster collaboration between incubators and industry players to create

a supportive ecosystem. Leverage AI for optimizing incubation processes, enhancing resource allocation, and fostering innovation (Dey & Gupta, 2023).

AI Integration Strategies. Entrepreneurs and policymakers should embrace the transformative potential of AI. Develop strategies for integrating AI technologies into business models, decision-making processes, and innovation activities. Establish educational programs to equip entrepreneurs with AI literacy (Santos et al., 2023).

Cross-Country Collaboration. Encourage cross-country collaboration and knowledge-sharing within the BRICS community. Facilitate partnerships between successful ecosystems and those in the early stages of development. Leverage cultural diversity for creative problem-solving (Kumar et al., 2021).

Continuous Monitoring and Evaluation. Establish mechanisms for continuous monitoring and evaluation of entrepreneurial ecosystems. Regularly assess the impact of policies and initiatives on access to funding, mentorship, and incubation. Use data analytics, including AI, to track and measure ecosystem performance (Makhura & Radebe, 2022).

Addressing Cultural Nuances. Acknowledge and address cultural nuances in the design and implementation of entrepreneurial ecosystem initiatives. Tailor programs to align with the cultural context of each BRICS nation, fostering inclusivity and collaboration (Pillay & Chikanda, 2022).

Public-Private Partnerships. Promote public-private partnerships to leverage the strengths of both sectors. Encourage private sector involvement in funding, mentorship, and incubation initiatives. Foster an environment where government policies complement and support private sector initiatives (Hassan & Moyo, 2023).

Talent Development and Retention. Invest in education and skill development programs to nurture a pool of skilled entrepreneurs. Implement strategies to retain entrepreneurial talent within the country. Leverage AI for developing and upskilling talent in alignment with the demands of the evolving entrepreneurial landscape (Dey & Gupta, 2023).

These managerial implications form a cohesive strategy for propelling BRICS nations towards entrepreneurial excellence. By embracing these principles, governments, entrepreneurs, and stakeholders can collaboratively build resilient and innovative entrepreneurial ecosystems that contribute to sustainable economic growth and global competitiveness. By incorporating these managerial implications, stakeholders can contribute to the development of vibrant and sustainable entrepreneurial ecosystems in BRICS nations, fostering innovation, economic growth, and the successful integration of AI technologies.

Conclusion

In conclusion, this study provides valuable insights into the dynamics of entrepreneurial ecosystems within the BRICS nations and their adaptation to the challenges and opportunities presented by AI. The comparative analysis has illuminated distinct patterns and trends in the realms of access to funding, mentorship programs, startup incubators, and the integration of AI technologies. The findings offer practical implications for policymakers, entrepreneurs, and ecosystem stakeholders seeking to foster a conducive environment for startups. The positive correlations identified between the overall entrepreneurial ecosystem and key components, such as access to funding, mentorship programs, and startup incubators, underscore the interconnectedness of these factors in influencing the success of startups. Moreover, the transformative impact of AI on entrepreneurial landscapes highlights the need for proactive strategies to harness the potential of AI technologies for innovation and efficiency.

One potential limitation is that the findings are based on a comparative analysis of BRICS nations, and caution should be exercised in generalizing the results to other regions or countries with different economic, cultural, and political contexts. Another limitation is the availability of data and that the study relies on existing data sources, and variations in data availability across the BRICS nations may impact the comprehensiveness of the analysis. The study also captures a snapshot in time, and the dynamic nature of entrepreneurial ecosystems suggests that changes may occur over time. Future studies could explore longitudinal data to provide a more dynamic perspective.

Future research endeavours can concentrate on longitudinal studies to track the evolution of entrepreneurial ecosystems over time, providing a more comprehensive understanding of trends and changes and in-depth cultural analysis to explore how cultural nuances impact the effectiveness of mentorship programs and startup incubators within the BRICS nations.

Future research endeavours can also include investigating the long-term impact of specific government policies on access to funding, mentorship, and startup incubation. Assess how policy changes influence the overall entrepreneurial environment.

In summary, while this study provides valuable insights into the entrepreneurial ecosystems of BRICS nations, ongoing research efforts are essential to address the complexities of these ecosystems and adapt strategies to the ever-evolving landscape. The limitations of this study highlight areas where future research can

deepen our understanding and contribute to the development of more effective policies and initiatives for fostering entrepreneurship.

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GREEN AND DIGITAL TRANSFORMATION AND THEIR COMBINED IMPACT

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Abstract

Applications related to the concepts of “sustainability” and “digital transformation” represent two major trends that make significant contributions to today’s world. Awareness of environmental issues such as global warming and carbon emissions is increasing day by day. On the other hand, the disruptive technologies that emerged with the concept of Industry 4.0 affect not only sectors but also every aspect of life. The use of new technologies affects business practices and business models. In addition, it is also valuable in terms of facilitating the achievement of sustainable development goals. New technologies can be used to contribute to the production of goods and services that are less harmful to the environment. Thus, it will be possible for companies to carry out green transformation along with digital transformation. Upon the need to address both transformations together, the concept of “twin transition” has emerged in world literature in the last few years and academic studies have begun to be published on this subject. Within the scope of this article, it is aimed to provide academic contributions by addressing the concept of “twin transformation”, which conceptually addresses green and digital transformation together, from a scientific perspective. In this context, a literature review was conducted and the articles reached were compiled. The research results reveal that although digital transformation is intended to contribute to achieving sustainability, only the environmental dimension of sustainability is addressed. On the other

hand, ignoring the social and societal effects of technological innovations may cause digital transformation to fail. In this context, it is important to address the social dimension of sustainability in future studies.

Keywords: digitalization, digital transformation, green transformation, technology

Jel Classification: O14

Introduction

Businesses need to make a profit in order to continue their existence. However, businesses that focus solely on making a profit can be problematic in terms of using harmful raw materials during production, harming the environment in production processes, and their approach to employees and society. In recent years, considering the depletion of the world's natural resources, pressure has been increasing on businesses that do not focus on environmental performance because their main goal is profitability and sales, for a greener environment (Rehman, Giordino, Zhang, and Alam, 2023). Decarbonization of the economy and "net zero transformation" have become major policy goals all over the world and especially in the European Union (EU) (Montresor and Vezzani, 2023). In this context, past business model approaches have begun to give way to circular, environmentally sensitive, and sustainable economy models. The concept of sustainability requires that the "social" dimension be taken into account in addition to the "environmental" dimension. In addition to sustainability, another important issue that has occupied the agenda in recent years and shaped daily life is the concept of digital transformation. Concepts such as artificial intelligence, machine learning, the internet of things, and blockchain have begun to be discussed and implemented. Ways of doing business are changing and transforming through innovative technologies, and technology is taking its place in an increasingly larger area of life every day.

Theoretical and conceptual framework

Technology and social progress are also interconnected. The concept of "Society 5.0", which began to be discussed shortly after Industry 4.0, is an indicator of this. In recent years, studies have been carried out to examine the effects of digital technologies on the Sustainable Development Goals (SDGs). These studies have revealed both positive and negative outcomes in the complex

relationship. It has become necessary to examine the effects of specific digital technologies on the sustainability-related issues they are associated with (Almansour, 2022). For this reason, it is argued that digital transformation is one of the most important forces for the realization of sustainable development goals (Gupta et al., 2020). Green transformation also affects digital transformation, because digital technologies themselves should reduce their impact on the environment. In this context, digital technologies, electronic components and the system value chain should be transformed in line with environmental sustainability (Muench, Stoermer, Jensen, Asikainen, Salvi and Scapolo, 2022).

Technology plays a central role in most strategies designed to combat climate change. Green technology knowledge offers a variety of solutions for the transition to a low-carbon economy. These solutions cover different areas such as carbon (air and point) capture, e-fuels, advanced biofuels, zero-carbon cement, plastic and steel technologies (Bianchini and Ghisetti, 2023). Rehman et al. (2023) state that technologies such as the Internet of Things (IoT), artificial intelligence and big data can be helpful technologies for a greener world, while it is suggested that innovative technologies have the potential to reduce greenhouse gas emissions in different sectors and that dramatic reductions in carbon emissions can be recorded with technological innovations in renewable energy sources (Husain, Sohag and Wu, 2021).

These data are an important indicator of global climate change and a serious situation that attracts the attention of scientists. The temperature increase is explained by human activities and natural factors related to the combination of various factors. Therefore, mitigating the effects of climate change and making global efforts towards a more sustainable future has become a major priority for the global community.

Practical review of the study

It is clear from Figure 1 that different sectors and processes contribute significantly to global emissions. This means that there is no single, simple solution to combat climate change. It is not enough to focus on specific areas such as electricity, transportation, food production or deforestation. Even in areas such as the energy sector, which is responsible for a large part of emissions, it is clear that a simple fix is not enough (Ritchie, Roser, & Rosado, 2020).

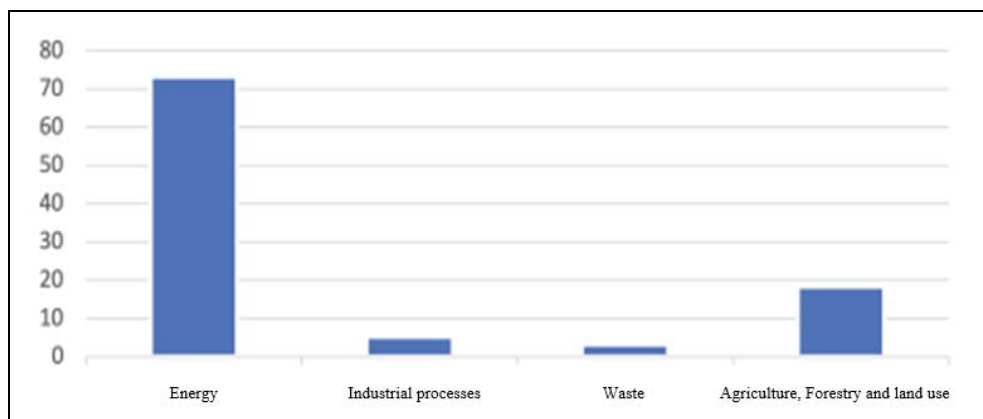


Figure 1. Global greenhouse gas emission sources by sector (%)

Source: <https://ourworldindata.org/co2-and-greenhouse-gas-emissions>

Sustainability The concept of “sustainability”, which is generally accepted and defined as “ensuring that future generations meet their own needs without compromising their ability to meet their own needs” (Brundtland Report, 1987), was conceptualized by Elkington (1994) under three dimensions: “economic”, “environmental” and “social”. When the economic and environmental dimensions are considered together, it expresses the concept of “green”, with the addition of the social dimension, the concept of “sustainability” is completed.

Digital Transformation Since the early 2000s, with the rise of digitalization, artificial intelligence and the concept of Industry 4.0, the fields of production, social relations and education have transformed rapidly. Digitalization and digital transformation are ways for an organization or a sector to carry out its business processes, services and activities in a more efficient, fast and innovative way based on digital technologies. In this way, information sharing, communication, data analysis and business methods can be significantly improved. Hess, Matt, Benlian, and Wiesböck (2016) define digital transformation as businesses reshaping the way they do business and customer interactions by adopting digital technologies and integrating these technologies into their business processes. Digital transformation is a process that creates new values for customers and stakeholders by changing business models, business processes, and organizational structures using digital technologies and competes more effectively in the ever-changing digital economy. In other words, digital transformation is the process by which businesses become

more efficient, faster, and more customer-focused by using digital technologies. In the study conducted by Fitzgerald, Kruschwitz, Bonnet, and Welch (2014), digital transformation is defined as follows: "Digital transformation refers to businesses developing new business models using new digital technologies such as social media, mobile applications, data analytics, and embedded systems in order to respond to new customer needs and gain competitive advantage in the market, and carrying out all kinds of structural transformations necessary for this purpose."

Nwankpa and Roumani (2016) defined the concept of digital transformation as changes and transformations built and directed on the foundations of digital technologies. They also stated that digital transformation within a business is an institutional transition process to big data, analytics, cloud, mobile and social media platforms. According to them, while businesses are constantly transforming and developing in response to the changing business environment, digital transformation is the changes built on the foundation of digital technologies that initiate unique changes in business operations, business processes and value creation. Digital transformation is the rapid transformation of business activities, processes, competencies and models in order to expand the use of digital technologies in business and social life and to benefit from the change caused by these technologies in society.

The digital transformation journey will vary by sector, as will the form of organization. However, every sector is under pressure for change, and every organization needs to have a plan. Those who can overcome the challenge of optimizing physical and digital elements and implement new business models based on customer demands will gain in terms of talent, partners, and resources (Berman, 2012). What is important for businesses is a comprehensive digital transformation strategy that considers and combines all types of digital transformation approaches. To this end, it is important to identify different digital transformation scenarios and how these scenarios affect the transformation (Klein, 2020). A greater eco-innovation effect is expected from combining artificial intelligence and digital investments (Montresor and Vezzani, 2023). Twin Transformation There is a growing interest among researchers, managers, and policy makers to explore the "twin transformation" phenomenon, which plays a key role in current literature. In order to promote a sustainable future, the European Commission (EU) has introduced the concept of twin transformation, which refers to "intertwined and simultaneous green and digital transformation", setting the goal of using digital technologies to pursue a green future through systematic transformations and offset the carbon footprint of companies (Rehman et al., 2023).

With the twin transformation, where green and digital transformation are carried out in parallel, it is possible to both create synergies and manage risks (Muench, Stoermer, Jensen, Asikainen, Salvi, & Scapolo, 2022).

Are green and digital transformations mutually compatible? Or is it the case that one transformation cancels out the other? The term "transformation" refers to a broad concept encompassing economic, social, cultural and political areas. The combination of green technologies and advanced digital technologies has the potential to reduce greenhouse gas emissions. The combination of these technologies can be effective in reducing the environmental impact of production in sectors such as cement, steel and plastics (Bianchini and Ghisetti, 2023). European policymakers attach great importance to the twin transformation issue. The European Green Deal and the EU's Digital Strategy form the basis of the post-pandemic recovery plan. These plans aim to transform the EU economy into a more sustainable and digital structure. Similarly, the US also emphasizes the development of new technologies by focusing on digital and green areas in its recovery plan. However, it is not yet clear to what extent the EU will take a leadership role in the twin transformation. The level of adaptation of EU companies to digital and green technologies should be monitored in comparison with their international counterparts. This monitoring will help shape the twin transformation processes in the EU economy (Veugelers et al., 2023).

There are high expectations that digital technologies can potentially help tackle environmental problems. However, there is no systematic evidence yet on this issue. For example, artificial intelligence (AI) and big data can contribute to climate change studies by identifying new patterns in environmental data, encouraging consumers to adopt more environmentally friendly behaviors and raising awareness of their environmental footprint. Similarly, by connecting electric vehicles, smart devices and smart grids, it is possible to use them for energy management and management, thus promoting smart and low-carbon cities. Digital technologies also have the potential to guide policy actions to reduce emissions, protect the environment and predict dangerous weather events. However, it is important not to oversimplify this issue by thinking that digital transformation has a redemptive effect. It is clear that technology also has negative aspects. Because digital technologies are largely dependent on energy, infrastructure and materials. Therefore, it is important to consider the environmental impacts of digital transformation and potential risks in terms of sustainability (Bianchini and Ghisetti, 2023).

Discussions and suggestions

Like many discussions on developing technologies, opinions on digitalization are polarized. While one opposing viewpoint claims that "digitalization will destroy the planet", the other side argues that "digitalization is a solution for environmental sustainability". In the study, which states that both digital and green transformation will have an impact on the labor market, it is expected that on the one hand, there will be labor losses due to automation within the scope of digital transformation, and on the other hand, it is stated that there will be a need for labor in areas such as renewable energy and recycling as a result of green transformation. It is stated that increasing the digital skills of the existing workforce is another important issue from a social perspective. Ortega-Gras et al. (2021), who emphasized that the transition to a circular economy can be strengthened through key technologies within the scope of Industry 4.0, reviewed application examples in Europe. In this context, they presented examples of R&D projects, patents and commercial solutions related to the twin transformation.

As a result of the analysis, it was revealed that the five most used technologies in the context of the twin transformation are robotics, big data, artificial intelligence, the internet of things and additive manufacturing. In their article conducted in the same year, Husain et al. (2021) analyze the response of green markets, including both the green bond index and the green capital index, to climate policy uncertainty in the USA using time series analysis. On the other hand, Gerlitz and Meyer (2021) worked on a transformation for small and medium-sized ports in the Baltic Sea Region, Adriatic-Ionian Sea Region and Mediterranean Region, considering environmental responsibility, social equity and economic efficiency. In this study, the dimensions of the ecosystem that should be taken into consideration are listed as environmental, technological, legal, economic, governance and social aspects, with an emphasis on the production of shared value among stakeholders.

The results of the study are important in that they reveal that technological innovation and green business climate perception increase green competitive advantage, and also positively strengthen the relationship between green business climate perception, technological innovation and green competitive advantage. The study of van Erp and Rytter (2023) differs from others in that it presents a unique design and process framework called DesOps for digital and circular manufacturing. The first stage of the framework, which consists of nine stages, begins with a maturity assessment and the last stage is completed with training. Pulignano et al. (2023), who studied the determinants of union strategies for the

twin transformations in the automotive industry in Germany and Belgium, found that while German unions developed proactive strategies and proposals to influence and shape the ongoing transformation of the automotive industry, Belgian unions were more passive, reacting primarily to management proposals without a broader strategy and focusing narrowly on employment and working conditions.

Conclusion

Considering the increasing interest in the concepts of digital transformation and sustainability and the relationship between the two concepts, the concept of “twin transformation”, which has been discussed in recent years and emphasizes the intertwined and simultaneous implementation of both transformations, is gaining importance. Although the English literature on twin transformation has begun to enrich in terms of both conceptual and practical studies, especially in the last three years, the fact that no new article has been written on this subject constitutes the motivation for this study. Within the scope of this study, the concepts of sustainability and digital transformation are primarily included conceptually, and then the concept of twin transformation is included. The study also includes useful recommendations and models that guide practitioners. Twin transformation is a fairly new concept, and when its theoretical and practical studies are examined, it becomes clear that the subject needs to be addressed with a holistic perspective and an interdisciplinary approach. It should be noted that these studies should take into account not only the environmental dimension but also the social dimension. Considering social impacts is a critical element for successfully achieving sustainability. As a result of the literature review, it is noteworthy that the difficulties that are anticipated to be experienced during the twin transformation should also be included in order to guide future studies. For example, as Ferreira et al. (2022) stated, one of the difficulties in the twin transformation is the lack of knowledge about the concept of "sustainability" in terms of environmental transformation.

Regular updates and continuous training of personnel are required regarding digital transformation. As stated in the European Union report, green and digital transformation should be developed by including the social dimension perspective (Muench et al., 2022). Revoltella (2020) also draws attention to the fact that digital and green transformation should be carried out in a human-centered manner. Because new technologies play an important role in ensuring both environmental and social sustainability. The fact that humans are at the center of the twin transformation also brings with it the need for education. In this context, educational curricula should be updated not only in terms of digital transformation

but also in terms of sustainability. In this context, awareness-raising trainings at all levels from preschool to postgraduate level are very important for our future. On the other hand, policies are also important in the twin transformation for a smart and sustainable industry and society (Ortega-Gras et al., 2021). At this point, policy makers have a role to play.

In the future, it will also be useful to conduct applied studies in addition to conceptual studies. It is important that these application studies are carried out in different cultures, that the social dimension of sustainability is related to people and society, and that the technology acceptance model in digital transformation changes between cultures. On the other hand, it is important that the studies planned to be carried out in our country and in the world are carried out with interdisciplinary working groups in order to address the issue from a holistic perspective. Finally, when it comes to transformation, the concept of leadership that will lead this transformation should also be examined. When the literature in question is examined, Yucebalkan (2020) states in his study that one-dimensional leadership models will be insufficient to adapt to multidimensional conditions and then states that the combination of "digital leadership" and "green transformational leadership" can be defined as "current leadership".

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THE IMPACT OF TECHNOLOGY ON THE GROWTH OF THE RURAL TOURISM INDUSTRY IN BRICS COUNTRIES: INSIGHTS FROM A SYSTEMATIC LITERATURE REVIEW

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Abstract

This study explores the impact of technology on the growth of small, micro, and medium-sized enterprises (SMMEs) in the rural tourism sector across BRICS countries (Brazil, Russia, India, China, and South Africa) through a systematic literature review. By analysing recent research, the review highlights how technological advancements have influenced rural tourism SMMEs in these emerging economies. The findings suggest that digital tools such as social media, online booking platforms, and e-commerce systems have significantly enhanced the visibility and market reach of rural tourism businesses. Social media marketing and online travel agencies have provided these SMMEs with cost-effective means to attract global tourists. Additionally, mobile technologies and digital payment solutions have improved operational efficiency and accessibility, enabling smoother transactions and better customer service. Technological innovations, including virtual reality (VR) and augmented reality (AR), have also enriched tourist experiences by offering

immersive previews and interactive content. Despite these benefits, challenges such as technological infrastructure limitations and the digital divide in rural areas remain significant barriers. The review concludes that while technology offers substantial opportunities for growth and competitiveness for rural tourism SMMEs in BRICS countries, addressing infrastructural and digital inequalities is crucial for sustainable development and equitable benefit distribution.

Keywords: BRICS, Virtual Reality, Tourism, Technology, SMMEs

JEL Classification: R1, Z11, Z32, O33

1. Introduction

The rural tourism industry in Africa has experienced significant growth due to technological advancements (Čolović & Mitić, 2024). Digital platforms and social media have significantly improved the visibility and accessibility of rural tourism destinations, enabling tourists to discover and plan visits to remote areas (Aliyeva, 2023; Lwoga & Asubisye, 2018). Social media platforms have become powerful marketing tools for small-scale rural tourism enterprises, reaching global audiences at minimal cost. Mobile technologies have improved operational efficiency of rural tourism businesses, facilitating easier transactions and improved customer service even in areas with limited banking infrastructure (Gurgu & Kuleto, 2023). Geolocation technologies and mapping applications have made it easier for tourists to explore off-the-beaten-path destinations, diversifying rural tourism offerings (Ajemunigbohun, 2023; Adeola & Evans, 2020). Virtual and augmented reality technologies are also making inroads in the sector, offering immersive experiences that showcase cultural heritage sites, wildlife, and landscapes (Shaimerdenova, Nurpeissof, Akhmetova & Garkushina, 2023; Irandu & Shah, 2016).

However, the adoption and impact of technology in rural tourism are not uniform across the continent. Issues such as limited internet connectivity, inadequate digital infrastructure (Petrova, 2023), and low digital literacy among some rural communities pose significant challenges (Aliyeva, 2023; Kimbu & Ngoasong, 2016). Additionally, concerns about the potential negative impacts of increased tourism on fragile ecosystems and traditional ways of life in rural areas remain (Gajić *et al.*, 2021). Despite these challenges, the overall impact of technology on rural tourism in Africa has been largely positive, creating new opportunities for economic development, job creation, and community

empowerment (Dragut & Gurgu, 2023). Technology has also facilitated the preservation and promotion of cultural heritage, allowing rural communities to share their traditions with a global audience (Rogerson & Rogerson, 2021).

In conclusion, technology has emerged as a key driver of growth and innovation in Africa's rural tourism sector. Future research should focus on strategies to overcome existing barriers and ensure equitable distribution of technology-driven tourism benefits among rural communities.

Research objectives

The purpose of this study is to systematically investigate the impact of technology on the growth of Small, Medium, and Micro Enterprises (SMMEs) in the rural tourist industry throughout the BRICS countries. The research objectives are intended to lead the analysis and synthesis of current material, resulting in a thorough understanding of how technology improvements impact rural tourist SMMEs. The research objectives of this article are to:

1. Identify key technological innovations affecting rural tourism SMMEs.
2. Evaluate the impact of technology on operational efficiency and market reach.
3. Examine how technology might improve tourist experiences.
4. Identify challenges and barriers to technology adoption in rural tourism SMMEs.
5. Recommendations to Improve Technological Integration in Rural Tourism SMMEs.

Importance of the Study

The impact of technology on rural tourism Small, Micro, and Medium Enterprises (SMMEs) in BRICS countries is significant due to its multifaceted nature (Sibiya, van der Westhuizen & Sibiya, 2023). Technology-driven growth can enhance the competitiveness of these enterprises, helping them overcome traditional barriers such as limited market reach and operational inefficiencies (Shaimerdenova *et al.*, 2023; Wickramasinghe & Sharma, 2005). Digital platforms and social media have revolutionized marketing strategies, making rural destinations more accessible to potential visitors (Kastenholz *et al.*, 2021). Mobile technologies and digital payment solutions have improved financial inclusion in rural areas, enabling smoother transactions and better customer service (Pazarbasioglu, Mora, Uttamchandani, Natarajan, Feyen & Saal, 2020). Technological innovations like virtual reality (VR) and augmented reality (AR)

have the potential to enrich tourist experiences by offering immersive previews and interactive content, potentially attracting more visitors, and creating new revenue streams for rural communities (Siddiqui, Syed, Nadeem, Nawaz & Alkhodre, 2022). However, the integration of technology presents challenges, including infrastructure limitations and the risk of overshadowing traditional practices (Nasibova, 2024). The digital divide in rural areas of BRICS countries remains a significant barrier, with many remote regions lacking reliable internet connectivity and necessary digital infrastructure.

There are concerns about the potential negative impacts of increased technology-driven tourism on fragile ecosystems and traditional ways of life in rural areas (Pazarbasioglu *et al.*, 2020). The rapid pace of technological change poses challenges for rural SMMEs in terms of adaptation and skills development (Siddiqui *et al.*, 2022). Many rural entrepreneurs may lack the digital literacy and technical skills required (Ciolac, 2021) to fully leverage new technologies, necessitating targeted training and capacity-building initiatives (Jongbo, 2022; Maina, 2021). Despite these challenges, the overall potential of technology to drive growth and innovation in rural tourism SMMEs across BRICS countries remains significant. By providing tools for improved marketing, operational efficiency, and enhanced visitor experiences, technology can contribute to the sustainable development of rural tourism sectors (Jabbarov, 2018). However, addressing infrastructural and digital inequalities is crucial for sustainable development and equitable benefit distribution. Future research and policy initiatives should focus on developing strategies to overcome existing barriers and ensure that the benefits of technology-driven tourism are inclusively shared among rural communities across emerging economies.

Purpose of the Systematic Literature Review

This literature review examines the influence of technology on rural tourism growth in BRICS countries, identifying key technological advancements that have impacted SMMEs, assessing their effects on growth, and highlighting opportunities and challenges associated with technological adoption. The review synthesizes findings from various studies:

Digital Marketing and Online Presence: Digital platforms, social media, and online travel agencies enhance visibility and market reach of rural tourism SMMEs. These tools provide cost-effective means for small businesses to attract global tourists (Adiyono, Rahmat & Anindita, 2021).

Operational Efficiency: Mobile technologies, digital payment solutions, and management systems improve operational efficiency and customer service (Shaimerdenova *et al.*, 2023; Iris & Lam, 2019).

Enhanced Tourist Experiences: Technological innovations like VR, AR, and interactive content enrich tourist experiences in rural areas (Breiby, Duedahl, Øian & Ericsson, 2020).

Infrastructure and Connectivity: Challenges related to technological infrastructure limitations and digital divide in rural areas are examined (Ungureanu & Ungureanu, 2020; Zhang, Meerow, Newell & Lindquist, 2019).

Economic Impact: Technology adoption has job creation, income generation, and community empowerment (Kaye, Okeagu, Pham, Silva, Hurley, Arron & Cornett, 2021).

Sustainability and Cultural Preservation: Technology promotes sustainable tourism practices and preserves cultural heritage (Jongbo, 2022; Pop, Borza, Buiga, Ighian & Toader, 2019).

Policy and Support Mechanisms: Existing policies and support mechanisms are examined to facilitate technology adoption among rural tourism SMMEs (Ungureanu & Ungureanu, 2020; Edmondson, Kern & Rogge, 2019).

This review aims to provide valuable insights for policymakers, practitioners, and researchers on how technology can support sustainable development in rural tourism. It will identify best practices, areas for improvement, and suggest future research directions to address gaps in understanding technology's role in rural tourism SMME growth across BRICS countries. The findings will contribute to the development of evidence-based strategies for technology integration in rural tourism, fostering inclusive growth, enhancing competitiveness, and ensuring long-term sustainability of rural tourism SMMEs in emerging economies.

Structure of the Paper

The paper presents a systematic review of the impact of technological advancements on rural tourism small and medium-sized enterprises (SMMEs) in BRICS countries. It outlines the methodology, databases used, inclusion and exclusion criteria, data extraction methods, and quality assessment of studies. The findings are categorized into key thematic areas such as visibility and market reach, operational efficiency, tourist experiences, and community empowerment. The paper concludes with a discussion of the implications for rural tourism SMMEs in

BRICS countries, proposing policy recommendations for leveraging technology in rural tourism development. It also highlights potential areas for further research, acknowledges the study's limitations, and provides final remarks on the future of technology in rural tourism SMMEs.

Methodology

This study uses a systematic literature review methodology to examine the influence of technology on the growth of rural tourism small, micro, and medium-sized enterprises (SMMEs) in BRICS countries. The review follows established guidelines, including Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), and involves a structured search strategy, clear inclusion and exclusion criteria, rigorous data extraction, and quality assessment of included studies. The aim is to minimize bias and provide a solid foundation for understanding the role of technology in rural tourism SMME growth across BRICS nations.

Search Strategy

A comprehensive search strategy was developed to identify relevant literature on technology, rural tourism, small and medium enterprises, BRICS countries, and impact. The search included peer-reviewed journal articles, conference papers, and relevant books published up to July 2024. Boolean operators (AND, OR) were employed to refine search results and capture a broad range of studies (Ajemunigbohun, 2023; Xiao & Watson, 2019). The use of multiple databases enhances the comprehensiveness of the review, while the inclusion of various types of publications allows for a diverse range of perspectives and findings. Keyword selection reflects the study's core concepts, and Boolean operators create more precise search strings. The time frame up to July 2024 ensures the most recent research, providing an up-to-date analysis of the field. This approach aligns with best practices in systematic review methodology, ensuring a rigorous and replicable literature search process.

Inclusion and Exclusion Criteria

Inclusion Criteria:

1. **Relevance:** Studies must focus on the impact of technology on rural tourism SMMEs specifically within BRICS countries.
2. **Publication Type:** Peer-reviewed journal articles, conference papers, and books.

3. **Time Frame:** Publications from the past ten years to ensure contemporary relevance.
4. **Language:** English-language articles.

Exclusion Criteria:

1. **Geographical Scope:** Studies not focused on BRICS countries were excluded.
2. **Focus Area:** Research focusing solely on urban tourism or technology impacts outside the context of rural tourism SMMEs was excluded.
3. **Publication Date:** Articles published before 2014 were excluded to maintain relevance.

Data Extraction and Analysis

Data extraction involved systematically reviewing the abstracts, introductions, and conclusions of selected studies to determine their relevance and quality. Full-text articles were then assessed to extract key information on:

- **Technological Innovations:** Types of technology discussed (e.g., digital marketing tools, mobile payments, VR/AR applications).
- **Impact on SMMEs:** Effects on visibility, operational efficiency, tourist experiences, and community empowerment.
- **Geographical Context:** Specific insights related to each BRICS country.
- **Challenges Identified:** Issues related to technology adoption and implementation.

A data extraction form was used to capture these details, ensuring consistency and comprehensiveness. The extracted data was then synthesized thematically to identify patterns, trends, and gaps in the current research.

Quality Assessment

The review used a modified version of the PRISMA checklist to assess the quality of included studies. The checklist evaluated key aspects such as research objectives, methodology, relevance, and findings. The reviewers adapted the PRISMA guidelines to ensure a comprehensive and standardized approach. High-quality studies with methodological rigor and relevance to the research question were prioritized for inclusion. This approach allowed reviewers to focus on the most relevant and reliable evidence, enhancing the overall quality and validity of the systematic review. The review aimed to present credible and applicable

research findings, providing a solid foundation for future research and informing evidence-based practices in the field.

Synthesis of Findings

The synthesis involved grouping the findings into key thematic areas based on the impact of technology on rural tourism SMMEs. Themes included:

1. **Visibility and Market Reach:** How technology enhances promotional activities and attracts global tourists.
2. **Operational Efficiency:** The role of technology in streamlining business processes and transactions.
3. **Tourist Experience:** Technological innovations that improve visitor experiences.
4. **Community Empowerment:** How technology supports local businesses and economic development.

The findings from various studies were compared and contrasted to provide a comprehensive understanding of the impact of technology on rural tourism SMMEs in BRICS countries.

Findings

The systematic literature review on the impact of technology on rural tourism SMMEs in BRICS countries reveals significant transformations across multiple facets of the industry. Technological advancements have markedly improved the visibility of these enterprises, likely through enhanced online presence and digital marketing strategies, enabling them to reach a broader audience beyond their immediate locales. Operational efficiency has also seen substantial improvements, with digital tools streamlining processes and potentially reducing operational costs. Furthermore, the review indicates that technology has played a crucial role in enhancing customer experiences, possibly through innovative applications that enrich tourists' interactions with rural destinations and local cultures.

Community empowerment emerges as another key finding, suggesting that technology has enabled local communities to take greater control of and derive more benefits from tourism activities in their areas. This could involve platforms for direct bookings, digital storytelling of local heritage, or apps that facilitate authentic cultural exchanges. Collectively, these findings underscore the transformative potential of technology in rural tourism, particularly for SMMEs in emerging economies. They highlight how digital tools and platforms are not just

modernizing business operations but also reshaping the very nature of rural tourism experiences and their impact on local communities.

Enhancing Visibility and Marketing

Digital marketing tools have significantly enhanced the visibility and promotional capabilities of rural tourism SMEs in BRICS countries (Jongbo, 2022; Swift, Guide Jr & Muthulingam, 2019). Social media platforms, travel blogs, and online review sites have significantly increased the exposure of rural destinations to a global audience, allowing rural areas to showcase their unique attractions and experiences (Rogerson & Parry, 2020). Platforms like Facebook and Instagram have become virtual windows to the world, enabling even the most remote destinations to capture potential visitors' imagination. The democratization of marketing through these digital tools has profoundly impacted rural tourism economies, with user-generated content on platforms like TripAdvisor becoming a powerful influencer in tourists' decision-making processes (Senyao & Ha, 2022). This peer-to-peer information sharing provides authentic insights for lesser-known rural destinations. By leveraging these digital platforms, rural tourism SMEs can reach and attract tourists more effectively, potentially leading to significant economic benefits for local communities.

Improving Access and Infrastructure

Technological advancements have significantly improved accessibility and operational efficiency for rural tourism SMEs in BRICS countries. GPS navigation systems and online mapping services have opened up remote rural locations, reducing travel disruptions and boosting visitor confidence (Nicoletti, Sirenko, & Verma, 2023). Online booking platforms like Booking.com and Airbnb have simplified the process of securing accommodation in rural areas. Mobile payment systems like M-Pesa have addressed limited banking infrastructure in some rural areas, facilitating smoother economic transactions for travellers. These technological solutions contribute to increased tourism flow to rural destinations and potentially leading to economic growth in these areas (Huseynov, 2023; Amalindo, Saggaff & Arliansyah, 2019).

On the operational front, mobile technologies and digital payment solutions have streamlined financial transactions and inventory management (Filipova, *et al.*, 2024). Mobile payment systems like M-Pesa and Alipay have enhanced security and simplified transactions, benefiting both businesses and tourists (Kuleto *et al.*, 2023; Banerjee, Duflo & Qian, 2020). Digital tools for inventory management, booking systems, and customer relationship management have empowered rural

tourism SMEs to operate more efficiently and provide higher-quality services (Trencheva *et al.*, 2024). These operational improvements enable rural businesses to compete more effectively in the broader tourism market, potentially leading to increased profitability and sustainability.

Enriching Tourist Experiences

The integration of advanced technologies like virtual reality (VR), augmented reality (AR), and mobile applications has significantly transformed the tourist experience in rural destinations, particularly in BRICS countries (Egunjobi, 2022; Ivasciuc, 2020). These technologies offer immersive previews of attractions, allowing users to virtually explore rural lodges, cultural sites, and natural landscapes (Serafimova, & Filipova, 2024). This pre-visit engagement helps tourists make informed decisions, build anticipation, and potentially increase bookings. VR and AR provide powerful tools to showcase rural destinations' unique appeal through vivid, interactive methods (Abd Halim, Mokhtar, Mohamad, Zakaria, Abd Hamid, Masnan & Saidin, 2024).

Mobile applications and digital guides enrich tourists' experiences by providing real-time, context-aware information about local attractions, history, and cultural practices (Crespi-Vallbona & Mascarilla-Miró, 2020). This technology-enabled information delivery deepens tourists' understanding and appreciation of the local culture and environment, leading to more meaningful and educational travel experiences (Zhang, Sotiriadis & Shen, 2022). Additionally, these digital tools can help overcome language barriers and provide personalized recommendations, enhancing the overall quality and enjoyment of the visit. By leveraging these technologies, rural tourism Small and Medium Enterprises (SMMs) can offer more engaging, informative, and memorable experiences, potentially leading to increased visitor satisfaction, longer stays, and positive word-of-mouth recommendations.

Empowering Local Communities

Technology has significantly impacted rural tourism, especially in BRICS countries, through direct market access and skill development (Ullah, Raza & Mehmood, 2023). E-commerce platforms and social media have revolutionized the way local artisans, farmers, and service providers market their products and services, bypassing traditional intermediaries (Egunjobi, 2022; Graham, 2019). This direct connection to international markets allows local producers to showcase their unique products to a wider customer base, potentially increasing sales and income (Kuleto, Ilic, Rankovic, Popovic-Sevic & Gurgu, 2023). Hoskins, Verhaal

and Griffin (2020). Additionally, it cuts out middlemen, ensuring a larger share of revenue remains within the local economy, contributing to more equitable economic development. This direct-to-consumer model helps preserve traditional crafts and agricultural practices by making them economically viable in a global marketplace (Rahimi & Demirbaş, 2023). Technology-driven training programs and community-based tourism initiatives are crucial in building the capacity of local communities to manage and promote tourism effectively (Huseynov, 2023; Trunfio & Campana, 2020). These programs equip local residents with valuable skills and knowledge, enabling them to take an active role in shaping tourism development while preserving their cultural and natural heritage.

Challenges and Considerations

The integration of technology into rural tourism SMEs in BRICS countries faces significant challenges due to infrastructure limitations and the need to balance technological advancement with cultural preservation (Shaidullina & Semenovskiy, 2022). The digital divide in rural areas hinders the full realization of technology's potential in rural tourism, as inadequate internet connectivity makes it difficult for rural SMMEs to utilize online marketing platforms, booking systems, or offer digital experiences to tourists (Torabi, Rezvani, Hall & Allam, 2023). This connectivity gap can put rural destinations at a disadvantage compared to urban counterparts, potentially exacerbating existing economic disparities (Carson, Carson & Argent, 2022). Lack of technological support and digital literacy in rural areas further complicates the adoption of new technologies. Many rural tourism operators may lack the skills or resources to effectively implement and maintain digital systems, limiting their ability to compete in an increasingly technology-driven market.

The research by Vinnakota, Mohan, Boda, Askarzai, Devkota, Shetty and Choden (2023) raises the risk of over-reliance on technology overshadowing traditional tourism practices and cultural authenticity. It is essential to balance technological innovation with cultural preservation for sustainable tourism development in these areas. This might involve developing technology solutions that complement and enhance traditional practices rather than replace them or creating digital platforms that showcase and explain local cultural heritage respectfully and authentically. Context-specific approaches to technology integration in rural tourism are needed, considering infrastructure gaps, building local capacity, and ensuring that technological advancements support the unique cultural and natural assets of rural destinations.

Conclusion

The literature review highlights the transformative impact of technology on rural tourism SMEs in BRICS countries. It highlights the enhancement of rural destinations' visibility through digital marketing tools, improved operational efficiency through streamlined processes and digital payment solutions, and enhanced tourist experiences through immersive technologies like VR and AR. These technological integrations have contributed to the growth and competitiveness of rural tourism SMEs, enabling them to reach wider audiences, operate more efficiently, and offer enhanced experiences to visitors. However, the review also highlights the challenges of infrastructure limitations and digital divide issues in rural areas, as well as the delicate balance between leveraging technology and preserving cultural authenticity. Addressing these challenges is crucial for sustainable and equitable growth in the sector. Future research should focus on overcoming infrastructural barriers, developing context-specific technological solutions, and integrating digital tools in a way that complements traditional practices.

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SATISFACTION WITH HUMAN RESOURCE MANAGEMENT IN COMPANIES AMONG RESPONDENTS OF VARIOUS SOCIO-DEMOGRAPHIC CHARACTERISTICS

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Abstract

Contemporary business society is increasingly moving towards the services sector, which focuses significance of the service quality and the employee satisfaction in providing quality service in order to secure competitive advantages of the companies. The main purpose of this research was to examine satisfaction with human resource management in the service sector among respondents of various socio demographic characteristics. As socio demographic characteristics authors used the following: gender, marital status, place of residence of the respondents, vocational degree and amount of monthly income. For that purpose, the original empirical research was conducted within the company Post of Serbia. IBM SPSS program 25 was used for statistical analysis. The key findings confirm the hypotheses set and indicate significant differences in the perception of HR management depending

on socio-demographic factors. The research results emphasize the importance of individual, regional and economic factors in the perception of human resources management, which can be useful for further research and improvement of HR practices in the contemporary companies.

Key words: *job satisfaction, employees, service sector, human resources management (HRM), socio demographic characteristics.*

JEL Classification: D23, J23, M12, O15

Introduction

Business society is in a phase of deep transformation which is the result of constant changes in the external and internal environment. In modern business, there is a shift from products to services that are created in such a way as to satisfy the growing needs of consumers, thus reducing the border between products and services more and more. As Premović point out, contemporary business society is increasingly moving towards the services sector, which focuses significance of the service quality in order to secure competitive advantages of the organizations. Organizations could not affect the environment and wouldn't be successful in competition arenas, even if they had the best technologies or facilities, but they didn't have skilled and efficient employees (Premović, 2025).

Employees are the life-blood of any business establishment. Even though virtually all organization is nowadays technologically driven in modern business management, human resources are still relevant and most desirable resources of the organization. The essential values of human resources stem from the fact that, apart from other resources employed in the course of production (Land, capital, technology etc.) which is passive, employees are endowed with discretionary decision-making powers and thus have competitive advantage over the other resources. Therefore, they are the most highly important and active resources of an organization (Irabor & Okolie, 2019).

Numerous theoretical and empirical studies have investigated the relationship between employees, their job satisfaction and intention to leave the company (Kurniawati, 2019; DiPietro, 2020; Romeo et al., 2020; Quek, 2021; Berber et al., 2022). Berber et al. (2020) investigated the dynamic capabilities of companies in the context of employee satisfaction and their tendency to turnover. This dynamic capabilities framework has been applied to different types of service companies, suggesting that future research could include other sectors, such as the

accommodation industry, where this concept could be relevant (Esitti & Kasap, 2020). The study indicates the connection of employee satisfaction with the dynamic capabilities of the organization, whereby the intention to leave the company is seen as a mediating factor in the relationship between employee satisfaction and the company's ability to adapt to changes. A company's stable dynamic capability refers to its ability to quickly reorganize and respond to market changes (Liu et al., 2021). Job satisfaction is a complex and multidimensional concept that is analyzed from different angles. In general, it is defined as a positive emotional state of an individual that results from his evaluation of work or experience at the workplace (Fisher, 2010). Employee satisfaction can be influenced by various factors, such as leadership style, level of work engagement, relationship with colleagues or salary (Sang et al., 2019). In this context, work engagement, which implies the degree of involvement, commitment and enthusiasm of employees towards their work and organization (Schuck et al., 2014), is closely related to job satisfaction. Namely, more satisfied employees often show a higher level of work engagement (Batura et al., 2016), which indicates the positive impact of job satisfaction on employee engagement (Pancasila et al., 2020). However, job satisfaction may depend on various factors (Kurniawati et al., 2019), including the perception of leadership, salary, sense of fulfillment through work, opportunities for advancement, employee turnover, and relationships among colleagues. Therefore, it is important to identify the key factors that most influence job satisfaction and its connection with work engagement (Dziuba et al., 2020). Some researchers point out those resource-based theories should fully explain how companies gain competitive advantage in a dynamic business environment, emphasizing the importance and role of dynamic capabilities. This need arises from the accelerated development of science and technology, as well as growing market competition in recent years (Winter, 2003). In order for a company to maintain its competitive advantage in changing conditions, it is necessary for its capabilities to be adaptive and dynamic (Ren et al., 2021). The key to success lies in the continuous improvement of those capabilities to ensure that the business strategy remains aligned with the external environment (Teece & Leih, 2016).

Silalahi and Sundiman (2016) point out those human resources should introduce an innovative way of thinking in company management, using available knowledge. Competent human resources play a key role in ensuring the long-term survival of a company. They represent a knowledge-based resource and possess the necessary skills to follow and master technological changes. Managers facing

business competition can choose between three strategies. They can focus on protecting their positions and resources, they can effectively manage and use their unique assets, or they can flexibly adapt and take advantage of temporary opportunities within basic business principles. Each of these strategies requires different competencies and functions optimally in specific conditions. The approaches used to determine the most effective coordination models in HR strategies are continuously evolving, adapting to changes in the business environment. The task of human resources management is to correctly define goals, direct organizational policy, plan the budget for personnel, as well as to coordinate and supervise HR processes. Based on this, he assumes a management role to ensure the achievement of the set goals. The person or team in charge of running the organization must operate in various sectors, including research, development, economics, marketing, IT, as well as the production segment. Thus, human resource management includes a strategic and systematic approach to working with employees, with the emphasis on attracting, motivating, professional development and retaining professional staff in order to improve business. Modern business conditions additionally emphasize the importance of effective HR management, because it plays a key role in the sustainability, development and success of the organization.

Literature Review

Employee satisfaction plays a crucial role in organizational success. Employee satisfaction is the state in which workers are happy and getting what they need and want from their jobs. Employee satisfaction is vital, but so is their ability to do assigned duties and contribute in any way that the company requests (Adewale et al., 2024). A high employee turnover rate represents one of the biggest challenges for companies, bringing numerous economic, psychological and organizational consequences (Jozsef et al., 2021), including the loss of professional staff and institutional knowledge (Verma & Kesari, 2020).

In recent years, research has intensively addressed the problem of employees' intention to leave the company, given the increasing difficulties faced by countries and companies in terms of recruiting and retaining an adequate workforce (Verma & Kesari, 2020; Jozsef et al., 2021).

Key responsibilities of HR managers include attracting, developing and retaining talented employees. The business environment and the labor market are affected by a number of challenging factors, the most significant of which are the emergence of new generations of workers (generations Y and Z) with different views on work, career and authority, then contemporary political, social and

economic challenges, the COVID-19 pandemic, as well as accelerated technological development.

Many companies today strive to achieve their goals with minimal investment, often neglecting employee satisfaction, both in the public and private sectors. This problem is also present in postal organizations, where a chain reaction occurs - employers strive for better efficiency with as little investment as possible, which leads to dissatisfaction of employees, and therefore of service users. In successful world organizations, employee satisfaction is considered a key resource for development, so special attention is paid to managing their potential. In order to increase their motivation and engagement, various methods are applied. Today, the success of an organization is not measured solely by profit, but the focus is on achieving the interests of all parties involved, including managers, employees and users. The key to the long-term success of a modern company is precisely satisfied employees (Tanasijević, 2006). For some people, work is a form of social recognition, for others it is a way of expressing creativity, and some find a deeper meaning in existence. However, for most people it primarily serves as a means of ensuring their existence. Motivation has become one of the key topics in management, and one of its definitions refers to a theoretical concept that explains the reasons why people in certain circumstances make certain decisions and behave in a certain way (Pavlović et al., 2014). The need for a better understanding of the mechanisms of human behavior has led to the development of various theories of work motivation, which are the basis for creating effective incentive systems, management practices and organizational policies. The goal is to increase employee engagement and encourage their creative contribution, which has become one of the main challenges of modern business and development. Motives can be viewed as psychological factors that motivate an individual to action, direct their efforts and encourage perseverance in activities that lead to the achievement of certain goals and the satisfaction of certain needs. Motives are divided into biological and social according to their origin, and into external and internal according to their choice (Mašić & Tot, 2020).

Employees can respond to good HRM practices not only through their actions, but also through positive work attitudes, such as job satisfaction, engagement, commitment, and other traits. However, most research has focused on job satisfaction as one of the most frequently studied variables. This is because employees' work attitudes, which include evaluative, cognitive, and affective components (Williams et al., 2017), reflect the degree of their satisfaction with the work they do. When it comes to employee turnover, the most effective way to

investigate this phenomenon is to monitor their intentions to leave their jobs, as these intentions are a reliable indicator of employees' actual behavior regarding leaving the organization (Verma & Kesari, 2020).

A review of the literature on the relationship between leadership satisfaction and its impact on employee engagement reveals several key findings from different leadership perspectives. Authentic leadership is associated with greater trust in management, employee empowerment, and employee engagement (Laschinger et al., 2012). Research shows that satisfaction with pay is positively associated with employee engagement (Tugade & Arcinas, 2023). Namely, financial rewards, including pay, are key factors that influence job satisfaction and employee motivation (Chinyio et al., 2018). In addition, satisfaction with pay is directly linked to improved work performance (Ewool et al., 2021).

Also, factors such as organizational support, leadership, and work environment can mediate the relationship between pay satisfaction and employee engagement (Majid et al., 2020). However, it is important to note that this relationship may vary depending on individual characteristics and context (Hsiao & Lin, 2018). Overall, pay satisfaction plays a significant role in driving work engagement (Bartolome et al., 2023). Strategic management directs the entire business of a company, defining its objectives, creating policies and plans to achieve them, and allocating resources to implement them. Management theorists and practitioners have developed numerous models and frameworks that help in making strategic decisions in complex environments and competitive conditions. Strategic management is not a static process; most models contain feedback mechanisms that allow monitoring the implementation of strategies and adjusting future plans. Many organizations use time frames that determine the dynamics of key business cycles.

From a resource-based strategy perspective, the importance of resources and capabilities in developing organizational strengths is emphasized. Innovation is key to gaining competitive advantage. Development systems are of vital importance for small and medium-sized enterprises, especially in order to improve long-term stability. Innovations are divided into two types: radical and gradual. A radical innovation is one that brings a significant and new change, which becomes a basic approach in an industry. On the other hand, incremental innovations refer to improvements and changes that are consistent with existing practices. Innovation is a powerful driver of business strength and organizational progress, especially when it comes to performance. The division's business strategy can be aimed at increasing its advantages in the production and provision of products and services.

Business strategies should integrate various beneficial activities to achieve the division's objectives. The concept of organizational advantage was developed using a general methodology from previous research. Factors that enable high competitive advantage include imitability, longevity and ease of integration. A high advantage is crucial for an organization's performance in a competitive market. An organization's advantage derives from the value or benefits it can create for its customers. If an organization can achieve an advantage in one of these three basic strategies, it is viewed from the side of interests, as well as from the point of view of the market in which it is directed. The ability to implement this strategy is evaluated from the side of the organization's resources and capabilities (Farida & Setiawan, 2022). Human resource management in strategy, on the other hand, the contingency approach believes that to improve business performance, it is necessary to ensure coherence between human resources policy, business strategy and other organizational aspects, so that the behavior of employees is aligned with the company's goals. Finally, there is the configuration approach. This approach relies heavily on the company's ability to create human resources as a planned system or pattern (planned human resources) that organizes each activity to achieve horizontal alignment (internal alignment) and vertical alignment (external alignment), which will result in better business performance. Horizontal alignment or horizontal fit shows agreement among different practices in human resource management, while vertical fit shows agreement between HR functions (systems and strategies) and the firm's strategy.

Workplace conflicts and job satisfaction are two major factors that affect organizational effectiveness. Some studies have even analyzed the role of employees' collectivistic traits as a moderating factor in the relationship between conflicts and employee job satisfaction (Ye, Liu & Gu, 2019). Workplace conflicts can be considered one of the most current topics for researchers, both in psychology and management (Williams, 2010). Different theories try to contribute to the study of human behavior and show how people achieve personal growth and development in the workplace (Janicijevic, 2008). Conflicts at the workplace and their resolution are key issues for the entire human activity, personal value systems, work activities, as well as the society in which this process takes place. Direct and indirect involvement in workplace conflicts affects individual well-being (Enehaug, Helmersen & Mamelund, 2016). Also, these conflicts are one of the most intriguing and interesting subjects of organizational behavior and human resource management. Conflicts in the workplace can be considered one of the most current topics for researchers, both in psychology and in management.

Different theories try to contribute to the study of human behavior and show how people achieve personal growth and development in the workplace (Pavlović et al., 2022). Conflicts at the workplace and their resolution are key issues for the entire human activity, personal value systems, work activities, as well as the society in which this process takes place. Direct and indirect involvement in workplace conflicts affects individual well-being (Enehaug, Helmersen & Mamelund, 2016). Also, these conflicts are one of the most intriguing and interesting subjects of organizational behavior and human resource management. In many theories and models of certain attitudes and behaviors, job satisfaction plays an important role, and research on this topic can be applied to improve human lives and organizational effectiveness (Judge & Klinger, 2008). Hoboubi et al. (2017) investigated the impact of workplace stress and job satisfaction on workforce productivity, identifying factors associated with declining productivity among employees.

Theoretical Background

Based on the theoretical approach, the authors decided to put the following elements in the questionnaire and examine certain dimensions of HR: HR management's transgression, strategic management, planning, job analysis and satisfaction.

Post of Serbia is a company that occupies a leading position among companies that provide a set of integrated postal services, oriented to users, accessible to everyone, recognizable among the competition, while constantly setting higher quality standards. With more than 1,800 access points and close to 3,500 delivery regions, the company covers all 88,390 square kilometres of the territory of the Serbia and connects them successfully with the rest of the world. One of the basic values of the company is „*Motivation, recognition of knowledge and skills of employees*” (<https://www.posta.rs/eng/o-nama/posta-danas.aspx>). Bearing in mind these data, the authors investigated the extent to which the employees of Post of Serbia are satisfied with the HR management in the company.

Research subject: Research on the connection between personnel practices, strategic human resource management, planning, job analysis, employee satisfaction and workplace conflicts, with a focus on the Post of Serbia.

Research objectives:

1. Analyze the role and contribution of personnel approaches and the human resources department in achieving organizational goals.
2. Examine the impact of strategic human resource management on employee satisfaction.

3. Determine the connection between human resources planning and the quality of employees' work.
4. Analyze how clearly defined job descriptions and responsibilities affect employee productivity and satisfaction.
5. Assessment of the effects of conflict management on interpersonal relations and work atmosphere.

Research objectives 2:

1. Identify the role of personnel practices within the Post of Serbia and their impact on operational efficiency.
2. Examine the contribution of strategic human resources management in the realization of key business functions, such as marketing, production, legal affairs and others.
3. Analyze the importance of human resource planning, including recruitment, training and reward system, to employee satisfaction.
4. Determine the connection between clearly defined job descriptions and employees' perception of their tasks and responsibilities.
5. Assessment of the effect of job systematization on productivity and organizational culture.
6. Examine the influence of the competence of superiors on the satisfaction of employees and their motivation for work.
7. Analyze the role of the reward system in the perception of fairness and opportunities for advancement.
8. Determine patterns of behavior in conflicts and identify the most effective strategies for managing conflicts in the Post of Serbia.
9. Consider the impact of interpersonal relationships on the workplace atmosphere and employee satisfaction.
10. Analyze the demographic characteristics of employees (age, length of service, education) and their impact on job satisfaction and conflict management.

Hypotheses:

- H1: There is a significant relationship between strategic human resource management and employee satisfaction.
- H2: Clearly defined job descriptions and responsibilities have a positive effect on the work productivity of employees.
- H3: Systematization of workplaces and assessment of employee success contribute to greater motivation and employee satisfaction.

H4: An adequate reward system has a significant impact on employees' perception of opportunities for advancement and salary increase.

H5: An open approach to conflict resolution reduces tensions and improves interpersonal relations in the organization.

Research results

In the research 164 respondents who work at the Post of Serbia participated, of which 68 were male and 96 were female (Table no. 1). The majority of respondents are aged 51 to 55 (74 respondents), followed by 41 to 45 years (34 respondents) (Figure no. 1). The respondents' work experience ranges from 2 to 41 years ($AS=26.51$, $SD=9.84$). More than half of respondents are married (55.5%), while the smallest number are single (18.9%) (Table no. 1). Most respondents are from Belgrade and its surroundings (36%) and Šumadija and Western Serbia (30.5%). The majority of respondents have completed university (48.2%) and secondary school (40.2%). Also, the majority of respondents have incomes from 65,001 to 90,000 dinars (47.6%), while the smallest number of respondents have salaries from 90,001 to 120,000 dinars.

Table no. 1. Sociodemographic characteristics of respondents

		f	[%]
Gender	Male	68	41.5
	Feminine	96	58.5
Marital status	Married	91	55.5
	Alone	31	18.9
	Divored	42	25.6
Place of residence	Belgrade and surroundings	59	36.0
	Region of Vojvodina	32	19.5
	Eastern and Southern Serbia	23	14.0
	Šumadia and Western Serbia	50	30.5
Vocational degree	High school	66	40.2
	Higher school	79	48.2
	Faculty	19	11.6
Amount of monthly income	Up to 65000 dinars	67	40.9
	From 65001 to 90000 dinars	78	47.6
	From 90001 to 120000 dinars	19	11.6

Source: Authors' research

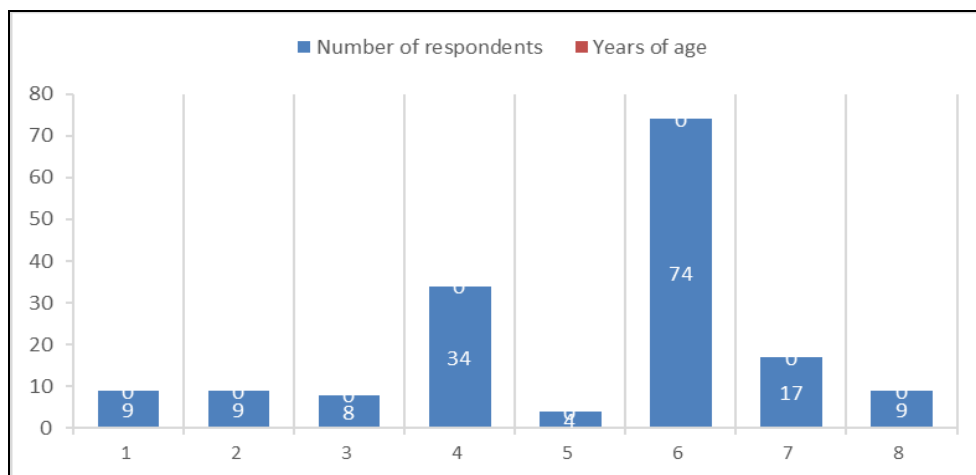


Figure no. 1. Age of respondents

Source: Authors' research

Based on the results shown in Table no.2, it can be concluded that respondents are most satisfied with strategic HR management (AS=5.00, SD=0.00) and the HR management approach (AS=4.73, SD=0.16), while they are least satisfied with the work they do (AS=3.39, SD=0.22).

Table no. 2. Human resources management

	Min	Max	AS	SD
Personnel approach	3.67	5.00	4.60	0.33
HR management approach	4.17	5.00	4.73	0.16
HR strategic management	5.00	5.00	5.00	0.00
HR planning	3.50	4.25	3.81	0.14
Job analysis	2.75	4.50	3.58	0.34
Job satisfaction	2.78	3.89	3.39	0.22
Conflicts	2.90	4.50	3.56	0.27

Source: Authors' research

The research examined whether there are statistically significant differences in human resource management in relation to the gender of the respondents. To examine the differences in relation to gender, an independent samples t test was used.

Based on the results of the t test shown in Table no. 3, it can be concluded that a significant difference exists for HR planning, where men have a higher level of satisfaction compared to women.

Table no. 3. Differences in satisfaction with human resources management by gender

	Male (N=68)	Female (N=96)	t	p
	Average value			
Personnel approach	4.59 ± 0.36	4.60 ± 0.32	-0.178	0.859
HR management approach	4.71 ± 0.16	4.74 ± 0.17	-0.990	0.324
HR planning	3.84 ± 0.14	3.79 ± 0.14	2.527	0.012*
Job analysis	3.57 ± 0.35	3.59 ± 0.33	-0.419	0.676
Job satisfaction	3.37 ± 0.22	3.41 ± 0.22	-1.103	0.272
Conflicts	3.55 ± 0.29	3.57 ± 0.26	-0.586	0.558

*Statistical significance at the 0.05 level

Source: Authors' research

The research examined whether there are statistically significant differences in human resource management in relation to the marital status of the respondents. To examine the differences in relation to marital status, a one-way analysis of variance (ANOVA) was used. Based on the results of the ANOVA test shown in Table no. 4, it can be concluded that there is no significant difference in satisfaction with human resource management in relation to marital status.

Table no. 4. Differences in the satisfaction of human resources management in relation to marital status

	Married (N=91)	Single (N=31)	Divorced (N=42)	F	p
	Average value				
Personnel approach	4.55 ± 0.36	4.62 ± 0.31	4.69 ± 0.28	2.331	0.100
HR management approach	4.73 ± 1.47	4.75 ± 0.16	4.70 ± 0.21	0.797	0.453
HR planning	3.81 ± 0.14	3.81 ± 0.12	3.81 ± 0.14	0.005	0.995
Job analysis	3.57 ± 0.30	3.64 ± 0.35	3.55 ± 0.41	0.598	0.551
Job satisfaction	3.39 ± 0.23	3.41 ± 0.23	3.40 ± 0.20	0.108	0.897
Conflicts	3.53 ± 0.25	3.59 ± 0.30	3.61 ± 0.28	1.691	0.118

*Statistical significance at the 0.05 level

Source: Authors' research

The research examined whether there are statistically significant differences in human resource management in relation to the place of residence of the respondents. A one-way analysis of variance (ANOVA) was used to examine differences in relation to the place of residence.

Based on the results of the ANOVA test shown in Table no. 5, it can be concluded that a significant difference exists for the personnel approach, approach to HR management and conflicts in relation to the place of residence. Based on the results of the post hoc test, it can be concluded that a significant difference in the personnel approach exists between respondents from Šumadija and Western Serbia with respondents from Belgrade and the surrounding area ($p < 0.0005$), the Vojvodina region ($p = 0.015$) and Eastern and Southern Serbia ($p = 0.001$), where respondents from Šumadija and Western Serbia have significantly lower satisfaction with the personnel approach compared to other groups of respondents. Based on the results of the post hoc test, it can be concluded that a significant difference in the approach to HR management exists between respondents from the Vojvodina region and respondents from Eastern and Southern Serbia ($p = 0.007$), where respondents from the Vojvodina region have lower satisfaction with the approach to HR management. Based on the results of the post hoc test, it can be concluded that a significant difference in conflicts exists between respondents from Šumadija and Western Serbia with respondents from Belgrade and the surrounding

area ($p=0.021$) and the Vojvodina region ($p=0.001$), where respondents from Šumadija and Western Serbia are more prone to conflict.

Table no. 5. Differences in satisfaction with human resources management by place of residence

	Belgrade and surroundings (N=59)	Vojvodina region (N=32)	Esatern and southern Serbia (N=23)	Šumadija and Western Serbia (N=50)	F	p
	Average value					
Personnel approach	4.67 ± 0.27	4.64 ± 0.29	4.73 ± 0.22	4.42 ± 0.40	7.700	<0.0005*
HR managment approach	4.73 ± 0.16	4.67 ± 0.21	4.82 ± 0.14	4.72 ± 0.14	3.649	0.014*
HR planning	3.80 ± 0.14	3.83 ± 0.14	3.84 ± 0.10	3.80 ± 0.15	0.679	0.566
Job analysis	3.55 ± 0.31	3.66 ± 0.39	3.48 ± 0.39	3.62 ± 0.29	1.601	0.191
Job satisfaction	3.40 ± 0.20	3.41 ± 0.23	3.47 ± 0.20	3.35 ± 0.24	1.649	0.180
Conflicts	3.60 ± 0.27	3.69 ± 0.32	3.53 ± 0.25	3.45 ± 0.21	5.924	0.001*

*Statistical significance at the 0.05 level

Source: Authors' research

The research examined whether there are statistically significant differences in human resource management in relation to the monthly income of the respondents. A one-way analysis of variance (ANOVA) was used to examine the differences in relation to monthly income.

Based on the results of the ANOVA test shown in Table no. 6, it can be concluded that a significant difference exists for the approach to HR management and conflicts. Based on the post hoc test, it can be concluded that a significant difference exists between respondents with an income of 90,001 to 120,000 dinars with respondents whose income is up to 65,000 dinars ($p=0.014$) and respondents with an income of 65,001 to 90,000 ($p=0.002$), where respondents with higher

incomes are less satisfied with the approach to HR management. Based on the post hoc test, it can be concluded that a significant difference in conflicts exists between respondents with an income of 90,001 to 120,000 dinars with respondents whose income is up to 65,000 dinars ($p=0.049$) and respondents with an income of 65,001 to 90,000 ($p=0.016$), where respondents with higher incomes are less prone to conflict.

Table no. 6. Differences in satisfaction with human resources management in relation to monthly income

	Unitl 65000 (N=67)	From 65001 to 90000 (N=78)	From 90001 to 120000 (N=19)	F	p
	Average value				
Personnel approach	4.57 \pm 0.36	4.60 \pm 0.33	4.70 \pm 0.26	1.086	0.340
HR management approach	4.73 \pm 0.16	4.76 \pm 0.14	4.61 \pm 0.22	6.056	0.003*
HR planning	3.79 \pm 0.13	3.82 \pm 0.14	3.84 \pm 0.16	1.283	0.280
Job analysis	3.55 \pm 0.34	3.58 \pm 0.35	3.72 \pm 0.28	1.875	0.157
Job satisfaction	3.42 \pm 0.21	3.39 \pm 0.22	3.32 \pm 0.23	1.681	0.189
Conflicts	3.55 \pm 0.29	3.53 \pm 0.23	3.72 \pm 0.32	3.933	0.021*

*Statistical significance at the 0.05 level

Source: Authors' research

The research examined whether there are statistically significant differences in human resource management in relation to the level of professional education of the respondents. One-way analysis of variance (ANOVA) was used to examine differences in relation to the level of professional education.

Based on the results of the ANOVA test shown in Table no. 7, it can be concluded that a significant difference exists for the approach to HR management and conflicts. Based on the post hoc test, it can be concluded that a significant difference exists between respondents with a university degree and respondents with a secondary school degree ($p=0.001$) and respondents with a higher education degree ($p=0.001$), where respondents with a university degree are less satisfied with the approach to HR management. Based on the post hoc test, it can be concluded that a significant difference exists for conflicts between respondents with a university degree and respondents with a secondary school degree ($p=0.046$)

and respondents with a higher education degree ($p=0.017$), where respondents with a university degree are more prone to conflict.

Table no. 7. Differences in satisfaction with human resources management in relation to the level of education

	High School (N=66)	College (N=79)	Faculty (N=19)	F	P
	Average value				
Personnel approach	4.56 ± 0.36	4.61 ± 0.33	4.70 ± 0.26	1.233	0.294
HR managment approach	4.73 ± 0.16	4.76 ± 0.14	4.61 ± 0.22	6.335	0.002*
HR planning	3.80 ± 0.12	3.82 ± 0.14	3.84 ± 0.16	0.906	0.406
Job analysis	3.55 ± 0.34	3.57 ± 0.35	3.72 ± 0.28	1.800	0.169
Job satisfaction	3.42 ± 0.21	3.39 ± 0.23	3.32 ± 0.23	1.465	0.234
Conflicts	3.55 ± 0.29	3.53 ± 0.22	3.72 ± 0.32	3.880	0.023*

*Statistical significance at the 0.05 level

Source: Authors' research

The research examined whether there is a statistically significant correlation between satisfaction with human resources management and the length of service of the respondents. Pearson correlation analysis was applied to examine the correlation.

Based on the results of the correlation analysis shown in Table no. 8, it can be concluded that there is no significant correlation between length of service and satisfaction with human resources management.

Table no. 8. Relationship between satisfaction with human resources management and length of service of respondents

	Length of service
Personnel approach	-0.114
HR managment approach	-0.115
HR planning	0.079
Job analysis	0.023
Job satisfaction	-0.126
Conflicts	-0.017

*Statistical significance at the 0.05 level

Source: Authors' research

Discussion of results

The results of the research indicate the important role of human resource management in employee satisfaction and organizational efficiency within the Serbian Post. The key findings confirm the hypotheses set and indicate significant differences in the perception of HR management depending on sociodemographic factors.

The analysis of employee satisfaction showed that the respondents are most satisfied with strategic human resource management and the approach of HR management, while satisfaction with the work they do is lower. These findings suggest that although HR strategies have a positive effect, there is room for improvement in the domain of the daily work experience of employees. Special attention should be paid to working conditions, professional development opportunities and transparency in communication between employees and management.

The statistical analysis showed that there is a significant difference in satisfaction with human resource planning between men and women, with men expressing greater satisfaction. This result may indicate differences in the perception of the work environment and the need for professional development by gender, but also the possible presence of gender differences in the approach to human resource management. Further research could focus on identifying the specific needs and challenges faced by women in the work environment.

In terms of marital status, no statistically significant difference was found in satisfaction with HR management, suggesting that this factor does not play a crucial role in the perception of the effectiveness of HR policies. This finding may indicate that business challenges and organizational culture have a greater impact on employee satisfaction than personal factors such as marital status.

On the other hand, place of residence proved to be a significant factor affecting satisfaction with the personnel approach, HR management approach and level of conflicts. The difference is particularly pronounced between respondents from Šumadija and Western Serbia and those from Belgrade and the surrounding area, where satisfaction is lower and conflicts are more present. This finding may indicate differences in organizational culture and management practices in different parts of the country, but also the need for a decentralized approach to human resource management in order to better respond to specific regional challenges. Analysis by income level showed that respondents with higher salaries are less satisfied with the HR management approach, but are less prone to conflicts. These results may indicate that employees with higher incomes have higher expectations

from management and different priorities in the work environment. It is possible that they are more likely to assess HR policies through the prism of professional development and advancement opportunities, while lower conflict propensity may stem from greater job security and lower financial pressures. The level of education also plays a role in the perception of HR management and conflict. Respondents with a university degree expressed less satisfaction with HR management and were more prone to conflict compared to those with secondary and higher education. This finding suggests that a higher level of education may increase employees' expectations regarding human resource management and organizational practices. It may also indicate greater critical thinking and awareness of management shortcomings, which leads to a lower level of satisfaction. Overall, the research results confirm the importance of strategic human resource management in employee satisfaction, but also indicate differences in perception depending on sociodemographic factors. These findings can serve as guidelines for further improvement of HR practices in the Serbian Post, with a special focus on individualized approaches to employees in different regions and groups. It is recommended to introduce flexible HR strategies, as well as develop programs that will allow greater adaptation to the specific needs of employees. Further research can contribute to a better understanding of the factors that shape employee satisfaction and enable more precise creation of HR policies that encourage motivation and productivity.

Conclusions

The 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. The results of this study highlight the key role of human resource management in shaping employee satisfaction, thus confirming hypothesis H1. Respondents are most satisfied with strategic management and HR management approach, while job satisfaction is at a somewhat lower level. These findings suggest that strategic human resource management has a significant impact on employee satisfaction.

Hypothesis H2, which assumes that clearly defined job descriptions and responsibilities have a positive effect on work productivity, could not be directly confirmed, because the analysis did not include specific data on job descriptions. Similarly, hypothesis H3, which refers to the connection between job systematization and performance appraisal with employee motivation and satisfaction, was partially confirmed, because respondents with higher incomes

expressed a lower level of satisfaction with HR management, which may indicate the need for a more precise evaluation and promotion system.

Hypothesis H4, which refers to the impact of the reward system on the perception of opportunities for promotion and salary increases, was not explicitly confirmed in the study. Although differences in satisfaction depending on income were observed, there was no direct data on the reward system.

Hypothesis H5, which assumes that an open approach to conflict resolution reduces tensions and improves interpersonal relationships, was partially confirmed through the analysis of differences in perceptions of conflict depending on the region of residence.

This research has certain limitations. First, the sample is limited to specific regions, which may affect the generality of the results. Second, the data were collected via an online survey, which may result in some bias in the selection of respondents, since the participants are mainly people with internet access and willingness to participate in the research. In addition, reliance on subjective responses from respondents may lead to socially desirable responses.

Future research could focus on conducting longitudinal studies to monitor changes in job satisfaction and perceptions of human resource management over time. Also, the inclusion of additional factors, such as organizational culture, leadership styles, and employee motivation, could provide deeper insight into the mechanisms that shape employee satisfaction. In addition, a combination of qualitative and quantitative research methods would allow for a more comprehensive analysis of employees' and managers' perceptions of human resource management effectiveness.

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INFLUENCE OF WORKPLACE SPIRITUALITY ON HUMAN RESOURCE MANAGEMENT: RECRUITMENT AND SELECTION IN FOCUS

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Abstract

The study examined the influence of workplace spirituality on human resource management practices with a focus on recruitment and selection practices. The components of workplace spirituality were identified to include a sense of community, meaningful work, inner life, and alignment of values. The study used a questionnaire as the research instrument to elicit responses from 238 respondents and a multi-sampling technique was involved to choose the sample and ample size. It was found that there exists a strong relationship between workplace spirituality and human resource management practices

with a focus on recruitment and selection practices and the findings also show that all the components of workplace spirituality have a positive relationship with recruitment and selection practices. It was concluded that workplace spirituality has an influence on human resource management practices, especially recruitment and selection practices, and thus recommends the use of interviews as a selection tool to understand individual values for alignment with the organizational values.

Keywords: workplace spirituality, employee mobility, recruitment, selection

JEL Classification: M12, M51

Introduction

Businesses have traditionally disregarded the spiritual aspect, perhaps for fear of the workplace becoming a religious battleground. However, spirituality has made its mark in the global business world and the time has come for companies to start engaging their employees spiritually by giving attention to the concept of bringing the person wholly to work (Lund, 2004). Over the years, the success of business organizations has been attributed to the quality of the workforce (people) at any given period which has been a function of many variables wherein human resources accounted for the successes recorded by organizations on account of its effect on employee commitment, motivation, and satisfaction at work without casting aspersions on the other resources at the disposal of the organization such as money, material, machine, structure, method, and market (Oginni, Ayantunji, Olaniyan, Ajibola & Ajakaye, 2023; Oginni, Ajibola & Olaniyan, 2022). Similarly, the role of human resources i.e. MAN as an interactive agent with other resources in the organization has further confirmed the premium placed on people in the workplace for organizational success and thus explains why every organization strives to attract qualified and competent employees into their service folds to actualize the objective of the organization although keeping them has always been a problem because of the degree of differences in employer and employee expectations (Akintayo & Oghenekohwo, 2018; Oginni, & Omoyele, 2018).

The dynamism of the business environment has been a factor in the degree of variation in employee and employer expectations at work although the bane of the differences in their expectations has always been the direction of human resource management policies and practices i.e. whatever that is found as operational outcome in the employment relationship between employer and employees in the workplace is deeply rooted in the human resource management policies and

practices (Adeniji, 2019) The implication is that the satisfaction or dissatisfaction of employees, commitment or non-commitment of employees, retention or non-retention of employees, family-like atmosphere or non-family-like atmosphere, motivated or not motivated, concern for productivity or no concern for productivity, performance or non-performance in the workplace, all these stem from the practice of human resource management at any given time wherein recruitment and selection is at the centre, deciding what would be the state of affairs in the organisation. In the views expressed by Kolawole, (2020); Ojeleye, (2022); Adaora, Iyke-Ofoedu, and Okechi, (2023) that the quality of human resource attracted into the organisational workforce will determine the degree of organisational objective attainment either in the short or long run.

This is so because people are unique with different personalities, needs, goals, desires, and backgrounds, and thus respond to stimuli differently. Therefore, there is a need to search for compatibility between employee and employer expectations with the intent to give meaning to work, inner life, connectedness, values, right attitudes, and behaviour, sense of belonging, appreciation, superior, and subordinate relationships has identified human resource management practices as the instrument to integrate the two opposing expectations. It is thus, evident that human resource management practices with a focus on recruitment and selection practices are the junction box in the employment relationship wherein employee and employer expectations are met in the workplace. By implication, the way an employer treats employees with recourse to the prevailing human resource management policies has a bearing on their performance, belief, attitude, and commitment to the organization. Not limited to these, but also on one's purpose in life, relationship with co-workers, work alienation, and alignment of one's core beliefs and values with the values of their organizations as well as a sense of community, fulfillment, integrity, and interconnectedness within the organization. This explains why organizations must strive to attract the right person in terms of quality (skills, knowledge, experience, exposure, personality, and sense of judgement) into the workforce to attain their pre-determined objectives.

There are indeed many human resource management practices and each of these practices, has different consequences on the behavioural outcomes of employees in the workplace which imply that it is not all the components of human resource management practices would yield the same expectation(s) or behavioural patterns (Armstrong & Baron, 2018; Okolie, 2019). Therefore, organizations striving to attract qualified and competent employees into their folds to attain their pre-determined organizational objectives must develop appropriate human resource

management practices to enhance their goodwill, reputation, and image in the labour market. Also ensuring employee commitment, employee purpose in life, relationship with co-workers, work alienation, and alignment of employee core beliefs and values with the values of their organizations as well as a sense of community, fulfillment, integrity, and interconnectedness within the organization otherwise it will be difficult to attract the right candidate into the organization thus missing the golden purpose of recruitment and selection i.e. integrating individual and organizational value systems towards organizational survival, growth, and profitability which is contingent on workplace spirituality.

Despite the enormous depth of the literature on the relevance of human resource management practices to organizational behaviour in general, research studies in the area of human resource management practices and workplace spirituality in business organizations especially in the Banking industry have not been properly integrated and coupled with the fact that there is little evidence in Nigeria about the human resource management practices with a focus on recruitment and selection and workplace spirituality in the Banking industry, hence, the study.

Literature Review

The concept of workplace Spirituality

Workplace Spirituality began in the early 1920s and emerged as a grassroots movement with individuals seeking to live their faith and/or spiritual principles at work. It is a relatively new phenomenon or a new dimension in global work culture that is gaining importance around the world since the shift in the employees' collective needs and values. The concept of spirituality at work might seem like being religious at work, but this is far from the truth and contrary to the popular conception. It has nothing to do with religious practices or beliefs. It is important to note that this doesn't necessarily imply religious practices at work rather, it means enhancing feelings of purpose, connectedness, and compatibility between personal and organizational values, fostering well-being and work satisfaction i.e. workplace spirituality is based on a sense of community, alignment between personal and organizational values, opportunities for personal growth and development, recognition of employees' inner life.

Defining Workplace Spirituality

Workplace spirituality involves the effort to find one's ultimate purpose in life, to develop a strong connection with co-workers and other people associated with work, and to have consistency (or alignment) between one's core beliefs and the

values of their organization. To this extent, workplace spirituality has been defined by many scholars out of which few were identified despite their commonality.

1. Mitroff & Denton (1999): defined workplace spirituality as the recognition that employees have an inner life that nourishes and is nourished by meaningful work.
2. Ashmos & Duchon (2000) defined workplace spirituality as a framework of organizational values whereby employees experience a sense of transcendence and connection to something larger than themselves.
3. Giacalone and Jurkiewicz (2003) defined workplace spirituality as a multidimensional construct that encompasses the values, attitudes, and behaviours that reflect a concern for the well-being of others and the organization as a whole.
4. Katz (2013): defined workplace spirituality as the integration of spiritual values and practices into the workplace to promote a sense of purpose, meaning, and fulfillment among employees
5. Majeed, Mustamil & Nazri (2022) described workplace spirituality as the integration of spiritual values and practices into the workplace to promote a sense of purpose, meaning, and fulfillment among employees.
6. Nöhammer (2023) defined workplace spirituality as a framework of organizational values that promote employees' experience of transcendence through the work process, facilitating their sense of being connected to others in a way that provides feelings of completeness and joy.

It is thus evident that workplace spirituality revolves around organizational state and therefore as a collective construct thus revealing the four dimensions of workplace spirituality i.e. transcendence, connectedness, completeness, and joy which can be further summarised into three i.e. work that has meaning, a sense of connection to the work community, and a feeling of alignment with an employer's goals.

Dimensions of Workplace Spirituality

Workplace spirituality is a complex and multifaceted concept because it encompasses different dimensions as identified by scholars who had contributed to the field to include four (4) different dimensions (Ashmos & Duchon 2000; Nöhammer, 2023) such as meaningful work, inner life, alignment of values, and sense of community.

1. **Meaningful work:** This is said to be at the individual level where the content is related to the meaning and purpose of one's work and how the employees interact at the individual level. It leverages the three aspects of

meaningful work i.e. enjoy work, energized by work and work gives personal meaning and purpose.

2. **Inner life:** This dimension takes place also at individual level. It is a dimension of spirituality that is the field of inner consciousness where people express themselves as they labour with a sense of agreement, interconnectedness, and unanimity which is characterized by the inclination that people have about their identity, i.e., what they are doing, and what commitments they make.
3. **Alignment of values:** The third dimension of workplace spirituality is at the organizational level. The main concept of this dimension is alignment with organizational values. It is related to the alignment of the employees' values with the organization's mission and purpose. It also involves the interaction of employees with the organization's larger purpose and contributing to society. There are three important aspects of the concept of the community namely i.e. feeling connected to organizational goals, identifying with the organization's mission and values, and caring about employees.
4. **Sense of community:** The fourth dimension is also at the group level which is based on the concept of community. It is related to the connectedness with others or the community and how the employees interact with others at the group level. There are three important aspects of the concept of the community i.e. sense of connection with co-workers, employees support each other, and linked with a common purpose.

Benefits of Workplace Spirituality

Sequel to the various dimensions of the workplace spirituality in the workplace, the following are the major benefits;

1. Improved employee satisfaction and engagement
2. Increased sense of community and belonging.
3. Sense of meaning and significance in work.
4. Better teamwork and communication.
5. Improved workplace culture.
6. Greater job loyalty and commitment.
7. Improved creativity and problem-solving abilities
8. Enhanced decision-making and ethics in the workplace.
9. Improved customer and client relationships
10. Increased motivation and productivity
11. Improved overall well-being of employees

12. Reduced absenteeism
13. Increased job satisfaction
14. Improved quality of life
15. Increased employee morale
16. Reduced workplace stress
17. Reduced employee burnout
18. Reduced employee turnover rates
19. Improved work performance.
20. Enhanced organizational image and reputation.

Spirituality versus Religion

There is a growing consensus among researchers that spirituality is distinct from religion i.e. there exists a general agreement that spirituality has nothing to do with the application of religious practices in the workplace and religion is not considered to be a relevant issue in the workplace but spirituality is treated as such (Duchon & Plowman, 2005). Therefore, neither is spirituality viewed as religion in disguise nor viewed as a dogma although Prabhu, Rodrigues, and Kumar (2016) opined that religiosity is a part of workplace spirituality which was supported by the work of Braam and Cecilia (2018)

Spirituality is about feeling connected to something larger than yourself, living with reverence, and seeking meaning and purpose. It's an inner journey, focusing on your soul's understanding and your connection to the present moment, self, others, nature, or the sacred while religion is a structured system of beliefs, often involving places of worship, holy books, rituals, and rules. Religions revolve around historical figures and their teachings, with a strong emphasis on external practices although religions and spirituality often share common features such as hope, trust, and love (Prabhu, Rodrigues & Kumar (2016).

Recruitment and Selection as Human Resource Management Practices

Recruitment

Finding the right man for the job and developing the man into a highly effective team member is an indispensable function and desire of every organization which is embedded in recruitment, selection, and placement (Oginni, Ayantunji, Olaniyan, Ajibola, & Ajakaye, 2023; Graham & Bennett, 2015). Temidayo (2018) described recruitment as the process of searching for prospective employees, stimulating, and encouraging them to apply for jobs in an organization. Graham and Bennett, (2015) believed that recruitment is the process of discovering the

sources of manpower to meet the requirements of the staffing schedule and to employ effective measures for attracting that manpower in adequate numbers to facilitate effective selection of an efficient workforce. Recruitment can therefore be described as the process of attracting a pool of qualified candidates to fill existing vacancies in organisations. This pool of qualified candidates must be created to meet the prevailing challenges of the organization where the organization can from time to time draw from whenever the need to add a new employee arises.

Qualified candidates can be sourced from time to time from two main sources i.e. internal and external. (Kalejaye, 2021; Guest, 2017; Graham & Bennett, 2015). Internal recruitment is the art of filling existing vacancies through the use of people who are members of staff of the organization at the time of recruitment (inside search) while external recruitment is about filling existing vacancies through the use of candidates who are not members of staff as at the time of carrying out the recruitment exercises (Oginni, Ayantunji, Olaniyan, Ajibola, & Famolu, 2022; Kolade, 2021). Graham and Bennett (2015) opined that any form of filling through the use of an inside search would invariably end in filling from outside because there would be a vacuum at a point which only the external source can meet.

Selection: This is the process of choosing individuals who possess the necessary skills, abilities, and personality to successfully fill specific jobs in an organization. It is essentially matching a person to a job to determine how suitable the person is in comparison to the characteristics of the job. The suitability of the person against the characteristics of the job is based on the skills, education in terms of qualification, experience, personality, etc. To this end, selection is the process of choosing the most suitable candidate to fill an existing vacancy. Here, emphasis is placed on the most suitable candidates as against the best candidates because on many occasions the best candidates may not be suitable for the job (Oginni & Famolu, 2022; Kolade, 2021; Maina, 2019;). Selection makes use of interviews, psychological tests, skill assessments, group discussions, presentations, etc., as selection methods to choose the suitable candidate for the job and organization. According to Graham and Bennett (2015) whichever method is used, the interview remains the most preferred and sometimes it is not used in isolation. According to Kolade (2021), the interview is good for finding the fit for a particular role when it is used in combination with other methods as it provides an opportunity for on-the-spot interaction and assessment.

Distinctions must be made at this juncture that recruitment and selection although interwoven, could not be said to be the same as the goal of each is quite different. The goal of recruitment is to create a large pool of qualified candidates

who are available and willing to work in a particular organization whereas the goal of selection is the sorting out or elimination of those judged unqualified to meet the job and organizational requirements (Okolie, 2019). The selection process is based on the principles and guidelines set out in the course of attracting a large pool of qualified candidates. Kolade (2021) opined that recruitment is a positive process and selection is a negative process because recruitment seeks to persuade people to apply for work (job) in the organization and selection tends to be somewhat designed to reject a good portion of the candidates who showed interest and willing to work in a particular organization but could not meet the criteria stipulated either for the job or the organization. This view was supported by Maina, (2019) on the ground that recruitment is broad (announcement to the public) and selection is narrow (sorting out the candidates).

Workplace Spirituality and Recruitment and Selection Practices

The nature of man as prescribed by economists from time immemorial shows that man is insatiable thus explaining the rationale behind the quest of man in the world of work to move from one job to another. The movement from one organization to another has been tagged as employee mobility which has implications on the survival, growth, and profitability of the organization. Ojeleye (2022) identified some reasons as the major reasons why employees move from one job to another which were considered to be contingent upon motivation and circumstances including career advancement, salary and benefits, work environment, lack of autonomy, work-life balance, job satisfaction, new opportunities, relocation, company culture, management and leadership, personal goals, abusive supervision, and burnout. This position was supported by the earlier works of Maina, (2019), who classified the reasons into two i.e. voluntary and involuntary while Oginni et al (2023) agreed with those reasons and classification, however, added poor communication, and company policies, psychological contract, and poor retention strategies to the list. These reasons have been a menace over the years for organizations and from time to time constantly devising strategies to combat to minimize recruitment costs and effect on the overall performance and profitability of organizations.

Aremu, Adegboyega, Opatola, Yusuf and Tiamiyu (2024) posited that to save an organization from the high recruitment cost, low performance, and profitability, workplace spirituality can play a significant role on account of the basic objectives pursued focused more on cultivating a work environment that supports the well-being and spiritual growth of employees i.e. creating a sense of meaning and

purpose (helping employees find meaning and purpose in their work); promoting a sense of connection and community (fostering a sense of belonging and connection among employees); nurturing the human spirit (recognizing and supporting the emotional, social, and spiritual needs of employees). Nöhammer, (2023) posited that workplace spirituality has a link in the form of solutions to many behavioural challenges in the workplace. Majeed et al (2022) asserted that workplace spirituality can be a leverage for an organization to minimize employee mobility when the recruitment exercise is anchored on the three (3) basic objectives of workplace spirituality i.e. helping employees find meaning and purpose in their work, fostering a sense of belonging and connection among employees, and recognizing and supporting the emotional, social, and spiritual needs of employees. Kolade (2021) believes that a selection interview is a good parameter to understand employee desires and goals in life thus linking to organizational opportunities and prevailing atmosphere to determine their purpose, team spirit, and emotional conditions which are domicile in the workplace spirituality. According to Prabhu et al (2016), workplace spirituality will make recruitment and selection exercises more focused and determine who is to be employed into the organization.

Afsar, Badir, and Kiani (2023) proposed that workplace spirituality is a form of an organizational culture driven by human resource management practices and sustained by recruitment and selection practices in an organization i.e. whatever is the prevailing atmosphere in an organization is caused by human resource policies put in place as practice and the sustainability of such is anchored on the focus of recruitment and selection practices for the purpose of sustaining the prevailing atmosphere or work conditions. The earlier work of Rolland, Merlyn, and Hawyah (2022) spirituality was in agreement with the position of Afsar et al (2023) where it was posited that the change in the global work dimension necessitated a shift in the employees' collective needs and values placed an enormous premium on the recruitment and selection practices to herald and sustain workplace spirituality. In the views of Okolie, (2019) and Oyeniyi, Afolabi, and Olayanju (2023) organizations through human resource management practices sustain workplace spirituality as a form of organization prevailing culture and exploit some of the benefits of workplace spirituality such as job loyalty and commitment, the overall well-being of employees, low absenteeism rate, teamwork and communication, good organizational image and reputation, sense of community and belonging, job satisfaction, increased employee morale, reduced workplace stress, and burnout, etc., (Aremu et al, 2024).

Underpinning theory

The study was pinned on the social identity theory (SIT) which was propounded by Henri Tajfel in the 1970s and advanced further by John Turner in the 1980s. The theory was built on the assumption that there exists an interplay between personal and social identities. i.e. focus is on how to specify and predict the circumstances under which individuals think of themselves as individuals or as group members thus influencing their attitudes, behaviours, and perceptions of both their own and other groups. It makes use of social categorization, social comparison, and social identification leading to positive distinctiveness or prejudice, bias, and discrimination to explain one's social identity. In a nutshell, social identity theory is summarised as a person's sense of who they are based on their group membership(s).

The implication and relevance of the theory to the study were because the theory leverages group interaction and places emphasis on belongingness, purpose, self-worth, and identity which were the basic fundamentals of workplace spirituality (Meaningful work, Inner life, Alignment of values, Sense of community) where recruitment and selection in this study serve as means to actualize the formation of the group in the workplace. The identity of individuals in the organization will invariably determine the degree of loyalty, motivation, cohesiveness, and desire to remain with the organization. It also serves as a point of reference when making recruitment and selection decisions on who should be brought in to join the workforce to attain predetermined stated objectives.

Conceptual Framework of the Study

The independent and dependent variables were depicted in Fig 1 to indicate the direction of the study.

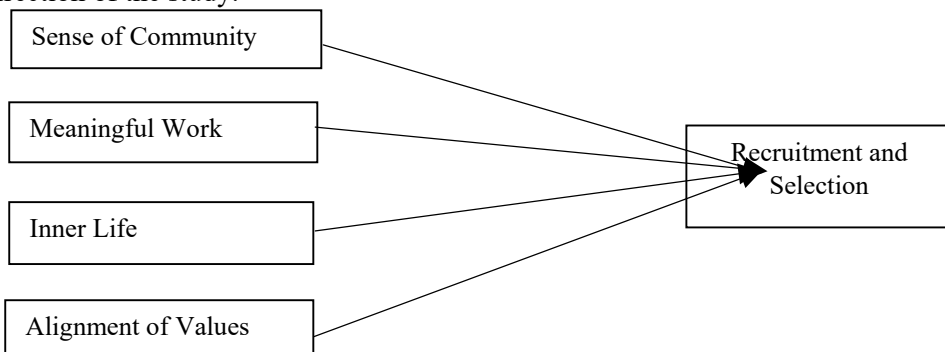


Fig. 1: conceptual framework for workplace spirituality and recruitment and selection

From Fig 1, there were four (4) different hypotheses for the study as indicated below signifying the direction of the study and objective of the study.

1. there is no relationship between a sense of community and recruitment and selection practices
2. there is no relationship between meaningful work and recruitment and selection practices
3. there is no relationship between inner life and recruitment and selection practices
4. there is no relationship between the alignment of values and recruitment and selection practices

Methodology

The study was anchored on the survey research method and also made use of primary and secondary sources of data collection where the research instrument for data collection was a questionnaire. The administration of the questionnaire revolved around multi-stage sampling techniques (purposive, proportional, and random) over a period of 6months from September 2024 to February 2025 to the sample size of 247 drawn from the sample of study which was the banking industry wherein their headquarters were chosen as the unit of analysis. At the end of questionnaire administration, 242 copies of the questionnaires were retrieved while 238 copies of the questionnaire were found useful for analysis purposes representing a respondent rate of 96%. The respondent rate indicated a fair and good representation of the sample population whose results could be generalized and data collected were analyzed through the use of descriptive (percentage and mean) and inferential statistics (correlation).

Results

Table 1: Demographic Characteristics of the Respondents

Variables	Variable Elements	Frequency Distribution	Percentage
Gender	Male	122	51%
	Female	116	49%
	Total	238	100%
Age Bracket	Less than 25yrs	20	8%
	25yrs – 30yrs	36	15%
	31yrs – 40yrs	50	21%
	41yrs – 50yrs	92	39%
	51yrs & above	40	17%
	Total	238	100%
Marital Status	Single	35	15%
	Married	189	79%
	Divorced	4	2%
	Widow/Widower	10	4%
	Total	238	100%
Work Experience	Less than 5yrs	10	4%
	6yrs - 10yrs	19	8%
	11yrs - 20yrs	121	51%
	21yrs & above	88	37%
	Total	238	100%
Educational Qualification	WAEC 'O' Level	24	10%
	OND/NCE	32	13%
	B.Sc./HND	121	51%
	M. Sc./MBA	18	8%
	Professional Cert.	43	18%
	Total	238	100%

Source: Survey 2025

Table 1 has information on the demographic characteristics of the respondents where it was evident that the banking industry was not dominated by the male gender although seems to be more than the female gender. Similarly, the age of the workforce has 31yrs – 40yrs, and 41yrs – 50yrs were in the majority representing 60% of the respondents while the majority of the respondents were married with a 79% respondent rate and fewer divorces, widows, and widowers. The work experience of the respondents as depicted in the questionnaire did not represent

cumulative experience but rather as obtainable in their respective banks and 11yrs – 20yrs represent the majority followed by 21yrs & above with 51% and 37% respondent rates respectively. It was also evident that the respondents in the banking industry have more first-degree holders/higher national diplomas in respective disciplines, professional qualification membership, and the ordinary national diploma. The implication of the demographic characteristics of the respondents signified maturity to understand the issue at stake coupled with the length of years of work experience in their organizations which also provided good leverage to understand the tradition of the organizations.

Table 2: Pearson Correlational Matrix for independent and dependent variables

<i>Workplace Spirituality Variables</i>	<i>SC</i>	<i>MW</i>	<i>IL</i>	<i>AV</i>	<i>RS</i>
<i>Sense of Community</i>	1				
<i>Meaningful Work</i>	0.564*	1			
<i>Inner Life</i>	0.602**	0.478*	1		
<i>Alignment of Values</i>	0.557*	0.524*	**0.581	1	
<i>Recruitment and Selection</i>	0.641**	0.762**	0.667**	0.785*	1

****Correlation is significant at 0.05 level *Correlation is significant at 0.01 level(2-tailed)**

The relationship is classified as a weak relationship where $r = \leq 5$, a moderate relationship where $r = \leq 7$, and a strong relationship where $r > 7$.

Where SC = Sense of Community

MW = Meaningful work

IF= Inner Life

AV = Alignment of Values

RS = Recruitment & Selection

From the Pearson Correlation Coefficient analysis for workplace spirituality and recruitment and selection practices, as shown in Table 2, the results have all the values of r i.e. SC and RS $r = 0.641$, $P < 0.05$; MW and RS $r = 0.762$, $P < 0.05$; IL and RS $r = 0.667$, $P < 0.05$; AV and RS $r = 0.785$; $P < 0.05$. it was evident from these values that recruitment and selection practices have a strong relationship (MW and RS $r = 0.762$; AV and RS $r = 0.785$; $P < 0.05$) with all the variables of workplace spirituality except for sense of community and inner life whose relationship were moderate (SC and RS $r = 0.641$, $P < 0.05$; IL and RS $r = 0.667$) therefore, indicating a positive correlational relationship and all were significant at 0.05 and 0.01 level of significance.

A link of the results to the hypotheses of the study revealed that the alternates of the four hypotheses were accepted to imply that there exists a relationship between

a sense of community and recruitment and selection practices and it was a moderate positive relationship; there exists a relationship between meaningful work and recruitment and selection practices and it was a positive and strong relationship; there exists a moderate positive relationship between the inner life and recruitment and selection practices and there exists also a relationship between alignment of values and recruitment and selection practices which was also positive and strong relationship. These outcomes were supported by the previous work of Ojodele (2022) that there were many reasons behind employees' movement from one job to another or from one organization to another organization. The results were also in tandem with the positions of Maina (2019) and Oginni et al (2023) while Nöhammer, (2023) posited that workplace spirituality has a link to many behavioural challenges in the workplace.

Table 3: Summary of Regression Analysis Result showing the influence of workplace Spirituality and Human Resource Management with a focus on Recruitment and Selection Practices

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	.682 ^a	.465	.462	.591

a. Predictor: (Constant), workplace spirituality

b. Dependent variable: HRM – Recruitment and Selection Practices

The F-statistics results for the study show that the model fits well and is statistically significant in explaining the influence of workplace spirituality on human resource management with a focus on recruitment and selection practices while the results in Table 3 summarised the relationship that exists between workplace spirituality and human resource management with a focus on recruitment and selection practices. This relationship which was found to be a positive linear relationship where $r = 0.682$ and $r^2 = 0.465$ representing 47% implies that workplace spirituality can explain the variations in the recruitment and selection practices of a business organization while the low value of adjusted r^2 i.e. 0.462 indicates that additional predictors are not improving the model while the relationship is significant at 0.05 level of significance. Therefore, the concern of business organizations for workplace spirituality will moderately influence the practice of human resource

management especially, the recruitment and selection practices on account of r that it is 0.682 and r^2 explaining the variations in the model.

This result buttressed the position of Afsar et al (2023) where it was asserted that workplace spirituality drives organizational culture heralded human resource management practices which are sustained by recruitment and selection practices in an organization. The result also supported the position of Okolie, (2019) and Oyeniyi, Afolabi, and Olayanju (2023) that organizations through human resource management practices sustain workplace spirituality to give an organization a prevailing culture and exploit some of the benefits of workplace spirituality such as job loyalty and commitment, the overall well-being of employees, low absenteeism rate, teamwork and communication, good organizational image and reputation, sense of community and belonging, job satisfaction, increased employee morale, reduced workplace stress and burnout.

Conclusion and Recommendations

The study seeks to examine the influence of workplace spirituality on human resource management practices with a focus on recruitment and selection practices and based on the findings of the study, it was revealed that there exists a strong relationship between workplace spirituality and human resource management practices with focus on recruitment and selection practices. It was further confirmed that all the components of workplace spirituality (sense of community, meaningful work, inner life, and alignment of values) have a positive strong relationship with recruitment and selection practices. It was therefore concluded on this basis that workplace spirituality influences human resource management practices positively and thus, places a premium on recruitment and selection practices to facilitate expected organizational culture.

Based on the conclusion drawn from the findings, the following were the recommendations postulated for the study to include

1. putting in place a well-defined recruitment and selection policies that will aid sound practice in line with the aspirations of an organization
2. using the interview as a selection tool to understand an individual's values for the purpose of alignment with the organizational values
3. placing a premium on recruitment and selection practices to sustain workplace sustainability as heralded by human resource management practices.

4. creating a work environment that will usher in a stable organizational culture through workplace spirituality and human resource management practices.

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EVALUATING TRAINING EFFECTIVENESS: THE APPLICATION OF KIRKPATRICK'S FOUR-LEVEL MODEL IN ORGANIZATIONAL DEVELOPMENT

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Abstract

Kirkpatrick's model is one of the most widely used models in organizational development to assess the effectiveness of training programs. This study is based on the assessment of training effectiveness through four main dimensions: reaction, learning, behavior, and results. This study seeks to determine the level of congruence between training initiatives and organizational objectives as well as the effect on individual competence. The last goal is to enhance the competence of the group in order to enhance its performance. This paper reviews numerous studies and existing literature to summarize best practices, identify common challenges, and provide practical recommendations for improving training evaluation methodologies. The results of this study have important implications for HR practitioners and organizational leaders and provide useful information on how to improve the return on investment in training. In addition, the study stresses the need for organizations to encourage learning and development in order to enhance their long-term success, adaptability, and sustainable growth in today's dynamic business environment.

Keywords: effectiveness of training, Kirkpatrick, performance, evaluating, development

JEL Classification: I21, M53, J24

Introduction

Training effectiveness is important from the perspective of organizational development because it helps ensure that training programs are having the desired effect on employee growth and company performance. The Four-Level Model is a classic model for evaluation of training programs developed by Donald Kirkpatrick. The Kirkpatrick Model evaluates training impact on four metrics: reaction, learning, behavior, and result, facilitating short-term and long-term impact measurement.

The study focuses on how we can tie up all the investment into training with the results in terms of organizational outcome. Employee training is big business, with organizations dedicating lots of resources to it — but unfortunately, systematic evaluation to identify whether something improves is still lacking. Using Kirkpatrick's framework, organizations can evaluate if training programs are improving employee skills, behavior, and business success.

To address these concerns, this paper undertakes a review of the literature, and examines case studies in which the Kirkpatrick model has been successfully employed. The research will focus on emerging best practices, gaps, and opportunities to adapt in order to increase the applicability across industries. To ensure a more comprehensive assessment of training programs, the study will also examine potential alternative or complementary evaluation methods.

The discussion contributes to the existing literature on organizational learning, HR development and training evaluation. Although earlier studies have affirmed Kirkpatrick's paradigm, this one adds to the existing literature by examining how Kirkpatrick's model is practically implemented, where it faces issues, and by suggesting improvements to ensure it meets the demands of dynamic organizations. By situating the model in the context of modern corporate training settings, this paper offers important perspective to HR practitioners, learning and development professionals and executives who are pursuing best practices for realizing the value of their training investment.

Literature Review

According to the first study we examined on this subject, the need for training and development of employees is a growing focus of HRM, since it helps organizations to build human capital and remain competitive in a fast-evolving business environment. Most of the employee training programs run into millions of

USDs and it becomes a very daunting task to the HR department to account for each USD spent. This paper seeks to determine the effectiveness of employee training programs in the banking sector in Malaysia. Specifically, utilizing the Kirkpatrick's four levels of evaluation model, this paper addresses the

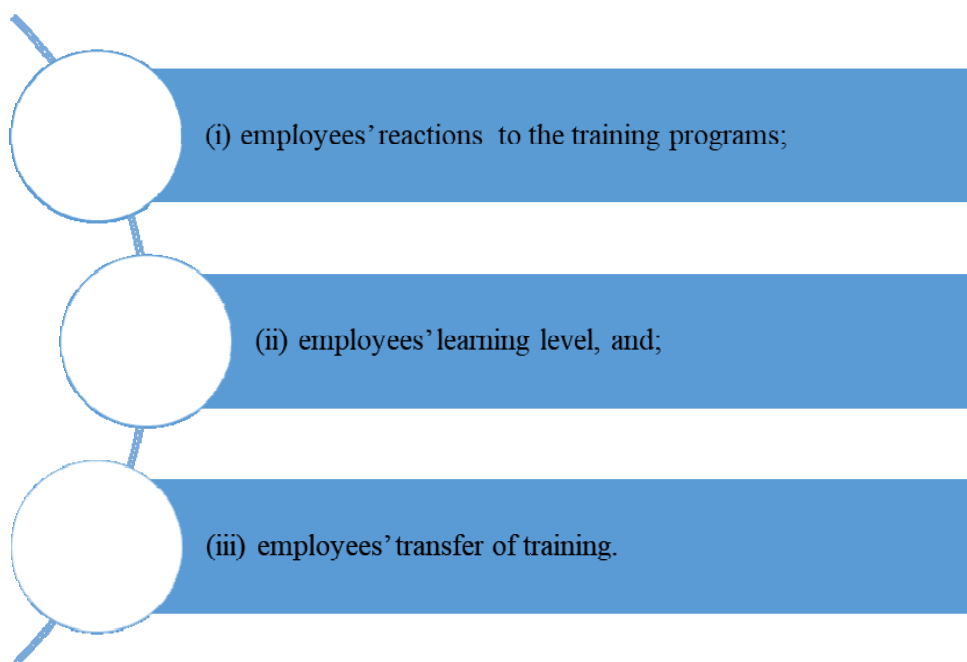


Figure nr 1. Kirkpatrick's four levels of evaluation model

Source: Mohamed, R. (2012, March). Evaluating the effectiveness of a training program using the four-level Kirkpatrick model in the banking sector in Malaysia. Paper presented at the 3rd International Conference on Business and Economics Research, Bandung, Indonesia.
https://www.researchgate.net/publication/265425958_Evaluating_the_Effectiveness_of_a_Training_Program_Using_the_Four_Level_Kirkpatrick_Model_in_the_Banking_Sector_in_Malaysia

Based on stratified sampling method a sample of 36 employees who attended the Intermediate Central Banking Course was selected. To assess the effectiveness of the training, the following methods were used: training feedback questionnaires, pre and posttests, face-to-face interviews, learner development plan reports and behavioral surveys.

The study found that the training delivered produced evidence to three of the four tiers of Kirkpatrick's model. The training was rated on average 4 out of 5 scale (Likert scale) On average, pre and posttest to assess learning revealed a 11.4 percent increase in knowledge.

The employee performance results showed that the face-to-face interviews and behavioral surveys were all overall well-received and in 68 percent of cases the training had actually transferred back into the workplace. Thus, the results support the HR unit in providing organization and owners with evidence and to further maintain the employee training and development as one of the core strategic management approach [Mohamed, 2012].

Next study compares two cohorts of students who studied the same subject but in different ways. A 90-student cohort studied group dynamics, action research, team performance, and participatory decision-making in real time. Another 171 students took the same course online [Baskin, 2001].

The real-time and online cohorts' satisfaction ratings were organized and critically mined using a four-level assessment of learning model to examine student-learning outcomes connected to online group work. The real-time student sample was much more satisfied with various aspects of group learning than the online sample. Comparing the learning outcomes of the online cohort of students using level two, level three, and level four evaluation strategies suggests that the online group work model supports group learning behaviors, practice transfer, and enterprise-level learner behavior improvement. Online group work improved group learning, despite disparities in outcomes [Baskin, 2001].

The next study's objective is to develop a quantitative technique that can be used to assess the success of training programs that are specifically designed for farmers, farm women, and rural adolescents.

The particular goal was to provide a strong framework for evaluating how effective the Farmers Training Centres (FTCs) of India are in their rural training programs. Kirkpatrick's training evaluation model gives us the basis for creating a four-dimensional composite framework that is based on range-based indicator normalization, principal component analysis-based indicator weight estimation, and rank correlation-based framework sensitivity testing [Paul et al., 2024].

To test and validate our suggested approach, we employed cross-sectional primary data that was obtained through home surveys and personal interviews with one thousand randomly selected trainees. When we apply it to our assessment goal, we see that the efficacy of the training programs differs; one out of every four training programs may not be beneficial. The trainees' responses to different parts of the training programs might have a positive and substantial impact on their learning [Paul et al., 2024].

The changes in behavior of the students after they have completed their training may be related to the results of the program. The suggested framework is not affected by changes in weighting schemes, according to the results of a sensitivity test. This suggests that the selection of indicators is reliable.

The findings provide an analysis of individual training programs that inform policy choices for a training organization. The suggested framework improves Kirkpatrick's training assessment model by providing standardized indications that may be used to evaluate the success of training [Paul et al., 2024].

Theoretical Background

Our study employs Kirkpatrick's Four-Level Model, a widely accepted framework for evaluating training programs at four levels: reaction, learning, behavior and results [Kirkpatrick, 2025].

Donald L. Kirkpatrick first introduced Kirkpatrick's Four-Level Model for evaluating the effectiveness of training in 1959 as part of his Ph. D. at the University of Wisconsin. It has become one of the most popular frameworks of its kind for organizations in training and development over the years.

The Kirkpatrick Model Evolution are:

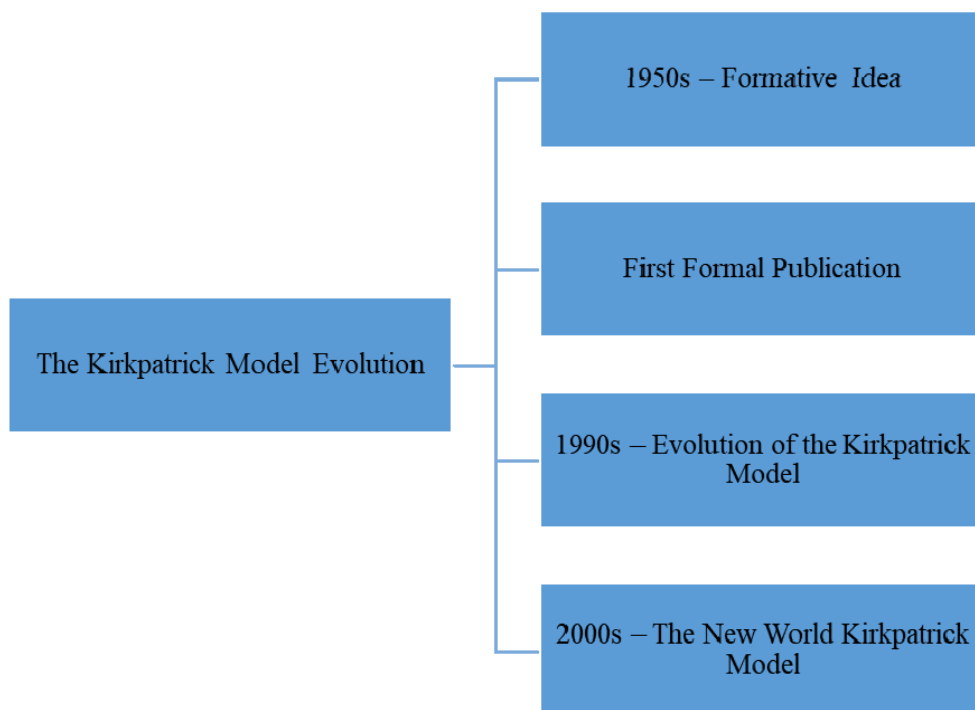


Figure nr 1. The Kirkpatrick Model Evolution

Source: Chernbumroong, S., Sureephong, P., Suebsombut, P., & Sekhari, A. (2022). Training evaluation in a smart farm using Kirkpatrick Model: A case study of Chiang Mai. 2022 Joint International Conference on Digital Arts, Media and Technology with ECTI Northern Section Conference on Electrical, Electronics, Computer and Telecommunications Engineering (ECTI DAMT & NCON). IEEE.

1950s – Formative Idea: The model was first created by Kirkpatrick as a method to measure training programs in corporate environments.

First Formal Publication: The model gained significant recognition when it was published in his book *Evaluating Training Programs* in 1975.

1990s – Evolution of the Kirkpatrick Model: The 1990s saw the model grow and adapt, as well, as both Kirkpatrick and his son, James D. Kirkpatrick, expanded on it to address changing training methodologies.

2000s – The New World Kirkpatrick Model: A revised version of the model put more emphasis on connecting training outcomes with business performance.

The Kirkpatrick Model is a strategy that is renowned all over the world for evaluating the success of training and learning initiatives. It evaluates both official and informal training techniques and ranks them according to four levels of criterias.

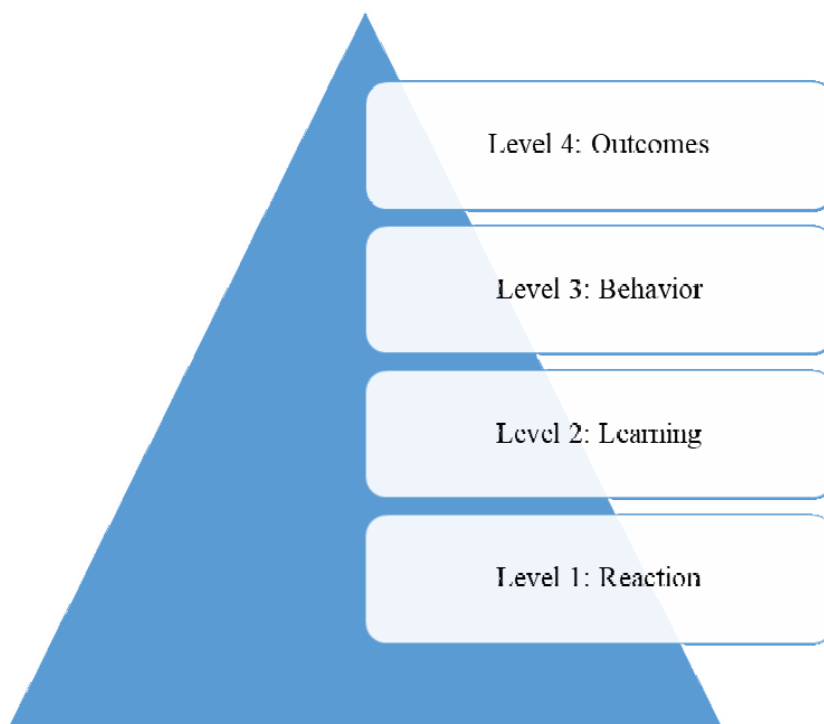


Figure nr 2. Four levels of criterias

Source: #Ardent Learning. (2020). What is the Kirkpatrick model? Retrieved from <https://www.ardentlearning.com/blog/what-is-the-kirkpatrick-model>

Level 1: Reaction

The first level of criterion is "reaction," which assesses whether learners believe the training to be interesting, pleasant, and relevant to their work. The most typical way to evaluate this level is through a survey that is given following training. This form, which is sometimes called a "smile sheet," asks students to score their experience [Ardent Learning, 2020].

A key part of Level 1 analysis is to concentrate on the learner rather than the educator. The Kirkpatrick Model suggests that survey questions should focus on what the learner has taken away from the training, even if it may feel more natural for a facilitator to concentrate on the training outcome, such as the content or learning environment.

Level 2: Learning

Level 2 assesses how well each person learns by determining whether or not they have gained the information, skills, attitude, confidence, and commitment that the course is meant to provide. Learning may be assessed in both formal and informal ways, and it should be evaluated by using evaluations before and after learning to determine how accurate and how well the material was understood [Arden Learning, 2020].

Exams and interview-style assessments are two examples of assessment methods. In order to minimize discrepancies, a clear and well-defined scoring method must be established beforehand.

Level 3: Behavior

Level 3 of the Kirkpatrick Model is one of the most important levels. It assesses whether or not participants were actually affected by the learning and whether or not they are putting what they learned into practice. By evaluating changes in behavior, it is able to determine not only if the skills were understood, but also whether it is feasible to use the skills in the job [Arden Learning, 2020].

Evaluating conduct often reveals problems in the workplace. If there is no change in behavior, it does not necessarily indicate that the training was useless. It might suggest that the organization's present procedures and cultural factors are not creating the best environment for the intended change to take place.

Level 4: Outcomes

Level 4, the last level, is focused on measuring immediate results. Level Four compares the learning to the business outcomes of a company, which are the Key Performance Indicators that were set before the learning began. Some common key performance indicators (KPIs) are a greater return on investments, fewer workplace accidents, and a larger number of sales [Arden Learning, 2020].

The Kirkpatrick Model provides a way to build a measuring strategy that can be put into action. This plan clearly defines goals, measures results, and identifies areas of significant influence. businesses may better comprehend the effects of training by analyzing data at each level, which allows them to examine the link between each level. Additionally, this analysis allows businesses to change their plans and correct their path during the learning process [Arden Learning, 2020].

Use of Statistical Tools and Methodologies: Various statistical techniques, metrics, and methodologies are used to authenticate the effectiveness of every training module. Interest in the effects of the program are assessed with descriptive statistics (mean, standard deviation) along with inferential methods (t-tests, ANOVA) to compare pre- and post-training outcomes.

Regression and SEM: Regression modelling or SEM is often used to study the relationship between training interventions and business outcome.

The data sources used for this analysis are both primary and secondary; the primary data is derived from evaluations of the training programs (surveys of participants and test scores), while secondary data is obtained from reports of the organizations and industry benchmarks. The data is processed using software tools (SPSS, R, Excel), which guarantees accurately and reliably processed data for the analysis.

Kirkpatrick's Framework for Training Evaluation

All training and development are necessities needed to achieve a better attitude and effort of employees while working in a firm or organization. But the drivers of all these can perhaps be summed up are their effectiveness, the right measure (bring together stakeholders), and its impact because measurement is a key aspect of these programs.

Kirkpatrick's Four-Level Model Since Donald Kirkpatrick developed Kirkpatrick's Four-Level Model (a.k.a Kirkpatrick Model) in 1959, it has been one of the most classical training evaluation frameworks.

This model evaluates training programs across four levels: Reaction, Learning, Behavior, and Results. In this essay, it have been closely examine how the model is applied to the organizational development and explicit training effectiveness at the workplace, and more importantly how outcome of the feedback further aids to improve training process and its efficiency.

Conclusion

1. Summary of Main Outcomes

The regex-based algorithm utilized in this study indicates that the Kirkpatrick 4-Level Model is still a largely utilized and effective framework to evaluate training across a multitude of industries. Results are promising, demonstrating the impacts of adaptively managing IVR systems using iterative field experiments in diverse settings ranging from banking to online education to agricultural training programs. Some distinguishing features from the case studies include:

- a) Most employees respond positively to training programs (Level 1).
- b) Workplace behavior changes (Level 3) vary by organizational parameters, with some studies indicating a high skill transfer rate.
- d) Level 4: Business outcomes — harder to measure, but the model helps organizations connect the dots between training and performance goals like productivity, sales, and efficiency.

2. Implications of Findings

With organizations continuing to invest in training programs, it is essential to take a systematic approach to training evaluation to cover all the bases with respect to training effectiveness.

Kirkpatrick's model is helpful, but measuring long-term behavior changes and business results is difficult during implementation.

Using additional assessment methods can enhance evaluation accuracy, including statistical approaches (ANOVA, regression models, SEM).

Inhibiting learning transfer from training to the job, organizational culture, structural support for applying learning in the workplace and the methods used in training all play a crucial role.

3. Recommendations for Future Research

- a) Utilization of AI and big data analytics to improve training evaluation for effective learning tracking and job performance.
- b) Comparative studies (also where possible) between conventional in-person training vs. digital/virtual training models in order to maximize the productivity of the delivery methods.
- c) Insights help fuel organizational learning, HRD systems and training evaluation processes to ensure that training investments translate into measurable, meaningful improvements in employee capabilities and business outcomes.

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EMOTIONAL EXHAUSTION AS DETERMINANT OF ACADEMIC STAFFS JOB PERFORMANCE IN THE SELECTED PRIVATE UNIVERSITIES

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Abstract

*Academics at Universities are going through a lot of stress in performing
 their statutory function in Nigeria, holding to variations trendy facilities
 available to their disposal. Given this, this study investigated emotional
 exhaustion as determinant of academic staffs' job performance in selected
 private universities. Descriptive survey research was adopted, the unit of
 analysis was the selected private universities and a simple random sampling
 technique was used to select respondents for the study from the target
 population. The underpinning theory is Conversation of Resources Theory.*

The study found that emotional exhaustion significantly affects academic staffs' job performance and work relationships and it was recommended that universities should regulate the tasks for academic staff and enhance mentorship; workplace counselling should be encouraged to reduce work and occupational stress. Nigerian universities ought to develop and implement a comprehensive leaves and sabbaticals policies, specifying eligibility, duration, and application procedures that allow academic staff to take breaks for personal development, rest, or family commitments. Such a policy must be in the public domain for fairness and consistency.

Keywords: *emotional, exhaustion, performance, sabbaticals, workplace counselling*

JEL Codes: *I31, M51, M52,*

1. Introduction

Researchers have been on the desk for years as a result of the effect of overworked and obsessed productivities because of poorly managed work culture (World Health Organization [WHO] 2019), which has led to burnout and its antidote for years, there is something deeper about human nature: lack of exercising the human brain. Work has been an elemental constituent of human existence from time immemorial once an individual starts working, there is a possibility that such individuals will use up a great part of their years working (WHO, 2019). According to Janina *et al.* (2022), working as a lecturer is regarded to be sensitively challenging which has resulted in a comparably high number of lecturer agonies. It is an occupational phenomenon driven by a chronic imbalance between job demands (workload pressure, poor working environment), and job resources is characterised by extreme tiredness, reduced ability to regulate cognitive, emotional processes, and mental distancing (Aneke & Uzochukwu, 2024; Schaufeli, 2018). Teaching is often described as a stressful work environment with a large number of stressors, such as student misbehavior, workload, and time pressure (Abos *et al.*, 2019).

Emotional exhaustion occurs in the academic staff due to multiple tasks, inhuman targets which have severe consequences on lecturers' performance, and also affect students' performance and motivation (Klusmann *et al.*, 2021). The diversity in the work environment of the academic environment is becoming appropriate on account of the technological advancement in the workplace which

brings about stress experienced by the personnel in the academic work, academic staff is expected to be effective at work and stable in life, academics experience higher stress than those in the general public due to workloads, hours of work, and incompatible task management all of these amount to strain and develop gradually to emotional exhaustion when academia is worn out at work (Asturias *et al.*, 2021). Emotional exhaustion, arising from extended exposure to stressors, not only affects the well-being of teaching staff but also plays a pivotal role in determining their overall quality of service. The ability to manage and mitigate emotional exhaustion is crucial for sustaining motivation, performance, and the delivery of high-quality academic contributions and good interpersonal relationships. The level of interpersonal relationships and service quality added shape to the challenges of job performance for academicians (Aneke and Uzochukwu, 2024 ;Jimoh *et al.*, 2020).

Building positive relationships with students, colleagues, and administrators is vital to a thriving academic community. However, navigating diverse personalities, addressing conflicting expectations, and fostering a collaborative atmosphere are demanding, the quality of service in terms of academic advising, mentorship, and overall support for students and colleagues contributes significantly to the overall success and reputation of the university in the world has impacted positively on the academic performance of the academia (Jimoh, 2023). Quality performance varies and changes over time (Lalatendu, 2021) quality service is associated with the ability of employees to deliver good products at the right time respond to customer complaints, meet clients' requests with assigned goals, fulfil expectations, and achieve assigned goals for the organizations this has a direct impact on the organization's image (Latlatendu, 2021). Jimoh (2023), opined that effective emotional exhaustion management needs to plan continuous professional development, effective time management, and cultivation act of positive quality service by acknowledging and proactively addressing these challenges, universities can create an environment that supports academic staff in achieving excellence in their knowledge dissemination, research endeavors, and service to the academic community limits stress at workplace while Mushonga and Ukpere (2023) noted that one of the aftermath of downsizing is occupational stress which can be in form of exhaustion.

2. Literature Review

Emotional exhaustion signifies a feeling of being jammed at work and it is the key component of burnout characterised by cynicism and reduced efficacy (Schaufeli *et al.*, 2001). Maslach *et al.* (2001) stated that when employees are

burned out, it is a sign of emotional exhaustion. Studies have recognised a wide range of job demands and resources as an experience of burnout and job demands have been the most important links of emotional exhaustion (Bakker *et al.*, 2017). The JD-R model recommended that burnout hurts job performance, studies have provided more evidence to support the proposition that job demands predict employee performance through emotional exhaustion. Emotional exhaustion is the mood of being tired result of heavy workloads in the place of work (Zhang *et al.*, 2021). Emotional exhaustion happens when an individual is facing an overstretched load, time at work place (Labrague *et al.*, 2021).

Emotionally exhausted people will desire to reduce themselves from a depleted work place, creating a higher return intention and more intentions toward withdrawal from the organization. Studies have indicated the significant support of emotional exhaustion as a predictor of many critical outcome variables, for instance, turnover intentions (Catton, 2020; Mo *et al.*, 2020). The COVID-19 pandemic has increased the probability of emotional exhaustion in healthcare workers due to high stress and overload (Kang *et al.*, 2021). Emotional exhaustion refers to the situation in which people feel that they can no longer give more of themselves on an affective level, it is a situation of depletion of one's power or emotional assets (Marrau *et al.*, 2022). Moreover, emotional exhaustion develops from an acute to a chronic problem when faced with persistently stressful circumstances (Martínez-Líbano *et al.*, 2021).

Williams *et al.* (2018), stated that emotional exhaustion occurs in students since its detrimental imbalances between the effort and the rewards they receive in return for their studies while the consequences of emotional exhaustion in students are as complex as mental distress, related to smoking and alcohol consumption are unhealthy lifestyle (Tlili *et al.*, 2020). Emotional exhaustion can also lead to depression (Al-Alawi *et al.*, 2019) and (Farrell *et al.*, 2019) feelings of abandonment while life becomes unbearable in general (Salmela-aro, 2017). The more practical consequences such as dropping out of school are evident (Williams *et al.*, 2018). Potentially leading to sleep disorders, depression, suicidal thoughts, and ideation are found in the middle age (Martínez-Líbano *et al.*, 2021). According to Maslach (1982), emotional exhaustion is the soonest manifestation of burnout. Therefore, it requires substantial attention from researchers and managers alike. Emotional exhaustion leads to considerable tangible and intangible costs. The substitution of an emotionally exhausted academic with an inexperienced one is going to be one of the hugest expenses connected with emotional exhaustion (Karatepe & Aleshinloye, 2009).

Emotional Exhaustion and Job Performance Generally, it is perceived that burnout is related to diminished job performance. Wright and Cropanzano (1998) found that emotional exhaustion was associated with job performance among social welfare workers. Emotional exhaustion was found as the most significant predictor of job performance after controlling for positive and negative. Similarly, the findings of Singh et al. (1994) study have shown that burnout, including emotional exhaustion, resulted in a substantively significant but negative effect on job performance. Wright and Bonett (1997) in their 3-year study of human services personnel examined the relationship between burnout and job performance. A negative and significant relationship was established between emotional exhaustion and job performance. A negative significant impact of burnout on performance among salespersons in Australia has also been reported by Lo *et al.* (2001), Witt *et al.* (2004) examined the relationship between emotional exhaustion and service quality ratings among call centre customer service representatives of a financial services institution, the study found that low levels of emotional exhaustion consequence influence high performance among the representatives.

Student's performance can be badly affected by the various disturbing, behavioural, cognitive, and physiological reactions caused by emotional exhaustion (Galbraith et al., 2015). Álamo *et al.* (2020) reported that lecturers generally have emotional imbalance at work; Emotional exhaustion is a core component of job burnout while emotions are based on where they lie, numerous in magnitudes, such as valence, stimulation and negative activation (Diefendorff *et al.*, 2019). Buzzetti Bravo (2021) opined that approach-avoidance emotions are discrete and should, therefore, be considered separately as a unique experiential state this position was corroborated the works of Mushonga and Ukpere (2023). Lecturers' emotions are usually conceptualised as resulting from prolonged job-related stress and the unkind and negative emotion that results from various aspects of the teaching experiences (Williams *et al.*, 2018). Arising from the above, objectives and hypotheses are postulated:

The objectives of the study are;

1. Determined the effect of emotional exhaustion on service quality in the selected private Universities in South-West Nigeria
2. Explore the effect of emotional exhaustion on work relationships in the selected private Universities in South-West Nigeria.

Evolving from the objectives were the hypotheses formulated for the study

Ho₁: Emotional exhaustion does not have a significant influence on academic staff's service quality in the selected private Universities in South-West Nigeria

Ho₂: Emotional exhaustion does not have a significant influence on academic staff's work relationship in the selected private Universities in South-West Nigeria

2.1 Theoretical Review

The theories and frameworks used to examine emotional exhaustion as a determinant of academic staff's job performance in selected private Universities in south-west, Nigeria. Popular among them is the Role and Conversation of Resources Theory (COR). The prominent theoretical perspective that this study engages and picked as the underpinning theory is the COR which predicts that resource loss is the principal ingredient in the stress process. Resource gain, in turn is seen as importance in the context of loss. Since resources are also used to prevent resource loss, at each stage of the stress process people are increasingly vulnerable to negative stress howls that if on-going result is rapid and impactful loss spirals. COR theory is seen as an alternative to appraisal-based stress theories because it relies more centrally on the objective and culturally construed nature of the environment in determining the stress process, rather than the individual's personal construe. COR theory has been successfully employed in predicting a range of stress outcomes in organizational settings, health, education, and the service sector, following traumatic stress, and in the face of everyday stressors.

2.2 Empirical Review

The study reviewed literature relevant to the variables as discussed in the objectives. Firstly, Levi *et al.* (2022) researched Occupational stress and academic staff job performance in two Nigerian universities. The quantitative ex-post facto research design, questionnaire was used for data collection, and simple linear regression analysis was used. The prediction of workload was negatively non-significant on the job performance of academics. The provision of institutional amenities has a positive but non-significant prediction on academic staff job performance in the two public universities. It was concluded that occupational stress significantly influences the job performance of lecturers in universities. The study is found to be related dimensionally.

Furthermore, Adekunle (2022), researched Influence of personal and occupational stressors on the job performance of library staffs' in private

Universities in Oyo state, Nigeria. A survey research method and correlation type were adopted, and data collected was analysed using the table of frequency, percentage counts and mean analysis the result showed underachieving, financial problems, bitterness, job uncertainty, relationships, and health issues are stress stimulants that contribute to personal stress among library employees in private universities in Oyo State. Disregarding library users, pitiable working conditions, overtime, overload, and using their own resources to work constitute major work-related stressors for library staff, the stressors are significantly linked with absenteeism, low productivity, resignation, lateness, sleeplessness, and alcoholism.

Safeer (2023) studied Impact of occupational stress on productivity of University employees. The study adopted a descriptive research design; the study's target population was recruited from Shifa Tameer-e-Millat University departments. The sample size of $N = 125$ was calculated using Rao-software. A questionnaire was used to obtain quantitative data while the data was gathered through the survey research method and SPSS (Version 27) was used to analyse the data while the data was computed using Chi-square and percentage analysis, the findings indicated that occupational stress has a significant effect on employee productivity and there is a significant difference in the impact of job stress on male and female employees, it also indicated that more than 80% of the employees are experiencing occupational stress.

Chin-Hung Wang (2020) Relationships among workplace incivility, work engagement, and job performance. This empirical study explored how co-worker incivility and customer incivility affect the work engagement and job performance of frontline employees. The methodology is to investigate the incivility and characteristics of hospitality industry workplaces, this study recruited frontline employees from tourist hotels as study participants. Convenient sampling was employed, questionnaire was used for data collection. Findings indicate that co-worker incivility and customer incivility reduced work engagement and job performance. The effects of co-worker incivility on work engagement and job performance are greater than those of customer incivility. Furthermore, work engagement has a positive effect on the job performance.

Bouckenoghe et al. (2022) opined a curvilinear relationship between work engagement and job performance, the roles of feedback-seeking behaviour and personal resources. The study examines the curvilinear relationship between employees' work, engagement and job performance. Data gathered from 190 employees and their supervisors in Ukraine and from 171 employees and their supervisors in Pakistan reveal that although work engagement enhances job

performance, the effect occurs at a declining rate as work engagement increases. Feedback-seeking behaviour moderates this curvilinear relationship, so the decline in the rate at which work engagement enhances job performance is mitigated by higher levels of feedback-seeking behaviour. Furthermore, after controlling for the role of feedback-seeking behaviour, the curvilinear effect of work engagement on job performance is mediated by personal resources (i.e., self-efficacy, optimism, and resilience).

3. Methodology

The study utilized the cross-sectional survey research design to understand a particular population at a time and generate facts and information about the concept at hand (emotional exhaustion and job performance), cross-sectional survey research design was used as it allows a structured questionnaire and consequently obtain data for analyses, it also give the researcher the opportunities to determine the population for the study. The selected private Universities in the south-west were chosen as a unit of analysis, the Universities were chosen because of the longstanding uninterrupted academic calendar, National Universities Commission (NUC) accreditations, information communication technology (ICT) as a medium of teaching and communication. The population of the study comprises the academic staffs of the Universities as of (2023) stood at 1,276 (Registry unit of the universities) while stratified sampling was employed to ensure there is adequate representation of the population, using an online calculator (Rao software) the sample size is 296. a structured questionnaire was administered to 296 academic staffs. Likert scale of 1-5 (strongly disagree to strongly agree) was used, descriptive statistics and simple regression analyses was used to analyses the data generated from the questionnaire on the independent variable (Emotional Exhaustion) and dependent variable (Job Performance)

4. Results

For the study, 296 Questionnaires were distributed to the employees of the selected private Universities of south-west Nigeria. At the end of three weeks, a total of 275 copies of the questionnaire were retrieved. The response rate of 93% is presented in Table 1. The response rate can be adjudged as sufficiently okay for further statistical analysis and inference since it is above 70% although scholars disagree on an acceptable threshold the acceptable benchmarks range from 50% (acceptable) to 70% (very good) for analysis and publication (Ajibola, 2019; Babbie, 2016).

Table 1: Response Rate Distribution

Questionnaire	Frequency	(%)
Response	275	92.91%
Non-response	21	7.09%
Total	296	100%

4.1 Demographic Information of the Respondents

Table 2 indicates that both the Males and Females participated in the study. From the results, 228 respondents were male representing 82.9% of the respondents. The remaining 47 were of female gender reflecting 17.1% of the respondents under study. This indicated that more males participated in the research than female respondents. Table 2. Also indicated that the respondents whose ages were between 36 and 45 years constitute the majority, which is represented by 52.4% of the total respondents in the study. This group was followed by those whose ages were below 36 years with 29.5% of the respondents. Respondents whose ages were above 45 years constituted 12% of the total respondents in the study and constituted the minority respondents in the research. This shows that the younger lecturers participated more in the study than the older ones.

Table 2. Also indicates that the majority of the respondents were married which was over 53% of the total respondents that participated in the study. Of those who were single at the time of the study 18% divorces made up 28%, and separated were 0% The implication is that the married participated more in the study than the widow and single. Considering the work experience the result in Table 2 shows that the majority (67%) of the respondents had between 6-10 years of service. This was followed by those (23%) who served between 11 and 15 years. Only 9% of the respondents served up to 5 years and below. This implies that the majority of the respondents served more than 6 years, which gives credence to the distribution of the sample of this study because of the higher percentage therefore; they are considered suitable for the study, given their years of service.

The highest educational qualification of the respondents shows that 54% of the staff respondents hold a Master's degree, 22% have a Ph.D, and 23.3% have a Bachelor's Degree and Higher National Diploma (Technologist). Therefore, this indicates that Master's degree holders are the dominant survey. This indicated that the respondents had sufficient education to respond to the questionnaires making

them suitable for the study. This was in line with the position of (Delighted, 2023 & Ajibola, 2019) who opined that a higher rate is better. As evident from the above the respondents are suitable for the study and thus capable of providing relevant input to the questionnaire.

Table 1: Demographic Characteristics of Respondents

Variables	Characteristics	Frequency	Percentage (%)
Gender	Male	228	82.9
	Female	47	17.1
Age	35 years and below	81	29.5
	36 - 45 years	144	52.4
	46 - 54 years	33	12.0
	55 years and above	17	6.2
Marital Status	Single	50	18.2
	Married	147	53.5
	Divorced	78	28.4
Highest Educational Qualification	Ph. D.	62	22.5
	Master's Degree	149	54.2
	Bachelor's Degree/ HND	64	23.3
Work Experience	less than 5 years	26	9.5
	6 - 10 years	185	67.3
	11 - 15 years	64	23.3
	above 16 years	0	0
University	Afe Babalola University	41	14.9
	Caleb University	48	17.5
	Crescent University	62	22.5
	Achiever's University	48	17.5
	Joseph Ayo Babalola University	46	16.7
	Ajayi Crowther University	30	10.9

Table 3: Descriptive Statistics on Emotional Exhaustion

Statement		Agree	Strongly Agree	Undecided	Disagree	Strongly Disagree	Total	Min	Max	Mean	SD
I feel emotionally drained from my work	N	9	38	133	95		275	2	5	4.14	0.772
	%	3.3	13.8	48.4	34.5		100				
I feel used up at the end of the work day	N	0	20	152	103		275	3	5	4.30	0.598
	%	0	7.3	55.3	37.5		100				
I feel tired when I get up in the morning and to face another day	N			78	197		275	4	5	4.72	0.452
	%				28.4	71.6	100				
I feel the task at work gives rise to my home conflict	N			6	97	172	275	3	5	4.60	0.533
	%			2.2	35.3	62.5	100				
I feel pain and tired at work	N				102	173	275	4	5	4.63	0.484
	%				37.1	62.9	100				

Table 3. Show the respondents' opinions on various issues about emotional exhaustion on academic staff's job performance in the selected private Universities in south-west Nigeria. The study found that, 3.3% of the respondents strongly agreed that they felt emotionally drained from their work, 13.8% were undecided, 48.4% disagreed, and 34.5% indicated that they strongly disagreed with the statement. The results show that over 82% disagreed that they felt emotionally drained from their work. This is attested to by the mean score of 4.14 which is closer to 5 than 1 and the standard deviation of 0.772 which is closer to 1 than 0. Also, 7.3% of the respondents were undecided on the statement that "I feel used up at the end of the work day", 55.3% disagreed and 37.5% strongly disagreed that they felt used up at the end of the work day. On average, the respondents disagreed

that they felt used up at the end of the workday (mean = 4.30, standard deviation = 0.598).

From the results, 28.4% of the respondents disagreed that they felt tired when they got up in the morning and faced another day, and the majority (71.6%) strongly disagreed. On average, the respondents disagreed that they felt tired when they got up in the morning to face another day, and the majority (mean = 4.72, standard deviation = 0.452). Further, a majority (62.5%) of the respondents strongly disagreed that they felt the task at work gave rise to their home conflict, 35.3% of the respondents disagreed and only 2.2% of the respondents were undecided. On average, most of the respondents disagreed with the statement that they felt the task at work gave rise to their home conflict (mean = 4.60, standard deviation = 0.533). This result implies that they disagree with the statement.

Similarly, the majority (62.9%) of the respondents strongly disagreed that they felt pain and tired at work, and 37.1% disagreed. Averagely, most of the respondents disagreed with the statement that they felt pain and tired at work (mean = 4.63, standard deviation = 0.484). The result points out that work does not give rise to their home conflict. The results indicated that emotional exhaustion does not affect academic staff's job performance in the selected private universities in the south-west. The finding of this study correlates with the findings of (Adekunle, 2022) and (Mohd *et al.*, 2022), who reported that employees recorded stress as a result of institutional factors and affected work performance negatively. However, the finding of this study was contrary to the findings of (Nugraha *et al.*, 2022), who submitted that having the right amount of stress aids work performance in their research.

Table 4: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.328	.205	.208	.128
a. Predictors (Constant), Emotional Exhaustion.				

4.2 ANOVA Model of Emotional Exhaustion and Academic Staff's Job Performance

From Table 4 it is noticeable that the generated significance value is .032 which is greater than the critical value 0.05 at 95% confidence level. This implies that the model is statistically insignificant in predicting the outcome variable. The model also shows a calculated F-value of 5954.360 which is greater than the F-critical value of 3.90 and the level of significance is 0.032 which is greater than 0.05 thus showing that the model is statistically not significant in predicting the influence of emotional exhaustion on academic staff's job performance. This implies that the model is capable of measuring the variables.

Table 5: ANOVA Model of Emotional Exhaustion and Academic Staff's Job Performance

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97.886	1	97.886	5954.360	.032 ^b
	Residual	4.488	273	.016		
	Total	102.374	274			
a. Dependent Variable: Academic staff Job Performance						
b. Predictors: (Constant), Emotional Exhaustion.						

Table 6: Regression Coefficients of Emotional Exhaustion and Academic Staff's Job Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.009	.069		-14.699	.032
	Emotional Exhaustion	-1.175	.015	.978	77.164	

Table 7: Descriptive Statistics on Work Relationships

Statement		Agree	Strongly Agree	Undecided	Disagree	Strongly Disagree	Total	Min	Max	Mean	SD
I help others who have heavy workloads	N				62	213	275	4	5	4.77	0.419
	%				22.5	77.5	100				
I go out of my way to help a new employee	N		10	23	115	127	275	2	5	4.31	0.774
	%		3.6	8.4	41.8	46.2	100				
I get a personal interest in other employees	N		22	61	73	119	275	2	5	4.05	0.988
	%		8	22.2	26.5	43.3	100				
I pass relevant information to co-workers	N		30	53	71	121	275	2	5	4.03	1.035
	%		10.9	19.3	25.8	44	100				
I care less about other employees' concerns	N			33	105	137	275	3	5	4.38	0.691
	%			12	38.2	49.8	100				

Table 7 displays the respondents' perspectives on the influence of emotional exhaustion on academic staff's work relationships in the selected private universities in South-West Nigeria. These findings answer research question two and allow the researcher to meet goal number two of the study. The study found that respondents disagreed that, I help others who have heavy workloads (22.5%) disagreed and (77.5%) strongly disagreed with the statement. These results show that 100% disagreed that they help others who have heavy workloads. This is attested to the (mean score of 4.77 with standard deviation of 0.419). Moreover, (2.5%) of the respondents were undecided on the statement that I go out of my way to help a new employee, (46.2%) strongly disagreed, (8.4%) were undecided, (41.8%) disagreed and (3.6%) strongly disagreed that I go out of my way to help a new employee. On average, the respondents disagreed that I go out of my way to help a new employee (mean = 4.31, standard deviation = 0.774). The results show that the respondents strongly disagreed that I have a personal interest in other

employees 43.3%, strongly disagreed (22.2%) undecided, (26.5%) disagreed and 8% strongly agreed of the respondents. On average, the respondents disagreed that I have a personal interest in other employees (mean = 4.05, standard deviation = 0.988).

Further, a majority (44%) of the respondents strongly disagreed that I pass relevant information to co-workers (25.8%) of the respondents disagreed while 19.3% were undecided and (10.9%) strongly agreed. On average, most of the respondents disagreed with the statement that I pass relevant information to co-workers (mean = 4.03, standard deviation = 1.035). This result implies that they disagree with the statement that (I pass relevant information to co-workers). Similarly, a majority (49.8%) of the respondents strongly disagreed that I care less about other employees' concerns, (38.2%) of respondents disagreed and 12% were undecided. On average, most respondents disagreed with the statement that I care less about other employees' concerns, (mean = 4.38, standard deviation = 0.691). The result shows that they are careless about other employees' concerns. The result inferred that the participants disagreed with all the items on the proxy (Work Relationship) of job performance in the selected private universities in the south-west.

Table 8 Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.328	.205	.208	.128

a. Predictors (Constant), Emotional Exhaustion.

4.5 ANOVA Model of Emotional Exhaustion and Work Relationships

Table 9. it is noticeable that the generated significance value is .030 which is greater than the critical value 0.05 at 95% confidence level. This implies that the model is statistically not significant in predicting the outcome variable. The model also shows a calculated F-value of 5654.350 which is greater than the F-critical value of 3.90 and the level of significance is .030 which is greater than 0.05 thus showing that the model is statistically not significant in predicting the influence of emotional exhaustion on academic staff's Work Relationship. This implies that the model is good at measuring the variables.

Table 9 ANOVA Model of Emotional Exhaustion and Work Relationship

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97.886	1	97.886	5654.350	.030
	Residual	4.488	273	.016		
	Total	102.374	274			

a. Dependent Variable: Work Relationship

b. Predictors: (Constant), Emotional Exhaustion.

Regression Coefficients of Emotional Exhaustion and Work Relationship

Findings in Table 4 indicate that there is a strong negative correlation between emotional exhaustion and academic staff Work Relationship with $R = .328$, unstandardized beta coefficient values of $.328$, and standardised beta coefficient $B = -1.175$ in Table 6. Thus, for every unit increase in emotional exhaustion, academic staff's work relationship will decrease by 1.175 ($.328$ standardized coefficient beta) units. Also from Table 9 the coefficients were significant with p -value = $.030$ which was greater than the alpha level of 0.05 . Hence, the null hypothesis for this study is accepted and the study concluded that emotional exhaustion has no statistically significant influence on academic staff's work relationship in the selected private universities in South-West, Nigeria.

Table 4.6 Regression Coefficients of Emotional Exhaustion and Work Relationship

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.009	.069		-14.699	.030
	Emotional Exhaustion	-1.175	.015	.978	77.164	

5. Discussion of Findings

The study investigated emotional exhaustion as a determinant of academic staff's job performance of the selected private Universities in south-west, Nigeria. Specifically, the study found that emotional exhaustion contributed to academic staff's job performance and work relationships. Findings concluded that emotional

exhaustion has a statistically significant influence on academic staff's job performance in the selected private universities in South-West, Nigeria. The study findings are consistent with (Hussain et al., 2022) that a favourable impact of emotional exhaustion and work environment on job satisfaction can be utilized to enhance academic staff's job performance. The results were also in line with (Fay et al., 2021) who worked on emotional labour, emotional exhaustion, and job satisfaction in the hospitality industry and reported that surface acting and emotional exhaustion were positively associated with job performance.

Moreover, emotional exhaustion has a statistically significant influence on academic staff's work relationship in the selected private Universities in south-west, Nigeria. The study findings are consistent with Aneke and Uzochukwu (2024) studied the effect of work-life balance, burnout, and workload on employee performance at transportation service companies in Bandung city. Simultaneously, the results were also in line with researchers that opined an increase in work engagement does not necessarily lead to the continuous growth of job performance, which may reflect an inverted U-shaped relationship (Bouckenoghe *et al.*, 2022). However, academics proposed an increase in work engagement, employee emotional, cognitive and forward-looking behaviours will positively improve academic staff work relationship (Wang and Chen, 2020).

6. Conclusion and Recommendations

Based on its findings, this study concluded that emotional exhaustion is an emerging phenomenon that affects academic staff's job performance in the selected private universities in south-west, Nigeria. The conclusion drawn from the findings herewith, the following recommendations were made to enhance job performance in Nigerian universities. The study is limited to private universities in south-west Nigeria with two variables, and the methodology are limitations to the study. the study found that emotional exhaustion have a significant impact on academic staff's job performance and work relationships based on this finding, the study recommended that Universities should regulate the number of tasks to prevent stress which will later turn into an inability to accomplish a given task and mentorship should be in place to enhance work relationship, universities should integrate workplace counselling in to reduce work and occupational stress. Nigerian universities should develop and implement a comprehensive leaves, sabbaticals policies specifying eligibility, duration, and application procedures that allow academic staff to take extended breaks for personal development, rest, or family commitments. Such a policy must be in the public domain for employees'

access; these will ensure fairness and consistency. On the foregoing, it's suggested that further research should delve more into the variable, methodology, and the public and private across the six geopolitical zones to extend the study for a better broader view.

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THE APPLICATION OF 4C MODEL OF HUMAN RESOURCE MANAGEMENT IN SERVICE SECTOR

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Abstract

Human resources are the key an intangible resource that plays a crucial role in achieving the competitiveness of modern companies. There are various models aimed at increasing the effectiveness of the human resources. one of the most famous is Harvard model or "4C" model. Commitment, Competence, Congruence and Cost-effectiveness (4C) are four core outcomes that are essential for effective human resource management.

The main purpose of this research was to examine implementation of the 4C model in the service sector. In order to obtain concrete data on the efficiency of human resources management in the service sector, an analysis of their competence, commitment, (non)compliance and cost-effectiveness, an origin empirical research was carried out. The empirical research in accordance with the presented "4C" model was conducted in the companies on the territory of Serbia. Sample consists of 215 respondents who are employed in different service companies.

The obtained results showed that professional development – knowledge, skills and abilities (KSA) have important role in improving the service activities and the business success.

Keywords: human resources, human capital, human resources management (HRM), service sector, KSA-knowledge, skills, abilities, Harvard-4C model.

JEL Classification: D23, J23, M12, O15

Introduction

In today's global market, businesses, regardless of sector, were made up of competitors. In order to gain a competitive advantage, firms must use their employees as a competitive weapon (Arokiasamy et al., 2023). Numerous and radical changes in all areas and spheres of life have affected all business activities, especially from the field of service activities. The service sector has faced and is still facing numerous challenges brought about by technical and technological progress (Premović, 2025).

Human resources are the key factor on which the competitiveness of national economies and modern business organizations is based. One of the most important forms of human resource development in business organizations and modern companies nowadays are knowledge, skill, abilities and the systematic and continuous implementation of learning, training and education processes. Comparative advantage can be turned into a competitive advantage based on human resources, that is, what the company knows, how it uses what it knows and how quickly it can learn something new from the environment and apply it in daily business. In order for today's companies to maintain their competitive advantages, they must constantly analyze and predict the business environment in light of choosing the best strategy for improving their work. Human resources, as the most important intangible business resources, play a particularly significant role in the service industry. Due to the aforementioned reasons, service companies can create a quality product and provide a quality service based on which they will achieve competitive advantages in the changing and highly competitive service market only if they possess quality and professional human resources that have the ability to anticipate, continuously improve their skills and adapt to the needs and highly sophisticated demands of modern consumers and customers.

Literature Review

Global competition and the rapidity of changes emphasize the importance of human capital in the company, as well as the speed and ways in which this "capital" acquires knowledge (Torrington et al., 2004). Human capital represents the total quantitative and qualitative value of all resources possessed by a modern business system.

The level of performance, development, competitiveness, and achievement of set goals of individual companies and entire economies is increasingly dependent on the knowledge and skills of employees and citizens (Source: Kucharcikova et

al., 2024). Wang et al. (2020) observed a diminishing impact of human capital on economic growth, as analysed through the traditional human capital theory's triad of education, training, and health (Source: Tian & Tóth, 2024). Human capital, as Dess, Lumpkin and Eisner point out, refers to the information and knowledge that each individual has and that allows him to be more productive in performing his activities. Also, human capital includes contacts and relationships that are important for the company or for the performance of a specific activity (2007). It includes the entire body of knowledge, abilities, skills and experience of managers and employees that are necessary to provide quality service to clients. Human capital is not the property of the company, but is individual and located on human resources that create added value. The basis of human capital is human resources as the total human potential of a business system, which includes available knowledge and experience, usable abilities and skills, possible ideas and creative achievements, as well as the degree of motivation and interest in achieving organizational goals. This means that human capital is viewed in the focus of overall human values and potential, and that the management's task is to recognize and activate them in the right way, that is, to direct them in the direction of the realization of the desired goals (Premović, 2021).

Bearing in mind that human resources are a dynamic, "living organism" and at the same time the basis of human capital, this means that human capital is also subject to change and differs from company to company. Human capital can also be represented by the present value of investment in human resources (salaries, bonuses, benefits, training, etc.) by the company. Until the 80s of the 20th century, the market value of the company corresponded to the book value of tangible assets, while in today's developed market economies, the market value of the company is on average three times higher than the book value. Intangible assets are the main "culprit" for this deviation of the market value from the book value, which is particularly pronounced in propulsive companies whose value of intangible assets is many times higher than the value of tangible assets and has a tendency to continuously increase. This is the result of increased investments in the company's intangible assets, primarily in human capital. Human capital constitutes the most potent position of intangible assets, which is why it is important to evaluate the efficiency of using all elements of intangible assets, especially human capital.

In modern human society and economy, human resources are the main source of competitiveness, as been told, but they do not create a competitive advantage a priori and per se. Rather it is necessary for the company to put the available human resources into the function of creating and achieving competitive advantages and to

use them in a superior way compared to the competition in the industry. As Armstrong highlights, Human Resource Management (HRM) is “a strategic, integrated and coherent approach to the employment, development and well-being of the people working in organizations” (2014).

Human resource (HR) management underpins people as one of the main sources of firms’ competitive advantage and examines the role of different employee groups as well as approaches in managing them. However, to maintain or gain a competitive advantage, organizations do not only need to hire the employees with the right knowledge, skills, and abilities, but also need to be able to capitalize on those with the help of HR systems (Batistič et al., 2022).

Many different factors influence the HRM policies of a company from external or situational to internal. These factors are quite varied and complex. From one side, there are external factors such as: the current economic situation, the labor market, the technological environment, public policies, the legal environment and competition and so on. From the other side, there are internal factors such as: the corporate mission and strategy, the organizational culture, the organizational structure and the human resources of the company. All of these and other factors and elements must be analyzed and managers must have in mind when determining the HRM policies. “Managers' awareness of the importance of communication with employees (Ndlovu et al., 2021) is also necessary for success because communication is extremely important, without which no operation can be carried out within the framework of any organization” (Iacob Mihaila & Gurgu, 2022).

HRM, as an integral part of the company, must be prepared to deal with the effects of changing world of work and business. Information technology, Digital technologies, Information and Communication Technology, and automation along with other technological advances have re-defined and re-shaped the business world, as well as all the other spheres of life (Pushova Stamenkova et al., 2023).

The success of human resources and human capital in companies is influenced by numerous quantitative and qualitative factors. Characteristics such as passion, desire, motivation, job satisfaction, innovation, creativity, knowledge - it is impossible to show in financial statements, but they are precisely what create and determine the fate of the company (Arsić & Premović, 2020). Within the human capital sector, the word "employee satisfaction" refers to a wider range of factors, including an employee's level of contentment with their jobs, their work experience, and the company they work for. It is a crucial indicator of an organization's general health and is frequently assessed through recurring surveys (Adewale et al., 2024). Motivation is a significant factor that affects employees,

their job satisfaction and willingness to improve and apply their knowledge and skills for the benefit of the company as an employer. Motivating and satisfying employees are especially important in service industries. According to Kotler and Keller, exceptional service companies know that a positive attitude from employees will certainly promote greater customer loyalty. Given the importance of a positive attitude from employees, service companies must attract the best possible employees. They must design a good training program and provide support and rewards for good results, the authors conclude (Kotler & Keller, 2006). Some authors, such as Rosenbluth and Peters, go so far as to emphasize that the company's employees, not its customers, must come first if the company wants to fully satisfy its customers. Karl Albrecht believes that: apathy, coldness, condescension, roboticism, strict (rigid) adherence to rules – the greatest so-called "deadly sins" in providing services. In his opinion, employee motivation and satisfaction are essential for providing quality service, because unmotivated and dissatisfied employees can actually be "terrorists"! Hitka, Rózsa, Potkány and Ližbetinová (2019) explicitly agree with the view that meeting employee needs is one of the greatest challenges for company management, especially since the success of a company depends on employee productivity.

Irabor and Okolie (2019) point out that the main challenges that organizations are facing today is not only managing its human resources but also satisfying and retaining them. Securing and retaining skilled workforce play an important role for any organization, because the knowledge and skills of employees have become highly essential in gaining competitive advantage in today's business environment.

Employees desire recognition, respect, and fair compensation for their efforts in enhancing the institution's performance and profitability. If organizations fail to fulfil the expectations of their employees, it can result in a hostile work environment (Mnyani et al., 2023). Also, regular feedback from superiors is a strong motivating factor for a representative number of employees (Iacob Mihaila & Gurgu, 2022). In the Syed et al. (2022) opinion „the possibility of continuous learning mobilizes employees in their careers. Training and development are fundamental for the continuous improvement of employee training and for the provision of services at the best standard”. Todorova (2022) underline that the role of the manager is to create those conditions that provoke employees to participate actively in the work process and perform their official duties with a conscious desire. 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 (Masindi et al., 2023).

Theoretical Background

In the scientific and professional public, as well as in practice, there are various models aimed at increasing the effectiveness of the use of human resources. Depending on the priority orientation and main focus, two types of models are distinguished. Models that are oriented on results, objectives and Key Performance Indicators (KPIs) - i.e. deliverables and outcomes belong to the group of so-called "hard models" while the so-called "soft models" include models that are primarily oriented towards people, attitudes, culture and motivation.

In order to evaluate the effectiveness of HRM, Harvard researchers proposed a model known as "*Harvard framework*", "*The Map of HRM territory*" or "*4C model*". The model was developed by researcher in Harvard University - Harvard Business School during 1984.

Beer and his colleagues were the first to underline the HRM tenet that it belongs to line managers. They suggested that HRM had two characteristic features:

1. line managers accept more responsibility for ensuring the alignment of competitive strategy and HR policies;
2. HR has the mission of setting policies that govern how HR activities are developed and implemented in ways that make them more mutually reinforcing (Armstrong, 2014).

This model is one of the most influential "soft HRM approaches" because their focus is on employees rather than outcomes. The model seeks to enable an optimal context for all employees to do their best work. The Harvard model is essentially a human resource-based model that prefers holistic approach to human resources and includes multiple levels of the outcome (Source: <https://hrmhandbook.com/hro/model/harvard-model/>). But although the Harvard model takes a soft view of HR, it is not entirely soft since it also considers the importance of reward systems, including payment, as been shown on the Figure no.1.

The Harvard Model identifies the four different areas of HR:

1. *HR Flows*: Human resource flows include placement, recruitment, appraisal, selection, termination, and promotion, among other things.
2. *Reward systems*: There should be both an inspirational and a salary system to help encourage the employees.
3. *Employee Influence*: A level of responsibility, power, and authority should be delegated.

4. *Work Systems:* This is the concept of work as well as the alignment of people.

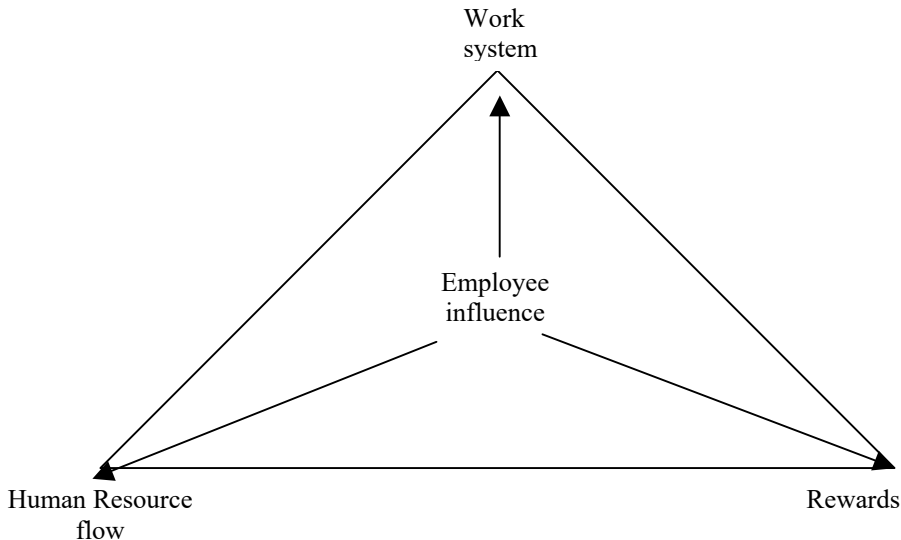


Figure no. 1 Harward HRM policy damond model

Source: Gado & Ülegen, 2018

These four areas leads to the Four C's or HR policies that must be implemented which are:

1. Commitment,
2. Competence,
3. Congruence and
4. Cost-effectiveness.

The managers are expected to provide constructive solutions for the problems regarding the human resources by means of said model (Soyhan & Agar, 2014). 4C model includes the global development of businesses, the power of different stakeholders like government, labour unions, and management, and linking corporates with human resource strategies (Poole, 2015). The model offers organizations with a framework for understanding and managing their employees, focusing on areas such as recruitment, training, performance evaluation, rewards and recognition.

Five significant componentson which the Harvard 4C model is operating are:

1. situational factors,
2. stakeholder interests,
3. HRM policies,
4. HRM outcomes, and
5. long-term consequences the organization is set out to accomplish.

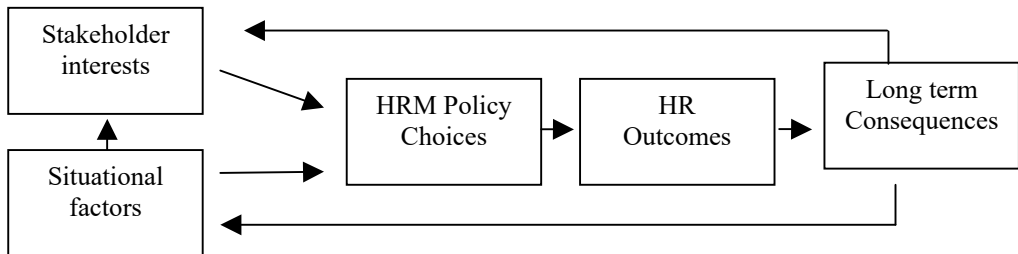


Figure no. 2. Harvard HRM model

Source: Gado & Ülegen, 2018.

The model encourages collaboration between all levels of the organization, with strong motivational practices for employees that empower general managers to be actively involved in the HR aspect of the business. As can be seen in the Figure no. 2., this model emphasizes the importance of communication and understanding between the different departments, allowing general managers to become more intimately familiar with their teams and the people they are managing. (<https://hrmhandbook.com/hro/model/harvard-model/>).

Commitment, Competence, Congruence and Cost-effectiveness (4C) are four core outcomes that are essential for effective human resource management which main characteristics are present in the Table no. 1.

Table no. 1. Harward 4C model

KEY EFFICIENCY FACTORS OF HUMAN RESOURCES MANAGEMENT:	MEANING/ EXPLANATION:
COMPETENCE	<p>To what extent are the employees competent for the work they perform?</p> <p>It includes an analysis of the level of education, knowledge and skills that employees have and that they need to perform existing jobs or to take on new roles and jobs, if the need arises.</p>
COMMITMENT	<p>To what extent are employees committed and dedicated to their work and the company?</p> <p>It involves analyzing and determining the extent to which employees are dedicated to the work they perform in the company and how ready they are for additional training and acquiring new knowledge and skills in order to perform their current and future work tasks more successfully.</p>
CONGRUENCE	<p>To what extent is there alignment between the company's mission and goals and individual employee goals?</p> <p>It includes the analysis and evaluation of the employee's relationship with the organizational goals and management structure of the company. It is manifested in the existence of cooperation, alignment of individual goals and organizational goals, satisfaction, harmony between superiors and subordinates, and the like.</p> <p>Incoherence implies the analysis and evaluation of the negative attitude of employees towards the organizational goals and management structure of the company, and it manifests itself in the absence of cooperation, inconsistency of individual goals and organizational goals, dissatisfaction, discord between superiors and subordinates, and the like.</p>

KEY EFFICIENCY FACTORS OF HUMAN RESOURCES MANAGEMENT:	MEANING/ EXPLANATION:
COST- EFFECTIVENESS	<p>To what extent and whether the company's human resources management policies are cost-effective in relation to expenses and costs such as: salaries, various benefits for employees, absenteeism, strikes, etc.</p> <p>It includes a cost-benefit analysis of investment in human resources and capital and an assessment of the competitive position, i.e., determination of expenditures for additional training and education of employees, determination of whether expenditures for human resources, such as: salaries, various benefits, paid training and the like - higher, lower or at the level of the competition.</p>

Source: Premović, 2021.

Each of these outcomes plays a crucial substantially role in the development and execution of HR strategies. From his very development up to nowadays, the Harvard model remains a valuable guide to the HRM (Bear et al., 2015). For more than 40 years, the model has found wide application in practice. It comprises several situational factors, the interests of the stakeholders, a long-term approach and a feedback process. There are various modifications done in the Harvard model from time to time to adapt to the changing environment. Their main objective is to resolve the problem of historical personnel management of traditional and routine functions (Campbell, 2003). Harvard's model uses modern techniques and strategic functions. But it has certain limitations. According to the authors, the main limitation is that it ignores the hard HRM approach which shows that there is a high chance of business failures (Brunetto et al., 2011).

Materials and methods

Respecting the fact that the service activity is a labor-intensive activity, the task of the managers of service companies in the implementation of the process of human resources management is even more significant and complex. Managers specialized in the field of human resource management are approached differently and they are differently organized in companies, depending on the specifics of each companies, its size and structure, type of business or activity, competition and

situation in the industry, decisions of capital owners and management and similarly. In some companies the area of human resources management is under the jurisdiction of the so-called top managers, other line managers and human resources specialists, while some enterprises hire employee relations experts, consultants, advisors and external associates (Premović, 2025).

In order to obtain concrete data on the efficiency of human resources management in the service sector - in companies on the territory of Serbia, an analysis of their competence, commitment, (non)compliance and cost-effectiveness, an origin empirical research was carried out. This research was created as part of the International scientific and professional project: Perspectives of interregional cooperation of local communities in the countries of the Western Balkans - in the fields of science, education, culture, economy, tourism and sustainable development organized by the Educational and Business Center for Human Resource Development, Management and Sustainable Development from Novi Sad.

At the very beginning of the empirical research, two basic hypotheses were set:
H₀: Continuous professional development through knowledge, skills and abilities have important role in improving the service activities and the business success.

The Statistical Package for Social Sciences (SPSS) for Windows 20 program, which works under the Microsoft Windows environment, was used for data processing.

Results and discussion

The empirical research in accordance with the presented "4C" model was conducted on the territory of Serbia. Sample consists of 215 respondents who are employed in different service companies, organizations, agencies, institutions on the territory of Serbia and who directly or indirectly participate in the creation and provision of different kind of services.

Some of the summarized results of this research based on a survey conducted through a structured questionnaire are presented in tables and figure as well as explanations. The sample structure according to gender, age and education is present in the Table no. 2.

Table no. 2 Sample structure

Variables		F	%
Gender	Male	128	59,53
	Female	87	40,47
Age	Less than 25	7	3,25
	26 -32 year	29	13,49
	33 - 40	58	26,98
	41 - 55	83	38,60
	More than 56	38	17,67
	Without answer	/	/
Education	Low high school	/	/
	High school	67	17,20
	College or academic studies	58	29,30
	University	76	45,12
	MSc or PhD	14	8,37

Source: Author research

The gender structure of the surveyed human resources that participate in the provision of service in the enterprises on the territory of Serbia shows the dominance of males with almost 60% in the basic sample, while females are represented with 40%.

When it comes to the age structure of the respondents, middle-aged employees from 41 to 55 ages are the most represented in the service enterprises. The number of employees between 33 and 40 and between 26 and 32 age is slightly lower, while at least 7 employees are under the age of 25. Having in mind the importance of knowledge and education in modern business, especially valuing knowledge and education in providing highly sophisticated services that are increasingly required by modern customers, an important segment of the research is dedicated to these issues. According to the conducted survey, the university-educated human resources are the most represented. The largest number of enterprises are from the field of Tourism and hospitality, followed by enterprises from the IT sector and from the Financial sector, and the smallest number is from the Public administration or public sector. Based on the data obtained from the respondents, it can be state that the largest number of enterprises has from 11 to 20 employees

while only 3% of the surveyed enterprises have more than 50 employees. The largest share of more than half of the enterprises is privately owned. The administrative staff is dominant with a share of 39% in the management structure of the enterprises and the representation of managers is on average 21% (Premović, 2025).

When it comes to the practice of managing human resource development in service companies in Serbia, human resource development: professional development through KSA as a regular work activity is defined in 67% of companies, while this is not the case in 33% of companies, as shown in Figure no. 3.

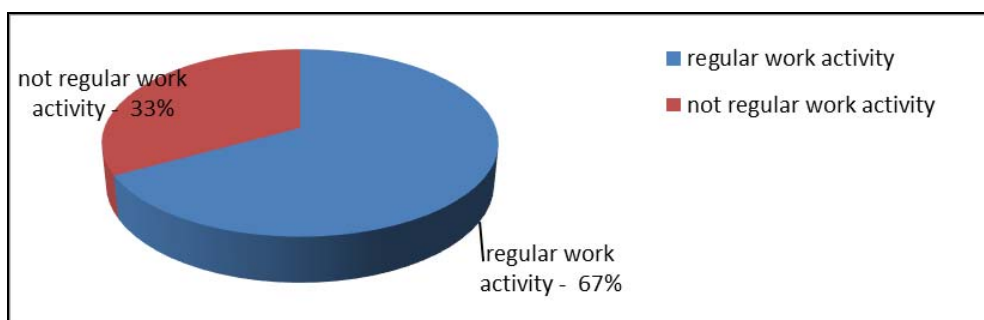


Figure no. 3. Professional development through KSA in service companies in Serbia

Source: Author research

To the question: Do you think that training and continuous improvement through KSA development should be mandatory for all employees in the service company? – the data shown in the following figure were obtained.

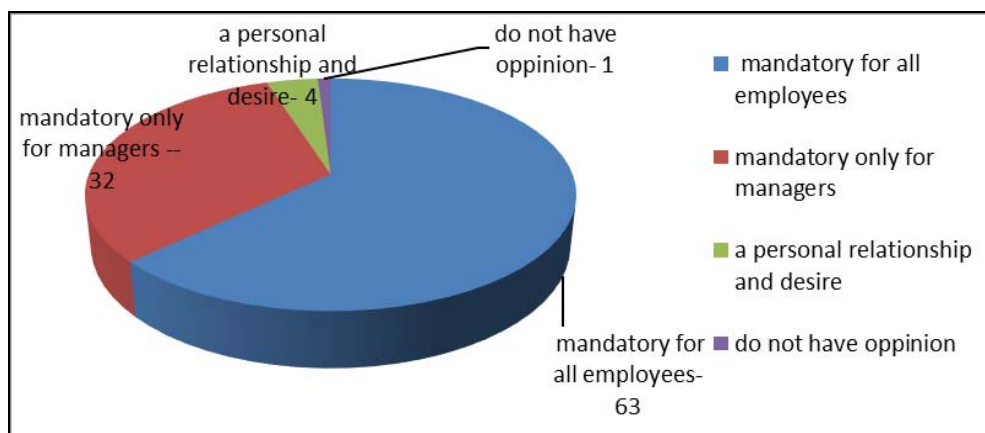


Figure no. 4. Mandatory lifelong learning and training in service companies in Serbia

Source: Author research

63% of respondents believe that training and continuous improvement through skill development should be mandatory for all employees in the service sector, while 32% of respondents think that training should be mandatory only for managers and professional staff. It is worrying that 4% of respondents believe that professional development, training and education should be a personal relationship and desire of each employee, and should not be mandatory for all employees in service companies. 1% does not have opinion.

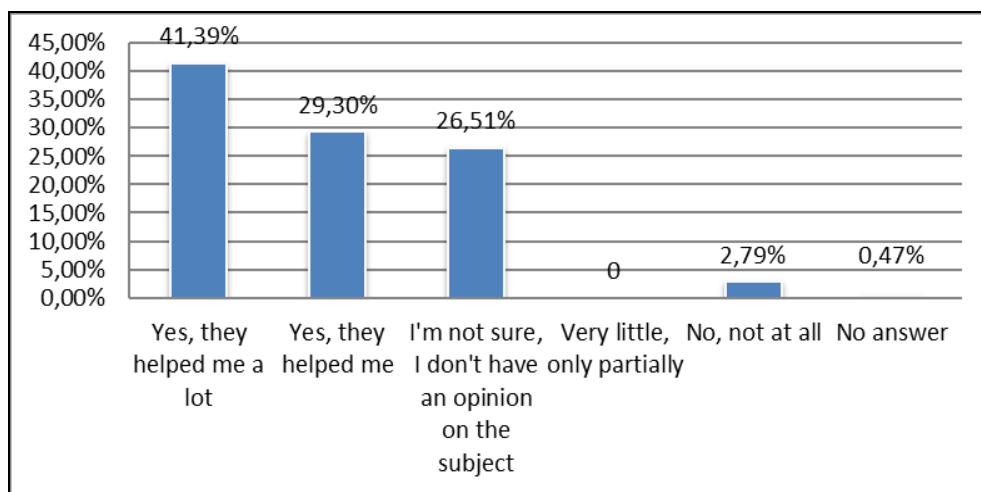


Figure no. 5. Usefulness of new knowledge and skills in work

Source: Author research

Over 70% or 152 respondents believe that the new knowledge skills and abilities acquired through in-company training have helped them and helped them a lot in their work. Of these, 89 respondents believe that the new knowledge and skills have helped them in their work, and 63 of them that they have helped them a lot in their work. However, 57 respondents claim that the training has helped them very little, or only partially (26.51%). On this topic, 1 respondent has no opinion, or is not sure about the usefulness of new knowledge and skills in their work, while 6 respondents believe that the new knowledge and skills acquired through in-company training have not helped them at all in their work.

Attending various trainings and workshops, according to the respondents, has contributed to being more efficient and productive at work to the greatest extent (Table no. 3). Analytical skills in performing work tasks, as well as more innovative and creative work are also one of the positive effects of applying new knowledge and skills acquired through training.

Table no. 3. Importance of new knowledge, skills and abilities in work

Answer	F
1. You perform your tasks more efficiently	74
2. You are more productive at work	65
4. You are more analytical in performing your tasks	58
5. You are more innovative in performing your tasks	37
6. You are more creative in performing your tasks	24
3. You successfully resolve emerging problems and interpersonal conflicts in the organization	21
7. Other	/
8. I don't know	7

Source: Author research

When it comes to the respondents' assessment of the role of continuous professional development and training in improving services and improving the business performance of companies (Figure no. 6), the data obtained indicate that professional development and training play an important or very important role in improving services and business performance of service companies, according to the majority of respondents. No respondent answered "no role, and especially not a significant role".

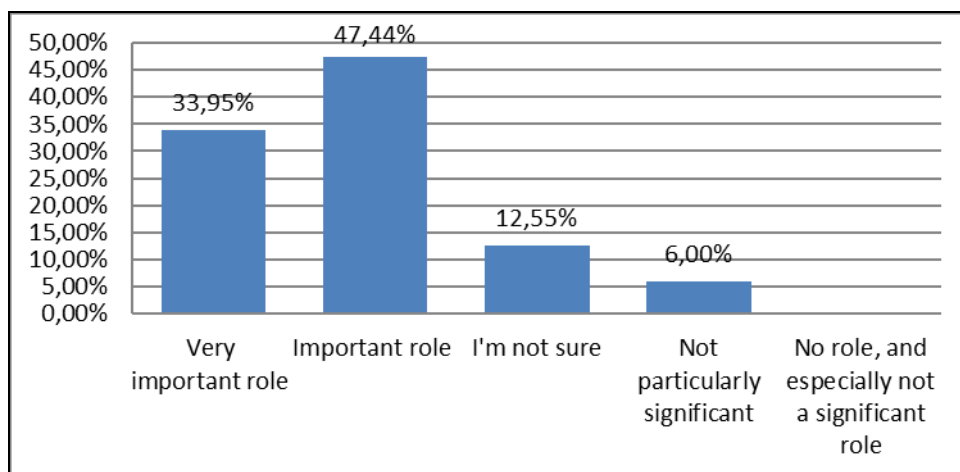


Figure no. 6. The role of training in improving the business of service companies in Serbia

Source: Author research

73 respondents which is more than a third of the sample, believe that professional development and training play an important role, and 102 or almost half of the sample believe that this role is very important. 27 respondents chose the answer that the role of professional development and training is not particularly important, and 13 of them which is 6%, chose the option "I am not sure".

In 73% of companies, the evaluation of human resources performance is carried out using ad hoc methods and based on the opinions of direct managers, i.e. subjective assessments. In 21% of companies, the evaluation is carried out through cost-benefit analysis. Formal implementation based on clearly defined criteria, i.e. in the form of objective measures, is carried out in only 6% of companies where the surveyed human resources work, as can be seen in the following figure.

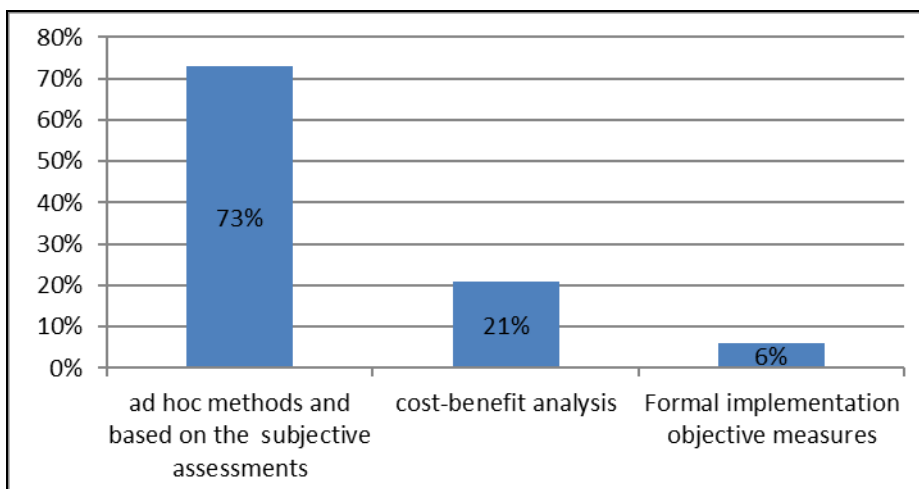


Figure no. 7. Evaluation of performance in service companies in Serbia

Source: Author research

In more than a third of companies (38%) in which respondents believe that training is a motivating factor at work, there is a reward and promotion system, while this is not the case in 62% of companies (Figure 8).

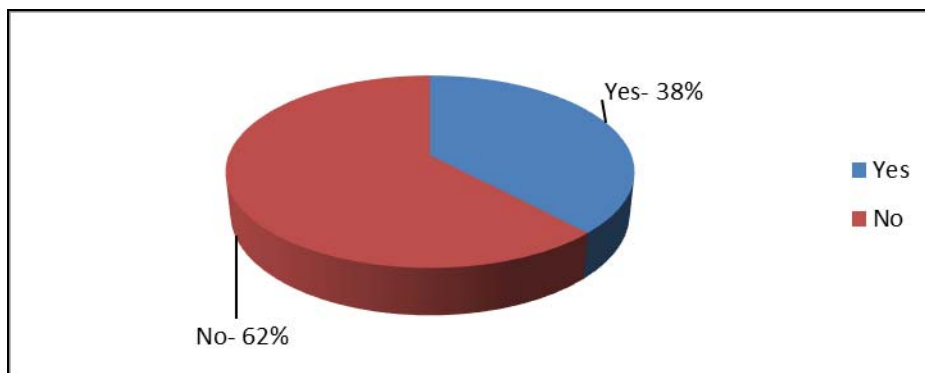


Figure no. 8. Reward and promotion system in service companies in Serbia

Source: Authors' research

When it comes to the implementation of the reward and promotion system in service companies, data was obtained indicating that in less than a third of companies in which respondents believe that training is a motivating factor at work, there is a reward and promotion system, while this is not the case in 72.31% of companies, and the specific methods of implementing this system are presented in the following table.

After statistical processing and analysis of the obtained results, their interpretation was carried out from the four core outcomes: commitment, competence, congruence and cost-effectiveness – from “4C” aspect, which is shown in the following table.

Table no. 5. Application of "Model 4C" in the service sector in Serbia

KEY EFFICIENCY FACTORS	RESULTS OF SPECIFIC RESEARCH CONDUCTED ON THE TERRITORY OF THE REPUBLIC OF SERBIA
COMPETENCE	<p>1. A higher education has the largest number of 76 respondents, followed by respondents with completed secondary education, of which there are 67. 58 respondents obtained higher education and 14 of the 215 respondents have a doctorate and/or master's degree.</p> <p>2. The importance of new knowledge and skills at work was expressed by the respondents primarily through more efficient and productive performance of work tasks, which was recognized by 139 respondents as a key, concrete advantage of newly acquired knowledge and skills. Analyticality in the performance of work tasks was highlighted by 58, and in the opinion of 37 respondents, more innovative and creative work are the positive effects of the application of new knowledge and skills that affect the level of competence of employees.</p>
COMMITMENT	<p>1. The largest number of 152 respondents believe that the new knowledge skills and abilities acquired through training in the company have helped them and helped them a lot in their work. Of these, 89 respondents or 41.39% believe that the new knowledge, skills and abilities have helped them in their work, and 63 of them or 29.30% that they have helped them a lot in their work.</p> <p>2. 135 out of 215 respondents believe that continuous professional development and education should be mandatory for all employees in the service sector. 8,6% respondents answered "no, because it should be the personal attitude and desire of each employee", while 1% respondent has no opinion on this issue.</p>
	<p>1. The majority of respondents (81.4%) are of the opinion that professional training and education play an important, or very important role in improving the service activities and improving the business performance of companies. No respondent answered "no role, especially not a significant role." 73 respondents believe that professional development and education have an important role, and 102 that their role is very important.</p>

KEY EFFICIENCY FACTORS	RESULTS OF SPECIFIC RESEARCH CONDUCTED ON THE TERRITORY OF THE REPUBLIC OF SERBIA
CONGRUENCE	<p>2. The largest number of respondents who have higher education - 64 out of 76 of them - emphasize the important and very important role of continuous training and education for all employees who participate in the creation and provision of services activities. According to respondents who have secondary education, continuous training and education have an important role, but should be binding only for managers and professional staff working in service companies.</p> <p>3. 63% of respondents believe that training and continuous improvement through skill development should be mandatory for all employees in the tourism sector, while 32% of respondents think that training should be mandatory only for managers and professional staff.</p>
COST- EFFECTIVENESS	<p>1. In 38% of the companies, the effects and results of conducted trainings and various professional development and education programs are monitored through evaluation of work performance.</p> <p>2. The effects of training and various programs of professional development and education are evaluated through a cost-benefit analysis in 21% of companies where the effects of training and professional development are monitored. Ad hoc methods and based on the opinions of immediate managers, i.e. subjective assessments, are applied by 73% companies. Formal implementation based on clearly defined criteria, i.e. in the form of an objective opinion, is implemented only in 6% of companies.</p>

Source: Author research

Conclusions

Bearing in mind the previous knowledge and obtained finding from original scientific research that was carry out for the purpose of this paper, it can be said that the success of any business organization is determined by the human resources at its disposal. In the competitive struggle on the domestic and the international market, the ultimate reserve consists of human resources, and the critical link in management is actually a manager who knows how to lead them. Establishing an organizational structure and business climate in which employees are motivated to

work is a very important task of human resource managers, since the productivity and creativity of employees directly depend on the degree of their work motivation and job satisfaction. Therefore, companies must provide good working conditions for employees in order to meet their needs and achieve the best possible results, business success and remain competitive. Human resource managers have the important task of balancing different interests. It is important to strike a balance between organizational goals and stakeholder and employees interests. If human resource are used effectively the company's ability to achieve its defined goals and objectives are significant and become more certain.

Based on the obtained results of empirical research and their interpretation, the following can be concluded:

1. Respondents whose level of education is lower have a more negative attitude about the importance of continuous professional development and education through knowledge, skills and abilities in improving the service activities and improving the business performance of the company.
2. Respondents whose level of education is lower have a more negative attitude about specific types of professional development and education through knowledge, skills and abilities that are applied in the company. It was found that these respondents are more dissatisfied with the offered and conducted types of professional development than respondents with a higher degree of education.
3. Older respondents have a slightly more negative attitude about the importance of continuous professional development and education through knowledge, skills and abilities, than is the case with younger respondents. It was determined that there is a statistically significant difference regarding the attitude about the importance of continuous professional development and education between, on the one hand, respondents who are over 56 years old, from respondents who are less than 32 years old and those between 33 and 40 years old, on the other hand.
4. Older respondents have a somewhat more negative attitude about the impact of continuous professional development and education on the improvement of service activities and the improvement of business performance of companies than is the case with younger respondents. Therefore, there is a statistically significant difference regarding the attitude about the importance of continuous professional development and education between, on the one hand, respondents older than 56 years, from those who are less than 32 years old, and from 33 to 40 years old, on the other hand.

5. Older respondents are more dissatisfied with the types of professional development and education applied in the company than is the case with younger respondents. This means that there is a statistically significant difference in terms of satisfaction with the types of professional development, training and education, between respondents over 56 years old and respondents who are between 33 and 40 years old.

The results of the conducted empirical research indicate the conclusion that the most significant influences on the success of the service sector in the Serbia have: constant professional training and education through knowledge, skills and abilities of employees, age - years of life of employees.

The obtained results showed that professional development and education through knowledge, skills and abilities have important role in improving the service activities and the business success.

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EXPLORING POTENTIAL CONTRIBUTIONS OF MINORITY TRADE UNION TO COLLECTIVE BARGAINING PROCESSES

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Abstract

Trade unions are organisations of employees who join to attain common objectives in key areas relating to decent wages, conducive working conditions and enhanced health and safety in the workplace. Moreover, trade unions are an important available mechanism for employees to combat the inherent inequalities that exist within the employment relationship. Within employment relations, the most used approach to combating inequalities in the employment relationship is through collective bargaining. Collective bargaining refers to engagement techniques through which employment parties amicably resolve disputes around terms and conditions of employment. However, due to the majoritarian principle, only majority trade unions currently enjoy collective bargaining privileges within the employment relations environment. The current paper's objective was to explore potential contributions that minority unions could add towards the process of collective bargaining. To achieve this objective involved the utilisation of a qualitative phenomenological research design, where semi-structured interviews were adopted for data collection purposes. In total, twelve participants contributed to the study. The current study's findings showed that inviting minority trade unions to collective bargaining processes could lead to enriched decision-making and creativity, due to the higher intellectual capacity within minority unions, which can lead

to enhanced problem-solving and productivity within workplaces. Conversely, few participants indicated that no constructive input would be added by minority unions to collective bargaining processes. It is recommended that employment parties have mutual respect for trade union functions and the employer's prerogative, allowing for enhanced employee participation in decision-making processes and of course, the enrichment and innovation of employment relations consultative mechanisms.

Keywords: *collective bargaining, minority trade unions, majoritarianism, employment relations, inclusiveness.*

JEL Classification: J510; J520

1. Introduction and background

Striving to achieve equity within employment relationships is an integral goal for employers and employees. When striving towards this goal, both employment parties participate in workplace practices, engaging in exchanges of power testing (Du Toit, 2015). This power testing often takes the form of collective bargaining in organisations, where employers and employees, through their trade unions, engage and negotiate on terms and conditions of employment. Okoro (2023) advances that collective bargaining involves discussions regulating employment matters such as remuneration, job grading, hours of work and work categorisation amongst others.

Trade unions can be defined as organisations of employees who join together to attain common objectives in key areas relating to decent wages, conducive working conditions and enhanced health and safety in the workplace (Nayak et al., 2020). Camen et al., (2008) maintain that a trade union is an important available mechanism for employees to combat the inherent inequalities that exist within the employment relationship. This relates to the employer's ability to discipline, establish patterns of work, direct the efforts of employees in the workplace, and dictate performance standards, amongst others (Mathis et al., 2014). Additionally, Yaacob et al., (2024) suggests that when employees join trade unions, such unions gain strength owing to the collective voice that unions advance for employees in the workplace.

Conversely, collective bargaining can be defined as engagement techniques through which employment parties amicably resolve disputes around terms and conditions of employment (Dash & Dash, 2020). Therefore, collective bargaining is viewed as a process of negotiating parties meeting, tabling demands, discussing these demands, tabling counterproposals and sometimes providing ultimatums in a

bid to reach agreement in the workplace (Femi et al., 2019). Moreover, Nkuna-Mavutane et al., (2024) define collective bargaining as processes of negotiation between employers and employees to determine employment conditions.

For employees to achieve their desired outcomes from collective bargaining processes, they place a heavy reliance on the trade union movement that exists within an organisation. However, Katono et al., (2012) states that where a trade union's power or effectiveness is limited in an organisation, this can have negative consequences for employees. This is owing to a considerable portion of the international workforce, especially in developing nations, remaining uninformed of their rights under labour law (de Rodolfo, 2025). This situation can lead to employers implementing decisions unilaterally in the workplace, which may adversely affect employees' working conditions, with no consultation or participatory processes taking place.

Presently, collective bargaining is reserved for only majority trade unions due to the majoritarian principle. Conversi (2011) defines majoritarianism as a governance practice based on the majority rule, where dominant groups are awarded some type of supremacy in respect of decision-making processes. This is consistent with the view of Allan (2017), who claims that groupings who possess the majority are likely to exert their power and authority against those groupings who belong to the minority. As such, majority trade unions are given superior organisational rights and privileges compared to minority trade unions through the implementation of majoritarianism. Consequently, minority trade unions are excluded from collective bargaining processes within the workplace. Moreover, if employees are to gain entry and influence into decisions-making processes at the workplace, collective bargaining becomes a primary tool to achieve this (Voss & Bertossa, 2022).

1.2 Problem statement

Due to the implementation of majoritarianism by employers and majority trade unions, minority trade unions are excluded from participating in collective bargaining processes. This results in minority trade unions being unable to advance their members' interests at the collective bargaining table and positively influencing their working conditions within organisations. Furthermore, potential important contributions to collective bargaining processes are lost, as minority trade unions and their members do not have a seat at the negotiating table.

1.2.1 Research question

Reflecting on the outlined research problem above, this study explores the following research question:

- Can collective bargaining processes benefit from the inclusion of minority unions?

1.2.2 Research objective

The objective of this study is:

- To explore the potential contributions of minority unions towards the process of collective bargaining.

2. Literature Review

Employment relationships are not deprived of conflict in the workplace. However, collective bargaining is a tool utilised to cordially resolve contentious issues between employment parties relating to workplace conditions (Femi et al., 2019). Kalaimathi and Hemalatha (2020) assert that collective bargaining establishes minimum remuneration, regulates working hours, and determines health and safety conditions within organisations. Collective bargaining therefore relates to rule-making processes, holding the promise of ensuring workplace stability through substantive and procedural rules, which aim to ensure harmonious employment relations within the workplace (Femi et al., 2019). Bukar et al., (2022) add that collective bargaining has historically been viewed as a central element of democracy in workplaces, creating mechanisms for improving terms and conditions of employment.

Within collective bargaining processes, the trade union movement plays an integral role in ensuring its success and effective implementation. According to Kalaimathi and Hemalatha (2020), trade unions are employee movements that strive to attain conducive employment conditions, whilst protecting and advancing employee interests through collective bargaining mechanisms. Furthermore, trade unions are regarded as moral movements, that seek to uplift vulnerable employees and secure their dignity in the workplace, delivering the justice that employees deserve (Nayak et al., 2020). In agreement, Wang (2024) opines that a trade union should endeavour to advance social justice and labour peace, ensuring that employees enjoy equity and fair treatment in organisations.

The literature related to this study firstly delves into the role that trade unions fulfill towards their membership base within organisations, regardless of the union's size in the workplace.

2.1 Role of trade unions towards its members

Trade unions are demarcated in section 213 of the LRA as associations of individuals, whose fundamental objective lies in regulating relations between employers and employees. Therefore, trade unions can be said to play an integral

role in ensuring that a conducive workplace environment exists for employees to perform their duties and to receive fair remuneration in return. Likewise, trade unions fulfil an important function in establishing conducive employment relations within organisations (Wang, 2024).

Addison (2014) declares that within a democratic society, an important function of trade unions is fostering ideas of democracy and unity. Furthermore, owing to the important functions that unions perform in organisations, participation from their members in union activities is key (Yaacob et al., 2024). Existing in democratic societies, therefore, compels the resolution of conflict, as well as indifferences through negotiations and dispute resolution, as employees select representatives to bargain with employers around terms and conditions of employment (Conversi, 2011). Engaging in collective bargaining is accepted as a fundamental function encompassed under the sphere of practices aligned to employment relations (Nkuna-Mavutane et al., 2024). Moreover, employees' rights to form trade unions and bargain collectively, allows them to participate in a mini-democracy and to hold trade union representatives accountable for delivering on their mandates (Nel et al, 2017). It can, therefore, be assumed that members can hold their trade unions liable for non-delivery of promises, as they join the union with a view to achieving certain outcomes in the workplace. The important role of trade unions towards their members was outlined in the case of *SAMWU v Jada & others*, where the court held that unions have a specific duty of care towards their constituencies and stakeholders. This is because the regulations through which a trade union exists are directed by its members, and members select figureheads and agree on essential matters that direct them in organisations (Cohen, 2013). Unions also have a reasonable influence on employee performance and workplace culture due to their participation in collective bargaining on behalf of their members (Bukar et al., 2022). Hence, it can reasonably be said that unions assist to develop active and responsible citizens within a country.

Burke and Cooper (2008) suggest that trade unions fulfil not only the economic but also the political needs of their members, as most employees view unions to be the extension of political will and democracy in the workplace. In this regard, Amankwaah (2023) comments that a typical union in Ghana, such as the University Teachers Association of Ghana (UTAG), was founded on promoting the welfare of members and ensuring high productivity in the workplace. Hence, employees may reasonably expect an effective level of delivery on mandates and other objectives as a result of their levies, which are deducted from their salaries and paid to trade unions in the workplace.

Due to the majoritarian principle, a trade union's size dictates the level of organisational rights and privileges that a union enjoys in the workplace. These organisational rights, in turn, prescribe whether a trade union participates in collective bargaining processes. This element is further discussed next.

2.2 Organisational rights and their influence in the workplace

Organisational rights refer to the rights that are conferred on registered trade unions as a consequence of their legitimacy and size within an organisation (Esitang & Van Eck, 2016). Finnemore (2013) mentions the number of rights and says that the potency of those rights extended to unions depends on whether a union is in the majority or minority within a workplace. It can, therefore, be said that the more members a union holds, the more organisational rights and power that the union will have.

Kruger and Tshoose (2017) assert that organisational rights strengthen and support a trade union, thereby allowing it to exercise authority and power within an organisation. These enable a union to attract members, network with and interact with those members, whilst establishing an effective degree of financial strength, amongst others. Moreover, the presence of unions in the workplace create an avenue for employees to turn to in situations where they feel mistreated (Amankwaah, 2023).

Hyman (2007), emphasises the enjoyment of general civil liberties or political rights within any society, including the right to associate, essential to exercising union rights in organisations. In the case of *Hospersa and Zuid-Afrikaanse Hospitaal*, it was held that union rights are designed to enable unions to gain initial access to a workplace. It can, therefore, be assumed that once unions obtain entry to workplaces, it is up to such unions to build their capacity and strength within that workplace or industry. Further to this, Parry et al., (2013) declare that a trade union's actions and behaviours within an organisation will be determined by its size and the number of organisational rights that such a union possesses. Unions, which represent the majority of individuals within an organisation are more likely to challenge the employer's decisions, negotiate higher wage increases for its members, and demand improved working conditions for employees (Moeti-Lysson & Ongori, 2011). After all, where members involvement in trade union activities are high, then such unions possess higher levels of power when bargaining with employers (Yaacob et al., 2024). One may reckon that majority trade unions, as a result of the power that they yield, are likely to look down on and exercise power over minority trade unions, especially in circumstances where there are soured relations between the different unions in a workplace.

van Niekerk et al., (2015) assert that organisational rights are not absolute, but rather enabling mechanisms for workplace democracy. Therefore, these rights can be said to be an accompanying element of the collective bargaining process, which gives an effect to organisational rights in the workplace. Due to the relevance and importance of collective bargaining to this study, this aspect is outlined next, as well as its importance in the South African context.

2.3 Collective bargaining and its importance to South Africa

Venter and Levy (2017) describe collective bargaining as a process whereby employees and employers draw claims on one another and resolve those through the progression of negotiations, leading to mutually beneficial outcomes. During this process, competing interests are reconciled, and common ground is reached (Camen et al., 2008). Bukar et al., (2022) posits that one of the most important tasks for trade unions in Nigeria is collective bargaining, utilised as a mechanism to improve employment conditions of their members.

van Niekerk et al., (2018) postulate that when commencing collective bargaining processes, organisational rights enable a union to possess an effective platform to engage the employer for purposes of negotiations. Further to this, engaging in collective bargaining, as envisioned in section 23(5) of the Constitution, assumes that employees are entitled to join and participate in trade union activities of their choice. The institution of collective bargaining is also important to realise employee dignity in the workplace (Bendix, 2010). Moreover, collective bargaining regulates fair remuneration and improves workplace practices within organisations (Okoro, 2023). Generally, employees are represented by their trade unions in collective bargaining processes and develop a mandate from which their representatives within the union need to negotiate (Grogan, 2009). Furthermore, unions should concurrently safeguard employees' interests and advance improved working conditions through collective bargaining (Voss & Bertossa, 2022). The doctrine originates from the notion that, collectively, employees enjoy greater strength or bargaining power when they unite rather than when they negotiate individually with the employer (Finnemore, 2013). As a result of its foundation in unity, collective bargaining is intrinsically a self-governing process, where the majority of individuals dictate the bargaining agenda and choose whether or not they approve to settle on these items.

Du Plessis and Fouche (2006) mention that collective bargaining is an internationally recognised human right. The reason for this is that the compromise that result from collective bargaining is the end-product of employees possessing an independent stance that reflects ideologies of dignity, parity and equality,

amongst others, which are consistent with human rights principles (Nel et al., 2017). Hall et al., (2013) postulate that collective bargaining also has economic consequences for employees. This is because of the sensitive nature of social and political issues that are usually involved in striving to achieve a balance between the interests of employees and those of organisations. Fanfani (2023) mentions that in a country such as Italy, collective bargaining is also utilised to govern other aspects of employment conditions outside of remuneration aspects. More importantly though, it can be said that the collective bargaining process produces conditions that allow for orderly and stable employment relations within a country (Parry et al., 2013). van Niekerk et al., (2015) state that when unions possess the majority of members, their influence will increase within the collective bargaining process. This is because only majority trade unions are allowed to participate in bargaining, thereby excluding lesser unions from the process. This is underlined by the majoritarianism principle, whereby the LRA promotes thriving bargaining, and aims to mitigate the propagation of unions in workplaces (Venter & Levy, 2017).

Grogan (2009) posits that the spirit of the LRA promotes centralised collective bargaining, which prefers that collective bargaining and negotiations take place between the least number of trade unions and employers. One may infer that, because of the LRA, smaller unions are excluded from bargaining processes. The proliferation of unions is detrimental to effective collective bargaining and destabilises conducive and orderly collective bargaining (Du Plessis & Fouche, 2006).

3. Research methodology

The current study assumed a qualitative phenomenological research approach in addressing the research problem. The study was conducted in Johannesburg, South Africa, where a purposive sampling technique was utilised to sample participants within my professional network. Semi-structured interviews, supported by field notes, were utilised to gather data for the study. This allowed data to be attained within its natural setting, where face-to-face interactions with participants were made possible.

The main motivation for implementing a qualitative phenomenological approach was to gather in-depth and rich data from research participants based on their lived experience around the phenomenon under study. Qualitative research focuses on studying phenomena over periods of time, achieving importance as theories associated to management usually develop as a process (Babbie & Mouton, 2011). Furthermore, qualitative research is fundamentally inductive,

usually leading to the development of contemporary theories (Babbie & Mouton, 2011). The present study sought to explore the experiences and interactions that participants had related to majoritarianism, and how it affects collective bargaining and minority trade unions. Twelve research participants formed the basis for this study, and each participant had lived experiences around the phenomena, having worked in and with all types of trade unions in the workplace. For data collection purposes, the interview guide designed is displayed (See table 1). Details around the profile of research participants is displayed in table 2.

Table 1: Interview guide questions

1. Can the process of collective bargaining benefit from the inclusion of minority trade unions
1.1 What contributions/value could minority trade unions add should they be included in collective bargaining processes?
1.2 In your experience, have any informal and/or indirect input been provided by minority trade unions to collective bargaining and workplace processes?
1.3 What impact, if any, has the exclusion of minority trade unions from collective bargaining had on the process and/or workplace environment?

Source: Author's fieldwork

Table 2: Profile of research participants

Research participant	Age	Gender	Working experience	Seniority	Current designation	Industry	Highest educational qualification
P1	56	M	32 years	Senior management	Head of HR	Music and entertainment	Masters Degree
P2	50	M	25 years	Middle management	Training and Development Specialist	Higher Education	MBA
P3	50	M	26 years	Senior management	Head of ER	Broadcasting	LLM
P4	53	M	35 years	Supervisor	Compliance Officer	Broadcasting	Diploma
P5	35	M	13 years	Middle management	Policy and Regulatory Specialist	Broadcasting	MBA
P6	59	M	36 years	Senior management	General Manager of HR	Mining	MBA
P7	68	M	42 years	Executive management	Retiree	Broadcasting	Higher Certificate
P8	53	M	31 years	Supervisor	Stock Controller	Steel and Engineering	Technical Certificate

Research participant	Age	Gender	Working experience	Seniority	Current designation	Industry	Highest educational qualification
P9	79	M	53 years	Top management	Retiree	Steel and Engineering	Diploma
P10	42	F	17 years	Top management	Manager: Litigation	Legal	LLB
P11	51	M	28 years	Middle management	Engineer	Technology	Masters Degree
P12	37	M	17 years	Supervisor	Team Leader	Retail	Matric

Source: Author's fieldwork

4. Findings and Discussion

This section provides the findings and articulation of themes that emerged from this study, based upon data gathered from research participants concerning their lived experiences around the phenomena under study. Participant responses are graphically depicted under figure 1 below:



Figure 1: Prominence at which themes emerged based on potential contributions of minority unions to the process of collective bargaining

Source: Author's fieldwork

Potential contributions of minority trade unions to the process of collective bargaining

Considering the above, the themes that emanated from the data are next discussed.

4.1 Theme 1: Enriched decision-making and creativity

The findings of the present study found that minority trade unions and their members can contribute positively to processes of collective bargaining and add creative approaches to finding resolutions to impasses within these processes. The value that could be denoted by these contributions could further strengthen the collective efforts of organised labour in situations where minority unions are invited to the negotiating table. For instance, RP2 remarked:

“A huge contribution hey, and those contributions could solve many issues. I will tell you this much: I indicated earlier that sometimes majority union heads or shop stewards are courted by management. They are not necessarily representing the true interests of employees and the minority union can pick that up that this is not correct. So, you do need minority unions and need to take them seriously because they provide an alternative to the unions”.

In a similar vein, RP5 commented:

“Yes, there have been very valuable contributions that have formed part of a larger negotiation. The only thing that might not happen is whether a majority union might credit certain points to the minority union, but, however, like I said, when points are aligned, then views of the minority union will be heard”.

The findings of the current study align with the work of Finnemore (2013), who claims that the promotion of employee participation in decision making processes in the workplace is one of the purposes and objectives of effective collective bargaining processes. Furthermore, the present study's findings advocate for holistic employee participation as part of striving towards a harmonious employment relations system. This is in line with the contributions of van Niekerk et al. (2018) who postulate that the principle of majoritarianism may no longer be suitable within the present employment relations system in South Africa. Esitang and Van Eck (2016) further assert that minorities possess a voice within their individual trade union movements; therefore, it should also apply in employment relations. RP10 elucidates this view, by adding:

“Yes, definitely. Like I said, it's not a question of a fact that they are not able to give valuable input, they would raise valid facts and issues that affect their members in the organisation. Although these concerns may not be taken into consideration, they are genuine and valid and are real life issues that affect their employees even though what is considered is what the majority rule says. The

minorities do make valuable and creative contributions to discussions pertaining to salaries, negotiations and the organisation as a whole”.

RP12 concurs, and stated:

“Yes, I definitely do think they will make better decisions with more creativity, and also it will make employees have a buy-in to develop business better because employees are not involved in management meetings, feedback and in final decisions being made”.

The present study’s findings present a case for the involvement of minority trade unions in collective bargaining processes, as creative ideas and solutions can be offered to better serve the interests of employees in the workplace. These solutions and ideas will lead to organised labour making better decisions and avoiding any impasses that may delay the implementation of mutually beneficial conditions in the workplace. The next section considers how minority trade union officials and members can utilise their higher intellectual capacity to assist with advancing the employee agenda within organisations.

4.2 Theme 2: Higher intellectual capacity within minority unions

The present study established that under certain circumstances, minority trade unions possess higher intellectual capacity and reasoning as opposed to majority unions. This higher intellectual capacity and reasoning can contribute towards reducing collective bargaining obstacles between organised labour and management, resulting in better outcomes for employees in the workplace. In this respect, RP9 said:

“A lot of the minority union guys are established and studied. These guys’ interest is to make sure the company is stable so that there are jobs so they will not destabilise the company. They will do everything in their power by even working hard or doing a little extra here, a little extra there, just to ensure their future because if the company goes down, everybody goes down and they play the leading role over the years that I’m aware of”.

In agreement, RP12 recounted his experience:

“I have sat with minority officials, and I’ve been quite impressed with their articulation and thinking around certain issues”.

The present study’s findings concur with the thinking of Du Plessis and Fouche (2006), who advance that smaller trade unions have the capability to sustain their

members' interests, providing for effective channels of communication and participation. Minority trade unions further offer a sense of security and stability for the interests of their members and the workplace (Kruger & Tshoose, 2013). The study further revealed that minority trade union members also have intellectual and reasoning prowess like that of their representatives. This finding illustrates the value of involving all unions in workplaces processes, regardless of their size or stature. In this regard, RP5 mentioned:

“I have heard the manner in which minority unions speak and articulate themselves. There’s a sense of intellectual ranking that I don’t often hear from the majority officials.”

RP6 added:

“In terms of intellectual capacity, many of them could add value on a superior level. They are in a position to articulate, interpret things in a more informed manner. They are able to go through a mulling process to reach a certain conclusion or to agree in a particular way forward towards methods and approaches as compared to employees in the majority. I think I might be going out of tangent, but if you look at the majority of employees who attend the adult education and training centres are those who belong to the majority trade unions, it tells you the kind of people they have in their organisation”.

The findings point to the contribution that can be made should minority unions be more involved in workplace processes. This view aligns with Allan (2017), who advances the notion that the presence of any trade union, whether large or small, plays a role in protecting members and ensuring that their treatment in a workplace is fair and just. Likewise, Kruger and Tshoose (2013) argue that minority trade unions are influential in balancing bargaining power in the workplace, whilst ensuring conducive working conditions. These instances can contribute to enhanced problem-solving and increased productivity in the workplace, and this aspect is delved into under the section below.

4.3 Theme 3: Enhanced problem-solving and productivity

The present study’s findings point to enhanced problem solving by including minority unions in workplace processes, which leads to higher levels of productivity owing to increased employee participation. Moeti-Lysson and Ongori (2011) state that trade unions have the potential to increase productivity where a conducive workplace environment exists. Moreover, trade unions influence the

climate in the workplace, as employees rely on union representatives to guide their behaviour and activity in the workplace (Hyman, 2007). Trade unions also fulfil an important function in communicating performance criteria and quality standards to employees (Finnemore, 2013). In this respect, RP12 said:

“This will give employees a lot more insight for them to understand that within the next coming months, this is what the potential growth of the business will be and where we want to let it grow. So, it gives you a lot of personal insights as an employee should they be more involved if the employers get a small minority of unions to get involved in this”.

RP2 shared a similar sentiment and added:

“Sometimes, minority unions come up with very sound academic positions around how negotiations should go, procedures and policy adjustments. They come with solid proposals, but, unfortunately, they will not be considered if the majority does not get the go ahead from their members. Minorities are always trying to provide good direction in terms of engagements I have had with them. You must understand that you really need them so that there is that balance of forces to provide alternative views to any made contributions”.

The present study’s findings further emphasise the benefits of involving minority unions in collective bargaining and employee participation processes. Not only will organised labour present a stronger and united front, but all employees will possess a sense of belonging and inculcate the organisation’s objectives. In this regard, RP1 expressed:

“If all issues are looked at and addressed in totality, then you would have a much more bigger cohort of happy employees. Ten brains are better than one, the more people are spoken on behalf of, the more employees will get qualitative benefits they will get from a tactical point of view. They could tap on the experience of the minority union, and it could just be a beautiful blend of a very strong front”.

RP6 echoed these sentiments, adding:

“Employees will have a sense of consensus being the order of the day and sometimes use expressions like ‘let us meet each other halfway’, I come from my side, and you come from your side as management and organised labour, but let's find some common ground on this particular workplace matter”.

The study's findings concur with Addison (2014), who contends that effective employment relations produces positive performance results for an organisation, with employees being the driving force behind higher productivity. Moreover, Mathis et al. (2014) advocate the importance of employee participation and input in a workplace to give effect to feelings of dignity and self-worth on the part of employees. Though the reasonable involvement of minority unions in collective bargaining processes and its benefits have been discussed under this research objective, a differing view also emerged. The next section articulates this contrasting perspective and discuss its aspects.

4.4 Theme 4: No constructive input from minority unions

The findings of the present study show that some participants believe that minority trade unions have no constructive input to add to collective bargaining processes. This perspective was informed by procedural/legal limitations restricting participation, as well as by substantive aspects, where the quality of minority unions' input has been questioned. From a legal and procedural perspective, RP4 pointed out the following:

“Look, in terms of inviting the minorities, I don't think it will work, I will tell you why. You know, when you join a trade union federation, there are rules and regulations that you need to abide by; you're signing an agreement with that federation to follow the ideologies of that federation. The federation also signs a collective agreement with the organisation about how the relationship between management and majority unions will work”.

The study's findings highlight the legality of the principle of majoritarianism and how preference is given to majority unions to dictate terms and conditions of employee participation. This is in line with the observations of Kruger and Tshoose (2013), who assert that the principle of majoritarianism permits the agenda of majorities to be upheld. Likewise, the effect of the majoritarian principle is that the rights and activities of smaller trade unions are limited (Cohen, 2013). From a substantive perspective, the study's findings illustrate that minority trade unions did not provide quality or credible contributions when called upon. In this respect, RP7 reported:

“No, that has not happened where minority members have added anything of importance to negotiations. It is just complaints to the line managers to determine on a one-on-one basis where people should be and how they should (be) scheduled to work, but when it comes to issues of collective bargaining, I haven't come across it”.

RP3 added:

“Honestly, the straight answer is that no, they have never made any constructive input that would advance and protect the interests of their members. In my view and interaction with them, it was more about the survival of the union's interest, particularly the subscriptions because that's all they were concerned about”.

The findings of the present study corroborate the views of Finnemore (2013), who posits that minority trade unions can be perceived to be less effective when compared to majority trade unions. van Niekerk et al. (2018) concur with Finnemore's (2013) view, suggesting that minority trade unions in most organisations face challenges relating to legitimacy and effectiveness.

5. Limitations of the study

Every research journey contains restrictive elements that affect the study. Within the current study, research was carried out within the Johannesburg district where participants are based, allowing easy accessibility to participants. Employment relations and human resource professionals, as well as trade unionists based outside of Johannesburg did not form part of the study's sample owing to geographical scattering. To lessen this limitation, this study used research participants that are highly knowledgeable and experienced in the phenomena under study. Secondly, qualitative studies are categorised as inherently subjective. This is due to data gathered being reflective of participants' experiences, attitudes and perspectives. Therefore, data is subjective in nature and will differ from one context to another. Thirdly, a researcher is at the forefront of data collection within qualitative studies, and the possibility of bias creeping into the study may influence the study's quality. However, this limitation was mitigated by implementing reflexivity and bracketing (Cresswell, 2014). Lastly, study participants were chosen using a purposeful sampling technique, and is therefore prone to certain degrees of bias. To alleviate any bias, I established a criteria of selecting HR/ER professionals and trade unionists who have personally experienced the phenomenon under study. Moreover, some of the HR/ER professionals in this study started off their careers as trade unionists, enabling them to provide holistic views on the phenomenon being explored.

5. Recommendations

Considering the research findings, the following recommendations are proposed:

Mutual respect for trade union functions and the employer's prerogative

Management within organisations should respect the important role that trade unions fulfil for employees in the workplace. Furthermore, organisational management should gain an appreciation of employee desires to influence employment conditions and understand that trade unions are the vehicle employees utilise to effect such desires. Additionally, trade unions and their members must respect management's right to establish and implement terms and conditions of employment, as long as these are implemented in a fair and reasonable manner.

Enhanced employee participation in decision-making processes

To this end, employees should be more involved in how decisions are made and implemented concerning employment terms and conditions. This could be achieved by inviting minority trade unions to the negotiating table, where they can play a reasonable role in how collective bargaining decisions are reached. This would promote an all-inclusive approach to collective bargaining, where all employee voices and contributions are heard, regardless of the trade union that they belong to in the workplace.

Enrichment and innovation of employment relations consultation mechanisms

Future employment relations consultation and participation mechanisms should become more flexible and innovative in its processes. Trade unions must actively advocate for the creation of fairer, more transparent and inclusive engagement mechanisms where all organisational stakeholders contribute to fostering a conducive atmosphere for employment relations. Furthermore, trade unions should adopt an active approach to ensure that all employee voices are heard and considered, which will promote the adoption of inclusive and reasonable trade union relations by management within organisations. Furthermore, trade unions should unceasingly develop and improve their negotiation skills and collective bargaining capabilities, where they cultivate strong and professional negotiators to assist employees in securing decent and reasonable remuneration and employment conditions.

6. Conclusion

The research problem's expression advances that majoritarianism limits conducive collective bargaining in the workplace, where minority trade unions

could provide valuable input but for their exclusion from the process. The lived experiences of research participants outline a deprived collective bargaining process, where valuable contributions are lost due to majoritarianism being strictly applied by management and majority trade unions in workplaces, to the detriment of minority trade unions. It therefore becomes important to note that study findings substantiate the research problem, where minority trade unions and their members could provide valuable and innovative solutions to collective bargaining processes in the workplace. This would lead to enhanced problem-solving and improved decision-making related to negotiated outcomes, to the benefit of all employees. Consequently, the present study revealed that minority trade unions can provide added creativity and enhanced decision-making to collective bargaining processes. This is owing to the high levels of intellectual capabilities that are possessed by minority trade unions and their members related to employment relations and collective bargaining processes. Thus, this would lead to enhanced problem-solving and improved productivity within workplaces, as innovative and effective contributions would be made to workplace and bargaining processes. Conversely, the study revealed that few research participants believed that no constructive input would be provided should minority trade unions and their members be invited to the collective bargaining table. These few participants believe that majoritarianism in its current form and implementation is effective, and that collective bargaining should only take place between employers and majority trade unions. However, the current study recommends a heightened level of mutual respect for trade union functions and the employers prerogative. This would involve an appreciation of the important role that trade unions fulfil in the employment relations environment while also appreciating management's right to develop and implement fair working conditions within organisations. Moreover, it is recommended that employee participation in decision-making processes be enhanced in the workplace. This involves inviting minority trade unions and their members to the collective bargaining table, where they could play a reasonable part in the process, enabling all employee voices and contributions to be heard and considered. Lastly, the study recommends enriched and innovative employment relations consultation mechanisms, where flexibility and reasonableness are the cornerstones of its foundation. This would enable more transparent and inclusive engagement mechanisms, where contributions from all relevant stakeholders to collective bargaining processes would contribute to a conducive employment relations environment within workplaces.

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DETERMINANTS OF FLEXIBILITY PARADOX: NARRATIVES OF ATYPICAL WORKERS

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Abstract

This study sought to explore the determinants of flexibility paradox amongst atypical workers at a manufacturing firm in Zimbabwe. Thirteen research participants, purposively sampled, participated in this qualitative research, involving one-on-one, semi-structured interviews to collect data. The study found numerous determinants of flexibility paradox among atypical workers at the case manufacturing firm in Zimbabwe. The four main determinants of flexibility paradox that the research participants identified are stereotypical gender roles, unclear work-family borders, the need to appear committed to work, and the need to return flexible working favours. However, a few research participants identified holding multiple jobs as one of the determinants of flexibility paradox among atypical workers at the case organisation. The current study recommends that the case organization should promote a culture that respects employees' personal time and discourages working outside of designated hours. Finally, the study suggests that atypical workers who work flexibly should have clear work-life boundaries, which separate work and non-work activities and incorporate structured breaks and time off to prevent flexibility paradox and burnout.

Keywords: *atypical worker, flexibility paradox, flexible working, gender stereotype, over-working.*

1. Introduction

Flexible working has emerged as a popular working model over the past few decades owing to changes in the demographic make-up of the labour market and workforce demands (Kelliher, 2024; Krishnan & Chinnathambi, 2024; Austin-Egole et al., 2023; Stamm et al., 2023). Chung (2024) attributes the surge in female and young generation participation in the labour market to the growing need for work flexibility. A recent study by Maraziotis (2024) shows that workers' growing interest in health work-life balance has led to an increase in demand for flexible working options. Similarly, a survey by Ramos et al. (2024) concluded that flexible working has become a common feature in the workplace. Many companies are providing their workers with a range of flexible working options, regardless of the nature of employment in response to a surge in demand for flexible working and a desire to stay competitive (Dixon, 2022; Kgarimetsa & Naidoo, 2024; Mwasaru, 2023; Sonidou, 2024; Edeh et al., 2024). Angelici and Profeta (2024) define flexible working as a working arrangement without strict restrictions regarding where and when to work. Similarly, Lee (2023) contends that flexible work arrangements allow employees some autonomy over their work schedule, location, and methods. From an organizational perspective, flexible working reduces absenteeism and labor turnover (Gašić & Berber, 2023; Çivilidağ & Durmaz, 2024), and boosts worker productivity (Estanio et al., 2023; Edeh et al., 2024). Flexible working helps workers to minimize stress, find a healthy work-life balance, and match work hours with personal obligations (Abid & Barech, 2021). Previous studies show that flexible work arrangements help working mothers to manage their jobs and traditional gender roles, improving gender equality in various cultures significantly (Maraziotis, 2024; Heath et al., 2024; Chung, 2022; Chung et al., 2020; Awang & Nadzri, 2023; Abrefa Busia et al., 2023). However, studies note that if flexible working is not handled properly, it may result in flexibility paradox (Chung, 2022; Forbes, 2020; Kamp, 2024; Lee, 2023; Cañibano, 2019). Flexibility paradox is a phenomenon, where flexible working might result in greater job intensity and possible self-exploitation (Chung, 2022; Lot, 2019; Kamp et al., 2024). Olsen (2023) claims that the freedom to work flexibly forces workers to work more hours than intended, negating the advantages of flexible working. A study by Chung (2022) shows that men who have flexible work options are more likely to work longer hours, whereas women are more likely

to exploit themselves through intensive mothering. Correspondingly, Mokomane (2023) posits that workers use the opportunity to work flexibly by increasing their work hours to boost their income premiums, leading to overworking and the flexibility paradox. Further to the said sentiments, a study by Cañibano (2021) reveals that flexible working encourages an always-on culture in which employees find it difficult to switch off, leading to flexibility paradox. The flexibility paradox has been the subject of several studies; however, most have centered on workers in the global north (Chung et al., 2020, Lott, 2020; Walthery et al., 2021; Chung, 2022). Therefore, the purpose of this qualitative study was to explore causes of the flexibility paradox among atypical workers in the global south.

2. Review of Related Literature

This section presents theories, which guided this research and uncovered causes of the flexibility paradox.

2.1. Akerlof's (1982) Gift Exchange Theory

The exchange of gifts between individuals and groups is the foundation of Akerlof's (1982) gift exchange theory. According to the gift exchange theory, when someone receives a gift, they are compelled to gift something in return. In short, the gift exchange theory is based on the idea that people are good to each other and when they receive a gift, they feel obliged to return the favor. Additionally, gifts were found to establish social ties and responsibilities that compel recipients to react favorably to them (Chung, 2022). Hence, employees view work flexibility options that their employers provide as gifts that should be reciprocated (Hildebrand et al., 2017). This means that workers feel obligated to their employers and, therefore, put in more effort at work, ultimately resulting in self-exploitation (Chung et al., 2019; Porroche-Escudero & Rothman, 2019). Similarly, Kim and Kankanhalli (2019) argue that when employees are given the option to work flexibly, they feel compelled to return the favor by putting in lengthy hours, which is likely to result in a flexibility paradox. Furthermore, according to Hildebrand (2020), employees can view work flexibility as a gift and feel pressured to return the flexibility favor by working more hours, resulting in the flexibility paradox.

2.2. Blau's (1964) Social Exchange Theory

The social exchange theory assumes that when one party gives something valuable to another, the recipient feels pressured to return the favor through a series of transactions. The social exchange theory further provides that workers who have the option to work flexibly return this favour to the employer by working

diligently. Similarly, Golden (2020) contends that when employees are granted the option to work flexibly, they trade their leisure time for work to repay the favor. Summarily, the social exchange theory states that an employee who receives a favor from the employer is obliged to return the favor.

2.3. Clark's (2000) Border Theory

Clark's (2000) border theory shows how work and life domains interact. According to the border theory, workers must maintain control over work and life borders to attain equilibrium between these. Glaveli (2015) asserts that to attain an optimal balance between work and life borders, people must maintain these to avoid a spillover effect. Clark (2000) asserts that flexible working causes work and life borders to become hazy and permeable, resulting in overworking. Summarily, the border theory explains the challenges of maintaining work and life borders when flexible working options are in place.

2.4. Atypical Work and Flexibility paradox

Kalejaiye (2019) defines atypical work as a non-standard type of employment that provides workers with a great degree of flexibility to decide how and when to work. Hence, it is a suitable form of work for those who strive to balance their family and work activities. Correspondingly, De Stefano (2018) asserts that atypical work gives workers the flexibility to control their working hours. A study by Kalejaiye (2019) showed that atypical work offers workers the freedom to select days and hours of work that best fit their needs. Furthermore, Scarfe (2019) postulates that employees can better manage their work-life responsibilities when they work on an atypical basis. Nonetheless, several researchers have discovered that the freedom that atypical employment offers causes a flexibility dilemma (Kamp et al., 2024; Chung, 2024; Chung, 2022; Olsen, 2023). Chung (2022) defines the flexibility paradox as a situation, where flexible working results in self-exploitation, overworking and burnout.

2.5. Determinants of Flexibility paradox

Extant literature shows that several factors cause the flexibility paradox. The following section presents the causes of this paradox.

2.5.1. Stereotypical Gender Roles

De Laat (2025) argues that the way in which people use their time is influenced by stereotyped gender roles and societal views about typical males and females. Men are expected to be the breadwinners (de Laat, 2025; Kanji & Samuel, 2017; Brinton 2017), while women are expected to take care of the home and provide

care for the children and broader family (Odenweller & Rittenour, 2017; Chung et al., 2021; Forbes et al., 2020; Cha, 2013; Dotti Sani & Treas, 2016). Rittenour (2017) states that societal norms associate women with primary care giving responsibilities, forcing them to perform more domestic work when working flexibly, which affects their ability to completely detach from work. Research by Chung (2022) indicates that working mothers who work flexibly end up exploiting themselves in an attempt to fulfill their professional and gender roles simultaneously. Additionally, a qualitative study by Castro (2021) concluded that women who work flexibly are expected to fulfill their stereotyped gender roles while fulfilling their professional responsibilities, resulting in a flexibility paradox. Furthermore, Ruiz (2022) contends that working mothers are forced to overwork themselves to balance stereotypical gender norms with their professional jobs. Similarly, De laet (2025) posits that men are expected to be breadwinners and when they work flexibly, they expand their paid work, which leads to overworking.

2.5.2. Need to be Viewed as Highly Committed

The flexibility paradox is the result of employees feeling pressurized to work more hours to show that they are totally dedicated to their profession. Gašić et al. (2024) state that even if employees have the option to choose their own work schedule, they feel compelled to demonstrate their dedication by working longer hours. A study by Kangogo and Wanambiro (2019) reveals that flexible working arrangements may stimulate workers to overwork themselves in a bid to be seen as having a keen sense of loyalty to the company. Similarly, a study by Ongaki (2019) demonstrated that flexible work arrangements encourage employees to work extra hours to demonstrate commitment and dedication to their jobs.

2.5.3. Holding Multiple Jobs

The depleting effects of having multiple jobs should be considered, according to Prasad and Thakur (2019), who argue that atypical workers who work flexibly, frequently work for multiple employers at the same time. A study by Bamberry (2020) found that juggling two or more jobs can be challenging and can result in overworking, poor work-life balance, and stress and burnout that affect employees' mental health and well-being. Building on this, another survey by Rivard (2021) showed that workers who have multiple part-time jobs experience fatigue and exhaustion from juggling different schedules, as well as physical and mental stress. Similarly, Russo (2018) posits that having several jobs has a negative effect on workers' wellbeing. Hence, Prasad (2019) argues that employees work longer hours and have less time for social and family activities. According to a recent study by Marucci-Wellman et al. (2024), having different occupations contributes

to a flexibility paradox since workers spend an excessive amount of time working in various roles, leading to burnout and self-exploitation.

2.5.4. Lack of Clear Work-life Boundaries

Chung (2022) declares that employees who work flexibly are likely to have blurred borders between family and work spheres, which lead to overworking. Kossek (2016) concurs, claiming that flexible work arrangements can make it difficult to separate family and work spheres, which pressurize employees to work all the time. A study by Shirmohammadi et al. (2021) reveals that unclear borders between work and home life make it difficult for flexible workers to detach from their jobs, which typically results in the flexibility paradox. Further, Chung (2022) found that flexible work arrangements, combined with a blurring of work-life boundaries, force workers to work continuously without breaks, resulting in a flexibility paradox.

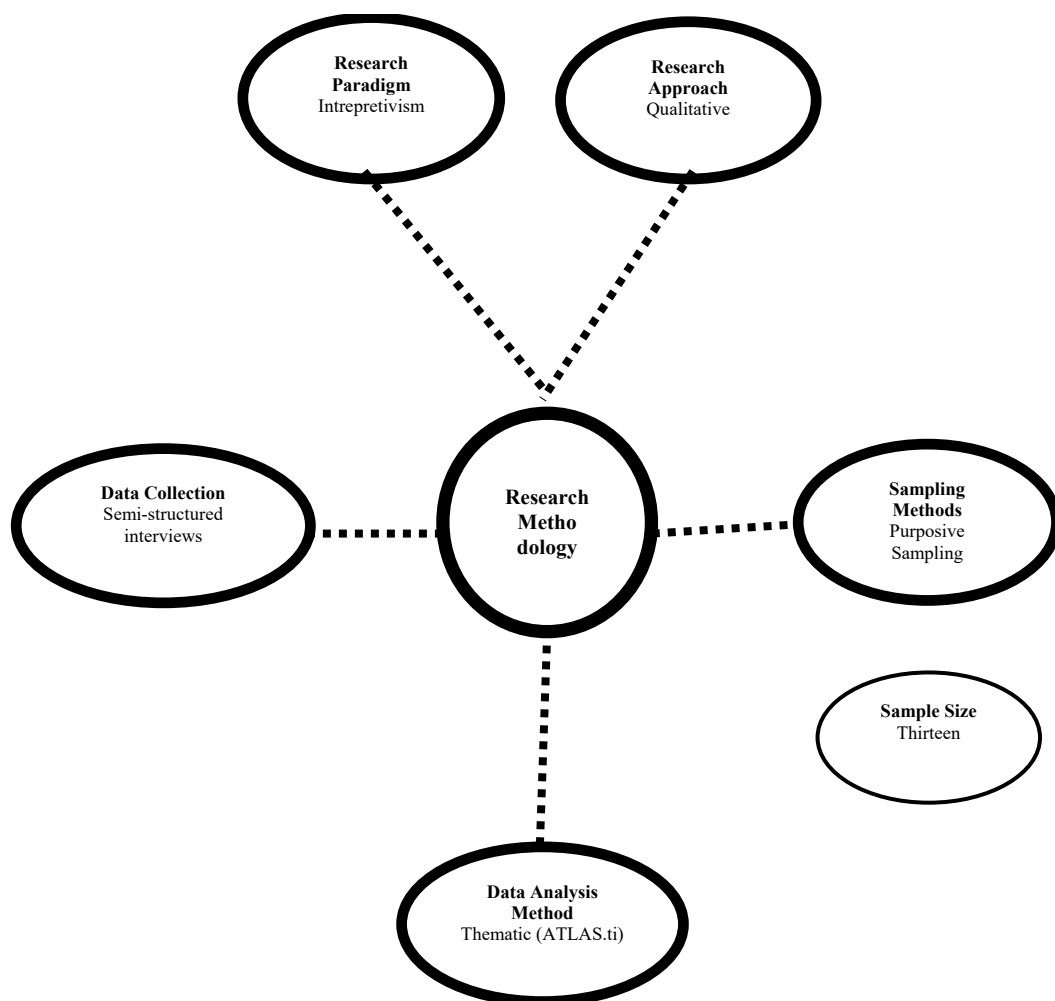
2.5.5. Need to Return Flexible Working Favors

Cook et al. (2018) argue that some workers feel obliged to overwork themselves to repay their employers for the gift of job flexibility. Similarly, Forsyth et al. (2022) assert that employees are willing to make sacrifices, like work long hours even if it means forgoing leisure time, in a bid to return flexibility working favors to the employer. A survey by Yin (2018) indicated that employees are willing to work diligently in exchange for the flexibility of their work schedule. Likewise, according to the social exchange theory, employees who are given the option to work flexibly have a duty to reciprocate the employer's favor. The social exchange theory further assumes that given an opportunity to work flexibly, workers try to return that favor by working long hours, leading to a flexibility paradox.

3. Research Methodology

The next section presents the study's research philosophy, research approach, sample techniques, data gathering tools, and data analysis method that the researchers used. The study's research methodology is shown in Figure 1 below.

Figure 1: Research Methodology and Design



Source: Authors' compilation

3.1. Demographic Characteristics of the Participants

The research participants who participated in this research study were recognized by the inscription “FP”. Their characteristics are presented in Table 1 below.

Table 1: Demographic Characteristics of the Research Participants

Pseudonyms	Sex	Age	Work Experience	Academic Qualification	Interview Length
FP01	F	22	1 year	‘A’ level certificate	8 minutes
FP02	M	23	1 year	‘O’ level certificate	7 minutes
FP03	F	27	2 years	Diploma	9 minutes
FP04	F	31	3 years	Bachelor’s degree	11 minutes
FP05	M	30	3 years	Bachelor’s degree	10 minutes
FP06	F	34	2 years	Master’s degree	8 minutes
FP07	F	33	4 years	Bachelor’s degree	8 minutes
FP08	M	27	2 years	Diploma	9 minutes
FP09	M	29	3 years	Diploma	11 minutes
FP10	F	22	1 year	‘A’ level certificate	9 minutes
FP11	M	33	3 years	Bachelor’s degree	10 minutes
FP12	M	24	2 years	Diploma	9 minutes
FP13	F	26	2 years	Diploma	8 minutes

Source: Authors’ fieldwork

4. Findings

This research sought to explore determinants of the flexibility paradox among atypical workers at a manufacturing firm in Zimbabwe. Table 2 below presents the study's themes and sub-themes.

Table 2: Themes and Sub-themes

Themes	Sub-themes
Stereotypical gender roles	Care-giving responsibilities Breadwinner mentality Intensive mothering
Blurred work-life boundaries	Working everywhere and all the time Failure to separate work and personal life Lack of clear work and life boundaries
Desire to appear committed	Always on and available to appear committed Increasing workload Always available for extra tasks without adequate remuneration to show commitment
Need to return flexible working favours	Returning work flexibility favours by working extra hard Reciprocal exchange Exchanging favours
Having multiple jobs	Multiple jobs increase working hours Moonlighting Difficult to manage multiple jobs

Source: Authors' fieldwork

4.1. Response Rate

Table 3 below shows the response rate per theme that emerged from the study.

Table 3: Response Rate

Theme	Frequency (N=13)
Stereotypical gender roles	10
Unclear work-life boundaries	7
Desire to appear committed	7
Need to return flexible working favours	8
Having multiple jobs	6

Source: Authors' fieldwork

4.2. Theme 1: Stereotypical Gender Roles

Ten research participants at the case organisation indicated that stereotypical gender role is one of the determinants of the flexibility paradox. Table 4 below presents participants' viewpoints in this respect.

Table 4: Research Participants' Quotes on Stereotypical Gender Roles

Pseudonym	Research Participants' Viewpoints
FP01	<i>"I am sure you are aware of the fact that as a lady I am expected to do house chores. In short, I am saying I expand my housework when working flexibly, which means I end up overworking".</i>
FP02	<i>"As a male adult, given work flexibility, I end up working two or more jobs to supplement my income, which in most cases lead to burnout and fatigue".</i>
FP04	<i>"As a mother, I end up exchanging the opportunity to work flexibly with my expected gender roles such as care giving and kitchen chores".</i>

Pseudonym	Research Participants' Viewpoints
FP05	<i>"I am the breadwinner in my family, so given the chance to work flexibly, I end up working multiple jobs, which lead to long working hours".</i>
FP06	<i>"Freedom to work without rigid work boundaries around will force us to work long hours due to intensive mothering and childcare responsibilities".</i>
FP07	<i>"Yes, flexible working options result in self-exploitation, my brother, because you end up working long hours".</i>
FP09	<i>"Given control over when and where to work, I end up doing multiple jobs in order to improve my financial security as the head of my family. On the negative side, having multiple jobs results in burnout and overworking".</i>
FP10	<i>"It increases (the) domestic burden of working mothers in the sense that they end up doing their expected gender roles and professional duties at the same time".</i>
FP12	<i>"Breadwinners usual expands their working hours due to flexible working, which results in flexibility paradox".</i>
FP13	<i>"Flexibility around work schedules and working time will lead to long working hours through intensive mothering".</i>

Source: Authors' fieldwork

4.3. Theme 2: Unclear Work-family Borders

The research study's results show that seven participants revealed that unclear work-life boundaries force workers who work flexibly to work long hours without rest, resulting in the flexibility paradox. Their related viewpoints are presented below.

"Unclear work-life boundaries will make employees struggle to disconnect from work given the opportunity to work flexibly" (FP02).

"Blurred work-life balance, coupled with flexible working, can lead to long working hours" (FP03).

"Flexible working triggers the expansion of (the) work sphere rather than contracting it because workers will do their work duties even at home" (FP04).

“Always on habits, which disrupt personal time and increase stress occur due (to) (the) availability of flexible working options and blurred work-life boundaries” (FP08).

“Poor separation between work and family domains will force workers who work flexibly to exploit themselves by working long hours” (FP09).

“Unclear work-life boundaries force workers working flexibly to work hard(er) and longer than they would otherwise” (FP10); and

“Permeability of work-life boundaries increases multi-tasking, which in most cases leads to overworking and (the) flexibility paradox” (FP11).

4.4. Theme 3: Desire to Appear Committed

Seven of the thirteen research participants revealed that fear of being viewed as being less committed force them to work long hours, which lead to the flexibility paradox. In this regard, FP03 said:

“As a(n) atypical worker with work schedule flexibility, I end up working long hours even without adequate compensation so that I appear committed to my work”.

Sharing the same viewpoint, FP05 said: *“Flexible working forces me to work long hours”.*

Similarly, FP06 remarked:

“I am pressured to demonstrate my commitment to the organisation by working extra hard and long hours”.

The above arguments continued with FP07, FP09, FP12 and FP13. Their quotes point to the fact that work flexibility forces them to work long hours without adequate compensation to appear committed to their job.

4.5. Theme 4: Need to Return Flexible Working Favours

The need to return flexible working favours emerged as another cause of the flexibility paradox at the case organization. Table 5 below presents participants' viewpoints in this regard.

Table 5: Research Participants' Viewpoints on Need to Return Flexible Working Favours

Pseudonym	Research Participants' Quotes
FP01	<i>"Opportunity to work flexibly will induce you to return that favour by working hard and long hours, which lead to (the) flexibility paradox".</i>
FP02	<i>"Work intensification act as a form of reciprocation to the opportunity to work flexibly".</i>
FP04	<i>"Afforded the chance to work flexibly triggers an exchange reaction, which results in workers expending greater effort than normal".</i>
FP05	<i>"Provision of flexible working results in flexible workers exercising high degree of work effort, which may result in self-exploitation".</i>
FP07	<i>"Workers make sacrifices, which affect their well-being and leisure time in return for (an) opportunity to work flexibly".</i>
FP10	<i>"Atypical workers are prepared to make sacrifices in return for their flexible working".</i>
FP11	<i>"We work more hours even if they are poorly remunerated in a bid to return flexible working favours offered by the employer".</i>
FP12	<i>"Opportunity to work flexibly force atypical workers to exchange (the) flexible working favour with work intensification".</i>

Source: Authors' fieldwork

4.6. Theme 5: Having Multiple Jobs

Six of the thirteen research participants confirmed that flexible working forces employees to work long hours, whilst they try to juggle multiple jobs, leading to the flexibility paradox. Their related sentiments are presented below.

"Once granted the opportunity to work flexibly, I end up working two or more jobs, which affects my personal life" (FP01).

"Given the freedom to work flexibly, workers end up having more than one job, which translate(s) into long working hours and burnout" (FP02).

"Having multiple jobs causes (the) flexibility paradox" (FP06).

"Flexibility working induces workers to hold multiple jobs, which then lead to (the) flexibility paradox" (FP08).

“Having at least one job will result in (the) flexibility paradox” (FP12).
“Multiple jobs lead to overworking an element of (the) flexibility paradox” (FP13).

5. Analysis of the Study’s Findings

The next section presents an analysis of the study’s findings.

5.1. Stereotypical Gender Roles

Stereotypical gender roles were identified as a determinant of the flexibility paradox among atypical workers at the case organisation in Zimbabwe. Some of the research participants’ viewpoints in this regard are presented below.

“I am sure you are aware of the fact that as a lady I am expected to do house chores. In short, I am saying I expand my housework when working flexibly, which means I end up overworking” (FP01).

“As a mother, I end up exchanging the opportunity to work flexibly with my expected gender roles such as care giving and kitchen chores” (FP04).

“It increases (the) domestic burden of working mothers in the sense that they end up doing their gender duties and professional duties at the same time” (FP10).

The above quotes are corroborated by the breadwinner model, which assumes that as breadwinners’ fathers work long hours to increase their wage premiums, given an opportunity to work flexibly. Similarly, a study by Chung (2022) shows that working mothers who work flexibly end up exploiting themselves to fulfill their professional and gender roles simultaneously. In addition, a qualitative study by Castro (2021) concluded that women who work flexibly are expected to fulfill their stereotyped gender roles while fulfilling their professional responsibilities, resulting in the flexibility paradox.

5.2. Unclear Work-family Borders

Seven of the thirteen participants revealed that unclear family and work boundaries force workers who work flexibly to exploit themselves by working long hours. Their related viewpoints are presented below.

“Unclear work-life boundaries will make employees struggle to disconnect from work once given the opportunity to work flexibly” (FP02).

“Blurred work-life balance, coupled with flexible working, can lead to long working hours” (FP03).

“Flexible working triggers the expansion of (the) work sphere rather than contracting it because workers will do their work duties even at home” (FP04).

“Always on habits, which disrupt personal time and increase stress occurs due (to) (the) availability of flexible working options and blurred work-life boundaries” (FP08).

The above opinions are supported by the border theory, which assumes that blurred borders between family and work sphere can lead to overworking. Correspondingly, a survey by Shirmohammadi (2021) revealed that unclear borders between family and work spheres make it difficult for flexible workers to detach from their jobs, resulting typically in the flexibility paradox. Further, Chung (2021) found that flexible work arrangements, combined with a blurring of work-life boundaries, encourage "always-on" behaviors that result in the flexibility paradox.

5.3. Desire to Appear Committed

Six of the thirteen research participants revealed that fear of being viewed as being less committed force them to work long hours, leading to the flexibility paradox. In this regard, FP03 said:

“As an atypical worker with work schedule flexibility, I end up working long hours even without adequate compensation so that I appear committed to my work”.

Sharing the same viewpoint, FP05 argued: *“Flexible working forces me to work long hours”.*

Similarly, FP06 remarked:

“I am pressured to demonstrate my commitment to the organisation, which gives me the opportunity to work flexibly by working extra hard and long hours”.

Kangogo and Wanambiro's (2019) study supports the above sentiments, showing that flexible working arrangements stimulate workers to overwork themselves in a bid to be seen as having a keen sense of loyalty to the company. Similarly, Gašić et al. (2024) contend that even if employees have the option to choose their own work schedule, they would feel compelled to demonstrate their dedication by working longer hours. In addition, a study by Ongaki (2019) demonstrated that flexible work arrangements encourage employees to put in extra hours to demonstrate their commitment and dedication to their jobs.

“Opportunity to work flexibly will induce you to return that favour by working hard and long hours, which lead to the flexibility paradox” (FP01).

“We work more hours even if they are poorly remunerated in a bid to return flexible working favours offered by the employer” (FP11).

“Opportunity to work flexibly force atypical workers to exchange flexible working favour(s) with work intensification” (FP12).

The above utterances from participants are supported by the gift exchange model, which assumes that, given an opportunity to work flexibly, workers try to

return that favor by working long hours, leading to the flexibility paradox. Similarly, Forsyth et al. (2022) assert that employees are willing to make sacrifices like working long hours even if it means forgoing leisure time in a bid to return flexibility working favors to the employer. In addition, a survey by Yin (2018) showed that employees are willing to work diligently in exchange for the flexibility of their work schedule.

5.5. Having Multiple Jobs

The research participants identified having multiple jobs as a cause of the flexibility paradox. Their related sentiments are presented below.

“Once granted the opportunity to work flexibly, I end up working two or more jobs, which affects my personal life” (FP01).

“Given the freedom to work flexibly, workers end up having more than one job, which translates (in)to long working hours and burnout” (FP02).

The research participants’ above sentiments are supported by Bamberly’s (2020) study, which found that juggling two or more jobs can be challenging and can result in overworking, poor work-life balance, and stress and burnout, affecting employees' mental health and well-being. Rivard (2021) concluded that workers who have multiple part-time jobs experience fatigue and exhaustion, as well as physical and mental stress from juggling different schedules. Correspondingly, a recent study by Marucci-Wellman et al. (2024) shows that having different occupations contributes to a flexibility paradox since workers spend an excessive amount of time working in various roles, which lead to burnout and self-exploitation.

6. Contribution of the Study

This study explores determinants of the flexibility paradox among atypical workers at a manufacturing firm in Zimbabwe. The qualitative research approach used in this study has contributed methodologically by providing a thorough examination of the causes of the flexibility paradox among atypical workers at the case organization in Zimbabwe. Practically, this study offers new information about the causes of the flexibility paradox that can be used by all human resource management actors. This study helps employers because it makes them aware of the flexibility paradox concept, which occurs when employees who work flexibly exploit themselves by working long hours without proper rest. Employees also benefit from this study because it makes them aware that, if handled improperly, the freedom that comes with atypical work might result in a flexibility paradox. The results of this study also provide a foundation upon which future studies can build.

7. Limitations

The study had limitations despite the researchers' efforts to ensure its credibility. First, the study was limited to a single manufacturing firm in Zimbabwe, making it difficult to generalize the findings. It is also important to note that the qualitative research approach that the researchers used had its own flaws, which could have been minimized had they used a quantitative approach or a mixed research approach. Future researchers should consider using mixed research when conducting similar studies.

8. Conclusions

This study explored determinants of the flexibility paradox among atypical employees at a manufacturing firm in Zimbabwe. The four primary determinants of the flexibility paradox that the research participants identified at the case organization were stereotypical gender roles, unclear work-family boundaries, need to return flexible working favours, and the desire to appear committed to work. A few research participants indicated that having multiple jobs contributes to the flexibility conundrum. The study recommends that managers should promote a culture that values employees' personal time and forbids working beyond designated hours. Additionally, the study recommends that supervisors should implement technology-free time by turning off work-related alerts during workers' personal time. Atypical workers who work flexibly are urged to develop clear work-life boundaries and take planned breaks and time off to minimize the flexibility paradox and burnout.

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Authors' Contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflicts of Interest

The authors declared that they have no conflicts of interest.

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POSSIBLE SOLUTIONS TO EXPAND THE AREA OF PROFESSIONALS WHO CAN PERFORM EXTERNAL AUDITS AT PUBLIC INSTITUTIONS, UNDER THE COORDINATION OF THE COURT OF ACCOUNTS OF ROMANIA

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Abstract: *The article aims to bring to attention a series of current issues related to finding possible solutions to expand the area of professionals who can perform external public audits at public institutions, under the coordination of the Romanian Court of Accounts, and for this purpose we have structured our approach on 4 aspects: 1)presentation of the Romanian Court of Accounts: normative act of operation, strategies and standards used, regulations, manuals, guides and other working tools that it develops; 2)ways of accessing the quality of external public auditor within the Romanian Court of Accounts and statutory financial auditor accredited by ASPAAS or CAFR; 3)ways of correlating the frequency and objectives of external public audit missions of the Court of Accounts teams with those of financial auditors certified by ASPAAS and CAFR at state and private entities; 4)conclusions.*

Keywords: *external public audit; statutory audit; theoretical knowledge test; competency exam; Court of Accounts of Romania; Public Supervisory Authority of Statutory Audit Activity;*

JEL Classification: M42

1.Introduction

This article covers a very current and burning issue for a significant segment of a reference accounting profession in Romania, namely that relating to finding possible solutions to expand the area of professionals who can perform external public audits at public institutions, under the coordination of the Romanian Court of Accounts, in order to cover statutory audit missions at public institutions annually, not as currently every few years.

The issue is very important both for the Romanian Court of Accounts and for other central public authorities in our country (Parliament, Government, Ministry of Finance, National Institute of Statistics, etc.), because annual financial audits conducted at public institutions would increase the degree of confidence of the aforementioned authorities in the position and performance of the state sector in the economy as a whole, in relation to the private and non-governmental environment, and more appropriate measures could be taken to correct possible dysfunctions in this sector.

To respond to the chosen research topic, we first investigated the existing situation in the Court of Accounts in terms of the normative act of operation, the strategies and standards used, the regulations, manuals, guides and other working tools that this institution develops, in order to understand its role in the area of financial audit at public institutions. Another direction of investigation referred to the modalities of access to the quality of external public auditor within the Court of Accounts of Romania and to that of statutory financial auditor accredited by ASPAAS or CAFR, the only professional bodies and professions that could join efforts to collaborate and broaden the scope of those who could carry out financial audit missions at public institutions.

A third and final issue investigated concerned the ways of correlating the frequency and objectives of external public audit missions of the Court of Accounts teams with those of financial auditors certified by ASPAAS and CAFR at state and private entities, in order to finally cover the annual frequency of statutory financial audit missions at all public institutions.

The issue of this article focuses on the idea of taking over the more valuable experience, proven in the private sector (through the annual audit of representative entities in terms of the value of assets, turnover and number of employees) and in the public sector (where auditing is done every few years and not correlated with the submission of annual financial statements) and on the possibility of capitalizing in the interest of the state a body of professional auditors accredited by ASPAAS and CAFR (which until now have only been used at private and non-governmental entities).

2.Literature review

The issue of the functioning of the Romanian Court of Auditors is present in all aspects in the normative acts, regulations, manuals, instructions and other operating instruments on the website of this representative institution of our country (www.curteadeconturi.ro), and we have consulted and exemplified these representative materials in our article. We have also consulted the INTOSAI standards (international supreme audit institution for public institutions) that the Romanian Court of Auditors applies in its current activity. We did not hesitate to consult also representative materials from the activity of the European Court of Auditors on the website of this institution (www.eca.europa.eu) and on that of our national authority, by virtue of the fact that it is subordinated and collaborates very well with the European institution in the field.

It was very important to also consult the line materials posted on the websites of the other two private audit authorities, the Supervisory Authority for Statutory Audit Activity – ASPAAS (www.aspaas.gov.ro) and the Chamber of Financial Auditors of Romania – CAFR (www.cafr.ro), in order to identify the possibilities of collaboration between these two bodies and the Court of Accounts of Romania. Since CAFR also periodically publishes a specialized magazine (the magazines "*Financial Audit*" and "*Practice in Audit*"), we consulted those materials that refer both to the activity of the Court of Accounts of Romania, but also to that of auditing professionals from the private and non-governmental environment or to the auditing profession in general (we exemplify the articles "*A qualitative approach regarding the impact of digitalization and automation on the accounting and auditing profession*", authored by Stoica Oana-Cristina and Ionescu-Feleagă Liliana in issue 4(176)/2024 and posted on http://revista.cafr.ro/RevistaDetalii_RO?Cod=1113 or the article "*Research on fraud in economic entities - a conceptual perspective*", authored by Tunsu

Alexandru Adrian in issue 1(177)/2025 and posted on http://revista.cafr.ro/RevistaDetalii_RO?Cod=1114).

Another set of materials that I consulted are those posted on the website of the Ministry of Finance (www.mfinante.gov.ro) which concern both the accounting regulations for public institutions (OMFP no. 1917/2005) and for private companies (OMFP no. 1802/2014) and non-governmental entities (OMFP no. 3103/2017).

To these regulations and related documents we add the content of the magazine of this ministry entitled *"Public Finance and Accounting"* (exemplify the article *"Calculation and declaration of income tax, social security contribution and health insurance contribution in 2025"* authored by Ionescu Mariana Mihaela in issue 1/2025 and posted on <https://mfinante.gov.ro/static/10/Mfjp/revista/MihaelaIonescup15-22.pdf>).

Finally, we mention that we also consulted some doctoral theses that referred to the activity of the Romanian Court of Accounts (we exemplify the thesis entitled *"The role of external audit in combating and preventing financial fraud in public institutions"*, defended in 2024, with the author being Dr. Brăneț Diana Sabina, doctoral supervisor Prof. Dr. Hațegan Camelia-Daniela and posted on the website: https://www.uvt.ro/wp-content/uploads/sites/2/2024/03/RO-Branet-Rezumat-teza-de-doctorat_v-2-1.pdf).

3.Theoretical basis of the topic

The problem we analyzed started from revealing the scientific and normative foundations in the two areas of statutory audit, that carried out by the Court of Accounts and by ASPAAS and CAFR.

The research tools we used were the investigation of the types of audits that the two categories of accounting professionals can perform, what are the rules and procedures for certifying professionals in the two categories (public and private sectors) and the identification of possibilities for harmonizing the process of acquiring a more complex qualification, so that auditors certified by the Court of Accounts, but also those confirmed by ASPAAS and CAFR, can jointly carry out missions at public institutions.

As a result of this research effort, we identified and proposed some viable solutions so that the new body of statutory auditors (of the Court of Accounts, ASPAAS and CAFR) can undergo much more complex training and be able to successfully carry out annual statutory financial audit missions at public institutions.

4. Possible solutions to expand the area of professionals who can perform external public audits at public institutions, under the coordination of the Romanian Court of Accounts

4.1. Presentation of the Romanian Court of Accounts: normative act of operation, strategies and standards used, regulations, manuals, guides and other working tools that it develops

In our attempt to find new solutions to supplement the forces of the Romanian Court of Accounts in order to annually audit the financial statements of public institutions (an action that should take place with this frequency, not every few years, given the major importance of these financial statements) we thought of starting the research by highlighting the attributions and all the working tools currently used by this supreme public audit body.

The Romanian Court of Accounts benefits from a series of normative acts, strategies, standards, regulations, manuals, guides, guidelines, practices and a code of ethical conduct for the staff of this institution for the performance of its activities.

External public audit is the audit activity carried out by the Court of Accounts, which mainly includes financial audit and performance audit (*chapter I-General provisions, art. 2, point b) of Law no. 94/1992, republished*).

The role and powers of this supreme audit institution are inserted in art. 140 of the Romanian Constitution and in Law no. 94/1992 on the organization and functioning of the Court of Accounts of Romania, republished with subsequent amendments and completions (published in the Official Gazette of Romania, Part I, no. 224/09.09.1992 and republished in the same publication, but in no. 282 of 29.04.2009 and the latest version, in no. 238/03.04.2014).

From the strategy category, we mention that this institution has configured and bases its activity on two such strategies: 1) *Strategy for the period 2023 - 2028* (https://www.curteadeconturi.ro/uploads/d4a5f9bb/c0df3cdb/d6d719b6/eb988ed5/6562aa19/7ccdc390/d7f704f6/9d491608/Strategia_de_Dezvoltare_Institucională_a_Curții_de_Conturi_a_României_pentru_perioada_2023_-_2028.pdf), which contains: introduction; mission, vision and values; strategic objectives; results framework; risk management; strategic planning, monitoring, evaluation and reporting; stakeholders; 2) *The Digitalization Strategy of the Court of Accounts of Romania for the period 2023 – 2028*

(https://www.curteadeconturi.ro/uploads/a65264c7/9297662a/088613a7/deeb95e6/92061381/b09ab568/62d7d94e/b06dbddb/Strategia_de_digitalizare.pdf)

lizare_a_Curții_de_Conturi_a_României_2023- 2028 .pdf), which contains: the strategy in detail; the roadmap for digital transformation; organization and management.

Regarding *standards*, the Court of Accounts of Romania uses the 37 INTOSAI standards (<https://www.curteadeconturi.ro/standarde-de-audit>), also translated and applied by our national authority.

As *regulations*, this national supreme audit institution uses the following normative acts of this type: 1) *Regulation on the external public audit activity* (approved by Decision no. 629/2022 of the Court of Accounts and was published in the Official Gazette of Romania, Part I, no. 12/05.01.2023); 2) *Regulation on the organization and conduct of specific activities of the Court of Accounts, as well as the use of documents resulting from these activities* (approved by Decision no. 155/29.05.2014 of the Court of Accounts and was published in the Official Gazette of Romania, Part I, no. 547/24.07.2014); 3) *Regulation on the organization and conduct of specific activities of the Court of Accounts, as well as the use of documents resulting from these activities* (approved by Decision no. 205/31.05.2017 of the Court of Accounts and was published in the Official Gazette of Romania, Part I, no. 500/30.06.2017); 4) *Rectification of art. 4 of the Regulation on the organization and conduct of specific activities of the Court of Accounts, as well as the use of documents resulting from these activities* (approved with reference to Decision no. 155/29.05.2014 of the Court of Accounts and was published in the Official Gazette of Romania, Part I, no. 814/07.11.2014).

Another set of documents that regulate the activity of the Court of Accounts of Romania refers to manuals. Among those of this type that are currently in force, we mention the following *manuals*: 1) *Performance Audit Manual* (definition, principles, approaches and characteristics of performance audit; performance audit planning; performance audit execution; reporting; monitoring the implementation of recommendations; performance audit quality assurance) ([https://www.curteadeconturi.ro/uploads/b146bc5c/8e38c369/07cdfd66/4236eb69/364d8812/b0](https://www.curteadeconturi.ro/uploads/b146bc5c/8e38c369/07cdfd66/4236eb69/364d8812/b0c632e7/eeaec722/247233a0/Manual_audit_perform_coperta_v1.pdf)

[c632e7/eeaec722/247233a0/Manual_audit_perform_coperta_v1.pdf](https://www.curteadeconturi.ro/uploads/b146bc5c/8e38c369/07cdfd66/4236eb69/364d8812/b0c632e7/eeaec722/247233a0/Manual_audit_perform_coperta_v1.pdf));

2) *Information Systems Audit* (the context for conducting IT audits domestically and internationally; IT audit standards; IT risks; IT audit procedures; checklists, templates and questionnaires)

(https://www.curteadeconturi.ro/uploads/25529564/77241a13/330b7f07/6c1123fc/16ba70a5/2eeb2cdf/0fbfb694/38bf227f/MANUAL_AUDIT_IT.pdf); 3) *Compliance audit manual* (general objective of control; characteristics of control and the

different ways in which it can be carried out; elements of control; general principles of control; stages of control action; glossary of terms) (https://www.curteadeconturi.ro/uploads/ba799d10/00f73f99/0b553817/efbebc95/dcaf673/e1638e13/9edcf166/e54c9a73/Manual_de_audit_de_conformitate.pdf).

The guidelines are another set of documents that help the auditors of the Court of Accounts in their specific mission. These *guidelines* in force are the following:

1) *The Guide for conducting environmental audits*

(https://www.curteadeconturi.ro/uploads/98b27e01/506a063a/ad167616/d51805e5/16488c0f/1201cb59/9d53ccd4/2d9b9988/ghid_mediu1.pdf);

2) *IT systems audit guide*

(https://www.curteadeconturi.ro/uploads/b3578fec/2e705397/8f5ff376/123728f6/08da8783/a7cf8c9a/974875d0/4f7867de/GHID_AUDIT_IT_CCR_24102012.pdf);

3) *Public debt financial audit guide*

(https://www.curteadeconturi.ro/uploads/17225ad8/35e2b21b/65371717/f5f3efe2/b2cbbdce/d9b3ba78/e5c0be53/dbfdce39/ghidul_auditului_financiar_al_datoriei_publice.pdf);

4) *Pri-vatization Audit Guide*

(https://www.Curteadeconturi.ro/uploads/13ee0244/bb179b2e/4742936f/7296413b/28f38888/4087ebcd/0a96cd18/74e12d00/GHIDUL_AUDITULUI_PRIVATIZARII.pdf);

5) *Guide on the compliance audit regarding the legality of the use of amounts from repayable financing*

(https://www.curteadeconturi.ro/uploads/33571652/e50d927b/13149fe0/3c02ae4c/113ce594/247ebbd9/31753985/e9af1563/Auditul_de_conformitate_privind_legalitatea_modului_de_utilizare_a_sumelor_provenite_din_finanțări_rambursabile.pdf);

6) *Guide on the audit of public debt management performance*

(https://www.curteadeconturi.ro/uploads/ef7a4a1b/bc1f046a/8525a987/d2717e3b/a8ddb121/cc757550/d53f2c24/0aa9f455/Auditul_performanței_in_gestionării_datoriei_publice.pdf);

7) *Guide on how to verify public procurement and sectoral procurement*

(https://www.curteadeconturi.ro/uploads/7d8fb4fe/a749a81a/b1874974/3143a111/c2a249a5/afe65c4c/a0ab0f5e/f76bdf15/Ghid_control_achizitiei_publice.pdf);

8) *Guide on how to verify concessions for works, services and public utility goods*

(https://www.curteadeconturi.ro/uploads/1f940b2e/0342ca98/215ea75c/d3260cf8/41a9d167/286a7276cc69d857/28db9ba6/Ghid_verificare_concesiunilor.pdf);

9) *Guide for quality assurance and control of specific activities carried out by the Court of Accounts of Romania*

(https://www.curteadeconturi.ro/uploads/071794e3/cbd7d76c/6a706636/5de735f7/46831d13/d9372321/c23801fa/1646d3cd/Ghid_pentru_asigurarea_si_controlul_calitatii_activitatilor_specifice_CC_2017.pdf).

Another section of useful documents in the activity of the auditors of this body is represented by guidelines and practices that are posted in the form of regulations and reports and amount to over 20 such documents.

From the perspective of the exercise by the Court of Accounts of Romania of audit missions and economic entities with state, mixed or private capital or non-profit organizations that also use public funds (for various requested subsidies to which they are entitled or European or research projects), normative acts specific to these auditable entities by this institution should also be taken into account (by way of example, we list the following: OMFP no. 1917/2005 (*was published in the Official Gazette of Romania, Part I no. 1186/29.12.2005 and republished several times later, as a result of amendments and additions*); OMFP no. 1802/2014 (*was published in the Official Gazette of Romania, Part I no. 963/30.12.2014 and republished several times later, as a result of amendments and additions*); OMFP no. 2,844/2016 (*was published in the Official Gazette of Romania, Part I no. 1020/19.12.2016*); OMFP no. 3103/2017 (*was published in the Official Gazette of Romania, Part I no. 984/12.12.2017*); Accounting Law no. 82/1991 (*was republished in the Official Gazette of Romania, Part I no. 454/18.06.2008*); Commercial Companies Law no. 31/1990 (*was published in the Official Gazette of Romania, Part I no. 126-127/17.11.1990 and republished several times subsequently, following amendments and additions*); Law no. 84/2024 supplementing Government Ordinance no. 26/2000 on associations and foundations (*was published in the Official Gazette of Romania, Part I no. 333/10.04.2024*); International Financial Reporting Standards (IFRS); International Standards on Auditing – ISA; etc.).

4.2. Modalities for accessing the quality of external public auditor within the Romanian Court of Accounts and statutory financial auditor accredited by ASPAAS or CAFR

A second objective of our research to find additional forces for the Romanian Court of Accounts in order to annually audit the financial statements of public institutions was to see under what conditions the financial auditors of the Romanian Court of Accounts and, respectively, those accredited by the Public

Supervisory Authority for Statutory Audit Activity (ASPAAS) and, respectively, by the Chamber of Financial Auditors of Romania (CAFR) acquire this professional quality and how this process could be standardized, so that both categories of accounting professionals can be used in financial statement audit missions at public institutions.

To see to what extent ASPAAS or CAFR accredited financial auditors can be involved in external public audit missions under the aegis of the Romanian Court of Accounts, we bring to your attention the rules according to which auditor qualifications are acquired at the three aforementioned institutions.

To acquire the quality of external public auditor at the Romanian Court of Accounts, the areas of knowledge examination within the recruitment competition for such a position are the following:

1) Organization and functioning of the Court of Accounts according to the legislation in force (organization and management; appointment and status of personnel; competence and powers of the court; certification of accounts; violations and sanctions);

2) Financial audit (attributions and powers of the Court of Auditors regarding financial audit; objectives of financial audit and certification of accounts; notification of the entity, designation of external public auditors, as well as organization of the financial audit mission; stages of financial audit; types of documents that are drawn up during the financial audit and their content; capitalization of the findings recorded in the documents drawn up during the financial audit missions);

3) Compliance audit (attributions and powers of the Court of Auditors regarding compliance audit; objectives of compliance audit; organization and performance of the regularity audit; notification of the entity, designation of external public auditors, as well as organization of the compliance audit mission; types of documents that are drawn up during the compliance audit and their content; capitalization of the findings recorded in the documents drawn up during the compliance audit missions);

4) Performance audit (attributions and powers of the Court of Accounts regarding performance audit; organization and conduct of performance audit);

5) Public finances (principles, rules and responsibilities; budgetary process; finances of public institutions; contraventions and sanctions; recovery of amounts representing damages/ illegal payments from public funds; public accounting; amounts due to the state; transfer of revenues due to public budgets that do not have deadlines established by the normative acts that regulate them; revenue

regime; regime of amounts resulting from the capitalization of fixed assets and material goods; special funds);

6) *Local public finances* (local budget revenues and expenditures; operating section; development section; budgetary principles and rules; powers and responsibilities in the budgetary process; responsibilities of credit officers; own preventive financial control, internal public audit and subsequent control; budgetary process; provisions regarding local public investments; budget execution; financing of public institutions; financial crisis and insolvency of administrative-territorial units);

7) *Accounting* (general framework for the preparation and presentation of financial statements; accounting regulations: asset accounting; debt and provision accounting; equity and reserve accounting; income, expense and profit and loss accounting; form and content of financial statements; approval, signing, auditing and publication of financial statements; closing of the financial year);

8) *Taxation* (scope of the Fiscal Code, principles of taxation; profit tax; income tax; mandatory social contributions; value added tax; excise duties and other special taxes; local taxes and fees; object and scope of application of the Fiscal Procedure Code; material and territorial jurisdiction of the central and local fiscal body; tax registration; establishment of tax receivables; tax control; collection of tax receivables; resolution of appeals against tax administrative acts; amicable procedure for the avoidance/elimination of double taxation; international tax aspects);

9) *Administration of public and private assets of the state and administrative-territorial units* (inventory of assets, liabilities and equity and their evaluation; concession and lease of goods in the public domain of the state; concession of public works; concession of public services; public property, private property of the state and administrative-territorial units, change of legal status);

10) *Sectoral public procurement* (public procurement: general provisions; general rules for participation and conduct of award procedures; award methods; organization and conduct of the award procedure; execution of the public procurement contract/framework agreement; specific cases of termination of the public procurement contract; contraventions and sanctions); sectoral procurement: general provisions; exemptions applicable to sectoral contracts; general rules for participation and conduct of award procedures; award methods; organization and conduct of the award procedure; execution of the sectoral contract; contraventions and sanctions);

11) *Internal managerial control* (general objectives of internal control; internal control requirements; sound financial management; objective of preventive financial control; organization of own preventive financial control; visa of own preventive financial control; organization of delegated preventive financial control; visa of delegated preventive financial control; visa refusal regime; duties of the internal public audit department; general framework of professional competences of internal auditors in the public sector);

12) *Legal concepts* (functioning of state-owned companies or administrative-territorial units (establishment, organization, administration; profit distribution; functioning of autonomous administrations - establishment, organization, administration; profit distribution; insolvency procedure; responsibility, liability - definition, similarities, differences; civil liability according to the Civil Code; criminal liability and offenses; contraventional liability, according to O.G. no. 2/2001; patrimonial liability, according to the Labor Code and the Administrative Code).

To acquire the quality of ASPAAS and CAFR certified statutory financial auditor, according to Law no. 162/2017 (published in the Official Gazette of Romania, Part I, no. 548/12.07.2017), an access test to the internship is taken, such an internship is carried out for 3 years and at the end a professional competence exam is taken.

Before listing the tests that are taken for access to this profession, we would like to specify that *statutory audit* means an audit of individual annual financial statements or consolidated annual financial statements carried out in accordance with international auditing standards, to the extent that: a) it is mandatory under European Union law or domestic law; b) it is carried out voluntarily for small entities, and the audited financial statements are published, together with the statutory audit report, according to the law (*chapter I-Object and definitions, art.2, point 1, subparagraphs a) and b*).

The internship access test is taken according to the Order of the President of ASPAAS no. 201/2019 (published in the Official Gazette of Romania, Part I, no. 283/12.04.2019) on questions from the following subjects:

1) *Financial audit* (regulatory environment - national and international; ethical requirements regarding statutory audit; types of missions; fundamental coordinates regarding financial audit missions; internal audit);

2) *Financial accounting* (general conceptual framework for financial reporting; obligations that, according to the law, lie on legal entities, in terms of organizing and managing accounting; inventory of assets, liabilities and equity; accounting

regulations according to OMFP no. 1802/2014, with subsequent amendments and supplements; preparation and presentation of consolidated financial statements in accordance with OMFP no. 1802/2014, with subsequent amendments and supplements);

3)*Cost accounting and management accounting* (general provisions on management accounting; cost calculation (principles of cost calculation, cost classification, losses, work in progress, rational allocation of indirect costs, production cost, period cost, debt costs; cost calculation methods; management accounting organization systems; internal reporting of management accounting information);

4)*Financial analysis* (identification and analysis of the main elements of the financial position; calculation and analysis of financial position indicators - liquidity, solvency, debt ratio, structure rates; calculation and analysis of profitability and return indicators; risk-return relationship - debt ratio, economic profitability, financial profitability);

5)*Company law and regulations on corporate governance* (legislative framework; forms of incorporation of companies with legal personality; incorporation of companies; operation of companies; amendment of the articles of association; exclusion and withdrawal of associates; dissolution, merger and division of commercial companies; liquidation of companies; corporate governance);

6)*Fiscal legislation* (legislative framework; profit tax; tax on income of micro-enterprises; income tax; tax on income obtained in Romania by non-residents and tax on representative offices of foreign companies established in Romania; value added tax).

The professional competence exam is scheduled to be held in accordance with art. 9 para. (1) of Law no. 162/2017, in the following subjects:

A) Areas of financial audit:

1)*Financial audit* (regulatory environment – national and international; professional ethics and independence; types of missions; fundamental coordinates regarding assurance missions; auditing the main elements recognized in the financial statements);

2)*Financial accounting* (general conceptual framework for financial reporting; obligations that, according to the law, lie with legal entities, in terms of organizing and managing accounting; inventory of assets, liabilities and equity; accounting regulations according to OMFP no. 1802/2014; aspects regarding the application of international financial reporting standards);

3) *Analysis and evaluation of financial statements* (identification and evaluation of the main elements of the financial position; calculation and analysis of financial position indicators (liquidity, solvency, debt ratio, structure rates; calculation and analysis of profitability and profitability indicators; risk-return relationship - debt ratio, economic profitability, financial profitability);

4) *Preparation and presentation of consolidated financial statements, in accordance with OMFP no. 1802/2014 and IFRS* (presentation of financial instruments held over group companies in individual financial statements; conditions for preparing consolidated annual financial statements; determination of control percentages, interest and consolidation method; adjustment of individual financial statements; conversion of individual financial statements of non-resident companies; elimination of intragroup accounts, unrealized internal results and dividends; elimination of participations; consolidation methods - global integration, equity method; preparation of consolidated annual financial statements; auditing of consolidated annual financial statements);

5) *Cost accounting and management accounting* (general provisions on management accounting; cost calculation - principles of cost calculation, cost classification, losses, work in progress, rational allocation of indirect costs, production cost, period cost, debt costs; cost calculation methods; management accounting organization systems; internal reporting of management accounting information);

6) *Internal audit* (definition, purpose and role of internal audit; legal framework of internal audit activity in Romania; mission, competencies and responsibilities; quality assurance and improvement programs: internal assessments, external assessments, reports, presentation of non-conformities; performance standards; risk management, control and governance within the entity; planning, objectives, scope and resources allocated to the internal audit mission; mission accomplishment: identification, documentation, analysis and evaluation of information; communication of results; monitoring of the implementation of recommendations);

B) Other areas or regulations, in accordance with art. 9 para. (2) of Law no. 162/2017:

1) *Company Law and regulations on corporate governance* (legislative framework; forms of incorporation of companies with legal personality; incorporation of companies; operation of companies; amendment of the articles of association; exclusion and withdrawal of associates; dissolution, merger and division of commercial companies; liquidation of companies; European company; registration or, as the case may be, registration in the trade register; making

registrations in the trade register; regime of companies and emblems; corporate governance);

2) *Insolvency law and other similar procedures* (legislative framework; general aspects of insolvency prevention and insolvency procedures; insolvency prevention procedures; insolvency procedure; cross-border insolvency);

3) *Tax legislation* (legislative framework; corporate income tax; micro-enterprise income tax; income tax; tax on income obtained in Romania by non-residents and tax on representative offices of foreign companies established in Romania; value added tax; excise duties and other special taxes; procedural obligations regarding the registration and payment of taxes and fees for taxpayers);

4) *Civil Code* (legislative framework; application of civil law; legal person; professional; goods; obligations; extinctive prescription, forfeiture and calculation of terms; private international law);

5) *Social insurance legislation and the Labor Code* (legislative framework; mandatory social contributions; procedural obligations regarding the registration and payment of contributions for taxpayers; scope of application of the Labor Code; individual employment contract; working time and rest time; remuneration; collective labor agreements; legal liability in labor relations);

6) *Information technology and computer systems* (Excel fundamentals; basic spreadsheet operations: spreadsheet, spreadsheet manipulation, cell and field referencing, formula editing, formula copying; character formatting: numeric character formatting, custom character formatting; conditional formatting; predefined tabular calculation functions; databases - Excel database query; decision support tools; graphical representations);

7) *Public finance, general and business economics* (public finance; financial markets; banking system);

8) *Mathematics and statistics* (mathematical calculations performed when preparing financial statements; descriptive statistics; exploratory data analysis; sampling methods; forecasting methods).

The manner of taking the professional competence exam is provided for in the Order of the President of ASPAAS no. 135/2018 (published in the Official Gazette of Romania, Part I, no. 829/27.09.2018, a normative act subsequently supplemented by two other orders of the same President of ASPAAS: no. 573/2019 and no. 391/2020) and consists of two tests: A) First test - the test on theoretical knowledge; B) Second test - the test on the practical application of theoretical knowledge.

The theoretical knowledge test, which constitutes the first test of the competency exam, is carried out over a period of 3 hours and consists of verifying theoretical knowledge, by taking a test containing both open-ended topics and multiple-choice questions, covering the following areas: a)general accounting theory and principles; b)legal requirements and standards relating to the preparation of annual and consolidated financial statements; c)international accounting standards; d)financial analysis; e)cost and managerial accounting; f)risk management and internal control; g)audit and professional skills; h)legal and professional requirements relating to statutory audit and financial auditors; i)international auditing standards, as mentioned in art. 32 of Law no. 162/2017; j) professional ethics and independence.

The theoretical knowledge test may also contain audit-relevant subjects from the following areas or regulations: a)company law and corporate governance regulations; b)insolvency law and other similar procedures; c)tax law; d)Law no. 287/2009 on the Civil Code, republished, as amended; e)social security legislation and Law no. 53/2003 - Labour Code, republished, as amended and supplemented; f)information technology and computer systems; g)public finance, general and business economics; h)mathematics and statistics; i)basic principles of financial management.

The weight of open-ended subjects provided for in paragraph (2) in the final grade is 40%, and 50% for multiple-choice questions. The subjects related to the areas mentioned in paragraph (2) letter a) g) - j) will have a weight of at least 50% of the total number of subjects, and the subjects related to the other fields will have a weight of at least 30%.

The subjects related to the areas mentioned in paragraph (2) letters g) - j) will have a minimum weight of 50% of the total number of subjects, and the subjects related to the other areas will have a minimum weight of 30%.

The second test of the competency exam aims to verify the candidate's ability to apply in practice the theoretical knowledge acquired in order to carry out the financial audit activity. This test is carried out over 4 hours and consists of:

a)a subject on the formulation of an audit opinion with the description/argumentation of the professional reasoning used, taking into account a practical case relating to one or more aspects related to the statutory audit;

b)a subject on the planning and conduct of statutory audit missions, the auditor's responsibilities in the statutory audit, as well as the differences in reporting between the financial and statutory audit;

c)a subject from the "International Standard on Quality Control (ISQC) 1, Quality Control for Firms That Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements".

The second test of the competency examination may be taken only if the first test of the examination is passed.

According to the provisions of art. 10 of Law no. 162/2017, the holder of a bachelor's degree, a master's degree or a professional qualification in one or more of the fields provided for in art. 6 para. (2) and (3) is granted exemptions from the theoretical knowledge test included in the competency examination, for the respective fields, in the event that the university curriculum followed by the holder covers one or more of the disciplines provided for in art. 6 para. (2) and (3). The exemption is granted based on protocols or agreements concluded by ASPAAS with national or international higher education institutions or with national or international professional bodies.

No exemptions are granted from the practical application of theoretical knowledge test, included in the competency exam.

The minimum passing score for each test is 6.00. The minimum passing score for the exam is 7.00, obtained as the arithmetic average of the two tests. For candidates who were exempted from the theoretical knowledge test, in accordance with the provisions of art. 10 of Law no. 162/2017, the minimum passing score for the second test, the practical application of theoretical knowledge test, is 7.00.

By carefully examining the manner of acquiring the qualifications of external statutory auditor of the Court of Accounts of Romania and that of independent statutory auditor accredited by ASPAAS, we allow ourselves to formulate a series of proposals for the standardization of the training for the two categories of auditors to acquire such a title that would allow them to audit the financial statements of public institutions.

Given that both categories of auditors can perform statutory audits and other audit missions, but at different entities (auditors certified by and registered with the Romanian Court of Auditors, at public institutions but also at private entities - autonomous regies and commercial companies with exclusive or majority state capital, commercial companies and non-governmental organizations that use public funds), but at certain intervals of time, not annually, and auditors certified by ASPAAS only at private entities, which meet certain express requirements (in the specific legislation) related to 3 indicators (turnover, assets and number of employees) and annually as frequency, and agreed-upon procedures type audits and other types, other than statutory ones, they can perform such missions at private

entities and public institutions) the substantive proposal aims both at organizing the certification exam as auditors for both areas (both for public institutions and for private entities) by a single authority (in this case either the Court of Accounts of Romania, or ASPAAS - which is also a public institution, for now subordinated to the Ministry of Finance, or another new public institution, let's say the Authority for Attestation and Supervision of Statutory Auditors in Romania - AASASR, established by a distinct normative act) and based on a common set of exam tests, which should cover both the audit needs of public institutions and private entities (commercial companies and non-profit organizations).

Regarding the examination subjects and audit tests, we propose that to the list of subjects provided for the theoretical knowledge test (we refer to the following subjects: *financial audit, financial accounting, analysis and evaluation of financial statements, preparation and presentation of consolidated financial statements, in accordance with OMFP no. 1802/2014 and IFRS; cost accounting and managerial accounting; internal audit; company law and regulations on corporate governance; insolvency law and other similar procedures; tax legislation; civil code; legislation on social security and labor code; information technology and computer systems; public finance, general and business economics; mathematics and statistics*) tests provided for the examination of external public auditors of the Court of Accounts of Romania be added (we refer to the following subjects: *INTOSAI standards, organization and functioning of the Court of Accounts of Romania; compliance audit; performance audit; public accounting; administration of public and private assets of the state and administrative-territorial units; public procurement; internal/managerial control;*).

We propose that there will be two exam tests: *A)The first test - the theoretical knowledge test; B)The second test - the practical application of theoretical knowledge test.*

The theoretical knowledge test, which is the first test of the competency exam, is conducted over a period of 6 hours and consists of verifying theoretical knowledge, by taking a test that contains both open-ended topics and multiple-choice questions, covering all the areas listed above, both in the area of auditing public institutions and other related disciplines, and in auditing private entities and other disciplines related to this type of audit. The minimum score to be obtained in this test is 6.

The second test of the competency exam aims to verify the candidate's ability to apply in practice the theoretical knowledge acquired in order to carry out all types

of financial audit activity used in public institutions and private companies. This test is carried out over 6 hours and consists of:

a) a topic on the formulation of an audit opinion with the description/argumentation of the professional reasoning used, taking into account a practical case relating to one or more aspects related to the statutory audit of public institutions and private entities;

b) a topic on the planning and conduct of statutory audit missions, the auditor's responsibilities in the statutory audit, as well as the differences in reporting between financial and statutory audits of public institutions and private entities;

In this way, a Protocol could be concluded between the Court of Accounts of Romania and the Authority for the Certification and Supervision of Statutory Auditors of Romania (AASASR), through which auditors certified by AASASR and not affiliated with the supreme public audit institution could also be used in missions to public institutions to audit the annual financial statements of public institutions, so that these situations would also be subject to such an examination annually, not as is currently the case every few years.

Also, such missions should be based on service contracts concluded with these professionals by the Court of Accounts and not by the audited public institutions, according to public procurement rules, but also on the basis of a quality control carried out by a specialized structure within the court on the services provided by the external statutory auditors managed by AASASR.

At the end of this second part of the research, we present the elements of differentiation between the external public audit carried out by the professionals of the Court of Accounts and the statutory audit carried out by financial auditors certified by ASPAAS and CAFR at private and non-governmental entities, which, however, can be mitigated to the point of elimination on the basis of the proposals advanced by us above in this chapter and in the next one.

Differentiating elements between the two forms of external audit	Provisions for external public audit	Provisions for statutory financial audit of commercial companies and non-profit organizations
1)Professional bodies that coordinate external audit activity at public institutions and private entities	The external public audit activity is coordinated by the Court of Accounts of Romania;	The statutory financial audit activity at commercial companies and non-profit organizations is coordinated by the Public Supervisory Authority for Statutory Audit Activity (ASPAAS) and can be delegated, on certain components and aspects, to the CAFR;
2)Normative acts regulating external audit activity	The external public audit activity is regulated by Law no. 94/1992 on the organization and functioning of the Court of Accounts of Romania, with subsequent amendments and completions (Law no. 217/2008); Accounting Law no. 82/1991, with subsequent amendments and completions; OMFP no. 1917/2005 on the Methodological Norms on the organization and management of accounting of public institutions;	The statutory financial audit activity of commercial companies and non-profit organizations is regulated by Law No. 162/2017 on the statutory audit of annual financial statements and consolidated annual financial statements, with subsequent amendments and supplements;
3)How to become an external auditor	The status of external public auditor is acquired according to Government Decision No. 130/2010 (for the approval of the Regulation on the organization and conduct of specific activities of the Court of Accounts, as well as the valorization of documents resulting from these activities);	The quality of financial auditor who can perform statutory audit missions is acquired based on an entrance exam, a 3-year internship and an aptitude exam (the exam is given in the following subjects: a) theory and principles of general accounting; b) legal requirements and standards relating to the preparation of annual and consolidated financial statements; c) international accounting standards; d) financial analysis; e) cost and managerial accounting; f) risk management and internal control; g) audit and professional skills; h) legal and professional requirements relating to statutory audit and financial auditors; i) international auditing standards;

Differentiating elements between the two forms of external audit	Provisions for external public audit	Provisions for statutory financial audit of commercial companies and non-profit organizations
		(meaning: International Standards on Auditing (ISA); International Standard on Quality Control (ISQC1); Other standards issued by the International Federation of Accountants (IFAC) through the International Auditing and Assurance Standards Board (IAASB), to the extent that they are relevant to statutory audit); j) professional ethics and independence; a) company law and corporate governance regulations; b) insolvency law and other similar procedures; c) tax legislation; d) Civil Code; e) social security legislation and the Labor Code; f) information technology and computer systems; g) public finance, general and business economics; h) mathematics and statistics; i) basic principles of financial management) organized under the aegis of ASPAAS or based on the delegation of this mission to CAFR;
4)Manuals and guides that regulate the conduct of various external audit missions	The Financial Audit Manual of the Court of Accounts from 2017; International Standards of External Public Auditing developed by INTOSAI (International Organization of Supreme Audit Institutions);	ASPAAS uses the International Standards on Auditing, 2020 edition, developed by the IAASB (International Auditing and Assurance Standards Board) and at the national level complies with the provisions of Law no. 162/2017 on the statutory audit of annual financial statements and consolidated annual financial statements, as subsequently amended and supplemented; ASPAAS also requires auditors to comply with the provisions of the Guide for a quality audit, assistance in the development and documentation of audit procedures for compliance with international auditing standards, developed by the Institute of Chartered Accountants in Scotland (ICAS) and CAFR in 2019;
5)The frequency with which	External public audit	Statutory financial audit missions are

Differentiating elements between the two forms of external audit	Provisions for external public audit	Provisions for statutory financial audit of commercial companies and non-profit organizations
such missions are carried out at public institutions and private entities	missions related to the financial statements of these entities are carried out every 2-3 years (not annually at the same public institution) and the report prepared will not accompany the annual financial statements of these public institutions;	performed annually by these accounting professionals, on the occasion of preparing the annual financial statements of certain commercial companies and non-profit organizations, which meet certain requirements expressly established by specific regulatory acts, and the report prepared will accompany these statements;
6) To whom is the external audit report submitted and how is the content used by the authorized bodies	External public audit reports (related to the financial statements of public institutions) in summarized form are transmitted to the Romanian Parliament, along with other missions carried out by the Romanian Court of Accounts and the European Court of Auditors; The Romanian Parliament and the European Court of Auditors are the authorities that decide how the conclusions from such reports will be used;	The statutory financial audit reports of ASPAAS certified auditors performed on commercial companies and non-profit organizations are examined by the users of the financial statements of these entities (the audit reports are submitted to the Ministry of Finance by private entities, along with the other components of the financial statements); at the same time, ASPAAS periodically verifies the statutory audit activity performed by such professionals and grants ratings to allow the activity of these professionals in the future or to require the improvement of the activity of these professionals, as a result of obtaining unacceptable ratings;

Source: Own contribution of the authors of the article

4.3. Ways to correlate the frequency and objectives of external public audit missions of the Court of Accounts teams with those of financial auditors certified by ASPAAS and CAFR at state and private entities

A third objective of our research to find additional forces for the Court of Accounts of Romania in order to annually audit the financial statements of public institutions, we thought of the ways to correlate the frequency and objectives of external public audit missions of the Court of Accounts teams with those of internal public auditors and financial auditors certified by ASPAAS and CAFR at state and private entities, in order to carry out the aforementioned missions at all public institutions every year.

Regarding the correlation of the frequency and objectives of the external public audit missions of the Court of Accounts teams with those of the internal public auditors and financial auditors certified by ASPAAS and CAFR at state and private entities, including the Ministry of National Defense:

References to the frequency and objectives of the external public audit missions of the Court of Accounts can be found in the Decision of the Court of Accounts no. 629/2022 for the approval of the Regulation on the external public audit activity (*it was published in the Official Gazette of Romania, Part I, no. 12/05.01.2023*), from which we will present the express provisions regarding the aspects that we intended to highlight.

The specific activity of the Court of Accounts consists mainly of the following types of audit missions: *a)financial audit; b)compliance audit; c)performance audit*. The Court of Accounts also carries out the following missions, without being limited to: *a)missions to verify the implementation of recommendations* (follow-up missions); *b)documentation missions*, which are carried out to obtain information and clarify aspects necessary for carrying out audit missions (*art.10, para.(1) and (2) of the Court of Accounts Decision no. 629/2022*).

We propose that the financial audit missions for the financial statements be carried out by the Romanian Court of Accounts annually at all public institutions, to accompany the other components of these statements and that statutory financial auditors accredited by ASPAAS or CAFR be co-opted into such missions, according to the proposal formulated above, because the staff of the Romanian Court of Accounts is not sufficient to cover such missions that should be carried out annually at public institutions throughout the country (in our opinion). The other audit or verification missions can be carried out at the same frequency and according to the current rules only by the external public auditors who are employed by the Court of Accounts and only in a very special way, when the human resources of this institution cannot cover the needs of carrying out such missions, can statutory auditors accredited by ASPAAS or CAFR also be called upon.

5. Conclusions

1)We wanted to bring to your attention the provisions regarding the 3 bodies (Court of Accounts of Romania; Public Supervisory Authority for Statutory Audit Activity-ASPAAS; Chamber of Financial Auditors of Romania – CAFR) and the corresponding professions they manage (external public auditors; statutory financial auditors), in order to identify the elements of similarity, but also of

difference in terms of the missions they perform in the areas of statutory audit, so that we can find better solutions for these professionals to cover external audit missions for all representative entities in Romania in the public domain, every year and not at certain periods of time longer than one year;

2)We also took such an approach because, from the point of view of statutory audit, public institutions are not fully and annually covered with missions in the area of verification of financial statements (as is the case of representative commercial companies in the economy, based on meeting the requirements for two of the three parameters established by regulatory acts: total assets; number of businesses; number of personnel) by the only institution currently authorized (the Romanian Court of Auditors) that currently carries out such missions, because they do not have sufficient human resources, although the annual financial statements represent the most important and representative component for any economic agent, especially for public institutions;

3)In order to cover the need for qualified human resources specifically for statutory audit missions on annual financial statements at public institutions (missions that are currently not carried out annually at all these institutions, but every 2, 3 or more years, although this type of audit is of major importance in relation to other types of similar missions) we conducted research on the way in which external public auditors and statutory financial auditors acquire professional qualifications and we formulated some proposals for revising the way in which these qualifications are supported by the professional bodies of which they are part, so that some of them, such as ASPAAS certified financial auditors, can also perform external public audits under the aegis of the Romanian Court of Accounts;

4)We have designed this approach in a more flexible and comprehensive manner, so that it can better cover the needs of public institutions in the areas of external public audit of annual financial statements (which are very important and must be audited annually, not as now at much longer intervals); at the same time, in this way, better complementarity and consistent and beneficial mutual support can be achieved between the financial and accounting professions in our country, which, at the moment, some are exercised almost predominantly only in the public environment (external public auditors of the Court of Accounts), and others only in the private environment (ASPAAS accredited statutory financial auditors, financial auditors within the CAFR).

5)We believe that the proposals formulated by us are feasible, can also be adjusted based on other considerations that we did not take into account, and we

are convinced that as soon as they are accepted and implemented, they will have the gift of increasing the quality of information about the financial statements of public institutions and initiating fair policies and measures to improve the activity of the public sector and, indirectly, the private sector;

6) We are convinced that a similar study can be undertaken in the future between the public internal audit performed at public institutions and the internal audit at private entities, in order to bring professionals from the two fields closer together to jointly perform such missions and to increase the quality of their work, so that external auditors from both fields (public and private) can rely much more on the results of these professionals when performing financial statement audit missions.

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FISCAL TREATMENT OF SHORT-TERM RENTALS VIA AIRBNB: A COMPARISON OF BULGARIA AND MATURE EU MARKETS

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Abstract: *The sharing economy has grown exponentially in the past decade, with platforms like Airbnb revolutionizing the tourism and hospitality industry. However, its expansion poses challenges to traditional sectors, including competition with hotels, tax compliance issues, and impacts on local economies. This study explores the taxation framework for short-term rentals in Bulgaria and compares it with systems in other European countries such as Italy, France, Greece, Germany, and Spain. Bulgaria offers three taxation methods for Airbnb hosts: a flat 10% income tax, business activity taxation, or the patent tax system, which is particularly advantageous for small-scale operators. Despite its simplicity, compliance involves multiple obligations, including registration in the Uniform System for Tourist Information (ESTI) and VAT registration for revenue exceeding thresholds. By contrast, countries like Italy and France impose withholding obligations on Airbnb, enhancing tax collection efficiency. This paper highlights the complexity of personal tax regimes across Europe, ranging from progressive systems to flat rates, and the varying deductibility of expenses. Bulgaria’s flat tax structure and low statutory deductions position it as one of the most host-friendly systems. However, enforcement and modernization, including digital systems such as*

Greece's AI-powered tax verification, remain critical for ensuring compliance and equitable contributions across the sharing economy.

Keywords: *Airbnb, taxation, sharing economy, fiscal treatment, Bulgaria*

Jel classification: H20, H24, H25, Z30

Introduction

The sharing economy has significantly expanded over the past decade, now rivaling major international corporations such as Booking Holdings and Expedia. Prominent entities within this sector include Airbnb and Uber, which are among the most highly valued companies. According to Zervas, Proserpio, & Byers (2017), a new type of online platform has emerged as the tourism industry has inevitably been influenced by diffusion of the sharing economy, and Airbnb is proving it in the last years. One of the “biggest pioneer[s]” of the sharing economy is the application Airbnb. Collaborative consumption and the sharing economy have become social and economic phenomenon in just a few short years (Martinez-Polo & Martinez-Sanchez, 2018; De Rivera et al, 2016; Hofmann et al, 2017; Key, 2017; Möhlmann, 2015; Pera et al, 2016; Xie & Mao, 2017). Short-term rentals (STRs) through online platforms have become increasingly popular in the tourism industry. The choice between short-term and long-term rental strategies depends on various factors, including property characteristics and location (Shokoohyar et al., 2020). Pricing of STRs is influenced by multiple determinants, which can be analyzed using hedonic price models and advanced regression techniques (Bobrovskaya & Polbin, 2022). On the other hand Airbnb is reviewed as a threat to hoteliers by impacting hotel revenues and occupancy rates (Zervas et al., 2017), by reducing hospitality employment (Fang et al., 2016) and by avoidance of tax (Guttentag, 2015). There is a growing trend towards integrating online and offline channels to provide a seamless customer experience. This includes offering personalized services and maintaining strong customer relationships (Zhou et al., 2024)

Tourism is a key sector for economic development and job creation throughout the world (Sofronof, 2017). Taxation rules for Airbnb in EU countries are diverse and depend on national, regional, and local regulations. Airbnb has long been one of the leaders in providing accommodation worldwide, but there are still a few tax issues related to Airbnb without clear interpretation (Janovec, 2023). Concerning income taxation, the tax office should investigate what type of contract de facto is

concluded and what partial tax base is to be used (Radvan and Kolářová, 2020). Some European countries like Italy and France ask Airbnb to withhold and collect taxes, and then Airbnb transfers the proceeds this tax directly to the cities on behalf of the hosts (Airbnb Tax Guide, 2024). In Greece the Independent Authority for Public Revenue (AADE) will begin verifying income from short term rental platforms using its new digital systems, which incorporate Artificial Intelligence (GTP, 2024). Data from Greece's Taxisnet system is examined by checking the property registration number (PNR), owner's details and payment flow information in order to prevent any tax evasion practices. Being a member of the European Union, Bulgaria must comply with the rules imposed by the EU regarding the harmonization of tax policies in the member countries. Alternately "The EU does not impose taxes; this is done solely by the individual member states. This means that the amount of tax Europeans pay is determined by their national governments" (EU Commission, 2024). Hence, every EU country applies its own rules regarding taxation of Airbnb hosts or the company itself. In Bulgaria the Government obliged Airbnb to register in its platform only hosts who have a unique identification number (UIN) in the ESTI system (Uniform System for Tourist Information). To obtain UIN every short term rental property owner has to visit the local municipality and register his/her property as a tourist accommodation. The obligation to report and remit the applicable taxes remains the sole responsibility of the property owner who rents out the property on Airbnb.

Methodology

A comprehensive examination was conducted of the Bulgarian laws governing the taxation of short-term rentals and tourist services in Bulgaria. Overlooked were the Corporate income tax law (ZKPO), Law of personal income taxes (ZDDFL), VAT law (ZDDS), Ordinances for local taxes and fees of the most visited municipalities in Bulgaria, including the "patent tax", the Social security Code (KSO). Various methods for the registration and payment of taxes in Bulgaria were examined, taking into account the specific classification of the taxpayer entity—whether an individual, a corporate entity, or a sole proprietor. The official tax guides of Airbnb for countries like France, Italy, Greece, Spain and Germany were examined to find the parallels and differences in tax systems of Bulgaria and these well developed touristic markets of Europe. Extracted were specific figures to help assess the tax burden in each country and the efficiency in taxation of income from short-term rentals on the Airbnb platform.

Results and discussion

Concerning income taxation, the tax office should investigate what type of contract de facto is concluded and what partial tax base is to be used (Radvan and Kolářová, 2020). The taxation of income from short term lettings in Bulgaria can be performed in three different ways:

{1} Firstly, when an individual rents out a portion of their primary residence – “*The original idea of the Airbnb*” (Guttentag, 2016), a 10% **personal income tax** is imposed on the total annual tax base, following the same taxation principles applied to long-term rental income. In this case the individual should not qualify for “patent tax” and cannot be qualified as a sole trader in the sense of the Commercial Law of Bulgaria. The property of the person who is hosting short term rentals has to be registered as class B accommodation - guest rooms and apartments (Sofia municipal tourism enterprise, 2024). In Bulgaria, it is not necessary to obtain consent from neighboring residents to list an apartment on Airbnb. The hosting person must collect and register the personal data of all guests in the Uniform System for Tourist Information (ESTI) and has the obligation to register for VAT in accordance with Article 97a of the VAT Act (Bulgaria VAT Law, 2024).

{2} The second option is **taxation as a business activity**. This applies when the income is generated from renting apartments, houses or other properties that are not primary used for living purposes. Additional services like cleaning, laundry, providing towels and others can classify this activity as business and the provider of the services as a sole trader. Once registered as a trader within the meaning of the Commercial Code, regardless of whether the individual is registered as a “sole trader” (Commercial Code, 2024), the income from the providing of hosting services will be obliged with 15% tax on the annual tax base under Art. 28 of the Income Tax Act of Bulgaria. In this case, an annual income tax return must be submitted, with the income from this activity being filled in Appendix No. 2. In these cases, together with the annual tax return, an annual activity report is also submitted (NRA, 2024).

{3} The third alternative for taxation is the so called “**patent tax**”. The patent tax is a fixed annual payment owed to the local municipality. Several conditions have to be met simultaneously if an individual wants to be a subject of this taxation form:

- the property that is being rented to tourists has to be categorized as a tourist facility, e.g. guesthouse, guest room, family hotel, hostel, bungalow etc., and has less than 20 rooms;

- the total generated income for the past 12 months should be less than 50 000 BGN;

- the host should not be registered for VAT purposes (except he/she is registered under the special regime which requires a self-charge and pay 20% VAT on services received from foreign service suppliers and some other exceptions).

In many towns of Bulgaria the patent tax is the most favourable method for taxation of people renting their apartments to online platforms like Airbnb and Booking.com. Usually the patent tax obligations vary between 25 and 250 BGN per room annually. Particularly in Sofia, the capital of Bulgaria and the city with the highest salaries and standard of living, the patent tax is set at only 25 BGN per room annually due to Covid pandemic conditions. As of 1st of September 2024 the new patent tax in Sofia for the year 2025 will be 250 BGN per room annually. The tourist tax for apartments also gets a hike from 0,40 to 1 BGN. Most of the major municipalities in Bulgaria have decided to rise the amount of tourist tax in 2025. Some rising just about 20 to 30 % while others are making an increase of tourist tax 1 to 3 times more compared to 2024 values. The increase of the tourist tax is aimed to help the local communities to gain more capital for supporting the sustainable and responsible tourism in their area, and invest in popularizing their municipality as a tourist destination.

“Regardless of the fact that you apply a patent tax regime, you are also obliged to submit an annual declaration under Art. 50 of the Law On Personal Income Taxes to the National Revenue Agency from January 10 to April 30 of the following year. In this declaration, you will not pay additional taxes, but you will have to fill in Appendix No. 7 and make the so-called annual recalculation of the due insurance contributions and, possibly, to add them, if the amounts actually received by you are higher than the insurance income you chose, on which you were insured in advance” (NRA, 2024).

Table 1: Patent tax and tourist tax for individuals in the most visited Bulgarian municipalities

Nº	Town	Patent tax (per room)	Tourist tax (per person)
1	Sofia	25 BGN (from 2025 – 250 BGN)	0,40 BGN (1 BGN from 2025)
2	Plovdiv	250 BGN	0,40 BGN
3	Varna	1 Zone – 250 BGN 2 Zone – 150 BGN	0,50 BGN

№	Town	Patent tax (per room)	Tourist tax (per person)
		3 Zone – 25 BGN	
4	Burgas	Burgas – 50 BGN Surrounding Villages - 25 BGN	0,50 BGN
5	Ruse	Ruse – 250 BGN Surrounding Villages - 25 BGN	0,50 BGN
6	Nesebar	Nesebar, Sunny Beach, Elenite - 100 BGN Obzor, St.Vlas, Ravda - 70 BGN Surrounding Villages - 25 BGN	0,45 BGN
7	Sozopol	Sozopol – 70 BGN Chernomorets – 50 BGN Surrounding Villages - 25 BGN	0,40 BGN
8	Balchik	25 BGN	0,60 BGN
9	Veliko Tarnovo	Veliko Tarnovo- 200 BGN Surrounding Villages - 25 BGN	0,60 BGN
10	Bansko	75 BGN	0,70 BGN
11	Blagoevgrad	1 Zone – 240 BGN 2 Zone – 200 BGN 3 Zone – 100 BGN	0,40 BGN

Source: Ordinance on local taxes and fees of municipalities of – Sofia, Plovdiv, Varna, Burgas, Ruse, Nesebar, Sozopol, Balchik, Veliko Tarnovo, Bansko, Blagoevgrad

Sometimes the host is actually a company registered according the Bulgarian Commercial Law or an individual that is registered for **VAT**. Typically, when the hosting company or individual generates a significant level of revenue, surpassing 100,000 BGN annually, it becomes obligated to register for Value Added Tax (VAT) in accordance with applicable tax regulations. Short-term rental of property through online platforms necessarily requires special registration under the VAT Act. This requirement arises from the utilization of intermediary services provided by platforms such as AirBnB, Booking, and similar entities. In these instances, you are the recipient of a taxable supply of services performed within the territory of the country by a foreign entity (the online platform) that is not established domestically. Consequently, you are obligated to submit an application for VAT registration pursuant to Article 97a of the Value Added Tax Act.

Regardless of whether the rental activity is conducted by an individual or a legal entity, those renting properties through platforms such as Airbnb or Booking.com are required to register for VAT under Article 97a of the VAT Act. This entails a

monthly obligation to remit 20% VAT on the commission charged by the respective online platform. Additionally, once the annual turnover from this activity surpasses BGN 100,000 (or BGN 166,000 effective from January 1, 2025), full VAT registration is mandated. Under full VAT registration, the host is then obligated to charge 9% VAT on the provision of overnight stays.

Upon registration for VAT, the obligation to pay the patent tax is waived. The taxable person is then required to apply VAT at a rate of 9% to each transaction.

Corporate tax

A 10% corporate tax is imposed on activities conducted by legal entities and does not apply to sole traders or individuals. This tax is levied on the taxable profit, which is determined by adjusting the accounting financial result for tax purposes. Legal entities are required to maintain accurate accounting records, and certain expenses related to their economic activities may be recognized for tax purposes. The taxable financial result, along with the annual corporate tax liability, must be declared through the submission of an annual tax return in accordance with Article 92 of the Corporate Income Tax Law (ZKPO). Additionally, the annual activity report must be submitted alongside the tax return.

Social security contributions. Irrespective of whether the short-term rental of property through online platforms is subject to patent tax or personal income tax, insurance contributions remain obligatory. These include contributions for social security, supplementary mandatory pension insurance in a universal pension fund (DZPO in UPF), and health insurance. Prior to initiating the insurance process, individuals must register as self-insured persons in the BULSTAT Register at the Registration Agency and obtain a unique identification code (EIK) from the BULSTAT Register.

Advance payments for social and health insurance are made based on a predetermined insurance income, with the corresponding amounts being remitted to the accounts of the National Revenue Agency (NRA) by the 25th of the month following the month for which they are due. Additionally, self-insured individuals are required to submit an insurance declaration, Form 1, on a monthly basis by the same deadline.

In addition to the monthly insurance declarations, self-insured individuals are also required to submit an annual income tax declaration, which includes the process of annual adjustment of their insurance income. For instance, if a minimum insurance income of BGN 993 (as applicable in 2024) is selected and monthly contributions are based on this amount, but the actual income from short-term

rentals via online platforms averages BGN 1,200 per month, the annual income declaration will trigger a recalculation. The final insurance income reported in the annual declaration will account for the difference, resulting in additional contributions for the income exceeding the initially declared BGN 933, up to the actual amount of BGN 1,200 per month.

Tourist tax is imposed on all overnight accommodations, irrespective of whether the lessor is an individual or a legal entity. As a local tax, the amount of tourist tax is determined by the Municipal Council of the respective municipality through ordinance and can range between BGN 0.20 and BGN 3.00 per overnight stay. The tax must be declared by January 31 for the preceding calendar year, and is payable by the taxable persons by the 15th of the month following the month in which the accommodations were provided. Payments are made to the budget of the municipality where the property is located.

The taxation of income derived from short-term rentals on platforms such as Airbnb varies depending on the country in which the service is provided and the legal status of the host, whether an individual or a corporation. The responsibility for fulfilling all tax obligations in Bulgaria rests with the recipient of the income, namely the property owner or the host in Airbnb platform.

EU taxation practices.

To enhance tax compliance, particularly among individual hosts, some countries, including Italy and France, have established agreements with Airbnb to facilitate tax withholding at the source. Under this arrangement, Airbnb collects the applicable taxes directly, deducts them from the payments owed to the host, and remits the tax to the fiscal authorities of the country where the service is rendered.

Establishing a legal framework to regulate income generated from short-term rentals via platforms such as Airbnb presents a significant challenge for many countries worldwide. In Greece, property listings on Airbnb require a registration number obtained in advance from local authorities. Similarly, in France, properties listed on the Airbnb platform without a valid registration number are subject to fines and may be removed from the platform. In Bulgaria, a comparable requirement has been introduced, mandating that every property listed on platforms such as Booking.com or Airbnb be registered with a unique identification number in the ESTI system (Uniform System for Tourist Information). This approach significantly enhances the traceability and accountability of rental transactions. The process of obtaining a unique number in the ESTI system is contingent upon the

registration of the property with the municipality in which the rental is situated, thereby streamlining both oversight and compliance with local regulations.

In this research we focus on the peculiarities of personal tax. For residents of Bulgaria, rental income is subject to a standardized deduction of 10% from the gross rental income for tax purposes. This deduction does not require any supporting expense documentation. Consequently, only 90% of the total rental income is considered taxable. When the standard tax rate of 10% is applied to this adjusted taxable base, the effective tax rate on rental income for Bulgarian residents is effectively reduced to 9%.

In contrast, non-residents of Bulgaria are taxed on the full 100% of their gross rental income, with no option to deduct the 10% recognized expenses that Bulgarian residents can claim. However, an exception exists for individuals who are tax residents of another EU or EEA member state. These individuals may, at the end of the tax year, submit an annual tax return to request that the tax regime applicable to Bulgarian residents be applied to their income, thereby enabling them to benefit from the reduced effective tax rate of 9%.

In order to evaluate the tax application for short term rentals through Airbnb we focus on the personal taxing in some European countries. Assessing the tax burden imposed on individuals in major tourist-receiving countries within the European Union and comparison with Bulgarian personal taxing is displayed in the Table 2. The taxation practices of Airbnb-listed properties in Italy, France, Greece, Germany, and Spain are analyzed. These countries represent the primary destinations for tourist inflows within the European Union.

Constructed is an example of a taxable Airbnb host who generates 6000 EUR yearly income from lending a room in his/her apartment through the Airbnb platform. To standardize the conditions under which income from short-term rentals on an online platform is taxed, this study assumes a monthly income of €2,000 for hosts. This assumption facilitates a balanced comparison of tax burdens across different countries. The findings reveal significant variation in taxation within the European Union, highlighted by the relatively low tax burden in Bulgaria. In contrast, an Airbnb host in Bulgaria pays only half the taxes compared to hosts in Italy and Greece, two well-established tourist destinations. This substantial disparity arises from differences in local government policies and the varying levels of development in the tourism sector. Italy and Greece, as highly popular destinations, impose higher taxes on tourism, not only to increase fiscal revenues but also to mitigate the adverse effects of over-tourism and promote the sustainability of tourist flows. On the other hand Bulgaria is trying to encourage

touristic enterprises targeting bigger tourist inflows that could generate larger base for taxation by attracting more tourists from abroad. Examining the taxation system in France, the most visited country in Europe in the last 5 years, reveals a comparatively low tax burden on short-term rental properties. Recent efforts by the French government to regulate Airbnb rentals, particularly in Paris, have not resulted in increased taxes on these properties. Instead, these measures have focused on restricting the ability of property owners to rent out their apartments in specific areas where long-term rental markets are adversely affected by the proliferation of short-term rentals through online platforms. Germany maintains moderate levels of taxation on income derived from short-term rentals facilitated by online platforms.

Table 2: Taxes on individual income from shared property unit on Airbnb in several EU countries

Country	Personal income tax	Tourist tax	Example: Taxation of 6000 € yearly income from sharing a room in your apartment on Airbnb
Bulgaria	Flat tax: 10%	€0,2-1.60 per person	Gross income= 6000€ - 10% statutory expenses=5400€ taxable income 5400€*10% tax = 540 € tax due per year
Italy	21% for first property 26% for the next	€1-7 per person	Gross income= 6000€ - 5% statutory expenses=5700€ taxable income 5700€*21% tax = 1197 € tax paid per year
France	Progressive tax: Up to €11,294: 0% €11,294 - €28,797: 11% €28,797 - €82,341: 30% €82,341- €177,106: 41% Above €177,106: 45%	€0.65-8.13 per person	Gross income= 6000€ - 50% statutory expenses=3000€ taxable income 3000€*17,2% social surtaxes = 516 € tax due per year *Other income from salaries 12*2000=24000€ Taxable income 24000+3000=27000€→11% tax 3000*11%= 330 € income tax + 516€ social surtaxes = 846€ total taxes due per year
Greece	Progressive tax: Up to €12,000: 15% €12,001 - €35,000: 35%,	€1.5-10 per person	Gross income= 6000€ - 5% statutory expenses=5700€ taxable income 5700€*15% tax = 855 € tax due per year *Other income from salaries 12*2000=24000€

Country	Personal income tax	Tourist tax	Example: Taxation of 6000 € yearly income from sharing a room in your apartment on Airbnb
	Above €35,001: 45%.		Taxable income $24000 + 5700 = 29700€$ $\rightarrow 35\%$ tax $3000 * 35\% = 1050 €$ taxes due per year
Germany	Progressive tax: Up to €9,744 – 0% €9,745- €14,753 : 14% €14,754€- €57,918: 24% €57,919 - €274,612: 42% Above €274, 613: 45%	€0.7-7 per person	Gross income= 6000€ - 50% deductible expenses=3000€ taxable income (if not any other sources of income) $3000€ * 0\%$ tax = 0€ tax due per year *Other income from salaries $12 * 2000 = 24000€$ Taxable income $24000 + 3000 = 27000€ \rightarrow 24\%$ tax $3000 * 24\% = 720 €$ tax due for short rental income
Spain	Progressive tax: Up to €12,450: 19% €12,451 to €20,200: 24% €20,201 to €35,200: 30% €35,201 to €60,000: 37% €60,000 to €300,000: 45% Above €300,000: 47%	€0.6-6.25 per person	Gross income= 6000€ - 50% deductible expenses = 3000€ taxable income $3000€ * 0\%$ tax = 0€ tax due per year *Other income from salaries $12 * 2000 = 24000€$ Taxable income $24000 + 3000 = 27000€ \rightarrow 30\%$ tax $3000 * 30\% = 900 €$ tax due for short rental income
*The host is a single living resident with 2000€ salary, renting out a room in his/her apartment on Airbnb platform.			

Sources: Assets taxing Airbnb for Bulgaria, Italy, France, Greece, Germany and Spain

In Germany and Spain deductible are many expenses such as: depreciation of the price of the property, interest expenses, maintenance and repair costs, property taxes, street cleaning, garbage disposal, water supply, heating costs, home insurance, house insurance, agency costs (such as the Airbnb service fee) if paid by the lessor. In Greece and Italy there are 5% statutory expenses, in Bulgaria the

statutory expenses are set to 10%. In France, when the taxed individual is classified within the "régime micro-BIC", the fixed deduction ("abattement"), vary between 50%#for non-classified tourism accommodation and 71% for classified tourism accommodation (French Finance Law, 2024). Focusing on the personal tax, most of the countries implement a progressive tax scale. Hence, the tax for short term rentals, are included in the total taxable income of the individual and may vary from 0% to 47% depending on the country and the size of income. In Italy there is a fixed 21% flat tax for the first property rented out via Airbnb platform. This tax is directly collected from the hosts by Airbnb and disbursed to the Italian tax authorities afterwards. In Bulgaria the personal income tax is also flat and it is only 10% of the income generated through short term rentals. These figures indicate that Bulgarian taxpayers benefit from an environment characterized by a relatively low tax burden, positioning the country as a competitive option when compared to leading tourist destinations within the European Union.

Conclusion

The study on the taxation of Airbnb in Bulgaria reveals that the country has established a robust and transparent framework for taxing short-term rentals facilitated through platforms like Airbnb. Bulgaria's system aligns with EU guidelines while allowing each member state to set its own specific rules. The analysis identifies three main taxation methods for Airbnb hosts: personal income tax, business activity tax, and patent tax. The Bulgarian approach includes mandatory registration in the Unified Tourist Information System (ESTI), ensuring better compliance and monitoring. Comparatively, Bulgaria's tax regime for short-term rentals is more straightforward and effective than those in some other European countries, enhancing traceability and legal accountability. The study underscores the importance of such regulations in maintaining tax compliance while supporting the growth of the sharing economy in Bulgaria. Conversely, tax collection practices in certain countries, such as Italy, offer the advantage of deducting taxes at the source. This approach minimizes or potentially eliminates the necessity for Airbnb hosts to independently track and report their income. These practices, already employed in certain European economies with advanced tourism sectors, can be comprehensively adopted in Bulgaria.

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EXPLORING THE EFFECT OF LOADSHEDDING ON THE FINANCIAL PERFORMANCE, GROWTH AND LONG-TERM SUSTAINABILITY OF A MINING COMPANY

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Abstract

Worldwide, the socio-economic contribution of the mining industry cannot be underestimated. The mining industry significantly contributes to economic growth of numerous low and middle-income nations, such as South Africa. However, for the mining industry to survive, it requires a reliable energy or power supply. Thus, due to a decline in high-grade resources and an increase in the demand for raw materials, energy is required to generate the necessary components. In South Africa, Eskom is the sole enterprise that supplies electricity to all industries, including mining. Unfortunately, Eskom struggles to meet electricity demand, leading to the introduction of load shedding in 2015, negatively impacting mining operations, leading to revenue loss, decline in growth, and sustainability. Against this background, this current study investigated load shedding impact on revenue, growth and sustainability of a mining company located in the Brits area. The study adopted a qualitative

approach to analyse the participants' perceptions of the subject matter. A purposive sampling technique was utilised to select participants, who have sufficient experience and knowledge of the effects of loadshedding on the mining company's revenue, growth and sustainability. Data was obtained from 10 participants via one-on-one semi-structured interviews and analysed using the thematic analysis to catalogue, arrange, and report on the emergent themes that emanated from the data. The study's findings exposed that loadshedding has indeed affected the revenue, growth and sustainability of the mining company, since it has resulted to loss of income, job destruction, project delays, and discontinuation of operations. In a nutshell, his study is a step forward toward understanding how loadshedding adversely affects the revenue, growth, and sustainability of mining companies in South Africa. Stemming from findings, the study recommends that Eskom should partner with the private sector, including the mining industry, to invest in renewable energy to help mitigate the energy crisis. Moreover, the mining industry should avoid overreliance on Eskom and invest in alternative energy sources to ensure the continuity of mining operations.

Keywords: *loadshedding, mining industry, growth, revenue loss, sustainability.*

JEL Classification: L71, L72

1. Introduction

Worldwide, the mining industry's contribution to a country's economic development cannot be underestimated. Butler-Adam (2018) notes that in most of several low- and middle-income countries, the mining industry extensively contributes to the growth of the national economy as determined by the updated Mining Contribution Index (MCI). Butler-Adam (2018) postulates that African countries have gained immensely from the mining industry. The findings by Butler-Adam (2018) are affirmed by Worlanyo and Jiangfeng (2021), who state that since time immemorial, the mining industry has played a pivotal role in infrastructural development, job creation, economic growth, and the provision of vital raw materials for society. In rich nations like Canada, Australia, the United States of America, and some parts of Africa, it serves as a catalyst for economic change (Worlanyo and Jiangfeng, 2021). However, it has been found that while the mining industry has changed numerous economies, it has also had detrimental effects on the environment and, to a lesser degree, society (Worlanyo and

Jiangfeng, 2021). For instance, in Africa, artisanal and small-scale mining (ASM) has been recognized as a major economic prospect for people, particularly in rural areas, and has contributed to the GDP of several economies in Africa, including Ghana and South Africa (Nakazawa *et al.*, 2016). The two major kinds of mining are surface and subterranean, according to Balasubramanian (2017). In open-pit mining and dredging, the former exhumes ores at the earth's surface or near it, whereas in hard-rock mining, the latter extracts minerals by excavating beneath the surface and removing the ore. Whether it is underground or surface mining, the mining sector has long been seen as a major contributor to economic expansion and development (Yende, 2024; Tshinavha & Ukpere, 2025).

According to a Minerals Council report from 2021, South Africa is amongst the leading mining and mineral-processing nations in the world (Minerals Council, 2021). It has the biggest manganese and platinum-group metals (PGMs) reserves in the world and is in the top three for fluorspar, chromium, vermiculite, gold, and zirconium. Because of this, the mining sector has been regarded as the backbone of the South African economy for the past few decades and continues to provide a significant contribution (Minerals Council, 2021). For example, in 2020, the mining sector alone accounted for 8.40% of South Africa's GDP, or R371.90 billion in nominal terms. Furthermore, the mining sector directly and indirectly employs more people and generates the largest portion of South Africa's export earnings. Furthermore, the mining sector employs more people directly and indirectly than any other similar industry and contributes the largest portion of South Africa's export earnings (Minerals Council, 2021). According to a related study by Khubana *et al.*, (2022), the mining sector in South Africa has had a higher impact on the nation than any other industry and contributes significantly to GDP, foreign exchange revenues, and employment levels.

However, it has been discovered that a dependable energy or power source is necessary for the mining sector to thrive. Because of the rising demand for raw materials and the decline in high-grade resources, Pouresmaeli *et al.* (2003) argue that energy is required to manufacture the necessary materials. Pouresmaeli *et al.* (2023) assert that it is critical to handle the intricate issues surrounding the smooth integration of various renewable energy sources into the mining sector and to maximize their synergy. This implies that stable and consistent source of electricity through power grid to the mining sector is crucial to enable effective production and a consistent supply of refined products to customers (Yaghoobi *et al.*, 2019;

Dlamini, *et al.*, 2025). However, the main challenge facing the mining industry is the inconsistent supply of electricity from Eskom (Gibson *et al.*, 2023).

Therefore, this study intended to investigate the consequences of loadshedding on revenue, growth and sustainability of a South African mining company.

1.1 The background of the study

Reliable and renewable energy sources are becoming more and more noticeable as parts of the global energy supply mix. The mining sector is known to utilise electricity very much across the globe, and has usually relied on grid power or diesel generators for distant localities. Levesque *et al.*, (2014) postulate that energy consumption increases because ore is mined from deeper levels. In South Africa, electricity is utilised in almost all business and private sectors including mining. The mining industry is one of the segments that consumes most of the electricity supplied by Eskom, consuming approximately 30% of the electricity supplied through the power grid by Eskom in South Africa (Chitaka *et al.*, 2018). The mining sector is mostly dependant on electricity supplied through the State-owned power supplier for efficient operations and productivity (Yaghoobi *et al.*, 2019). Igogo *et al.*, (2020) state that both off-grid and grid-connected energy are used in mineral operations. Off-grid plants provide energy for most miners. In the mineral extraction stage, coal, heavy oil, or diesel are burned to produce and transport minerals, depending on the kind of fossil fuels utilized in mining activities (Igogo *et al.*, 2020). However, grid-connected mining activities use fossil fuels to some extent. In most mining locations where the grid is accessible, it provides the most affordable energy source for mining operations.

In South Africa, Eskom is the sole enterprise that supplies electricity in South Africa. Eskom is an integrated and state-owned organisation that produces almost 95% of the energy that is utilised in South Africa and neighbouring countryside (Roopnarain and Adeleke, 2017). Since the last few years, there has been an upsurge in the need for electricity supplied through the power grid in the mining industry because of new ventures and expansion of existing mining activities (Votteler and Brent, 2016). Eskom has been struggling to provide its customers with the required electricity through the power grid owing to an increase in demand for electricity (Bowman, 2020; Govender, 2016). Since 2015, most South Africans have raised concerns about loadshedding, a term referred to as the rotation of electricity amongst the users of the primary South African power supplier (Mabuza & Maphosa, 2023; Shambira *et al.*, 2025). When commenting further, Naidoo (2023) points out that loadshedding has had a detrimental effect on the South African economy, resulting to several challenges, such as closures of the sector, a huge fall in productivity, joblessness, inadequate healthcare, and a crisis in education. Naidoo (2023) was of the view that loadshedding has had a negative

effect on the economy of South African. Furthermore, it has been found that loadshedding impact operations of mining companies severely, as they have to switch off sections of their operations to comply with directives of loadshedding from Eskom (Gibson *et al.*, 2023). Statistics South Africa (2023) recorded that the mining sector experienced declined in output by 2.6% in March 2023 and steady decline in the electrical grid's infrastructure reliability, along with additional elements like Transnet which reported a lose of R150-billion in export value. Schiff (2023) reports that loadshedding impacts the profitability of the mining industry and the overall economy.

From the discussion, it is evident that the energy crisis in South Africa has greatly affected mining sector. Therefore, the purpose of the study was to investigate how loadshedding affects a mining company's earnings, expansion, and sustainability in South Africa. The study's main focus was a mining corporation in South Africa's North-West area in Zandfontein, 7 km south of the Brits area (Eastplats, 2023).

1.2 Statement of the Problem

Recently, South Africa's mining industry has come under threat following loadshedding strategy implemented by ESKOM As a final measure to avoid the complete breakdown of the nation's electrical system (Adams *et al.*, 2020; Motepe *et al.*, 2022). Although loadshedding in South Africa dates back to 2015, compared to all previous years, loadshedding was more prevalent in 2022 (Naidoo, 2023). With almost 209 days of blackouts, Masinga and Madzivhandila (2023) agree that the ongoing power outages caused 2022 to be known as South Africa's most load-shed year. On the contrary, According to Nkosi and Govender (2022), the most significant nationwide power outage in South Africa occurred in 2008. Eskom is confronted with significant financial and technical obstacles in reversing the bad electrification condition, according to Ateba *et al.* (2019). According to data, one of the difficulties in ensuring a steady supply of electricity is electricity theft (Eskom News, 2020). The survival of Eskom and its enterprises is threatened by energy theft, which unquestionably results in financial losses (Depuru *et al.*, 2017). Electricity theft costs Eskom and the municipalities about R20 billion a year. Eskom's implementation of loadshedding has had widespread repercussions on mining operations, resulting in revenue loss, lack of job creation, damage to mining equipment, declining growth and lower sustainability (Erero, 2023). Additionally, Erero (2023) notes that revenue losses in the mining sector will have a major impact on the government's capacity to collect taxes and royalties.

Erero (2023) concludes most industries, including mining, have lost vast amounts of money due to failure to manufacture lacking electricity. Similarly, Makhubu (2023) confirms that the mining industry alone was down R22 billion in June 2023, while loadshedding is estimated to have a R60 billion negative effect on tax collections. In a recent study, Phiri (2024) observes that loadshedding negatively affects the stocks or equity shares of the South African mining industry's attractiveness to foreign investors.

Although the global scope of loadshedding impact on various sectors, research conducted in South Africa has concentrated on economic consequences of loadshedding largely within hospitality sector and municipalities (Goldberg, 2015). While Maringa (2017) conducted research on the economic impact of loadshedding resulting from recurrent Eskom plant failures, there is a noticeable void in information concerning specific effects of loadshedding on revenue, growth and sustainability of the mining industry. Appeals by Eskom for organisations to curtail their power demand and consumption necessitates that the study mining company continually reassess its business strategy to ensure sustainability amid the constraints imposed by the loadshedding policy by Eskom. Additionally, although loadshedding has been prevalent in South Africa for some time now, there is a dearth of research to show its impact on the mining industry. Hence, it is necessary to investigate loadshedding's impact on a mining company's revenue, growth and sustainability, which is the focus of this case study.

1.3 Research questions

The following research question is the focus of the study:

- How does loadshedding impact mining company's revenue?
- How does loadshedding affect growth and sustainability of a mining company?

2. Theoretical Foundations

To provide a better understanding of the study, it is necessary to first explain the important variables that serve as its foundation. The key variables that underpin this study include mining, loadshedding, revenue, growth, and sustainability. Ateba *et al.* (2019) defined loadshedding as a cautious shutdown of the energy supply to certain sectors of the economy. Masinga and Madzivhandila (2023) claim that loadshedding is used to address the lack of electricity generation, which is brought on by several issues, including but not limited to unsustainable infrastructure and Eskom's poor maintenance of the coal-fired power plants.

Khubana (2021) argues that mining is a vital economic activity over 100 nations across the globe, with South Africa in the top 50 "mining countries" worldwide. Jain *et al.* (2016) defined mining as "excavating into the earth to extract naturally occurring minerals usually of high value." Similarly, Worlanyo and Jiangfeng (2021) state that mining involves removing precious minerals or other geological elements from the earth's surface or interior, generally from an orebody. Exploration, mining, processing and dressing of mineral, and metallurgical processing are the four primary phases in mining, regardless of the kind and volume of production (Gandy *et al.*, 2016; Balasubramanian, 2017). The first step is exploration, which is carried out to find reserves of economic relevance. The process of taking materials out of the earth is called mining. Physical, chemical, and mechanical techniques are used in mineral processing and dressing to extract minerals from the gangue for additional part treatment. Smelting and refining processes that create pure metals and get the alloy ready are examples of metallurgical processing (Balasubramanian *et al.*, 2017; Gandy *et al.*, 2016).

According to Remenová *et al.* (2020), a number of businesses are more interested in implementing an individual revenue model that guarantees their sound and long-term growth since income streams offer financial stability for business development. According to the value or values that are offered to customers, a company's revenue is made up of many revenue streams with varying price models (Roma and Ragaglia, 2016; Myšková and Hájek, 2018; Zott and Amit, 2010; Sun *et al.*, 2025).

Vuković *et al.* (2022) state that a firm's ability to grow depends on its size increasing over a specific period. Growth indicates how much a business has developed the ability or capacity to grow and develop soon. According to Vuković *et al.* (2022), growth can be quantified in several ways, including asset growth, profit growth, turnover growth, and operational revenue growth. Nonetheless, this study used revenue growth to gauge the growth rate. According to Vuković *et al.* (2022), the sales growth rate is the pace at which a company's sales revenue increases over a specific time. Sampagnaro (2013) observed that sales growth is an easily measurable metric that is unaffected by shifts in the horizontal and vertical integration of production, irrespective of the industry in which the businesses are involved.

A firm's sustainability, also known as competitive advantage, has attracted a lot of scholarly attention, however the results regarding its meaning have been inconsistent and ambiguous (de Azevedo Rezende *et al.*, 2019; Ivković & Ivković, 2024). Rahman *et al.* (2022) contend in their study that the most innovative and

fascinating field of study for academics, managers, consultants, rival businesses, and contemporary customers is organizational sustainability. Despite its widespread use, there remains disagreement over what sustainability means. As a result, the phrase "sustainability" is all-encompassing, vague, and wide. Rahman *et al.* (2022) state that organizational sustainability entails giving organizations the personnel and organizational frameworks required for success in the twenty-first-century global economy. This definition implies that an organization must be sustainable to thrive in the current market. Sustainability, according to Kumari and Singh (2023), is a multifaceted paradigm that is frequently employed to address enduring business issues like social well-being, industrial waste, climate change, and economies of scale.

2.1 Prospects for South Africa's mining sector

Mining industries across the globe have underpinned industrial and technological advancement, providing a foundation of raw materials, which are indispensable within economies of the modern industrialized era such as electronic chips, roads, railways, airports, and other essential contemporary infrastructure (Azevedo *et al.*, 2022). South Africa is home to "the oldest mine in the world, the 40,000-year-old Ngwenya mine in Swaziland, where haematite was mined, presumably for use as a cosmetic," according to Van der Merwe (2011). In South Africa's past, mining was the primary engine that shaped and advanced the economy of the nation, with the infamous gold rushes of the late 1800s being the precursor (Casey, 2022). The mining sector in South Africa is an essential part of the national economy and can drive horizontal spillovers, downstream beneficiation, and upstream manufacturing. According to Smith *et al.* (2021), the mining sector in South Africa has long been regarded as a significant employer and contributor to the nation's gross value added (GVA) economy. Activities in the mining sector include hard and soft rock mining, open pit, underground, and quarrying. (Smith *et al.*, 2021). In the mining industry, raw materials such as minerals and fossil fuels are processed to produce finished products including metals and energy (Igogo *et al.*, 2021). The mining and mineral resources segment within South Africa is the primary driving force behind economic development across the entire African continent, as the country boasts a wealth of natural resources of various kinds considering the growth of its mining sector. Most (40%) of the world's known gold reserves have been supplied mainly from the country's Witwatersrand Basin, while other mining commodities include 80% and 72% of the manganese and chromium, respectively, across the world (Swart, 2023).

However, the involvement of mining in South Africa's economy has decreased from 21% to 7% over the past ten years, with the industry predominantly in a loss position during the last two years owing to low commodity prices, regulatory uncertainty, loadshedding, the collapse of the rail transport and port systems, and significantly higher input costs (Choshi, 2020).

2.2 The historical background and current state of the South African energy industry

Scholars (Bah and Azam, 2017; Lekavičius *et al.*, 2019; Samu *et al.*, 2019) have argued that that a developing nation's capacity to generate, transmit, and use electricity is largely responsible for its social, economic, and infrastructure growth. In support of this claim, Ouedraogo (2017) contends that it is expected that South Africa, which is the continent's biggest energy consumer, is one of the most developed countries in Africa. Not up to 30 years after Michael Faraday invented the dynamo, in August 1, 1860, Mr. Charlton Wollaston demonstrated an arc light at the Castle of Good Hope in Cape Town, which is thought to be the earliest known instance of electricity lightning in South Africa. The first electric arc lights were erected in South Africa in 1881 to light the railway terminals in Cape Town, following Thomas Edison's invention of the incandescent lamp in 1879. To enhance mining operations at night, the first electric streetlights in South Africa were subsequently mounted in the mining town of Kimberly (Electricity in South Africa, 2020; Lunderstedt, 2019). Owing to gold discovery in Witwatersrand, in Johannesburg, as early as 1886, the first electricity plant was built in 1889 because of the increased productivity that the electricity in the Cape mines provided (Harrison and Zack, 2012).

Municipal electrification began in Rondebosch around 1892 and spread gradually throughout other municipalities in the country in the subsequent years (Clark II, 2017). Later, in July 1894, Siemens and Halske began distributing electricity to Johannesburg as well as Pretoria after being given a concession by the government of South African. But in 1895, the concession was granted to the newly established Rand Central Electric Works LTD (RCEW), which was tasked with overseeing the extension of Johannesburg's power supply to adjoining goldmines (Departure to South Africa, 2020). In 1895, a similar development took place in the Cape colony when Cape Town founded the Graaff Electric Light Station, a municipal power project. In order to power mine machinery and provide illumination for cities, South Africa saw a sharp rise in the production and delivery of electricity between the 1890s and the turn of the century. However, the electricity bills were exorbitant owing to the small size and the power plants

inefficiency, as well as the poor communication between the users (Akinbami *et al.*, 2021). In light of this, the concept of a central energy project started to take shape, but it wasn't until 1906 that the Victoria Falls Power Company (VFP) came into being due to the simultaneous acquisition of General Electric and RCEW power.

The total installed capacity of VFP's thermal power plants in 1915 was over 160 megawatts (MW), and a control centre was set up in Simmerpan (ESCOM 1923–1929). Owing to the importance of energy, the colonial government of Transvaal created the Power Act, which sought to provide the government with the authority to take over privately owned electrical companies after 35 years. An electrification study conducted in South Africa after the Power Act resulted in the Electricity Act of 1922, which in turn created the Electricity Supply Commission (ESCOM) in March 1923 (Cape Town's Electricity Supply, 1930). After being activated, ESCOM, which is known in Afrikaans as the Elektrisiteitsvoorsieningskommissie (EVKOM), helped electrify the railway and built new power plants all around South Africa. The Malieveldspruit hydro station was erected by ESCOM in the year 1925 as a interim substitute for the Sabie River Gorge plant that started operation in 1927. Together, the two facilities became ESCOM's first set of plants to be built (Moore, 2019). ESCOM put additional facilities into service to meet the demand created by the gold rush, and by 1929, it was able to boast of selling roughly 800 million units of electricity (ESCOM, 1923 – 1929). Later, in 1948 and 1950, respectively, ESCOM purchased VFP and Kimberley's central power plant. To meet the growing need for energy, the rural electrification department was conceived in 1951 to provide power to South African rural areas (Boers, 1985).

The expansion of ESCOM persisted until early 1983, when a drought struck South Africa. Due to several causes, including the drought, ESCOM's productivity suffered, and eventually energy prices started to climb once more. As a result, the government established the electrical council, which was composed of roughly 15 individuals and oversaw ESCOM's operations (ESCOM/ESKOM 1980 – 1989). A revised Electricity Act was established in 1987, renaming ESCOM to Eskom (a combination of the two acronyms of its former name, ESCOM/EVKOM) and expanding its customer base to further increase production (ESCOM/Eskom 1980 – 1989). The government changed the Electricity Act and changed the Electricity Council board with a National Electricity Regulator because of Eskom's problems with unregulated electricity pricing and noncompliant customers. This change lessened the financial crisis that Eskom was experiencing to some extent. However,

Eskom warned the government that if the power plants are not urgently renovated, there will be a scarcity of electricity in the ensuing years.

About 95% of the electricity utilized domestically and a great proportion of the electricity produced in the African continent is generated by the state-owned Eskom, which is a vertically integrated power corporation (Ang *et al.*, 2015). It manages the national energy transmission grid and 70% of the energy supply network, while the remaining is owned by municipalities (Ayamolowo *et al.*, 2022). The electricity sector is typically subject to political intervention involving the government controlling all energy cost adjustments to balance energy security with economic stability (Baker and Phillips, 2019). Since 2015, there has been a huge electricity energy crisis in South Africa, with rolling blackouts occurring for up to twelve hours or more daily (Ang *et al.*, 2015). Since 2007, power utility has struggled to supply enough power to satisfy the need in South Africa; a situation that worsened in 2023 when electricity generated by Eskom failed to meet demands by businesses and households, resulting in significant detrimental effects on manufacturing, activities in industries, education, employment, food security, crime, and political stability, amongst others (BizNews, 2023). Since the start of 2023, South Africa experienced over 4000 hours of scheduled electricity outages through loadshedding (Akinbami *et al.*, 2021). Loadshedding is defined as an intentional temporary reduction in the amount of available electricity to limit utilization of available energy sources and thereby lessening the load on an electrical grid owing to an excessive demand for electricity outstripping generation capacity (Goldberg, 2015). Since Eskom's provision of electricity is at significant deficit with the utility unable to satisfy national demand, loadshedding decrease pressure on the electricity grid to avoid its collapse and subsequent prolonged nationwide blackouts (Inglesi-Lotz, 2022).

2.3 Loadshedding impact on the revenue of the mining sector

The financial impact of loadshedding on the mining sector is significant. Eberhard *et al.* (2021) mention that the direct costs associated with equipment damage, maintenance, and repairs are substantial. Frequent power interruptions lead to more frequent breakdowns, necessitating costly repairs and replacement of damaged equipment. In addition to direct costs, there are indirect costs associated with lost production time and missed deadlines. Ryan (2024) notes that when mining operations are disrupted, the delays in ore processing and delivery to markets can result in missed contractual obligations, leading to penalties and lost revenue. Moreover, Doe and Roe (2019) highlight the long-term financial risks posed by loadshedding. As power interruptions become more frequent and

unpredictable, mining companies may find it increasingly difficult to plan and budget effectively. This uncertainty can erode profit margins over time, threatening the financial sustainability of mining operations.

Loadshedding has a profound effect on the revenue streams (Mpabanga & Ukpere, 2023) of mining companies by disrupting production schedules, leading to financial penalties and increased operational costs. The inability to meet production targets owing to frequent power outages results in missed deadlines and contract breaches, which in turn trigger financial penalties. Smith and Jones (2021) argue that these disruptions translate directly into revenue losses, as mining companies are unable to fulfil their commitments to customers and partners on time. This does not only affect instant-term revenue, however, also undermines longstanding-term profitability and the reputation of mining companies.

Brown *et al.* (2020) posit that the unpredictability of power supply deters foreign investment, as investors are wary of committing capital to an industry where consistent production cannot be guaranteed. This lack of investment can stifle growth and limit the sector's potential to expand and modernize, leading to long-term revenue constraints and reduced competitiveness on the global stage. Ihua *et al.* (2019) point out that while generators can keep operations running during power outages, they increase operational costs significantly owing to the high fuel consumption and the need for regular maintenance. Doe and Roe (2019) further argue that reliance on generators is not a sustainable solution, as the costs associated with fuel and maintenance can quickly erode profit margins, particularly in an industry where energy consumption is already a major expense. Van der Merwe (2017) and Zhang *et al.* (2018) postulate that the cumulative loadshedding impact on revenue can be severe, especially when considering the additional costs of equipment maintenance and repairs owing to the stress of frequent power interruptions. Andersen and Dalgaard (2013) aver that the financial strain caused by these operational inefficiencies can threaten the long-term viability of mining operations, as companies struggle to balance rising costs with declining revenues.

2.4 Loadshedding impact on the growth and sustainability of the mining industry

The failure to fulfil production goals owing to power outages can lead to missed deadlines and contract penalties, causing financial losses for mining companies (Smith and Jones, 2021). The uncertainty and instability created by loadshedding can deter foreign investment in the mining sector, hindering its long-term growth potential (Brown *et al.*, 2020). While other companies have relied on backup power generators during loadshedding periods, this can lead to increased operational

costs, as these generators consume fuel and require regular maintenance (Doe and Roe, 2019). Therefore, loadshedding presents a severe risk to the Long-term sustainability and financial success of the mining industry, necessitating effective solutions and alternative sources of energy (Nasir *et al.*, 2022).

2.5 The theoretical framework

The current study is anchored within the Economics of Power System Reliability and Planning Theory, which was propounded by Mohan Munasinghe in 1979. Küfeoğlu and Lehtonen (2016) mention that while power system reliability entails creating and enhancing the infrastructure of the power system, power system reliability refers to an electrical grids or energy supply institution's capacity to provide customers with a steady and continuous power supply. Theoretically, to address then ongoing loadshedding, power suppliers and distributors, including Eskom must design and optimise the power system infrastructure to deliver power to users consistently and uninterrupted. According to Olajuyin and Mago (2022), the Economics of Power System Reliability and Planning Theory is based on the premise that electricity is critical for productive purposes. This notion is consistent with the relevance of energy supply to South African mining companies, including the case study organisation. This implies that the mining company can only be productive with a reliable and sustainable power supply. Küfeoğlu and Lehtonen (2016) observe that the theory is based on the premise that providing electricity that is dependable to reaching customers at the appropriate time and location, depends on three essential components: production, transmission, and distribution. The proponents of the theory believe that electricity may encounter unreliability during power outages, loadshedding, blackouts, or voltage variations, which could affect an organization's ability to produce (Olajuyin and Mago, 2022; Ilić, 2024). According to the idea, calculating the cost of an industrial outage can be used to evaluate the effects of unstable electricity, particularly loadshedding. According to Olajuyin and Mago (2022), the estimate is the result of a thorough examination of a number of variables, including spoilage, idle output, and the recovery of lost production. According to the argument, loadshedding affects productivity, disrupts supply chains, and causes inconvenience for end users, including mining businesses, resulting in large financial losses.

Furthermore, a key element of Munasinghe's (1979) theory includes the "value of lost load" (VOLL) concept, which evaluates the economic impact of loadshedding or power outages (Gorman, 2022). Therefore, consumers and decision-makers, including mining corporations, can evaluate the trade-offs between accepting a certain amount of unreliability and investing in greater

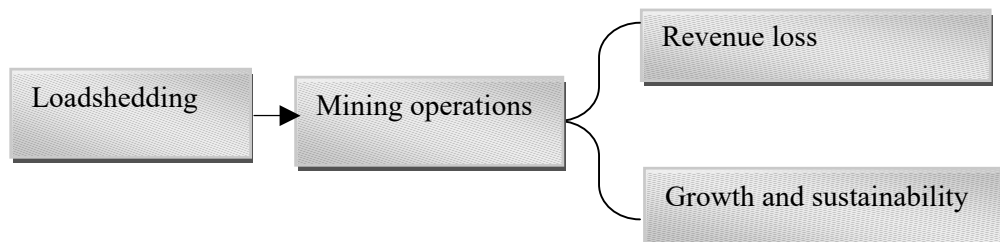
capacity by giving each unit of lost load a monetary value. In electricity system planning, this method helps customers and decision-makers make better informed choices (Gorman, 2022; Olajuyin and Mago, 2022). Furthermore, according to Olajuyin and Mago (2022), a steady supply of electricity is essential for raising an organization's production. Assessing the costs of power outages is another crucial component of the theory (Aklin *et al.*, 2016). According to Aklin *et al.* (2016), the expenses include, but are not restricted to, the direct monetary losses that customers sustain during power outages as well as indirect costs like lost productivity and equipment damage. Policymakers and businesses can thus make well-informed judgments on investments in infrastructure upgrades or putting policies in place to shorten outage periods by calculating these costs (Gorman, 2022).

The theory fits into this study as it affirms that organizations, including the mining corporation, should plan and develop methods to lessen the effects of loadshedding. It emphasizes taking proactive steps like investing in battery storage systems or backup generators, diversifying energy sources, and creating and putting into practice energy-saving techniques (Olajuyin and Mago, 2022; Mwange *et al.*, 2022). Therefore, the corporation may minimize loadshedding problems and guarantee business continuity by integrating planning into mining operations. Additionally, the theory improves comprehension of how loadshedding affects operations of mining companies, resulting in revenue loss, decline growth and sustainability.

2.7 The conceptual model

The conceptual model upon which the research is predicated is shown in figure 1. The Economics of Power System Reliability and Planning Theory form the theoretical basis of conceptual model.

Figure 1: Loadshedding impact on mining operations



Source: Brown et al., 2020; Munasinghe, 1979; Ryan, 2024

The conceptual model illustrates that loadshedding has diverse implications on mining operations, leading to revenue loss, decline growth and sustainability. This assertion is supported by existing research. For instance, Ryan (2024) claims that when mining operations are disrupted, the delays in ore processing and delivery to markets can result in missed contractual obligations, leading to penalties and lost revenue. Van der Merwe *et al.* (2017) found that the mining sector faces significant financial challenges owing to interrupted production schedules and increased operational costs associated with loadshedding. Moreover, it has been argued that the uncertainty and instability created by loadshedding can deter foreign investment in the mining sector, hindering its long-term growth potential (Brown *et al.*, 2020).

3. Methodology

3.1 Research philosophy

There are various predominant research paradigms under research philosophy, each with its own assumptions and implications for research design and selection of the corresponding methodological approaches. The notable paradigms include positivism, interpretivism, realism, and pragmatism, which offers a distinct lens to understand social phenomena (Hammersley, 2013). However, the current study adopted the interpretivist paradigm. Interpretivist researchers employ methods such as interviews and participant observation to better understand viewpoints and experiences of participants (Alharahsheh and Pius, 2020). This philosophical stance allowed the researcher to explore how individuals interpreted and responded to loadshedding, providing insights that are grounded in real-world lived experiences (Creswell and Poth, 2018).

3.2 Inductive approach

Researchers used a research approach to investigate a specific issue or topic (Tarozzi, 2020). The research approach outlines the overall framework and techniques that the researcher uses to collect, analyse, and evaluate information to address the study's research questions. Tengli (2020) argues that the decision to choose a research approach is determined by a particular philosophy. The study adopted the induction approach to study perspectives of the loadshedding impact on the mining company's revenue, growth and sustainability. Saunders *et al.* (2019) state that, from the logical perspective, induction approach is where the researcher uses premises designed from observation to draw untested conclusions. Thus, the research works from specific to general. The induction approach was

chosen because it originated in qualitative studies, where the goal is to collect data to identify patterns and themes that will help develop a conceptual framework.

3.3 Research design

Using the exploratory design, a cross-sectional study was undertaken to offer an adequate comprehension of loadshedding of how loadshedding impacts mining operations, resulting in revenue loss, decline growth, and sustainability. According to Couper (2017), an exploratory design is applicable to discover general details about a subject that has not been comprehended. This design allowed the researcher to obtain raw facts about the phenomenon under study, which was not well known previously. Additionally, the researcher was able to use an exploratory study design to adequately explain how loadshedding impacts the mining company's revenue, growth, and sustainability (Hay *et al.*, 2020). Likewise,

3.4 Methodological choice

Methodological choice involves selecting and using qualitative, quantitative, or mixed methods research design (Saunders *et al.*, 2019). Of different methods of research, this study adopted the qualitative research approach which is commonly used to gather and analyse data that focuses on understanding the subjective experiences, perspectives, and meanings that individuals attach to a given phenomenon or event (Gehman *et al.*, 2018). Qualitative research enabled the researcher to probe into how management and employees perceive or experience loadshedding, uncovering the essence of these experiences.

3.5 Data analysis

This study was conducted at a mining company in the Brits area, covering both surface and underground operations, administrative offices, processing plants, and maintenance workshops. The target population for the study included employees, contractors, and key stakeholders involved in the mining company's operations. The target population was approximately 500. Ten participants were chosen for the study using the purposive sampling technique. Purposive sampling enabled the researchers to elicit important information from the participants who were directly affected by loadshedding (Singh & Masuku, 2014). Semi-structured interviews were carried out with participants to obtain in-depth data regarding loadshedding effect on mining operations. The participants gave their consent for the interviews to be audio recorded. In addition, the researcher took appropriate notes to record visual signals during the interviews as extra information to support the recordings. Using specialized transcribing services, the audio recordings were verbatim transcribed. Repetitive immersive reading helped to identify patterns and trends in

the content, which were coded. The codes were categorized under their respective themes, which were defined prior to undertaking the exploratory investigation. Data analysis was conducted by employing the six thematic steps recommended by Braun and Clarke (2006): 1) familiarize oneself with the data; 2) create initial codes; 3) look for themes; 4) evaluate the themes; 5) define the themes; and 6) produce the report

The gathered data was transcribed manually and scrutinised, using latest NVivo software, version 14.0. NVivo has become a common data analysis tool for qualitative researchers because it helps to organise and evaluate vast volumes of qualitative data, enhances research effectiveness, promotes teamwork, and aids in the generation of superior research outcomes (Limna, 2023). The data was analyzed using thematic analysis. It gives researchers a methodical way to arrange and analyze qualitative data, enabling them to draw insightful conclusions.

3.6 Quality Assurance

Quality assurance in this study was measured through trustworthiness. Kyngas *et al.* (2020) described trustworthiness as the magnitude to which research findings and analysis are dependable and legitimate. Trustworthiness was evaluated based on several criteria, which include transferability, credibility, confirmability, and dependability. Credibility implies to the sureness that the study's findings are accurate, truthful, and believable. The findings' credibility was achieved by extended interactions with research participants, member checking, and debriefing. The degree to which a study's findings can be transferred or adapted to different contexts, settings or groups is known as transferability. To enable transferability to other settings in a similar context, the sample, procedure, and design descriptions were provided in sufficient detail (Newman *et al.*, 2014).

Dependability simply means stability and consistency of the study's findings throughout time. It involves ensuring that the process of research is logical, traceable, and well-documented. Dependability is akin to reliability in quantitative research, focusing on repeatability and consistency of research procedures and findings. The data and research findings were given to the supervisor for comments and validation. The degree to which respondents and the study's context influence the results rather than the researcher's prejudices, motives, or viewpoints is known as confirmability. It emphasises objectivity and neutrality in qualitative research, ensuring that the data and interpretations are clearly derived from the participants' experiences (Creswell and Poth, 2018). The study adequately described the research steps that were followed during early stages of research to develop and report research findings.

3.7 Ethical considerations

Participants took part in the research voluntarily and were allowed to withdraw at any moment. The researcher obtained permission from every individual involved in the research, which also included consent for the interviews to be recorded. Anonymity was maintained by omitting participant names from the interview transcripts and the final report. In addition, interview answers were only accessible to the researcher, whilst all data derived from them was stored in a file that required password and can be accessed by the researcher (Patten, 2016). All results and recordings pertaining to the study were securely maintained in adherence to Protection of Personal Information Act (POPIA) requirements for five years, after which it will be destroyed.

4. Findings of the study

The study's results are shown in this section.

4.1 Demographic information

Findings of the biographic data are shown in Table 1 below.

Table 4.1: Biographic data

Research participants	REP 1	REP 2	REP 3	REP 4	REP 5	REP 6
Gender	Male	Female	Female	Male	Male	Male
Age	63	29	40	48	48	44
Highest education	Grade 12	Degree	Diploma	Diploma	Degree	Masters
Designation	Mine overseer	Production foreman	Production foreman	Engineering manager	Mining manager	Metallurgical manager
Years of employment	8	2	2	4	1	3
Organisational leadership level	Middle supervision	Junior supervision	Junior supervision	Senior supervision	Senior supervision	Senior supervision
Experience with loadshedding	Yes	Yes	Yes	Yes	Yes	Yes

Tabelul 4.1 (continuare)

Research participants	REP 7	REP 8	REP 9	REP 10	Total
Gender	Male	Male	Male	Male	F = 2 M = 8
Age	37	38	36	55	Average = 44
Highest education	Grade 12	Diploma	Masters	Masters	Grade 12 = 1 Diploma = 3 Degree=1 Masters = 3
Designation	Mechanical foreman	Plant engineer	Process specialist	Human resource manager	Production foreman = 2 Mechanical foreman = 1 Process Specialist = 1 Plant engineer = 1 Mining overseer = 1 Managers = 4
Years of employment	15	0.25	2	2	Average years of employment = 3.9 years
Organisational leadership level	Junior supervision	Middle supervision	Middle supervision	Senior supervision	Junior supervision = 3 Middle supervision = 3 Senior supervision = 4
Experience with loadshedding	Yes	Yes	Yes	Yes	Yes = 10

Source: Author's fieldwork

REP1 was a 63-year-old male who had eight years of experience at the mining company. He held a grade 12 certificate and had worked at several companies and had knowledge in the mining industry. **REP 1** experienced loadshedding and provided detailed responses to the questions and demonstrated a strong commitment to his work.

REP2 was a 29-year-old female who had been employed at the mining company for two years. She held a degree and had been dealing with loadshedding since 2022. **REP2** was calm and precise in her responses to the research questions.

REP3 was a 40-year-old female who had worked at the mining company for two years. She held a diploma and had dealt directly with loadshedding issues since 2022. **REP3** was vocal and expressed concern about the impact of load shedding.

REP4 was a 48-year-old male who had been employed at the mining company for four years. He held a higher diploma and joined the company at a middle management level, at the time of the research, served in a senior management role. He had been dealing with loadshedding since he started with the company.

REP5 was a 48-year-old male who had been with the mining company for one year, serving in a senior management role. He remained calm during the interview and noted that his experience with loadshedding had been minimal, as he only joined the company the year before the interview was conducted. Nevertheless, he displayed confidence in answering the research questions.

REP6 was a 44-year-old male who had been employed at the mining company for three years. He held master's degrees in two disciplines and occupied a senior management position within the company. He noted that his department was impacted directly by loadshedding. **REP6** demonstrated a thorough understanding of and experience with load shedding, and he displayed a prominent level of confidence during the interview.

REP7 was a 37-year-old male who had worked at the mining company for 15 years. He held a grade 12 certificate as his highest qualification. Initially hired at a non-management level, he had been promoted to a junior management position. **REP 7** demonstrated a solid understanding and knowledge of loadshedding.

REP8 was a 38-year-old male who joined the company in January 2024. He held a diploma, and his department was affected directly by loadshedding. He remained calm and answered the interview questions with confidence.

REP9 was a 36-year-old male who had been with the company for two years. He held a master's degree and was furthering his studies. Employed at a middle management level, he provided detailed answers to the research questions and was quite vocal about the impact of loadshedding on the company.

REP10 was a 55-year-old male with two years of experience at the company. He held a master's degree and served in a senior management role. He was thorough in answering the interview questions.

4.2 Influence of loadshedding on revenue of the mining company

This section considered the extent to which loadshedding influenced the mining company's revenue. To address this, related questions were posed, and the

participants' responses triggered the following themes: loadshedding impact on revenue; notable losses incurred owing to loadshedding.

4.2.1 Theme 1: Loadshedding impact on revenue of the mining company

Regarding revenue, all the participants confirmed that loadshedding affected the mining company's revenue negatively. Moreover, the study found that revenue loss was one of the notable losses attributed to load shedding in the mining company. In this respect, **REP1** expressed:

"The revenue has been down due to load shedding and has been elevated by decreased pricing. The loadshedding had resulted in the target not being met, which affected revenue".

REP3 responded by saying:

"It is affected in the sense that there is certainty on revenue due to loadshedding disruptions, which affected supply and demand constraints".

REP8 agreed, stating:

"The income is notably reduced and the company operating at strict budget. This has also resulted (in) to loss of employees due to the company not performing well".

4.3 Loadshedding impact on growth and sustainability of the mining company

The study also sought to establish how loadshedding affected the mining company's expansion and long-term viability. The findings from the interviews revealed five sub-themes pertaining to loadshedding's impact on the mining company's expansion and long-term viability. Figure 2 below displays these sub-themes, which served as the foundation for the results.



Figure 2: Loadshedding impact on growth and sustainability

Source: Author's fieldwork

4.3.1 Theme 1: Income loss

Some of the participants expressed that loadshedding at the mine affected the company's income, which ultimately affected its growth and sustainability. **REP1** responded to the question by saying:

"Without proper planning on reduced productivity and not meeting the target, the profit can be negatively impacted, which directly or negatively affects the growth and sustainability of the mine".

REP2 agreed with **REP1**, and expressed:

"Less revenue and consistent production will directly have negative impact on growth and sustainability".

4.3.2 Theme 2: Job loss

All the participants concurred that loadshedding at the mining company led to jobs lost, which impacted the company's growth and sustainability. **REP5** noted:

"The employment rate has been reduced due to loadshedding".

Similarly, **REP8** responded by saying:

"It affects the production chain, leading to early closure and reduced operation of the mining company, which can lead to job losses".

4.3.3 Theme 3: Project delays

Further, the participants shared a common view that loadshedding caused project delays at the mining company, impacting the company's growth and sustainability negatively. **REP4** claimed:

"Less income will negatively affect the growth and sustainability of the mine as some of the projects will be kept on hold/delayed".

Concurring with the others, **REP6** affirmed:

"It has affected it a lot. The mine should have started underground operations 3 years ago. The slow generation of revenue affected the project".

4.3.4 Theme 4: Discontinued projects

Besides the above, some participants argued that loadshedding resulted in discontinued projects, affecting the mining company's growth and sustainability. **REP5** responded to the question by saying:

"Growth and sustainability have impacted the company negatively because of discontinued projects".

Following other respondents' line of reference, **REP8** remarked:

"It affected the growth and sustainability of the discontinuity of existing projects".

4.3.5 Theme 5: Turnover

Lastly, the participants stated that loadshedding impacted the mining company's growth and sustainability because of its decline of turnover. In light the above findings, **REP2** mentioned:

"Because of operating at a reduced capacity, this leads to low turnover or declined productivity. The (This) overall affect the growth and sustainability negatively of a business".

REP7 shared a similar view, and stated:

"It holds the operations quite a lost because production targets are not met and capital for expansion is not generated".

The findings revealed that loadshedding impacts the mining company's growth and sustainability negatively, since it results in income loss, job reductions, project delays, and discontinuations.

5. Discussion of findings

The research explored how loadshedding affected a mining company's revenue, growth and sustainability. The findings indicated loadshedding negatively impacted the mining company's revenue generation, growth, and sustainability. According to Van der Merwe *et al.* (2017), the mining industry faces significant financial challenges owing to interrupted production schedules and increased operational costs associated with loadshedding. Smith and Jones (2021) aver that the inability to meet production targets owing to power outages can lead to missed deadlines and contract penalties, causing financial losses for mining companies. Also, it has been found that uncertainty and instability created by loadshedding can deter foreign investment in the mining sector, hindering its long-term growth potential (Brown *et al.*, 2020). Besides, it was established that loadshedding at the mining company led to job losses, thereby impacting the company's growth and sustainability. Further, the findings showed that loadshedding had delayed projects at the mining company, impacting the company's growth and sustainability negatively. The above findings are supported by existing research (Van der Merwe *et al.*, 2017; Zhang *et al.*, 2018), indicating that loadshedding impacts financial stability and project timelines severely. Also, Chanza and Sigauke (2019) highlight the detrimental effects of loadshedding on South Africa's mining industry's sustainability and profitability.

6. Limitation of the study and future research directions

The research was limited in scope as it focused on a mining company, located in the Brits area. Therefore, it is recommended that future studies should embrace comparative methods for gathering data from more than one mining company. Also, the study adopted the qualitative approach to respond to the aims and research questions. Criticism against qualitative approach is that its findings cannot be validated; hence cannot be generalised. This critique arises because qualitative research often relies on subjective interpretations and non-replicable data such as personal interviews and observations (Patton *et al.*, 2018). Given this, the study recommends that future studies should integrate qualitative and quantitative methods. Another limitation study's limitation was that the unit of analysis. The study included individuals of interest such as production engineers, and sustainability managers or executives, who are directly affected by loadshedding, knowledgeable about the energy requirements of mining operations, and who influence decisions relating to energy technology and projects, including renewable energy. Hence, the findings cannot reflect the opinions of the entire workforce of the mining company.

7. Recommendations and conclusion

The study explored the effects of loadshedding on the mining company's revenue, growth and sustainability. The findings showed that loadshedding impacts the mining company's revenue, growth and sustainability negatively, since it results in income loss, job reductions, project delays, and discontinuations.

South Africa's main fuel source is coal, which is inexpensive but environmentally damaging, despite the country's vast biomass, wind, and solar energy potential. Furthermore, the current coal power plants are under stress due to the over-reliance on coal; for this reason, the development of renewable energy sources is absolutely necessary to mitigate the ongoing loadshedding and, at the same time, address the environmental challenges. The study recommends that Eskom partner with the private sector, including the mining industry, to invest in renewable energy to help mitigate the energy crisis. On the other hand, the study recommends that the mining industry should avoid overreliance on Eskom and make an investment in renewable energy sources to ensure continuity of mining operations.

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THE NEXUS BETWEEN INFORMAL ENTREPRENEURSHIP AND SUSTAINABLE DEVELOPMENT

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Abstract

Informal entrepreneurship is a vital aspect of economic activity in Nigeria, which has become very popular due to its capacity to generate income and employment thus reducing poverty and enhancing skills acquisition. This study seeks to contribute to the existing literature on how informal entrepreneurship in Nigeria can be made more sustainable. This study adopted a survey research design to investigate the relationship between informal entrepreneurship and sustainable development in Nigeria with attention to

selected small businesses located in Lagos state. 327 respondents were randomly selected. Data collection was through a self-made questionnaire. Data collected were analyzed using frequency count and simple percentages while Regression analysis was used to test for formulated hypotheses at a 5% level of significance. The result of the study indicated a significant positive relationship between informal entrepreneurship and sustainable development in Nigeria. The result also identified some of the challenges confronting the conversion of informal entrepreneurship to formal entrepreneurship to make it even more functional. Based on the outcome of the study, the study recommended that the government intervention through granting loans to industrious entrepreneurs still operating in the informal setting in exchange for them to formalize their enterprises for the benefit of both the entrepreneur and the government. Government should provide a training ground for youth entrepreneurs that will motivate them to think bigger and get better such that, they will see formalizing their enterprise as a step for development.

Keywords: *informal entrepreneurship, formal entrepreneurship, sustainable development*

JEL Classification: L26,O17,Q01

Introduction

Informal entrepreneurship is a vital aspect of economic activity in Nigeria, which has become very popular due to its capacity to generate income and employment thus reducing poverty and enhancing skills acquisition. In this light, it serves as a pathway to formal entrepreneurship and the development of dynamic entrepreneurs. Following its recognition and role in sustaining livelihoods for the citizens of a nation, research on the sector has become quite common. The renewed interest in the informal process of entrepreneurship by developing countries has made most of these countries to change the direction of their policy formulation such that the role of micro, small, and medium enterprises (MSMEs) in economic growth and development are recognized. The economic impact of informal entrepreneurship in developing countries has been viewed from two perspectives. The foremost perspective regards informal entrepreneurship in terms of the contribution it makes in terms of employment, income generation, poverty reduction, and economic growth. The second perspective views informal entrepreneurship as being harmful, in terms of tax evasion, and the manufacture of pirated products, which discourages innovation, hinders urban physical planning structures, and poses health hazards in residential areas (Usman, 2016) and all these

had made informal entrepreneurship a popular research area. The implication is that informal entrepreneurship is the brainer behind the informal sector of the economy. The informal sector acts as a kind of safety net for the formal economy as it allows those without jobs and the unemployable to find work to do or start their businesses, make better income and alleviate poverty. It also offers goods and services in capacities that may be impossible or unappealing for formal networks. The informal sector comprising informal entrepreneurs is an important contributor along the value chains as it sources most of its goods from the formal economy (Olaleye, Emeagwali, Olasehinde, Oladele, Adelakun, Ebhoaye, & Solanket, 2021; Hamilton, 2020).

Sustainable development stands on three codependent pillars which are the economic, social, and environmental dimensions of development and they affect present and future generations (Ozgur, G., Elgin, C. & Elveren, A. Y. (2020). The livelihood of underprivileged people in developing countries often hinges critically on informal economic activity which accounts for about 70% of employment. Furthermore, informal economic output has been appraised at about 35% of the total GDP in developing economies in comparison with about 15% of GDP in advanced economies (World Bank, 2019). While the informal sector offers the advantage of flexible employment in some situations, it is also related to a wide range of adverse economic outcomes, including poverty, low productivity, income inequality, and limited fiscal resources.

The current economic system in Nigeria also contributes to the unsustainable development experienced in the country (Benería et al., 2016) where high levels of informality can be linked to lower productivity levels and poor wages, investment, and economic growth which corroborated the earlier works of Rada and Arnim, (2014). However, when there is a shift of labor from low productive and informal sectors, to highly productive ones, there tends to be an increase in economic growth and wages; human capital increases as a result of these changes, thus reducing dependence on the goods and financial services of developed countries (Rada & Arnim, 2014). However, with the predominance of informality, labor is trapped in sectors with low productivity thus depriving the economy of the necessary income growth that could enhance sustainable growth and development.

Statement of Problem

In Nigeria as well as other African countries, the informal sector has played a significant role in the absorption of unemployment in the labor market; however, it is still greatly marginalized, especially in Nigeria. Factors have been identified to be responsible for this marginalization; first is the notion that the economy is

divided into two main sectors; the private sector and the public sector, which means the informal sector is neglected and unrecognized. The second contributory factor is the Nigerian educational system which focuses on training students to be employed while neglecting self-employment or entrepreneurship (Özgür et al., 2020). Given this view of the neglect of the informal sector amidst the significant contributions to the national economic development towards continuous growth and development as well as the low level of attention given to the informal sector, it stands to reason that these among other factors are major hindrances to African sustainable development. To this end, this study seeks to investigate the relationship between informal entrepreneurship and sustainable development in Nigeria and the challenges militating against the informal economy for entrepreneurial development in Nigeria.

Literature Review

Many Africans operate in the informal economy which generally refers to businesses or profitable activities by individuals and organizations which are neither fully registered nor supervised and taxed by the government or its agencies. It can include subsistence farmers, street traders, small manufacturers, service providers (such as carpenters, freelance photographers, hairdressers, private taxi drivers), etc. the aim is not to avoid government control, rather, it is about the need to survive in the business arena (Ugochukwu, 2018). Economic activities are separated from formal institutional boundaries, but then provide products and services which stay legitimate for a large percentage of the society are referred to as informal or shadow economy. Informal entrepreneurship functions within this informal economy to avoid sunken costs associated with registration, compliance with policies and regulations, and regulatory costs and taxes (Hallam & Zanella, 2017). It is considered informal since these businesses are hardly registered at national or regional levels, are cash-based, and usually do not have official arrangements with employees.

There is no unanimity about the effect of the shadow economy on a nation's economic growth and age of establishing business (Hallam & Zanella, 2017). This lack of formality also means that little is known of the 'shadow' economy and, as a result, it is likely to be overlooked during policy formulation, marginalized in business strategy, and too easily connected with disreputable activities. Ozgur, *et al* (2020) argued in support of this position and opined further that age has nothing to do with the time to establish a business but maturity in age contributed more to the success and survival of such business while Akingbade and Famodun (2024) linked

maturity to pro-activeness, innovativeness, and risk-taking which tends to improve the performance of SMEs. One of the reasons for the informal operation of many businesses is because there are no evident advantages to being registered, and the single argument to be made in favor of registration is that, it will facilitate business growth and grant access to bigger markets. Economists and finance experts commonly believe that it is in the best interest of a country's economy to transit businesses in the informal economy to the formal economy to allow the government effectively structure taxation and services.

This might not be the best for developing nations in Africa as the purpose of taxes is to help the Government take care of its people, improve their standards of living and implement fundamental human services so that the country may flourish. Informal businesses are already doing all these in that they are improving the lives of their owners (Ugochukwu, 2018). Özgür et al. (2020) examined the association between the size of the informal sector and various indicators of sustainable development, using a novel, annual cross-country panel dataset that covered 160 economies from the period of 1950 to 2016. The range of indicators encompassed environmental, health-related, education, economic and social variables. The results suggested that the size of the informal sector is negatively associated with GDP per capita, educational attainment, education, carbon dioxide emissions per capita, life expectancy, and access to safe drinking water, and positively connected to poverty rates, mortality rates, female labor force participation rate and air pollution, indicating that the effect of larger informal sector size is stronger in less developed economies.

Youssef et al. (2017) carried out a study the entrepreneurship and sustainability goals with a view to understanding the roles played by institutional quality, innovation, and entrepreneurship in the structural change of economy in the course of developing sustainable future in Africa. Environmental Kuznets curve was employed and the results showed that informal and formal entrepreneurship activities were favourably to less environmental quality and sustainability in about seventeen (17) African countries especially where the input of the formal entrepreneurship is less than the informal entrepreneurship i.e. where the input of informal entrepreneurship is much higher than the formal one. It was concluded that there exists a strong positive relationship between the entrepreneurship and sustainability with premium on innovations and institutional quality. Hallam and Zanella (2017) examined informal entrepreneurship in an emerging economy by applying the theory of planned behavior in studying the cognitive process of informal entrepreneurship and also exploring the effect of experience on the intention to start a business. This

exploratory study involved 855 university students and the findings provided evidence that the decision to start a business in the informal economy emphasizes the effect of subjective norms on entrepreneurial intentions.

Williams and Shahid (2016) evaluated the varying degrees of informalization of entrepreneurs and analyzed the levels of formalization associated with various levels of entrepreneurship institutional asymmetry in Pakistan. A 2012 survey was adapted to examine the varying degree of entrepreneurship formalization using 300 entrepreneurs as the unit of analysis. The results showed that 62% of entrepreneurs operate completely within the informal enterprises of the economy, 31% on mostly informal, and 7% mostly formal enterprises. This implies that none was found to be exclusively operating formal enterprises while those with lower levels of formalization displayed higher levels of institutional asymmetry, fear for high tax as it possessed lower tax morality, and worried about public sector corruption. These entrepreneurs tended to be younger, had lower incomes, and were less educated (Olaleye, Emeagwali, Olasehinde, Oladele, Adelakun, Ebhoaye, & Solanket, 2021).

Neo-liberal theory

The neo-liberal school propounded by Hernando de Soto opines that costs of formalization and over-regulation impede informal entrepreneurs. The implication of this is that deregulation and simplification of the registration procedure lead to economic freedom and entrepreneurship in developing countries. This theory argues that there are enormous prospects for growth inherent in this sector but are constrained by government regulations. The theory considers Informal entrepreneurship as the only alternative left to less privileged citizens who desire to work legally, but cannot due to the heavy cost of formalization and bureaucracy, thus preventing many of such businesses from being legal entrepreneurs. The theory, therefore, views the engagement in informal entrepreneurship as an entrepreneurial pursuit that promotes economic growth hindered by cumbersome regulations (Packard et al., 2012).

In summary, the view of Neo-liberalism regarding informal entrepreneurship can be linked to an outcome of rational behavior with assumption that informal entrepreneurs were highly productive although retarded by government regulations through avoidance of appropriate regulations. Finally, it is also the view of this theory that informal entrepreneurship flourishes in a free market economy and increase development. This theory has been criticized for ignoring the existence of agents of the formal firms within the sector while concentration on entrepreneurial activity (Usman, 2016)

Methodology

The study adopted a survey research design that was used in examining the relationship between informal entrepreneurship and sustainable development in Nigeria, using Lagos as the place of study given the large number of small businesses located in the state. The respondents were randomly selected from various SMEs located within the state. According to SMEDAN (2017), Lagos state has about 8,396 SMEs. Thus, using purposive simple random and snowball sampling technique, 350 respondents' comprising small and medium enterprise owners were selected for the study. 350 questionnaires were distributed but only 327 were properly filled and returned. The actual sample size studied therefore is 327 and thus formed the basis for the analysis presented in this section. The questionnaire was used to source data and was structured into two sections. Section A contained the demographic data while section B contained questions developed in this paper. Analysis was done using frequency count and simple percentages while Regression analysis was used to test for formulated hypotheses at a 5% level of significance. The reliability of the structured questionnaire was tested using twenty (20) questionnaires, which were analyzed using Statistical Package for the Social Sciences (SPSS).

Results

Table 1. Demographic data of the respondents

Demographic	Perimeter	(n=327)	
		Frequency (F)	Percentage (%)
Gender	Male	214	34.6
	Female	113	65.4
Age	Less than 30 years	108	33.0
	30 but less than 40 years	91	27.0
	40 but less than 50 years	60	18.3
	50 years and above	68	20.8
Highest educational qualification	OND/Technical/NCE	11	3.3
	B.Sc/ B.A./HND or Equivalent	246	75.2
	Master's Degree	70	21.4
Years of experience	Less than 5 years	93	28.4
	5 but less than 10 years	137	42.2
	10 but less than 20 years	35	10.7
	20 years and above	62	19.0

Researcher's computation (2024)

The table above presents the demographic characteristics of the respondents. As indicated in the table, both males (34.6%) and females (65.4%) participated in the study indicating that both males and females can be informal entrepreneurs with the majority of the females dominating the sector. The ages of the participants varied from less than 20years to above 50 years which implies that there are no specific year requirements for engaging in informal entrepreneurship. The respondents also have diverse levels of educational qualification which shows that respondents were literate and thus can read and understand the questionnaire unassisted. The table also revealed that the participants have different years of working experience.

Objective 1: To investigate the relationship between informal entrepreneurship and sustainable development in Nigeria?

Table 2: The relationship between Informal entrepreneurship and sustainable development in Nigeria

ITEMS	SA/A		UN		D/SD	
	F	%	F	%	F	%
Informal entrepreneurship drives economic growth and innovation	258	78.9	22	6.7	47	14.4
Informal entrepreneurship improves social conditions	280	85.6	9	2.8	38	11.6
Informal entrepreneurship addresses social and environmental challenges	266	51.4	55	16.8	6	1.8
Informal entrepreneurship promotes job creation	234	71.5	67	20.5	26	7.9
Informal entrepreneurship improves the standard of living and creates wealth	198	60.6	49	15.0	80	24.8
Promotes the use of available resources to create a new product	274	83.8	9	2.8	44	13.5

Researcher's computation (2024)

Table 2 shows the relationship between informal entrepreneurship and sustainable development in Nigeria. It shows that respondents ranging between 51.4% to 85.6% were in agreement that informal entrepreneurship has relationship with sustainable development. This is because informal entrepreneurship drives economic growth and innovation (78.9%); improves social conditions (85.6%); addresses social and environmental challenges (51.4%); promotes job creation

(71.5%); improves the standard of living and creates wealth (60.6%), and promotes the use of available resources to create a new product (83.8%). This result is in agreement with some earlier studies such as Hamilton (2020); Özgür et al. (2020); World Bank (2019); and Ugochukwu, (2018) respectively. These studies also identified several functions of informal entrepreneurship that are essential for sustainable development which were found to be in tandem with the position of Akingbade and Famodun (2024).

Objective 2: To identify the challenges of formalizing the informal economy for entrepreneurial development in Nigeria?

Table 3: The challenges of formalizing the informal economy for entrepreneurial development in Nigeria

ITEMS	SA/A		UN		D/SD	
	F	%	F	%	F	%
The inability of entrepreneurs to test-trade their business through the informal sector startup	231	70.7	47	14.4	49	14.9
Customers of entrepreneurs operating in the informal sector will pay prevailing market price because cheaper goods and services won't be available again.	281	85.9	28	8.6	18	5.5
Perception of not being a real business	289	88.4	20	6.1	18	5.5
High and multiple taxations and unfavorable tax regime	312	95.4	9	2.8	6	1.8
Limited intermittent income streams	190	58.1	96	29.4	41	12.5
Complexity of compliance	217	66.4	32	9.8	78	23.8
Lack of advice on how to formalize	208	62.6	50	15.3	72	22.1
Difficulty in business registration as a result of red-tape and bureaucratic procedures.	204	62.4	73	22.3	50	15.3
Lack of Incentives and reliefs	297	90.8	6	1.8	24	7.3
Institutional challenges such as poor basic infrastructural facilities.	309	94.4	0	0.0	18	5.5
Limited access to finance	258	78.9	13	4.0	56	17.1

Researcher's computation (2024)

Table 3 indicates the challenges of formalizing the informal economy for entrepreneurial development in Nigeria. Among these are the inability of entrepreneurs to test-trade their business through the informal sector startup (70.7%); customers of entrepreneurs operating in the informal sector will pay prevailing market price because cheaper goods and services won't be available again (85.9%); Perception of not being a real business (88.4%); high and multiple taxations and unfavorable tax regime (95.4%); limited intermittent income streams (58.1%); complexity of compliance (66.4%); Lack of advice on how to formalize (62.6%); difficulty in business registration as a result of red-tape and bureaucratic procedure (62.4%); lack of Incentives and reliefs (90.8%); institutional challenges such as poor basic infrastructural facilities (94.4%); and limited access to finance (78.9%). The result is consistent with Ugochukwu, (2018); Hallam and Zanella (2017); and Williams and Shahid (2016) who also identified different challenges in the process of converting informal entrepreneurship to formal entrepreneurship.

4.2 Testing of hypothesis

There is no significant relationship between Informal entrepreneurship and sustainable development in Nigeria.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.733 ^a	.537	.536	.5448

a. Predictors: (Constant), Informal entrepreneurship

The result in the model summary table above indicates that about 53.7% of sustainable development in Nigeria is accounted for by informal entrepreneurship. The remaining 46.3% can be accounted for by other factors.

ANOVA

Model	Sum of Square	Df	Mean Square	F	Sig.
Regression	112.019	1	112.019	377.480	.000 ^b
Residual	96.446	325	.297		
Total	208.465	326			

a. sustainable development in Nigeria.

b. Predictors: (Constant) Informal entrepreneurship

The ANOVA table shows that the model is significant and thus a good fit for the relationship between Informal entrepreneurship and sustainable development in Nigeria.

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	1.922	.106		18.143	.000
Informal Entrepreneurship	.535	.028	.733	19.429	.000

a. Dependent Variable sustainable development in Nigeria

The coefficient table revealed that the probability value is 0.000 which is less than the significant level of 0.05, therefore, the null hypothesis was rejected to imply that there exists a significant relationship between informal entrepreneurship and sustainable development in Nigeria.

Discussion of findings

It was evident from demographic information that the informal entrepreneurial sector was dominated by the females while males gender was also found there. The study also corroborated the earlier work of Ozgur *et al* (2020) that age has nothing to do with establishment of business that forms the bedrock of informal entrepreneurship which implies that there are no specific year or age requirements for engaging in informal entrepreneurship. It also affirmed that the entrepreneurs in the informal sector were not illiterate but educated with many years of experience.

For objective 1, it was found that there exists a moderate positive relationship between informal entrepreneurship and sustainable development and 53.7% of sustainable development in Nigeria is accounted for by informal entrepreneurship. The remaining 46.3% can be accounted for by other factors. This position was buttressed by the earlier work of Youssef *et al* (2017) with premium on innovations and institutional quality. For objective 2 identified challenges confronting the formalization of the informal economy for entrepreneurial development in Nigeria such as inability of entrepreneurs to test-trade, perception of not being a real business, high and multiple taxations, limited intermittent income streams, institutional challenges such as poor basic infrastructural facilities, etc. this was supported by Rada and Arnim, (2014); Hallam and Zanella, (2017); Ozgur, *et al* (2020).

Conclusion

The place of entrepreneurship in sustainable development of every nation is important given their innovation and creativity. Entrepreneurs convert what others overlooked into lucrative business opportunities. The result of this study has proven that informal entrepreneurship drives economic growth and innovation; improves social conditions; addresses social and environmental challenges; promotes job creation; improves the standard of living and creates wealth, and promotes the use of available resources to create a new product while identifying several functions of informal entrepreneurship that are essential for sustainable development. Informal entrepreneurship however does not contribute significantly to the national economy due to a lack of taxation and registration of businesses. In other words, informal entrepreneurship is a vital aspect of economic activity in Nigeria as it generates income and employment for individuals thus reducing poverty and enhancing skills acquisition.

It becomes imperative to convert these informal entrepreneurships to formal entrepreneurships following its recognition and role in sustaining livelihoods for the citizens of a nation. Such conversion has lots of challenges and limitations and some of these challenges as revealed in this study are; the inability of entrepreneurs to test-trade their business through the informal sector startup; customers of entrepreneurs operating in the informal sector will pay prevailing market price because cheaper goods and services won't be available again; perception of not being a real business; high and multiple taxations and unfavorable tax regime; limited intermittent income streams; complexity of compliance; lack of advice on how to formalize; difficulty in business registration as a result of red-tape and

bureaucratic procedure; lack of Incentives and reliefs; institutional challenges such as poor basic infrastructural facilities; and limited access to finance. Thus, concluded that the identifiable challenges should be addressed to achieve sustainable development.

Recommendations

To overcome these challenges, the study recommends government intervention by granting loans to industrious entrepreneurs still operating in the informal setting in exchange for them to formalize their enterprises for the benefit of both the entrepreneur and the government. To embark on educational campaign to encourage registration of businesses in the informal sector, tax rebase and streamline all forms of taxation at all levels. Government should provide a training ground for youth entrepreneurs that will motivate them to think big and get better such that, they will see formalizing their enterprise as a step towards sustainable development.

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COMPETITIVENESS AND SUSTAINABILITY THROUGH THE APPLICATION OF BUSINESS NETWORKS IN THE INFORMAL SECTOR

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Abstract

Interestingly, enterprises owned by foreign nationals appear more sustainable, potentially due to their participation in business networks. With the purpose of determining whether or not business networks play a significant role in the survival of small businesses, this study will examine the effects of network participation. It is imperative to comprehend the role that business networks play in the sustainability of small businesses.

This research employed an exploratory approach and utilized a quantitative method to investigate the impact of business networks in sustaining small business enterprises. Data for this study were gathered from 300 small business enterprises in Pretoria, the capital city of South Africa, using a structured questionnaire. The findings emphasize the importance of fostering and supporting business networks to enhance the resilience and long-term viability of local entrepreneurs. Stakeholders Can use the findings to develop targeted interventions and policies that facilitate the establishment and growth of business networks, ultimately contributing to poverty alleviation, economic growth, and the reduction of unemployment rates in South Africa.

Keywords: *business networks, migrant business owners, competitive advantage, city of Tshwane Municipality*

JEL Classification: R1, Z11, Z32, O33

1. Introduction

Small Medium and Micro Enterprises (SMMEs) play a fundamental role in promoting economic growth globally and deserve prioritization in policy and development agendas (Izevbigie, 2025). Within the context of South Africa, the informal sector serves as a prime example of SMMEs and holds significant representation, particularly in townships and rural areas. The sector employs over 2.4 million individuals, accounting for approximately 17% of the country's total workforce (Duncan, Kanayo & Djemilou, 2019: 535-549). In situations where governments and large corporations struggle to generate and sustain employment opportunities, SMMEs emerge as a potential solution (Ladzani & Netswera, 2009: 225-239; Mbonyane & Ladzani, 2011: 550-560). They act as a safety net, preventing individuals from sinking into the depths of abject poverty. It is noteworthy that as of 2019, South Africa faced an unemployment rate of 27.6% (Duncan, Kanayo & Djemilou, 2019: 539), which has since escalated to a staggering 32.6%, with the majority of the affected individuals being young people (STATSSA, 2021: 17-30). Such circumstances pose a significant threat to the country's trajectory and overall well-being. Thus, understanding the role of SMMEs in addressing unemployment and fostering economic growth is of paramount importance.

Business networks play a crucial role worldwide, providing business owners with valuable opportunities to leverage the platform and collaborate with other network members. The significance of business networks is exemplified by how migrants often pool resources within these networks, contributing to their continuous growth while local businesses may face closure, creating a perplexing and contradictory scenario. Researchers in this study affirm the benefits of business networks for their members, offering a competitive advantage and a cushion to sustain optimal operations in the face of challenges. These advantages are attributed to resource sharing, enhanced market access, collaboration among members to leverage their strengths, and the influence of group dynamics (Scheba & Turok, 2020: 77-94).

The study was conducted within the City of Tshwane Metropolitan Municipality, with a specific focus on Pretoria West. The City of Tshwane Metropolitan Municipality is one of South Africa's eight metropolitan

municipalities and is home to the Union Buildings, the seat of government. The study specifically examines Pretoria West, an area within the metropolitan municipality that has a notable concentration of informal traders. Descriptive data analysis is employed to assess affiliation with business networks, perceptions regarding their importance and usefulness, and other relevant factors. Furthermore, factor analysis is conducted to identify key dimensions pertaining to the significance of business networks. The findings reveal five factors, namely, (a) the competitive advantage derived from networks, (b) the backing networks offer in business operations, (c) the role of networks in building relationships, (d) the bargaining power enabled by business networks, and (e) the networks' ability to effect critical decisions and outcomes in favour of businesses. Consequently, this paper aims to examine the perceptions on impact of business networks.

Problem statement

The problem addressed in this study pertains to the notable performance disparity between local business owners and their migrant counterparts in South Africa, which has led to significant social challenges. Migrant business owners, often operating within cohesive groups, consistently outclass their local counterparts, resulting in detrimental consequences such as high unemployment rates that necessitate the development of small and medium-sized enterprises (SMMEs) for mitigation. Migrant business owners benefit from supportive networks that enable them to leverage collective resources, information, and opportunities. In contrast, local business owners typically work in isolation, struggling to navigate the entrepreneurial landscape and frequently experiencing business closures or being replaced by migrant entrepreneurs (Scheba & Turok, 2020). These circumstances have wide-ranging implications. Moreover, the persistently high unemployment rate in South Africa remains a pressing concern, and SMME development is widely acknowledged as a crucial avenue for job creation and poverty alleviation. However, the limited success of local business owners hinders the realization of this potential.

Moreover, the prevalence of migrant-owned businesses, bolstered by supportive networks, exacerbates social tensions and strains community cohesion. The unequal distribution of economic opportunities and wealth accumulation fuels resentment and perpetuates socioeconomic disparities (Baktiono, 2024). Consequently, the problem statement revolves around the significant underperformance and challenges faced by local business owners compared to their migrant counterparts, resulting in adverse social consequences, particularly

concerning unemployment rates and community cohesion. Addressing this disparity and fostering a more equitable and supportive business environment for local entrepreneurs are vital for sustainable economic growth, poverty reduction, and social harmony.

Research methods

The research design adopted for this study was exploratory in nature, employing a quantitative approach (Bless, Highson-Smith & Kagee, 2006). A sample of 300 participants representing small businesses in the proximity of Pretoria was selected using convenience-snowball sampling methods. Ultimately, a total of 261 participants returned fully completed questionnaires, forming the final sample size. The data collection instrument utilized in this study was a structured questionnaire, developed based on relevant literature. The questionnaire comprised closed-ended and four-point Likert-scale questions, enabling structured data collection and assessment of participants' perception's regarding "small business support network". Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). Descriptive analysis was employed to calculate measures such as frequencies and percentages. Additionally, Cronbach's Alpha was computed to assess the internal consistency of the questionnaire items. Moreover, factor analysis was utilized to condense the data and identify key factors contributing to perceptions about "small business support networks". Through the application of these quantitative analysis practices, this study aimed to provide insights into participants' perceptions and the factors influencing the effectiveness of small business support networks. The utilization of SPSS facilitated data analysis and statistical assessments, contributing to a comprehensive understanding of the research topic.

Literature review

When examining the substantial role migrants play in the economies of countries like China and India, a significant issue emerges, particularly in relation to their utilization of diaspora networks (du Plessis, Kroon & van der Merwe, 2012: 335-358). This raises pertinent questions regarding how others can navigate and overcome the challenges they encounter. Despite the implementation of various government measures to support entrepreneurs, local individuals continue to struggle in achieving the expected growth and sustainability in their businesses (Scheba & Turok, 2020). In contrast, migrant entrepreneurs thrive and expand, while local entrepreneurs face decline and closure. Understanding why locals

encounter difficulties while migrants succeed within the same environments is of utmost importance. The late Dr. Richard Maponya, a highly regarded property investor and entrepreneur, emphasized the significance of collaboration among businesspeople rather than working in isolation. Dr. Maponya highlighted the issue of migrants arriving in South Africa and seamlessly collaborating to achieve notable accomplishments, while South Africans operating in the same environments fail to leverage available resources and opportunities. This discrepancy in outcomes is a cause for concern (Ungureanu & Ungureanu, 2020; Mgayi, 2015: 15).

These circumstances give rise to critical questions concerning the factors that contribute to the success of migrants compared to the challenges faced by local entrepreneurs. Understanding the mechanisms that enable migrants to effectively collaborate and capitalize on available resources is crucial for fostering growth and sustainability among local businesses (Suwangsih & Kustiningsih, 2022). By investigating the dynamics and factors that facilitate the success of migrant entrepreneurs, valuable insights can be gained to inform policies aimed at promoting collaboration and providing support for local entrepreneurs. Business Networks and their perceived role in Supporting Small and Medium-sized Enterprises (SMEs) A business network can be defined as a collection of interconnected business relationships, where joint resource development within these relationships can lead to a competitive advantage (Eng, 2008: 569). Businesses within these networks often exchange resources and collaborate through various agreements to achieve specific goals, allowing members to gain credibility in the market, acquire knowledge, and overcome limitations (Vasilchenko, 2011: 99-100; Scheba & Turok, 2020). The success of migrant businesses is often attributed to their participation in business networks, as many migrants trading in South Africa are members of associations or networks (Jongbo, 2022; Mmako, 2017; Radipere, 2018).

In contrast, locals often trade in isolation, which is considered a major reason for their business failures (Mini, 2017; Phayane, 2013). Their isolation leads to a lack of a strong support structure, limited capital and resources, and difficulty negotiating prices with wholesalers and suppliers (Kuleto, Ilic, Rankovic, Popovic-Sevic & Gurgu, 2023; Phayane, 2013). Those who purchase stock in bulk as part of a group have bargaining power, allowing them to compete based on price, unlike those who buy stock individually and face higher costs (Scheba & Turok, 2020: 77-94; Verma, 2007: 22).

Participation in business networks is motivated by the ability to obtain information on opportunities, share experiences and ideas, and gain market access (Egunjobi, 2022; Anderson, 1994; Hakansson, 2002). This confirms the advantage of combining resources, sharing risks, accessing wholesalers easily, and negotiating with suppliers (Radipere, 2018: 248). Operating in isolation presents limitations and disadvantages that can undermine a business's success (Ajemunigbohun, 2023; Aldrich, 2007: 147-165), making the importance of networks undeniable. These networks are not only crucial for new businesses but also for established ventures seeking to solidify their positions (Aliyeva, 2023; du Plessis, Kroon & van der Merwe, 2012: 341). For refugees, these networks also provide a support base and an opportunity to connect with fellow countrymen. Through their networks, members can mobilize knowledge, resources, capital, and opportunities. Some even share customers to ensure mutual growth and optimal operations among members (Huseynov, 2023; du Plessis, Kroon & van der Merwe, 2012: 342).

Although unwritten, these networks operate effectively. Developing business networks facilitates innovation by providing additional resources, skills, and competencies (Merino, Lavissiere & Mandjak, 2018: 196). Many migrants become well integrated into their host countries, displaying a strong commitment to their homeland and families, which drives their hard work and success through well-structured and governed business networks (du Plessis, Kroon & van der Merwe, 2012: 339). With these factors in mind, it can be assumed that there is a positive correlation between participation in business networks and business performance.

Discussion of findings

Demographic Profile and Business Network Affiliation of Respondents

The following section presents the biographic and demographic information of the respondents. The collected data indicates that 69% of the respondents were male, while 31% were female. In terms of age, slightly over 55% of the respondents were classified as young individuals under 35 years old, while the remaining 44.9% consisted of individuals aged 36 years and above. Regarding their affiliation with business networks, nearly one-third (30.7%) of the respondents stated that they are members of business networks, while the majority (69.3%) reported that they do not belong to any business networks and consequently operate their businesses in isolation. Analysis of the collected data revealed that 54.8% of the survey participants were migrants from diverse countries, while 45.2% were South African business operators. These findings strongly point to the growing

supremacy of migrants in the informal (micro) enterprise sector, highlighting the challenges faced by local entrepreneurs in retaining market share. The existing literature supports this trend, as numerous authors as shown above have discussed the phenomenon. Notwithstanding the presence of various support measures aimed at easing local business growth and sustainability, migrants still continue to dominate the local business environment. The sample of the migrant business operators revealed that Ethiopians (22.4%) are more represented, followed by Bangladeshis (18.9%), Nigerians (16.8%), Somalians (13.3%) and the rest constituted 27.9%.

When surveyed on the benefits derived from being part of a business network, the findings revealed various findings that corroborate the above literature. Question 9_17 showed the lowest mean for questions in question 9, (mean=2.90, SD=1.28) and this showed that on average, respondents Agreed that *"Being part of a business network helped me with quick business registration"*. Question 9_5 recorded the highest mean (mean=3.86, SD=0.35) reflecting that on average, respondents Strongly Agreed that *"Being part of a business network helped me with getting business advice"*. This supported the notion that respondents realize the advantages and benefits of being part of business networks, furthermore, they indicated that these networks help them to grow their businesses. This proves that one can gain the advantage of combined resources, risks sharing, easy access to wholesalers, and bargaining power.

Perceptions about business networks

Based on the findings, business networks positively offer a significant opportunity for their members, by giving them a competitive advantage through, among other benefits, the facilitation of pooling of resources, funding, labour, and bulk purchasing of stock (Phayane, 2013). This aligns with the literature, which confirms the role played by networks in supporting the growth and sustainability of businesses.

The respondents Agreed with the statement Question 10_11 that says, *"My network has helped me to increase my profits,"* and this was shown by its highest mean score (mean=3.34, SD=0.91). However, the lowest mean score was found in Question 10_15 (mean=1.84, SD=1.09), suggesting a disagreement with the statement that says, *"Back home I trade the same way I trade in South Africa."*

These findings reveal that the respondents trade and cooperate with operators of the same nationality. It was also found that their business operations in their home countries are not the same as those of their businesses in South Africa.

Respondents' perceptions about business networks

Five factors were derived from this section of the questionnaire, and they are as discussed below:

- Factor 1 – Competitive Advantage *had high loadings for the following statements: "I believe that I could achieve success even without business networks," "My business network has provided me with a competitive edge over my competitors," "My business is linked to other businesses outside South Africa," "I intend to remain a member of the network for my entire life," "My network has provided mentorship and guidance," and "I have no desire to operate independently outside of my business network."*

This shows that respondents believe that their success can be attributed to their participation in business networks. This should also be seen as an indication of their reliance of these networks beyond the borders of South Africa, as per the facilitations given facilitated by business networks. The participants in these networks acknowledge that they have clear advantages over those trading in isolation. This is based on the support provided and the fact that they are able to bank on the resources of the networks.

- Factor 2 – Operations had high loadings for the following statements: *"My business networks include individuals from different nationalities," "I am a member of a network within my own country," "I have a business operating in my home country," and "I conduct my business in the same manner both in South Africa and in my home country."*

This suggests that most of the business networks have members from diverse countries, and this might be what gives them an advantage because they are able to bring their diversity to the networks. This might be one of the differentiating factors for their members and their businesses. One can assume that these networks sort of play a role even in their home countries by facilitating their arrival and establishment in South Africa. They are able to maintain a presence back home and this helps them to run their businesses in both countries. This helps them to use their experience back home to be successful in South Africa and to pull in their resources from both environments.

- Factor 3 – Relationships, showed high loadings for the following statements: *"I trust businesspeople who are not part of my network" and "My relationship with those outside my network is good."* This indicates that on average businesspeople place emphasis on the success of their businesses more than focusing solely on their network connections.

Respondents ensure that they actively involve themselves in the building of relationships with others who are also not part of their networks so that they are able to build more networks and extend their reach. This is also linked to their rapid growth that is often observed in most townships and rural areas in South Africa. The trend has also started gain strength in other urban areas including CBDs. The fact that they now build new relationships outside their nationalities and networks helps them to leverage on each other's networks and thus gaining more possibilities to access opportunities (Gunawan, & Iksari, 2025). This diversity gives them the advantage of getting different skills and resources.

Factor 4 - *Network position* demonstrated high loadings for these statements: "*I have decision-making power in my network*" and "*I am not exploited in my network.*" It can be concluded that the members of business networks are given opportunities to interact and engage with like-minded individuals and this enables them to make meaningful contributions in various platforms and networks. Their ability to participate in decision-making and to also share their ideas helps them freely be involved without necessarily feeling exploited by those who manage the networks. Being part of decision-making somewhat ensures that participants feel like part of the network and thus they can make contributions that will be beneficial to the whole network and not only themselves.

Factor 5 - *Network brokering* had high loadings for the following statements: "*I trade directly with wholesalers*" and "*My network has policies written down.*" This factor showed that participation in business networks enables the members to be able to participate in trading directly with wholesalers due to the group dynamics that require buying in bulk. Furthermore, trading directly with wholesalers gives the members the competitive advantage they need because they are able to get trade discounts which enables them to buy at lower prices and thus be able to sell their products cheaper than their competitors. This can also help them to be more profitable than their counterparts who buy stock as individuals. Their policies are often not written down but somehow, they manage to have some kind of guiding principles that are set and followed. They can secure a large market share wherever they trade and ultimately their competitors end up closing down. Their structures are often dependent on their flexibility, adaptability, and agility and this is something that their local counterparts are struggling to compete with. It is intriguing to observe how they can play different roles in the networks without necessarily causing chaos in the networks due to different ideas, suggestions, and decisions that need to be taken. It can be assumed that they stick to the vision of the

networks and that the management of those networks can somewhat exert some kind of control over them.

This study provided a balance between the literature and the findings from the data collected. The factors loaded strongly suggested and indicated that there is congruence with the literature and thus it can be concluded that the assumptions of the study have been confirmed. The respondents mostly indicated that they are part of the business networks in South Africa and that they see value in participating in these networks. It was interesting to see how respondents perceive their networks and the benefits gained from participating in them. It is worth noting that even though one cannot say networks are without flaws and faults, however, the members perceive value in being members. Amongst the most notable benefits provided by respondents, the following were given improved efficiency, competitive advantage, building relationships, creating and accessing opportunities, and also accessing markets. There was also mention of information and facilitation of logistics when starting and in continuance of running the business. Respondents indicated that this often helps them to build their businesses easily and to gain a bigger market share and build on their dominance.

In essence, all this firmly indicated that they end up having a competitive advantage over locals who often operate in isolation. It is therefore the conclusion of the researchers in this study that it is important to belong to a business network so that one can work with like-minded individuals. Members of business networks are given a good support structure and a cushion that they can often rely on in their quest to make their business a success. Business is always challenging due to its unpredictable nature and it's always easier to run it when one is surrounded by people who can give them the necessary support. South African business operators must learn to build their business networks and work together so that they can be able to get the support they need to be able to be competitive in business.

The significance of being part of a business network cannot be underestimated and thus it is the view of the researchers that the business operations of South African business operators can be improved if they join business networks. Respondents indicated that they would like to remain in their networks for life and that also necessitates the need to join networks because it means that they can be guaranteed that needed support system for life. Interestingly, this support from business networks is also made available in the members' countries of origin, this can mean that they also facilitate their arrival in South Africa and thus it becomes easy for them to settle down in South Africa once they arrive. Of importance would be for South African business operators to ensure that they learn the dynamics of

the business networks so that they can also derive maximum benefit from participating in such platforms.

STUDY'S MANAGERIAL IMPLICATIONS

The study confirms that business networks are important to small businesses and thus it is important for business operators to belong to business networks. This study firmly recommends that South African business operators must join business networks and actively participate in them so that they can get maximum benefit from them so that they can further enhance their business performance. Various governmental institutions can have interventions that seek to better support local small businesses to ensure that they can grow and be sustainable. This is an important measure as South Africa is facing an astronomical problem of unemployment, with devastating effects. It is also important to place more priority on the informal sector due to its flexibility because a lot of people end up finding themselves in that sector when formal employment cannot be secured. Continuous business training is of utmost importance to ensure that proper management of finances and the business itself can be enabled and this will lead to sustainable businesses.

The establishment of networks will help to ensure that mentorship platforms can be made available for small business operators and then platforms for access to markets can then be made available. Providing continuous business training can also be considered vital so that business operators can easily be able to identify and access opportunities and be able to grow their sales and turnover. Business networks will thus aid to ensure that the above is made possible and thus proper support systems can be made available to the participating business operators. This will help to enable business operators to be able to speak in one voice/ unity when they engage the government and then this in turn helps government to be able to provide the relevant needed support. All the above will help to give local business owners the needed support and thus give them the possibility of gaining a competitive advantage over their competitors.

Conclusions and recommendations

In light of the study's objective, the researchers affirm the importance of establishing and belonging to business networks to ensure sustainability. This has been seen throughout the study, both from the literature and the data collected. The findings revealed how business operators can easily gain a competitive advantage due to their participation in business networks. It is further confirmed that business

operators can leverage on each other's' strengths and resources when they work together in business networks. It is strongly recommended that South African business operators should join business networks or ensure that they establish them if none are available in their surroundings.

It is worth noting that the researchers in this study support the participation in business networks, however, they do not in any way intend to suggest that business networks are the only reason that businesses run by foreign business operators succeed. It is merely to say they provide a good platform to gain a competitive advantage. Various other factors can be provided for the distinction between foreign and South African business operators. It must also be taken into consideration that for this study, the perceptions of the business operators not thoroughly studied since this is a quantitative study, and thus those perspectives were not fully interrogated. A richer study could be provided through interviews or similar studies to ensure that respondents are given the opportunities to fully express themselves. This will help to generate more fuller data and provide a clearer picture of the subject matter.

It would also be more insightful to conduct a comparative study to compare the business operations and performance of both members and non-members of business networks. This will help to show how business networks can have an impact on business performance and its sustainability. Government needs to work together with institutions of higher learning and interested stakeholders to ensure that business operators can be given business training so that they can do better management of their finances, market better, and run their business better. There is also a need for policies to be promulgated to ensure that all businesses in South Africa should have some share of South African ownership. This will translate into skills transfer and help locals to also learn from their counterparts. It is imperative to ensure a platform that promotes collaboration between foreign nationals and South African business operators. Once this is achieved, information, skills, resources, and methods can be shared. the above can aid the government in building more businesspeople who are sustainable, add more businesses, reduce unemployment, and eradicate poverty levels in South Africa, and thus this can bolster economic growth.

Conflict of interest

None

List of abbreviations

Small, Medium and Micro Enterprises (SMME)

Small and medium enterprises (SMEs)

Statistical Package for the Social Sciences (SPSS)

Statistics South Africa (STATSSA)

Ethics approval and consent to participate

Not Applicable

Availability of data and materials

Data will only be shared upon request.

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PUBLIC DEBT AND ECONOMIC PERFORMANCE: A VECM ANALYSIS

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Abstract

Public debt is a prominent policy tool for governments worldwide used to finance public expenditure and stimulate economic growth. However, the relationship between public debt and economic growth is complex and has generated a lot of debate. This study examines the relationship between public debt and economic growth in Nigeria. Time series data spanning from 1981-2022 were gathered from CBN Statistical bulletin. Unit root test was carried out to determine the stationarity of the data set. All the data were integrated at 1st difference I(1). The data was subjected to Johansen Co-integration test and it was established that the data set were co-integrated. The VECM model was used to estimate the relationship among the variables. Findings indicate that domestic debt had significant but negative long run relationship with real gross domestic product. External debt was positively related with RGDP though not significant. Debt servicing had a negative but non-significant relationship with real gross domestic product. The study amongst other things recommended that borrowing should be aligned with productive investments that can generate economic returns such as infrastructure, education and healthcare rather than being used for recurrent expenditures. Also it is important that debt servicing is sustained at manageable levels thereby optimizing debt repayment structure to minimize fiscal stress and strengthening institutional and governance frameworks.

Keywords: *Debt servicing, Domestic debt, External debt, Fiscal Policy, Co-integration, Unit Root*

JEL Classification: H6, O4, E6

Introduction

Public debt, often referred to as government debt or national debt, is a critical financial tool used by countries worldwide to finance economic activities, infrastructure projects, and social programs. Oladipo *et al.* (2020) avers that the necessity for external borrowing emerged when limited public funds hindered the ability to finance national development projects, as capital accumulation enhances productivity, ultimately driving economic growth. While excessive debt can pose economic risks, moderate and well-managed public debt is essential for national development, economic stability, and growth. Public debt plays a pivotal role in shaping a nation's economic trajectory, serving as a tool for financing development projects and addressing budget deficits. In Nigeria, the dynamics of public debt have been a subject of extensive analysis, especially concerning their impact on economic performance. Historically, Nigeria's debt profile has experienced significant fluctuations, with notable increases in the 1980s and early 2000s, leading to various economic challenges which has profoundly influenced the nation's economic landscape. For instance, in 1987, the country's total debt rose by 96.9%, reaching N137.58 billion, and by 2004, it escalated to N6,188.03 million (Essien, *et al.*, 2016). Public debt is a critical instrument for governments to finance development projects and manage budget deficits. The debt accumulation in the 1980s and early 2000s therefore needed comprehensive policy responses.

Public debt proliferation suffered by numerous developing countries has attracted global attention; this experience which is occasioned by the fall in oil prices, exchange rate volatility, increasing financing costs etc. have negatively affected the economies of developing economies around the world, especially the Nigerian economy (Favour, Ideniyi, Oge and Charity, 2017). Debt or loans have been described as an important fiscal policy tool available to the government to finance national development and ultimately increase productivity and enhance economic growth. (Muhammad, Ruhaini, Nathan, & Arshad, 2017).

The relationship between public debt and economic growth is complex and multifaceted especially in a developing country like Nigeria. While some studies

suggest that external debt can positively influence economic growth, others highlight the potential adverse effects of domestic debt on the economy. For example, recent research indicates that external debt positively impacts economic growth, whereas domestic debt may retard growth asymmetrically in the short term and linearly over the long term (Oladotun and Olanipekun, 2024).

Nigeria's debt profile is made up of both external and domestic debt. Domestic debt is contracted in Nigeria, usually through bonds and government bonds while external debts also known as foreign debt are typically owed to foreign creditors. These are multilateral agencies such as the Africa Development Bank, the World Bank, or the Islamic Development Bank, and bilateral agencies such as the China Exim Bank, the French Development Bank, or the Japanese Aid Agency. Borrowing by countries is occasioned by inability to raise enough revenue from local sources for the administration of government business as observed by (Essien et al, 2016) which is meant to accelerate economic growth and development of a country. Chinanuife, Eze, and Nwodo (2018), avers that the practice of borrowing is not bad, if borrowed fund is used judiciously. However, the Nigerian situation have been marred with corrupt practices leading to overwhelming debt overhang almost choking the nation.

In recent years, Nigeria has undertaken significant economic reforms to address its debt challenges and stimulate growth. Key measures include unifying exchange rates to prevent losses from oil proceeds and cutting regressive petrol subsidies to fortify public finances and stabilize the naira. These reforms aim to create a more sustainable economic environment, reduce reliance on debt, and enhance overall economic performance. This study aims to critically examine the intricate relationship between public debt and economic performance in Nigeria. By analyzing recent data and evaluating the outcomes of implemented economic reforms, the research seeks to provide insights into how public debt influences economic growth and development in the Nigerian context. In examining this relationship the study is premised on the broad objective to assess the effect of government debt on the economic growth in Nigeria with specific objective including to: examine how domestic debt impact on the Economic Growth in Nigeria., (2) determine the impact of external debt on the Economic growth in Nigeria and to ascertain the effect of debt servicing on the economic growth in Nigeria.

Literature Review

Public debt, defined as the total amount of money that a government owes to external creditors, has been a focal point of economic discourse, especially in the aftermath of global financial crises and the COVID-19 pandemic. The relationship between public debt and economic growth is complex and multifaceted, with varying implications depending on a country's economic status, debt levels, and external economic conditions. Public debt is an important instrument for governments to fund public spending, particularly when it is difficult to raise taxes and reduce public expenditure.

Economic theories present divergent views on how public debt influences growth. Some argue that moderate levels of public debt can stimulate economic activity by financing infrastructure, education, and other public goods that enhance productivity. Conversely, excessive debt may lead to higher interest rates, crowding out private investment, and potentially triggering fiscal crises. Misztal (2021) noted that public debt does not have to be detrimental to the economy. It was noted that an increase in public debt could either increase or decrease prosperity depending on the situation. The seminal work by Reinhart and Rogoff (2010) suggested that when a country's gross external debt exceeds 90% of its GDP, economic growth rates tend to decline significantly. However, subsequent critiques have questioned the universality of this threshold, emphasizing the need for context-specific analyses.

Recent empirical studies offer different insights into the debt-growth nexus. Kikuchi and Tobe (2021) analyzed data from 50 countries between 1997 and 2015, finding a positive correlation between foreign debt and GDP growth. Their study indicates that foreign debt can enhance investment and subsequent economic growth, particularly in OECD countries. Similarly, a study focusing on the G7 nations highlighted that the impact of public debt on economic growth varies across different income levels, necessitating tailored policy approaches (Kikuchi & Tobe, 2021).

The heterogeneity in findings underscores the importance of context-specific policy formulations. For lower-middle-income countries, public debt can serve as a tool to spur economic growth, provided it is managed prudently and invested in growth-enhancing sectors. In contrast, advanced economies with high debt levels might need to focus on fiscal consolidation to prevent potential negative effects on growth. Moreover, the global economic landscape, including factors like interest rates and investor confidence, plays a crucial role in determining the sustainability of public debt.

The relationship between public debt and economic growth is not linear and is influenced by a myriad of factors, including a country's economic structure, debt composition, and external economic environment. Policymakers must carefully assess their unique circumstances when formulating debt-related strategies, ensuring that borrowed funds are utilized effectively to promote sustainable economic growth.

Empirical Review

The link between public debt (control) and economic growth is one of the macro-economic issues that has been intensely debated by economists due to its economic and social implications, as well as its complexity. There have been several empirical studies conducted on the effects of public debt on economic growth around the world including Nigeria. The following is an overview of some of the relevant empirical reviews both from developed and emerging economies

Otieno (2024) utilized a novel spatial econometrics methodology to examine the spill-over effects of foreign public debt and foreign direct investment (FDI) on the economic growth dynamics of Eastern Africa. Specifically, the Spatial Durbin Fixed Effect (SDM-FE) Model was employed, utilizing balanced panel data sourced from the World Development Indicators (WDI) covering the years 1992 to 2019. The study enhances the existing literature by incorporating a spatial weight matrix and exploring its interactions with economic growth alongside various macro-regional factors, thereby revealing the existence of spatial spill-over effects and the significance of geographical proximity among countries in the region. The findings demonstrate that foreign public debt, FDI, gross fixed capital formation, human capital development, inflation, and government expenditure exert significant spatial spill-over effects on regional economic growth. Furthermore, the results highlight the phenomenon of regional growth divergence and provide compelling evidence of considerable regional spatial dependence in economic growth. These findings indicate that foreign public debt adversely affects economic growth, aligning with the debt overhang theory and the crowding-out hypothesis.

Onofreil *et al.* (2022) examined the short- and long-term effects of public debt on economic growth in EU countries, using data that covers a period of 25 years (1995–2019). For public debt was proxy as general government gross debt (as a percentage of GDP), while for economic growth, the real GDP per capita growth rate was used. The models included a set of control variables to highlight the impact of other determinants on economic growth. Several econometric methodologies related to ARDL (autoregressive distributed lag models), such as

the pooled mean group (PMG), the mean group (MG), and the dynamic fixed effects (DFE) models were utilized in the study. The results of the study show that in both the short and long term, an increase in public debt is negatively and significantly associated with economic growth. Specifically, in both the short- and long-term analyses, the estimated coefficients of public debt were statistically significant and negative, while the magnitude of the negative impact on economic growth differed. They advised for both the rigorous monitoring of the level of public debt and the control of public allocation to support economic growth to be of major importance.

Liu and Lyu (2021) found out that there is a non-linear relationship between public debt and economic growth, both in developing and emerging countries, and in developed countries. However, the debt threshold differs from one country to another, depending mainly on the current account balance, gross savings, crisis, and the degree to which the economy is opened. In the same wise Chudik et al. (2017) showed that the impact of public debt on economic growth differs from country to country depending on country-specific factors, such as the degree of their financial deepening, the history of past debt settlement, and the nature of their political system

Siong *et al.* (2021) using a dynamic panel threshold technique, provided new evidence on the threshold value of the ratio of public debt to the gross domestic product in seventy-one developing countries from 1984 to 2015. Debt has a negative and statistically significant impact on economic growth at a high level of public debt but an insignificant effect at a low level of public debt. The findings also reveal that better institutions tend to minimize the negative impact of public debt on economic growth. For further robustness checks, different estimations, without outlier sample countries, and panel quantile regression were used and the findings are unaltered.

Onyewife *et al.* (2023) assessed the effect of public debt on economic growth in Nigeria from a two pronged approach. Disaggregating debt into bank sourced debt and non-bank sourced debt. They appraised the implication of public debt on growth in the tradable sector and in the non-tradable sector for the period of 1981-2021. The study concluded that different elements of public debt have varying impacts on the growth of the tradable sector. External debt and debt obtained from non-bank sources positively drive the growth of the tradable sector. However, debt acquired from banks and the associated servicing costs hurt the growth of the tradable sector. Furthermore, the different components of public debt have varying impacts on the growth of the non-tradable sector. Specifically, foreign debt and

debt obtained from non-bank sources have a significant positive influence on the growth of the non-tradable sector. The influence of debt acquired from banks on the non-tradable sector is positive but insignificant. However, similar to the tradable sector, the servicing of debt undermines the growth of the non-tradable sector

Obadiaru and Onovughe (2022) examine the relationship between public debt and economic growth in Nigeria. The model was estimated using the ARDL (Autoregressive Distributed Lag) method. The sample size was 30 years, covering the years 1990-2020. Their research showed that public debt has a short-term negative effect on economic growth, but the long-term relationship was found to be insignificant.

John, Fedir, Maxim, Banchuk-Petrosova and Olena (2022) concluded that government consider more domestic borrowing than foreign borrowing, which is used only when necessary when they examined the short and long term effects of public debt on economic growth in Nigeria. The model was estimated for longitudinal study co-integration using autoregressive distributed lag constraints. The data was collected from the Central Bank of Nigeria Statistical Bulletin and Annual Reports and covered the years 1991-2020. The findings reveals that all explanatory variables were statistically significant. In particular, economic growth is significant and responds negatively to changes in external debt by 0.19 percent and in debt service by 0.07 percent, in contrast to positive responses to changes in domestic debt and by 0.18 percent to changes in exchange rates.

Adegbie, Otitolaiye, Aguguom and Ajayi (2022) suggested that appropriate measures should be put in place to ensure that the borrowed funds are optimally invested in productive projects in Nigeria. This assertion was arrived at from their study on the relationship between public debt management and economic growth in Nigeria. A retrospective study design was used for time series data on relevant macroeconomic variables. They found that public debt service (RGDP) had a significant positive impact on economic growth in Nigeria.

Sani and Sunday (2021) examined the impact of public debt on economic growth in Nigeria. Their review revealed that borrowing has negatively affected the growth of the Nigerian economy. Diversifying the country's economy from oil to non-oil sectors, creating an enabling environment for businesses to thrive and curbing the menace of financial outflows and corruption are some of the recommendations of the study to curb the growth of Nigeria's public debt.

Nwakanma and Iwuji (2021) used dynamic analysis to examine the relationship between public debt and economic growth in Nigeria between 1981 and 2019.

Their research showed that public debt has a negative impact on economic growth. Their study found that high levels of public debt could hamper Nigeria's economic growth.

Adegbite, Adeleke and Olowolaju (2021) found a positive relationship between public debt and economic growth in Nigeria using a VAR model to analyze data from 1981 to 2019. They argued that public debt could promote economic growth through investment in infrastructure and social services. Onyele and Nwadike (2021) examine the impact of government debt on economic stability in Nigeria. The study covered the period 1981-2019 and annual data was obtained from World Development Indicators and Central Bank of Nigeria Statistical Bulletin, 2019. The analysis used an ARDL (Autoregressive Distributed Lag) model because the variables are stationary at both levels and first difference. . The ARDL estimation shows that the explanatory variables together have a long-run decreasing effect on economic stability, and that income adequacy has a negative and significant effect. In the short run, all components of the debt burden, except the debt surplus, have a negative and significant impact on the stability of the economy. In such a situation, the exchange rate has a positive and significant effect on the stability of the economy in the long term.

Iteh and Oyeonu (2021) avers that policy makers should adhere to the proper use of debt by making effective investments to promote economic growth and avoid excessive accumulation of debt after examining the impact of external debt on economic growth in Nigeria from 1985 to 2018 using a vector autoregression (VAR) approach. Empirical results showed that both external debt balance and external debt management had a negative and significant impact on economic growth. These results led to the fact that when the external debt balance changed by one unit, economic growth slowed down by 0.495 units. In contrast, if the external debt service changed by one unit, economic growth slowed down by 0.017 units.

Opara, Nzotta and Kanu (2021) observed that government should be careful with its domestic borrowing policy as debt servicing always becomes a burden on the sustainability of economic gains and also tends to crowd out private sector investment in Nigeria. This was the conclusion after examining the impact of Nigeria's national debt on Nigeria's economic development between 1981 and 2018. The used ordinary least square regression to determine the statistical relationship between Nigeria's public debt profile and human development index and private sector investment. The result of the first model study showed that internal debt management and the internal debt of state governments are

significantly related to economic development. On the other hand, federal domestic debt and state domestic debt are significantly related to private sector investment. Ezenwobi and Anisiobi (2021) investigated the impact of government borrowing on economic development in Nigeria. The study covered the period 1990 to 2020, with annual data obtained secondarily from the database of World Development Indicators (2020) and the CBN Statistical Bulletin, analyzed using multiple regression models with Augmented Dickey-Fuller (ADF) unit root test, Johansen. co-integration and an error correction mechanism (ECM). The study used external debt (EXD), domestic debt (DOD), interest rate (INTR) and inflation (INF) as independent variables, while human development index (HDI) was used as dependent variable and development descriptive variable. The result showed a positive statistically significant relationship between external debt and the economic development of Nigeria, while interest rates have a negative statistically significant relationship with the economic development of Nigeria. The report recommended that the government direct loan funds to economic sectors/regions that stimulate economic growth, such as education, health, industry and transport.

Chukwuemeka and Samuel (2021) examine the impact of public debt on economic growth in Nigeria. Annual data series for the variables used in the study were obtained from the Central Bank of Nigeria for the years 1981–2019. The unit root test was performed using Augmented Dickey-Fuller test and Phillips-Perron test techniques, and the results showed that the variables were stationary, although at different levels. The co-integration test was also performed using Johansen's co-integration method and the result showed that the variables in the model were co-integrated, that is, the variables have a long-term relationship. The error correction mechanism showed that the coefficient of multiple determination (R^2) was 0.890,783 in the over parametric model, while it was 0.846548 in the parsimonious model. The short-run regression result showed that external debt has a negative and insignificant effect on economic growth in Nigeria. The short-term result also showed that domestic debt has a positive and significant effect on Nigeria's economic growth, while loans to the private sector have a negative and insignificant effect on Nigeria's economic growth. The result of the long-term dynamic analysis showed that external debt has a negative and insignificant effect on Nigeria's economic growth, while domestic debt has a positive and significant effect on Nigeria's economic growth. Long-run dynamic analysis also showed that credit to the private sector has a positive and significant impact on economic growth in Nigeria. The report recommended that the government reduce the amount of foreign borrowing it needs to finance its operations. Domestic debt

should be properly managed by channelling it into activities that stimulate economic growth.

Methodology

Data for this study was obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and Debt Management Office Website. The data was considered adequate and relevant for the study because the Central Bank of Nigeria (CBN), which collected the data, is the apex banking institution in Nigeria with regulatory and supervisory powers. The country's financial institutions submit an annual report on their activities to the CBN. Researchers can access these reports and other information on the CBN website or by contacting CBN directly. Using this CBN data, researchers can obtain high quality and reliable data on the Nigerian economy that can help identify the impact of public debt on Nigeria's economic growth.

Model Specification

To attain the objectives of this study, the following functional models were formulated:

$$EG=f(\text{Government debt})$$

$$RGDP=b_0+b_1ED_t+\mu_t$$

$$RGDP=b_0+b_1DD+\mu_t$$

$$RGDP=b_0+b_1DS_t+\mu_t$$

Where,

ED = External debt

DD = Domestic debt

DS = Debt servicing

EG = Economic growth

RGDP = RGDP growth rate

μ = error term

b_0, b_1, b_2 = parameters of the variables

Data Analysis Technique

Data were analyzed using descriptive statistics and inferential statistics. The descriptive statistics summarized data using measures such as mean, median, mode, standard deviation, and range in a meaningful way. Conclusions were drawn on the population based on the sample size testing hypotheses and with regression analysis. Some other pre-estimation test were conducted such as Unit Root Test

used to determine whether the time series data was stationary or not. If the data were not stationary, they were transformed before applying other statistical methods. The result of the unit root test showed that all variables were stationary at the first difference, so we had to perform a co-integration test to determine the long-run relationship between the variables of interest.

Results and Discussion

Descriptive Statistics

The descriptive statistics for both the dependent and independent variables are presented in table 1.

Table 4.1: Descriptive Statistics table

	LOGRGDP	LOGRCEXP	LOGEXD	LOGDMD	LOGCEXP	DS__GNI
Mean	4.520136	2.507452	2.803188	2.865178	0.400766	2.648780
Median	4.430322	2.762904	2.812120	3.007310	0.421604	2.000000
Maximum	4.865594	3.909644	4.200173	4.284263	0.958086	6.500000
Minimum	4.209823	0.676694	0.367580	1.048931	-0.193820	0.100000
Std. Dev.	0.232011	1.071495	0.904044	0.977108	0.277797	2.085800
Skewness	0.266564	-0.378365	-0.859062	-0.312032	-0.210171	0.480223
Kurtosis	1.496489	1.740256	3.308167	1.894439	2.192075	1.830120
Jarque-Bera	4.347315	3.689307	5.205151	2.753355	1.416943	3.913919
Probability	0.113761	0.158080	0.074083	0.252416	0.492396	0.141287
Sum	185.3256	102.8055	114.9307	117.4723	16.43142	108.6000
Sum Sq. Dev.	2.153155	45.92409	32.69184	38.18963	3.086846	174.0224
Observations	41	41	41	41	41	41

Source: Authors output from E-views 10

The result in table 1 is the descriptive or summary statistics of both the dependent and the independent variables in their logged values employed in the study (RGDP, DMD, EXD, RCEXP, CEXP and DS). The summary statistics were used to compare the measures of central tendency, the measures of dispersion and the measure normality of the data set. The central tendency measure compares the mean and the median values of the data set. From the results we observe that the

mean values of RGDP, RCEXP, DMD, EXD, CEXP and DS were 4.520136, 2.507452 2.865178, 2.803188, 0.400766, 2.648780 respectively. The measure of dispersion which measures how widely spread the dataset was from the mean value is indicated by the minimum, maximum, and standard deviation values. Their values are as shown in table 4.1. The test for normality measures whether the data set is normally distributed or otherwise. These measures include the values of skewness and kurtosis. The skewness measures the degree of asymmetry of the data set whether they are normally skewed, positively skewed or negatively skewed and can affect the centre of the distribution while kurtosis can affect the distribution's tails. The rule of thumb argues that skewness value that lies between (-1, 1) and (-2, 2) for kurtosis is an acceptable range for a normally distributed data set. From the table we observe that the data set indicates a normally distributed data set and there are no possible outliers in the study. The Jarque-Bera statistics alongside the revealed p-values confirms the normality of the data set. We observed that the p-values of JB statistics are all not significant (0.113761, 0.074083, 0.252416, and 0.141287) indicating a normal distribution of the data employed in the study.

Stationarity/ Unit Root Test

To avoid running a spurious regression, unit root test is carried out to ensure that the variables employed in this study are mean reverting i.e stationary. To this end the Augmented Dickey Fuller (ADF) test is employed to establish the stationarity of the data. The result is presented in table 2

Table 2: Unit Root test

Variable	Augmented Dickey Fuller (ADF)		Order of Integration
	T-Statistics	P-value	
RGDP	-4.003609	0.0035	1(1) 1 st difference
DMD	-4.699981	0.0005	1(1) 1 st difference
EXD	-4.863682	0.0003	1(1) 1 st difference
RCEXP	-11.62989	0.0000	1(1) 1 st difference
CEXP	-7.797534	0.0000	1(1) 1 st difference
GN_I	-6.137392	0.0000	1(1) 1 st difference

Source: Researcher's output from E-views 10

The result shown in table 2 reveals the individual stationarity of the variables. The ADF unit root test result can be interpreted using the t-statistic or the p-value. A variable is stationary if the ADF t-statistic in absolute term is greater than the ADF 5%critical value or the p-value is less than or equal to 0.05 level of significance. Table 2 indicates that all the variables (RGDP, DMD, EXD, and DS) are all stationary at first difference. We will therefore estimate the long run relationship subsisting among the variables using the Johansen Co-integration

Co-integration Test

Table 3: Table for Johansen Co-integration Test

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.466924	59.00766	47.85613	0.0032
At most 1 *	0.385337	35.10221	29.79707	0.0111
At most 2 *	0.245539	16.60830	15.49471	0.0339
At most 3 *	0.143849	5.901729	3.841466	0.0151

Trace test indicates 4 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The presence of co-integration can also be interpreted as the presence of a long-run equilibrium relationship between the variables in question that is the RGDP and domestic debt. Co-integration focuses on whether the long-term linear relationship between two or more time series is stationary even if this linear relationship does not exist or is not strong for the short term. Table 3 shows that variables in model 1 are co-integrated and thus have a long run relationship. The long run existence is confirmed by the p-value of the trace statistic all of which are less than 0.05. We therefore reject the null hypothesis where the trace or Max-

Eigen statistic is higher than the 0.05 critical value. The null hypothesis of no co-integration is rejected and it is concluded that a long-run relationship exist among the variables.

Table 4: Table for Johansen Co-integration Test (Model 2)

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.470102	59.57657	47.85613	0.0027
At most 1 *	0.407741	35.44387	29.79707	0.0100
At most 2 *	0.262733	15.53904	15.49471	0.0492
At most 3 *	0.098880	3.956449	3.841466	0.0467

Trace test indicates 4 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 4 shows that variables in model 2 are co-integrated and thus have a long run relationship. The long run existence is confirmed by the p-value of the trace statistic all of which are less than 0.05. We therefore reject the null hypothesis where the trace or Max-Eigen statistic is higher than the 0.05 critical value. The null hypothesis of no co-integration is rejected and it is concluded that a long-run relationship exist between external debt and Real gross domestic product.

Table 5 Johansen Co-integration Test for Model 3

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.449681	57.29445	47.85613	0.0051
At most 1 *	0.354156	34.59866	29.79707	0.0130
At most 2 *	0.292333	17.98514	15.49471	0.0206
At most 3 *	0.119717	4.845452	3.841466	0.0277

Trace test indicates 4 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 5 shows that variables in model 3 are co-integrated and thus have a long run relationship. The long run existence is confirmed by the p-value of the trace statistic all of which are less than 0.05. We therefore reject the null hypothesis where the trace or Max-Eigen statistic is higher than the 0.05 critical value. The null hypothesis of no co-integration is rejected and it is concluded that a long-run relationship exist among the variables in model 3.

Having established the long-run relationship subsisting among the variables in the three models, it is pertinent to estimate the Vector Error Correction Model of the models in the study. Estimating this model will enable us analyse the long-run equilibrium relationships among variables and short-run deviations from that

equilibrium. Moreover the adjustment coefficients show us how the short-run deviations or disequilibrium are corrected.

Regression Estimates of Model Summary

Model 1: Testing for the effect of domestic debt on the economic growth of Nigeria

Table 6: Short Run Equation (Error Correction Result)

Variable	Coefficient	T-statistic	P-value
CointEq1	-0.071692	-1.07479	0.0344
D(logRGDP(-1))	0.431837	3.21732	0.0016
D(logDMD(-1))	-0.065205	-1.33352	0.1847
D(logCEXP(-1))	0.013065	0.54053	0.5897
D(logRCEXP(-1))	0.010524	0.59540	0.5526
C	0.013886	2.59061	0.0107

Table 6 is the result of the short-run equation of model 1. We observe that the CointEq1 coefficient shows a negative position of -0.071692 at a p-value of 0.0344 which is rightly signed. We therefore state that the previous periods deviation from the long-run equilibrium is corrected in the current period at a speed of 7.1%. This indicates that there is a short-run relationship among the variables. Also for DMD coefficient, a unit change in DMD is associated with 0.065205 decrease in RGDP in the short run.

Table 7: Co-integrating Equation (Long-run Equation Model 1)

Variable	Coefficient	T-stat
LogRGDP (-1)	1.00000	
LogDMD (-1)	-0.170735	-3.23348
LogCEXP (-)	0.376137	10.8294
LogRCEXP (-1)	-0.001206	-0.02459
C	-4.174853	
R ²	0.347883	
Adj. R ²	0.249077	
F-stat	3.520879	
D.W	2.144598	

Source: Researcher's output from E-views 10

Table 7 show the Co-integrating equation result. In other words it indicate the long-run position of the relationship subsisting among the variables in the study. From the table it is observed that Log DMD reveals a negative long-run association with LogRGDP at (-0.170735) with a t-stat of 3.23348 significant at 5% level of significance. The control variables of LogCEXP and LogRCEXP indicate a positive and negative association respectively with only LogCEXP being significant. The null hypothesis is thus rejected and the alternative sustained. Therefore domestic debt has significant effect on Real Gross domestic Product in Nigeria. The Cointegrating equation is thus stated:

Model 2: Testing for the effect of External debt on the economic growth of Nigeria

Table 8: Short Run Equation (Error Correction Result)

Variable	Coefficient	T-statistic	P-value
CointEq1	-0.265487	-3.43300	0.0008
D(logRGDP(-1))	0.306971	2.32676	0.0215
D(logEXD(-1))	0.008011	0.55828	0.5776
D(logCEXP(-1))	0.046647	2.16930	0.0319
D(logRCEXP(-1))	-0.015275	0.01843	0.4086
C	0.0123212	3.40608	0.0009

Source: Researcher's output from E-views 10 (see Appendix)

Table 8 is the result of the short-run equation of model 2. It is observed that the CointEq1 coefficient is negatively signed with at a value of -0.265487 and p-value of 0.0008 which is rightly signed. We therefore state that the previous period's deviation from the long-run equilibrium is corrected in the current period at a speed of 26.5%. This indicates that there is a short-run relationship among the variables. For EXD coefficient, a unit change in EXD is associated with 0.008011 increases in RGDP in the short run.

Table 9 Co-integrating Equation (Long-run Equation Model 2)

Variable	Coefficient	T-stat
LogRGDP (-1)	1.00000	
LogEXD (-1)	0.028666	1.76884
LogCEXP (-)	0.296531	8.07291
LogRCEXP (-1)	-0.190649	-11.7931
C	-4.237718	
R ²	0.463457	
Adj. R ²	0.382152	
F-stat	5.700968	
D.W	2.175460	

Source: Researcher's Analysis from E-views

Table 4.8 show the Co-integrating equation result of model 2. In other words it indicates the long-run position of the relationship subsisting among the variables in the study. From the table it is observed that Log EXD reveals a positive long-run association with Log RGDP at (0.028666) with a t-stat of 1.76884 significant at 5% level of significance. The control variables of Log CEXP and Log RCEXP indicate a positive and negative association respectively with only and significant. The null hypothesis is thus rejected and the alternative sustained. Therefore external debt has significant effect on Real Gross domestic Product in Nigeria. The Co-integrating equation is thus stated:

$$\begin{aligned}
 D(\text{LOGRGDP}) = & C(1) * (\text{LOGRGDP}(-1) + 0.028666 + * \text{LOGEXD}(-1) - \\
 & 0.190649 * \text{LOGRCEXP}(-1) + \\
 & \text{LOGRCEXP}(-1) + 0.296531 \text{LOGCEXP}(-1) - 4.237718 + C(2) * D(\text{LOGRCEXP}(-1) + \\
 & C(3) * D(\text{logexd}(-1) + C(4) * D(\text{LOGRCEXP}(-1) + C(5) * D(\text{LOGCEXP}(-1)) + C(6)
 \end{aligned}$$

Model 3: Testing for the effect of Debt Servicing on the Economic performance of Nigeria

Table 10: Short Run Equation (Error Correction Result)

Variable	Coefficient	T-statistic	P-value
CointEq1	-0.197222	-3.08245	0.00025
D(logRGDP(-1))	0.315758	2.35940	0.0198
D(logDS_GNI(-1))	0.001131	0.57567	0.5658
D(logCEXP(-1))	0.039501	1.81920	0.0711
D(logRCEXP(-1))	-0.007047	-0.40756	0.6843
C	0.012161	3.40091	0.0009

Source: Researcher's output from E-views 10

Table 10 is the result of the short-run equation of model 3. It is observed that the CointEq1 coefficient is negatively signed with at a value of -0.197222 and p-value of 0.00025 which is rightly signed. We therefore state that the previous period's deviation from the long-run equilibrium is corrected in the current period at a speed of 19.7%. This indicates that there is a short-run relationship among the variables. For DS coefficient, a unit change in DS_GNI is associated with 0.001131 increase in RGDP in the short run. Also a unit change in CEXP is associated with a unit increase in RGDP. While a unit change in RCEXP is associated with a unit decrease in RGDP.

Table 11 Co-integrating Equation (Long-run Equation Model 3)

Variable	Coefficient	T-stat
LogRGDP (-1)	1.00000	
LogDS_GNI(-1)	-0.001191	-0.18793
LogCEXP (-1)	0.346045	7.52841
LogRCEXP (-1)	-0.166388	-11.9944
C	-4.234451	
R ²	0.420337	
Adj. R ²	0.332509	
F-stat	4.785917	
D.W	2.159525	

Source: Researcher's Output from E-views 10

Table 11 show the Co-integrating equation result of model 3. In other words it indicates the long-run association that exist among the variables of the study. From the table it is observed that Log DS_GNI reveals a negative long-run association with Log RGDP at (-0.001191) with a t-stat of -0.18793 significant at 5% level of significance. The control variables of Log CEXP and Log RCEXP indicate a positive and negative association respectively and significant. The null hypothesis is thus rejected and the alternative sustained. Therefore debt servicing has significant effect on Real Gross domestic Product in Nigeria. The Co-integrating equation is thus stated:

$$D(\text{LOGRGDP}) = C(1) * (\text{LOGRGDP}(-1) + 0.001191 * \text{DS_GNI}(-1) + 0.346045 * \text{LOGCEXP}(-1) - 0.166388 * \text{LOGRCEXP}(-1) - 4.234451 + C(2) * D(\text{LOGRGDP}(-1) + C(3) * D(\text{DS_GNI}(-1) + C(4) * D(\text{LOGCEXP}(-1) + C(5) * D(\text{LOGRCEXP}(-1)) + C(6)$$

Discussions and Policy Implications

Impact of domestic debt on Economic Growth.

The findings from hypothesis one revealed that domestic debt has negative and significant impact on economic growth of Nigeria. The result indicates also a long-run and short-run relationship exist among the variables (Domestic debt and

economic growth) of which the short run deviations in the previous period are corrected in the current period at a speed of 7.1%.

The finding is consistent with that of Opara *et al* (2021) and Ajayi & Edewusi (2021) who established significant long run and short run relationship among domestic debt and economic growth in Nigeria. This outcome points to the fact that increasing domestic debt consistently hampers economic performance. Invariably borrowing does not translate to productive economic activities. This calls for prudent debt management, limit to excessive borrowings and focus on maintaining a sustainable debt-to GDP ratio. Also borrowing should be aligned with productive investments that can generate economic returns such as infrastructure, education and healthcare rather than being used for recurrent expenditures. Policy makers must adopt a comprehensive fiscal reform strategy, reduce reliance in debt and enhance expenditure efficiency and promote economic diversification to create a more sustainable economic environment with minimal debt related risks.

Impact of External Debt on the Economic Growth

From hypothesis two findings reveal that external debt exerts a positive and significant impact on economic growth. This result is contrary to the findings of Iteh and Oyeau (2021) who established a negative and significant relationship between external debt and economic growth in Nigeria using a VAR model. Findings in hypothesis two also established long and short run relationship among the variables but significant at 10% level of significance. This outcome suggest that borrowing from foreign sources contributes meaningfully to economic performance in Nigeria. It is therefore imperative that external debt is sustainably managed. Also borrowings should be targeted towards productive investments, while prioritizing investment in sectors with high growth potential and ensuring that external debt remains beneficial. While external debt may currently boost growth, excessive borrowing could lead to future debt sustainability issues.

Impact of Debt servicing on the Economic Growth

From hypothesis three, findings reveal that debt servicing exerts a negative and insignificant impact on economic growth. This result agrees with the findings of Chukwu (2023) who determined that debt servicing has no significant impact on economic growth in Nigeria and thus cannot be used to predict economic growth according to his findings. This present study though established a long run and short run relationship, the relationship is however negative and insignificant. This implies that while debt repayment may have a slightly adverse effect on economic

performance, its impact is weak or statistically insignificant. Government and policy makers must therefore reassess its debt sustainability framework to ensure that debt servicing does not become a future burden especially where debt is incurred continuously. This also calls for strategic borrowing for productive investments, enhancing fiscal discipline, sustaining debt servicing at manageable levels, optimizing debt repayment structure to minimize fiscal stress and strengthening institutional and governance frameworks.

Conclusions and Recommendations

Based on the analytical results carried out in the study, it is evident that public debt has effect on economic performance in different ways. The study specifically established that external debt impacts positively on economic performance of Nigeria both in the short run and long run while domestic debt possesses negative relationship with economic growth both in the long run and short run. Based on the findings of the study, we therefore conclude that public debt does impact economic performance depending on the form of debt contracted. Based on the findings ascertained in the study, the following policy recommendations become imperative.

- i. Policy makers should ensure that borrowing is aligned with productive investments that can generate economic returns such as infrastructure, education and healthcare rather than being used for recurrent expenditures. Integrate appropriate measures towards ensuring suitable management of domestic debts so as to enhance the productivity level of the country.
- ii. Government should ensure that borrowings should be targeted towards productive investments, while prioritizing investment in sectors with high growth potential and ensuring that external debt remains beneficial.
- iii. Government and policy makers must therefore reassess its debt sustainability framework to ensure that debt servicing does not become a future burden especially where debt is incurred continuously.

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INFLATION TARGETING AS AN ALTERNATIVE MONETARY POLICY FRAMEWORK (1970-2019)

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Abstract:

This study examined Inflation Targeting as an Alternative Monetary Policy Framework for Nigeria. The study covered the period 1970-2019. Time Series data were sourced from secondary sources and analyzed using Vector Autoregression (VAR) methodology. The variables of interest are Inflation (proxied by Consumer Price Index, CPI), Gross Domestic Product (GDP), Exchange Rate (EXR), Money Supply (MS), Government Expenditure (GXP) and Interest Rate (INT). However, the results of the analysis showed that GDP, EXR, INT, GXP and MS have significant relationship with inflation so we rejected their null hypotheses. The block test which represents the Granger Causality test suggested that there was bivariate and mutual joint significance of the monetary policy variables MS, GXP, INT and EXR on GDP and CPI. The unit root analysis showed that the variables were integrated of order 1 (I). The result of the estimated VAR system was analyzed with and it was found out that GDP, MS and GXP responded negatively to CPI shocks. Based on these findings and results, the study, among others, recommends that the CBN should adopt the Inflation Targeting Framework for its monetary policy.

Keywords: *inflation targeting, monetary policy, vector autor-regression.*

JEL Classification: E31, E52, E58

1. INTRODUCTION

A fiscal arrangement structure is any procedure which national banks use for directing its money related approach towards achieving the predetermined strategy objective. Essentially, the system for fiscal arrangement diagrams the goal of strategy, just as the instruments and working methodology for accomplishing the expressed goal” (Tutar, 2012). World over, there are various techniques utilized by national banks in the direct of fiscal approach. These techniques influence the working, transitional and extreme focuses via various channels. The basic techniques incorporate fiscal focusing on, conversion standard focusing on, ostensible GDP of yield focusing on and swelling focusing on.

Notwithstanding, actually 2006, 24 nations are delegated swelling targeters, including 8 modern nations and 16 developing business sectors and non-industrial nations” (Aigbedion, 2017). As per Batini and Laxton (2007), “noticeable among the industrialized districts that have received Inflation Target (IT) are United Kingdom, New Zealand, Canada, Norway, Sweden, Switzerland, Iceland and Austria while early adopters of IT in developing business sector economies incorporate South Korea, Brazil, Mexico, Poland, Czech Republic, Thailand, South Africa, Colombia, Hungary, Chile, Israel and Peru”.

2. CONCEPTUAL LITERATURE REVIEW

2.1 Inflation Targeting (IT)

Inflation targeting is a monetary policy framework that apportions great importance and relevance to the maintenance of price stability. As per Bernanke and Mishkin (1997), “inflation targeting is characterized as the name suggests by the announcement of official target ranges for inflation rate and by explicit acknowledgement that low and stable inflation is the overriding goal of monetary policy”. Eichengreen (2001) in Nwaru (2006) defined inflation targeting (IT) as a monetary policy operating strategy with four elements, viz;

- an institutional commitment to price stability as the primary goal of monetary policy;

- mechanism rendering the central bank accountable for attaining monetary policy goals;
- the public announcement of targets for inflation; and
- a policy of communicating to the public and the markets the rationale for the decisions taken by the central bank.

Essentially, inflation targeting may be viewed as a strategy in which the central bank adopts a numerical target for inflation and commits to achieving the target, (Pierre, 2014). Mordi (2008) noted that this means that as long as inflation remains within the stated range, the central bank is free (and indeed expected) to stabilize the economy. However, if at some point inflation threatens to exceed the permissible range, then the central bank must make the inflation target its overriding objective and work towards containing it to within that range.

2.2 Pre-conditions for Inflation Targeting

There are some pre-conditions for implementing an inflation targeting regime successfully. These as per CBN (2011) include:

- Existence of stable and predictable connectedness amid monetary policy instruments and inflation
- Independence of the Central Bank
- The degree of accountability and transparency of the CBN
- Institutional Considerations
- Technical Considerations

2.3 Instruments Employed in Inflation Targeting

The instruments employed in inflation targeting which are similar to those instruments of monetary policy are discussed below:

- A Cash Reserve Ratio (CRR)
- B Liquidity Ratio (LR)
- C Open Market Operation (OMO)
- D Discount Window Operations (DWO)
- E Monetary Policy Rate (MPR)

2.4 Advantages of Inflation Targeting

Several gains are expected to be realized from inflation targeting. These, as per Nwaru (2006) include:

- Inflation targeting framework maximizes transparency, accountability and effective communication in conduct of monetary policy.
- It enhances the credibility of the CBN's

- It helps in the achievement and sustenance of low and stable inflation rate and well anchored inflation expectations. This will enhance improved policy outcomes as regards output and employment and savings and surged investment.
- The strategy fosters in depth understanding of inflation and better ways of combating it.

3. THEORETICAL LITERATURE REVIEW

The literature is very rich with several approaches (theories) to the explanation of inflation. These theories include:

- Demand-pull theory
- Cost-push theory
- Structuralist theory

3.1 Demand-pull Theory of inflation

This theory posits that a rise in price is initiated by the emergency of excess demand over existing supply, assuming the existences of full employment in the economy”. The amount of inflationary pressure would depend on the size of the demand (Gbosi, 2015), Demand-pull inflation is a situation often described as “too much money chasing too few goods”.

3.2 Cost-Push Theory of Inflation

Cost-push theory of inflation occurs where costs of factor services or inputs into production process rise independently of the level of demand for the goods or services in question (Adebisi, 2010). Cost-push inflation is caused by wage surges enforced by unions and profit surges by the employers. As per Jhingan (1985:414), the cost-push theory of inflation was found during the medieval period but was reviewed in the 1950’s and again in the 1970’s as the principal cause of inflation. It also came to be known as the new inflation.

3.3 Structuralist Theory of Inflation

The structuralist argues that surge in investment expenditure and the expansion of money supply to finance it are the only proximate and not the ultimate factors responsible for inflation in the developing countries like Nigeria. The Structuralists enumerated various sectoral constraints or bottlenecks which generate the sectoral imbalances and lead to rise in prices. They are:

- Agricultural bottlenecks.
- Resources Gap constraints or Government’s budget constraint

- Foreign Exchange bottlenecks
- Physical Infrastructural bottlenecks.

4. Empirical Literature Review

As it is notable, expansion focusing on was presented in New Zealand in 1990. As Murray (2006) brought up, when swelling focusing on was carried out in New Zealand, it was seen as an uncommon case, in light of the fact that New Zealand was a little open economy that had quite recently reported various venturesome changes. Those changes were useful in limiting expansion especially in the country's critical fiscal union, work market changes, and substantial decreases in obstructions to global exchange.

A few investigations have been led to survey the effect of IT on the receiving economies like Australia, Spain, Israel, Sweden, United Kingdom, Canada, New Zealand, among others. In his work, Bernanke (2015) embraced a far-reaching overview of the encounters of the early industrialized nations (New Zealand, Canada, United Kingdom, Sweden, Israel, Spain, and Australia) that received IT as a structure for fiscal arrangement. He discovered that IT appropriation achieved lower swelling in these nations. Both the paces of expansion and swelling assumptions were altogether decreased because of the appropriation of IT in contrast with their past encounters. Likewise, the Bernanke's examen additionally found that subsequent low swelling stayed at low levels in any event, during the later time of repeating fiscal progress.

Roger and Stone (2014) examined (22) undeniable expansion focusing on national banks and found that swelling outcomes were for the most part inside focuses for both mechanical and developing business sector nations. Their investigation noticed very continuous misses of focuses in the IT requires and credited the misses to outside and homegrown stuns. The outside stuns emerged from changes in capital inflows just as progress in world fuel costs. Homegrown stuns were set off fundamentally by changes in fiscal and money related approaches just as in homegrown food supply.

In crafted by Batini (2016) he saw that nations embracing IT didn't encounter huge yield misfortunes because of lower expansion levels. The encounters of Canada, United Kingdom and Sweden further propose that the impacts of fiscal stuns on expansion were not huge on the grounds that individuals' assumptions had been well changed under the IT structure. Heedlessly, decrease in swelling was related with lower than typical yield level during the disinflationary cycle.

Masson, Savastano and Sharna (1997) identified two major prerequisites for adopting Inflation Targeting (IT) as a framework for monetary policy. The first is that the central bank of the country must be in a position to conduct its monetary policy with a strong degree of instrument independence. To this end, there should be no symptoms of fiscal dominance which may make the country susceptible to inflationary pressure generated by inappropriate fiscal policy. The second prerequisite is that the country must not be committed to targeting the level or path of any other nominal variable. In other words, the monetary authorities must be strongly committed to price stability as the primary goal of monetary policy. In particular, the authorities must avoid making any commitment to any particular level of the nominal EXR. When these two prerequisites are met, the third precondition is that the monetary authorities should possess the technical and institutional capacities to design and operate the IT framework (Ojo, 2013).

Aliyu and Englama (2009) evaluated whether Nigeria is ready to adopt IT, a monetary policy framework that several emerging markets have adopted over that last one decade. Applying vector Auto regressive (VAR) model to some selected monetary policy and other macroeconomic variables to explore various channels using the Granger causality tests, impulse responses and variance decomposition, the outcomes show that inflation in Nigeria is impassive to monetary transmission variables in the model. Specifically, weak link amid prices and credit and IR channels were established. However, evidence of strong inverse link amid EXR and prices was found in the model. They, therefore, concluded and recommend the pursuance of IT lite in Nigeria

Odior (2012) in his work inflation Targeting in an Emerging Market: VAR and impulse Responses Function (IRF) Approach examined inflation targeting in developing countries using Nigeria as an example. The VAR and IRF were used to estimate the data collected on customer price index, broad money supply, EXR, GDP and government expenditure over the period 1970-2010. The model ascertained the extent to which policy target of these macroeconomics variables does lead to changes in inflation. The outcomes show that money supply and past level of inflation have the potentials of causing substantial changes in inflation in Nigeria. The work, therefore, advised that more policy attention be given to these variables in order to have stable inflation rate in Nigeria.

Riti and Kamah (2015) carried out a work titled "Inflation Targeting and Economic Growth in Nigeria: A Vector Auto Regressive (VAR) approach". The work examines the achievement of sustainable growth via inflation targeting in Nigeria using the VAR model. Annual time series data were using covering span of

1981-2010. The variables used include Customer Price Index (CPI). GDP, EXR, US Customer Price Index (CPI) as a proxy for foreign price, money supply (M_2) and IR (INTR). The work found out that EXR contribute substantially to inflationary pressures in Nigeria-which is a reflection of the import-dependent nature of the Nigerian economy. The work recommends amongst others that the objective of monetary policy should be made clear thereby improving planning in the private and public sectors.

5.0 METHODS AND STUDY

5.1 Sources and methods of Data Analysis

This study employs Vector Autoregressive (VAR) model approach using annual time series data spanning from 1970-2019 obtained for the following variables: Consumer Price Index, CPI (proxy for inflation), Gross Domestic Product (GDP), Money Supply (MS), Government Expenditure (GXP), Interest Rate (INT) and Exchange Rate (EXR). The data for the study is obtained from the Central Bank (CBN) Statistical Bulletin 2019 Edition and National Bureau of Statistics (NBS) Annual Reports and Statistical Publication, 2009 Edition.

The inquiry adopted quasi-experimental research design. The quasi-experimental design focuses on causal statistical connectedness devoid of manipulation of the explanatory variables (Belli, 2017). The VAR involved testing for the stationarity of the variables before the ascertaining the existence of long run connectedness amongst them.

The impulse response function and variance decomposition follows the whole system of VAR and these tests determine the size of the impact of shocks to the system plus the rate at which the shock dissipates allowing for interdependencies.

5.2 Model Specification

As discussed earlier, it was concluded that Nigeria is strongly committed to satisfying the pre-conditions for a successful transition to an inflation targeting framework. Hence, this inquiry sets out to examine the major empirical pre-conditions for inflation targeting regime namely “the existence of a stable predictable connectedness amid monetary policy instruments and inflation rate”. This work developed a model suitable for the Nigerian economy by adopting a six variable VAR model in which GDP, CPI, MS, GXP, INT and EXR are simultaneously interrelated.

$$GDP_t = f(GDP_{t-1}, CPI_{t-1}, MS_{t-1}, GXP_{t-1}, INT_{t-1}, EXR_{t-1}) \quad \dots 3.1$$

$$CPI_t = f(CPI_{t-1}, GDP_{t-1}, MS_{t-1}, GXP_{t-1}, INT_{t-1}, EXR_{t-1}) \quad \dots 3.2$$

$$MS_t = f(MS_{t-1}, GDP_{t-1}, CPI_{t-1}, GXP_{t-1}, INT_{t-1}, EXR_{t-1}) \quad \dots 3.3$$

$$GXP_t = f(GXP_{t-1}, GDP_{t-1}, CPI_{t-1}, MS_{t-1}, INT_{t-1}, EXR_{t-1}) \quad \dots 3.4$$

$$INT_t = f(INT_{t-1}, GDP_{t-1}, CPI_{t-1}, MS_{t-1}, GXP_{t-1}, EXR_{t-1}) \quad \dots 3.5$$

$$EXR_t = f(EXR_{t-1}, GDP_{t-1}, CPI_{t-1}, MS_{t-1}, GXP_{t-1}, INT_{t-1}) \quad \dots 3.6$$

where GDP_t = Gross Domestic Product at time t (current period)

GDP_{t-1} = Previous Gross Domestic Product

CPI_{t-1} = Previous Consumer Price Index

MS_{t-1} = Previous Money Supply

GXP_{t-1} = Previous Government Expenditure

INT_{t-1} = Previous Interest Rate

EXR_{t-1} = Previous EXR

The functional equations above represent the Vector Autoregression model where each of the variables is taken as a linear function of past lags of itself and past lags of the other variables. That is to say that each variable is a linear function of the lag 1 values for itself and all other variables in the set

Furthermore, the CBN (2018) asserted that the existence of a stable predictable connexion amid monetary policy instruments and inflation rate is one of the pre-conditions for any economy that wants to adopt the inflation targeting regime. Taking due note of this pre-condition, we take the equation above and subject it to a long run test where we ascertained the cointegrating connexion and if the monetary policy variables affect CPI in the long run. This is represented by:

$$X_t = \tau_1 X_{t-1} + \tau_{k-1} X_{t-k+1} + \pi X_{t-k} + \varepsilon$$

Where ε represents the Gaussian random variable, τ_1 and π are the matrices of parameters of the equation estimated using OLS. The component πX_{t-k} produces different linear combinations of levels of the time series X_t as such the matrix π contains information about the long run properties of the system described by the model.

If the variables CPI_{t-1} , GDP_{t-1} , MS_{t-1} , GXP_{t-1} , INT_{t-1} and EXR_{t-1} are each integrated of order 1, and the coefficients $\beta_1 - \beta_6$ are such that they are integrated of

order 0, then CPI_{t-1} , GDP_{t-1} , MS_{t-1} , GXP_{t-1} , INT_{t-1} and EXR_{t-1} are cointegrated and exhibit a stable predictable connexion with consumer price index (a proxy for inflation rate). In this case, we have satisfied the pre-condition for inflation targeting.

5.3 DISCUSSION OF RESULTS

The table below shows the results of the Unit root test. The Unit root test for stationarity was conducted using the Augmented Dickey Fuller (ADF) test. The Purpose was to affirm whether each data series is integrated and has a unit root.

Table 4.2: ADF Unit Root Tests Outcomes

Variable	ADF Statistic at Level	5% Critical Level	ADF 1 st Difference	Order of Integration	Decision
Ln GDP	0.2695	-2.8763	-3.6699	1(1)	Stationary at 1 st difference
CPI	1.8385	-2.8766	-4.3454	1(1)	Stationary at 1 st difference
LnMS	0.3809	-2.8660	-14.5153	1(1)	Stationary at 1 st difference
LnGXP	-0.7111	-2.8766	-4.2438	1(1)	Stationary at 1 st difference
INT	-2.3960	-2.8769	-2.8980	1(1)	Stationary at 1 st difference
EXR	1.4800	-2.8769	-3.5553	1(1)	Stationary at 1 st difference

Note: The lag length selection via this research is based on Schwarz Information Criterion (SIC)

Source: Author's Computation (2020)

The outcome of the unit root test at level in table 4.2 shows that computed values for ADF for all the variables were less than the critical values. This means that each of the variables was not stationary at 5 percent level. However, to subdue this challenge, the first difference approach was carried out to establish the order of integration amid the variables and thereafter, we carried out unit root test following the lag length selection for ADF using Schwarz Information Criterion (SIC). The outcome provided the maximum lag while the optimum lag was provided using SIC with statistical package E-view 9.0. We conducted the Augmented Dickey Fuller (ADF) 1979 to know the stationarity level and integration order of the series that we used in our model.

Drawing from the above, there is a call for further analysis of the long-run co-integrating connexion amid the variables using Johansen method. This procedure involves estimation of the Eigen Value and Likelihood Ratios (Trace Statistic)". The outcome of the analysis is shown in table 4.3.

Table 4.3.9: Johansen Unrestricted Co-Integration Rank Test (Trace Test) For CPI and Monetary Policy Instruments

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.277929	174.0762	95.75366	0.0000
At most 1 *	0.237689	110.5780	69.81889	0.0000
At most 2 *	0.143312	57.65493	47.85613	0.0045
At most 3	0.103403	27.49195	29.79707	0.0902
At most 4	0.031322	6.207936	15.49471	0.6709
At most 5	1.30E-05	0.002543	3.841466	0.9574
Trace test indicated 3 co-integrating eqn(s) at the 0.05 level *Denotes discardion of the hypothesis at the 0.05 level ** MacKinnon-Haug-Michelis (1999) P-Values				

Source: Author's Computation (2020)

Table 4.3b: Unrestricted Co-Integration Rank Test (Maximum Eigenvalue) for CPI and Monetary Policy Instruments

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob. **
None*	0.277929	63.49820	40.07757	0.0000
At most 1 *	0.237689	52.92304	33.87687	0.0001
At most 2 *	0.143312	30.16298	27.58434	0.0228
At most 3	0.103403	21.28402	21.13162	0.0476
At most 4	0.031322	6.205393	14.26460	0.5870
At most 5	1.30E-05	0.002543	3.841466	0.9574
Max-eigenvalues test indicates 4 co-integrating eqn(s) at the 0.05 level * denotes discardion of the hypothesis at the 0.05 level.				

Source: Authors' Computation (2020)

Table 4.3a and 4.3b show that both Trace and Max-Eigen Statistics (Likelihood ratios) were greater than the 5 percent critical values. While the Trace statistics indicate 3 co-integrating equations at the 5 percent level of significance, the Max-Eigen statistics indicate 4 co-integrating equations at the 5 percent level of significance. Both outcomes confirm the presence of long-run connexion amid the variables and the hypothesized fundamentals for the period under consideration i.e. 1970Q1-2019:Q4. The discarding of the null hypothesis of no co-integration amongst the variables is established but we do not discard the alternative hypothesis.

5.4 Testing the First Condition for Adoption of Inflation Targeting: Long-Run

Aliyu and Englama (2009) argued that one of the main pre-requisites for a successful adoption of inflation targeting framework, as expounded in many empirical studies, is the existence of a stable and predictable relationship between monetary policy instruments and inflation. They further asserted that this stable and predictable relationship can be determined using the Impulse Response Function (IRF) and the Block Granger Causality test within the framework. Table 4.3 shows the result of the Granger Causality test.

Table 4.3 Summary of the Granger Causality Test (Baseline VAR 1970-2019)

Effect on Price (CPI)	Chi-Square	Probability
GDP	6.5227	0.0118*
MS	5.3172	0.0176*
GXP	3.5905	0.0161*
INT	0.6195	0.7336
EXR	0.9866	0.6106
Joint	18.4661	0.0476

Effect on Output (GDP)		
CPI	21.2754	0.0326*
MS	11.5678	0.0456*
GXP	0.4138	0.8131
INT	7.2353	0.0184*
EXR	1.5692	0.4563
Joint	18.9256	0.0412

Source: Extracted from EViews output

The table above suggests that there exists a bivariate and mutual joint significance of the policy variables (MS, GXP, INT, and EXR) on GDP and CPI. The joint probabilities for the multivariate tests suggest the rejection of the null hypothesis. The bivariate tests for CPI suggest that all the variable except interest rate and exchange rate cause tangible variations in CPI. This is in line with the confirmation and earlier expectations of Aliyu and Englama (2009) that the level of GDP, MS, INT, EXR and GXP ignite variations in CPI or the level of prices in the economy.

More so, the outcome from Table 4.3 further proved that the two key monetary policy variables namely INT and MS greatly drive GDP while GXP and EXR do not. Also, CPI was found to drive economic growth positively. The discovery from the two key equations of the VAR model, that is, the GDP and the CPI equations agree with one of the main policies thrust of monetary policy. Thus, the joint influence of the monetary policy variables on CPI and GDP aligns with the position of Aliyu et al that Nigeria should begin the process for the adoption of inflation targeting.

6. Conclusion and Recommendations

This study examined whether or not one of the pre-conditions for a successful inflation targeting framework is present in Nigeria. It attempted to find out whether or not a stable and predictable relationship exists between inflation and

monetary policy instruments in Nigeria. The result revealed that GDP, EXR, and MS are positively related to inflation while INT and GXP are negatively related to inflation. This divergence could be as a result of the current recession being experienced in the country and its attendant fall in interest rate and government expenditure as increased money supply would likely cause inflation.

Having analyzed the data, it was found out that the explanatory variables were statistically significant at the conventional level of 5 percent and they exhibit a stable predictable relationship with inflation, thus, satisfying the first pre-condition for inflation targeting.

Based on the findings and policy implications from this study, the following recommendations are proffered:

1. The CBN should practice restrictive monetary policy which is designed to control the growth of aggregate demand through reduction in the rate of growth of the money supply, thus, making credit less available and interest rates high.
2. The Federal government should practice restrictive fiscal policy (reduction in government expenditure and/or increase in tax) in order to control inflation.
3. There should be close cooperation between the fiscal and monetary authorities for policy objectives to be achieved.
4. There should be prudent macroeconomic policies, adoption of flexible exchange rate, political and price stability goals and proper manipulation of instruments of policy.
5. The Nigerian government should adopt measures to correct persistent deficits in the nation's balance of payments position.
6. The Federal government of Nigeria should use exchange rate and interest rate to ensure a reduction in imported inflation.

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MACROECONOMIC POLICY EFFICIENCY IN THE ECOWAS AND EAC COUNTRIES: DOES FINANCIAL SECTOR DEVELOPMENT MATTER?

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Abstract

The study examined the extent to which financial sector development and macroeconomic performance spurs the policy action efficiency in the ECOWAS and EAC countries of SSA region between the period of 1980 and 2022. The System Generalized Method of Moments and Pedroni's cointegration techniques were employed and the study found an existence of long run relationship and cointegration among the variables in the study. The study revealed that the financial sector development and macroeconomic performance both had the negative hypothesized coefficients signs, and both variables were found statistically and negatively significant, implying a negative correlation among financial development, macroeconomic performance and monetary policy efficiency. This result suggested that a deeper financial development and improved macroeconomic performance both enhanced and increased the policy efficiency in ECOWAS and EAC countries. The study found the efficiency of monetary policy to be mixed among ECOWAS and EAC countries, implying that while a policy efficiency has improved more in ECOWAS countries, it has rather improved less in the EAC countries. This study, therefore, recommends the need for EAC and ECOWAS monetary

authority to put in place adequate policies and strategic reforms that would enhance the financial development and financial systems in the EAC and ECOWAS countries, since both variables play largely vital roles in enhancing, increasing and improving of policy efficiency in developed and developing economies.

Keywords: *monetary policy, macroeconomic performance, financial development, and policy efficiency.*

JEL Classification: E61, E62, E63, G20

1. Introduction

The sub-Saharan Africa over the years have experienced both a strong macroeconomic growth and impressive developments in financial system and sectors, this is in addition with a global macroeconomic growth increase and macroeconomic performances accompanied by a general price boom, inflation and a fluctuation increase in output growth, aggregate prices, exchange rate, aggregate demands, and slow recoveries and sluggish macroeconomic policy driven impacts and influences on both aggregate output and inflation in the developing countries (SSA inclusive). Hence and based on the foregoing, many African countries (SSA inclusive) are today in a quest for an active monetary policy effect and the effective monetary policy practices, targets and implementations in driving the policy goals and objectives of output and inflation. However, despite the several strategies, macroeconomic policies and institutional policy reforms in elevating the stable economies and increased macroeconomic stability in SSA, there are still global debates increases and arguments on the nexus between financial development and policy efficiency.

Therefore, while it is true that Africa's financial sector and financial system are viable, well developed and impressive in the past three decades (since 1990s), its uneven performances and efficient benefits or overall impacts on output and inflation across the different regions and African globe, including SSA countries have been a cause for a major concern and debate among the academia and scholars in the extant literature. Most notably, is because it has a direct impact and positive effect direction on the efficiency of monetary policy that is set by the central banks. Thus, balancing the inflationary growth, the macroeconomic (general price) stability concerns and aggregate output objectives of the monetary policy especially in the midst of external headwinds and hitting shocks as a result

of the adverse effects and/or impacts of global financial crisis everly remains a key challenge and unravelled puzzles to many central banks in the developing countries, particularly in SSA. This is because African (SSA) economies and regions are the most hit by this devastating financial crisis and global economic recessions since 2000s and during the post financial crisis periods.

Hence, even with a series of policy strategies, targets and policy reforms to strengthen and enhance the policy effects and efficiency directions and impacts on financial sector development and macroeconomic growth (performance), it is very surprising that both output growth fluctuations and inflation changes still remains very high in SSA countries, implying that a more knowledgeable understanding of the influence or effect of the policy efficiency on output, aggregate demand and inflation is not just only necessary, but germane and sacrosanct for a proper empirical and theoretical appraisal and an effective econometric methods analysis in the developing countries. Thus, very few available studies exist in the literature on the nexus debates and the possible dynamic interactions and effects of financial development and macroeconomic variable performance on the policy efficiency in the developing economies. This is because the roots of Africa's slower monetary policy transmission effects or efficient impacts have been hinged upon and adduced to the nexus between the financial development and monetary policy efficiency, in addition, with the external hitting and demands shocks effects such as the oil price, global financial crisis, financial distress and the macroeconomic variable performances in the SSA and developing countries (Ma & Lin, 2016; Samba & Mbassi, 2016).

These foregoing therefore brought about a rise of divergences, major concerns and global debates among the academia and scholars. Although, there is a consensus that a deeper financial system affects largely the effective transmissions channels and the efficiency of monetary policy on output and inflation, the empirical and methodological problem however, lies on the divergences of findings and the theoretical strands on the degree of relationships and extent of this degree and nexus, the causality directions of the nexus on the relationships among the financial development, macroeconomic variable performances and the monetary policy efficiency due to the adverse impacts and shocks emanating from the devastating financial crisis in many developing and developed economies. These global debates and arguments remain on among the scholars because of the absence of consensus on kinds of the degree nature and nexus, the causality directions and the extent degree of the dynamic relationships that perhaps exists among the financial development, macroeconomic variable performance and the monetary

policy efficiency of the central banks and monetary authorities in an economy whether developed or developing. This study thus bridges this gap by examining the possible effects of the financial sector development and macroeconomic performance on the monetary policy efficiency in the developing countries and SSA.

This study therefore, determines the extent to which financial development influences, spurs and has contributed to the efficiency of monetary policy in the sub - Saharan African region. As a result of this purpose, the authors developed a methodology following the methodology provided by Krause and Rioja (2006) in order to analyze the nexus between financial development and monetary policy efficiency, and the impacts of financial institutions and markets on the policy efficiency in the developed economies. Put simply, this study therefore assesses how the developed policy efficiency measures (PEMs) of monetary policy have been influenced or affected by some useful indicators like financial development, macroeconomic variable performances, oil price and global financial crisis so as to ascertain and identify the adverse implications and effects they have on the monetary policy efficiency in the developing and SSA countries. Hence, the rest of the paper proceeds as follows: section two presents some stylized facts and trends of policy efficiency in SSA and the review of both the empirical and theoretical literatures, while the methodological approach and estimation models to the analysis of the paper is discussed in section three. Section four presents, explains and interprets the empirical results of the paper, while the conclusion and policy implications of the study are drawn in section five.

2. Literature Review and Stylized Facts on Monetary Policy Efficiency in ECOWAS and EAC Countries

Few studies have sort to investigate the nexus between financial sector development and monetary policy efficiency in ECOWAS and EAC countries in the literature, while very fewer studies have researched on the nexus among financial development, macroeconomic performance and policy efficiency. However, and even at that, these fewer empirical studies have been found mixed and inconclusive (Effiong, Esu. & Chuku, 2017; Nkoro & Uko, 2021; Oyaromade, 2006). In other words, three key strands of empirical findings and studies exist among researchers on the nexus between financial development and the monetary policy efficiency. These are positive (direct) strand, negative (indirect) strand and the mixed studies strand. Thus, while studies on the positive (direct) and negative (indirect) strands most times constituted the first and second, the mixed

relationships strand, however constitutes the third. All of these above propositions showed that an abundant number of studies are found on nexus between financial development and monetary policy transmission effectiveness, very few studies exist on the nexus among financial development, macroeconomic performance and the policy efficiency of the central banks both in developed and developing economies.

However, most previous and current available studies are yet to delve into and clearly relate the nexus between financial development and monetary policy efficiency unlike the nexus with monetary policy effectiveness and transmission mechanisms that filled the literature. All of these therefore made Posen (1995, Kashyap & Stein (1995) to research largely on the policy efficiency measures and its nexus with financial sector development. Hence, for Posen (1995) and Kashyap and Stein (1995), their studies argued for the importance of societal forces supports on the monetary policy objectives of the central banks such as inflation and price stabilization. Therefore, their studies conclude and guarantee the central banks' stability objectives in as long as the financial sector is ready to support the policies associated with reducing inflation and price stabilization objectives. In other words, it implies that the more developed is the financial sector, the more successful will be the stabilization policies of monetary policy and the more efficient is the monetary policy of the central banks. Also, Cecchetti and Krause (2001) affirmed this proposition and they found the evidence of an improvement in financial depth and financial sector development as the keys to the reduction in inflation and output fluctuations of monetary policy objectives. Consequently, the Krause and Rioja (2006) also supported the foregoing claims, empirical findings and evidences, that the more the financial sector development and improvement, the more efficient is the monetary policy implementation of the central banks in an economy.

Also important is the study by Kashyap & Stein (1997), which examines the impact of bank's liquidity or balance sheet on the policy efficiency in European Monetary Union (EMU) member countries using the bank lending channel theoretical approach. This study thus, finds that an active monetary policy becomes more efficient via its effects on the loan supply & bank lending, specifically when banks have less liquidity or less liquid balance sheets to lend, thereby indicating an indirect relationship between policy efficiency and financial sector development via a decline in the banks' liquidity or balance sheets. In other words, this study found that a monetary policy action will be more efficient in performance when the banks have a less liquidity balance sheet which eventually affect the banks' loan

supply and credit lending to borrowers in an economy. Also, prior to the foregoing studies is the study of Mullineux (1994) that investigated the impact of financial innovation on monetary policy efficiency in United Kingdom, and the results found a prior validation of credit lending channel as the dominant channel in monetary policy transmission in UK. The study found a negative and indirect nexus between financial sector development and monetary policy efficiency suggesting that a higher level of financial fictions became negatively associated with a stronger monetary policy transmission and efficient monetary policy actions via the dominant credit channel of the credit channel theorists and modern paradigms.

Samba and Mbassi (2016) researched upon the nexus between macroeconomic policy efficiency and financial sector development using the methods of Policy Efficiency Measures developed by Krause and Rioja (2006) and the panel ordinary least squares regression technique between the period of 1986 and 2009 in the CEMAC area and countries of East Africa. The study found the efficiency of BEAC monetary policy to be mixed, where policy efficiency improvement and performance ability were found in countries like Gabon, Cameroon and Central Africa Republic, while the policy efficiency improvements were found to be opposite i.e. stagnated, worsened and declined in the countries like Chad and Equatorial Guinea. In addition to above studies is the study of Carranza et al., (2009) examined the in-depth relationship between development in the financial sector and the monetary policy effectiveness using a sample of more than 60 countries and the use of Non-hierarchical Cluster analysis, Dynamic Panel and VARIMAX estimation techniques; where the overall findings showed that there is no unanimous relationship between financial development and monetary policy effectiveness between the developed and developing countries, but the results revealed specifically a negative relationship and showed that a more advanced financial sector will reduce the effectiveness of monetary policy due to financial innovation for the period between 1985 and 2005.

Similarly, is a recent study by Ma and Lin (2016) which used panel quarterly data for 41 economies for the period 2005 to 2011 in examining the nexus between financial development and the effectiveness of monetary policy. They employed pooled least squares, fixed effect, and random effect estimation techniques and the results showed that the effect of monetary policy on output and inflation are significant and negatively correlated with financial development. The study differs as it further compares and distinguishes the impacts of monetary policy and its effectiveness on financial system components (i.e. based on financial market and institution) measures. Also, studies by Thi, Lam and Ho (2022) assessed the impact

of financial development on monetary policy efficiency in the developed economies and G7 countries using the feasible general least squares technique. The study found a mixed empirical finding between the policy efficiency and financial sector development in G7 countries, therefore suggesting both a negative and positive nexus. In other words, while a negative nexus was found between the financial market measures and policy efficiency, that of financial institutions and policy efficiency were found to be positive and significant in the developing countries.

Also, besides the financial factors like the financial sector development, there are also other related non - financial factors that can affect and have affected the effectiveness and efficiency of monetary policy. These according to the modern paradigms are the institutional and legal factors (Cecchetti, 1999 & Ma & Lin, 2016). In other words, there are complementary literatures on the importance of institutions for financial sector development and monetary policy effectiveness and efficiency, and this strand of literature according to Effiong et al., (2017) builds from the previous studies that have examined the links between the legal system and financial system in developing economies. The study found a negative linkage and nexus between financial development and monetary policy efficiency in developing economies. However, other supporting evidences are found in the studies by Cecchetti (1999) and Djankov et al., (2007) on the 129 developed countries, and the study found that economies with better legal protection of shareholders and debtors have more general association and nexus with a less potent (weak) monetary transmission thereby showing negative relationship between financial development and monetary policy efficiency.

2.2.1 Trends Analysis of Monetary Policy Efficiency Measures in ECOWAS Countries

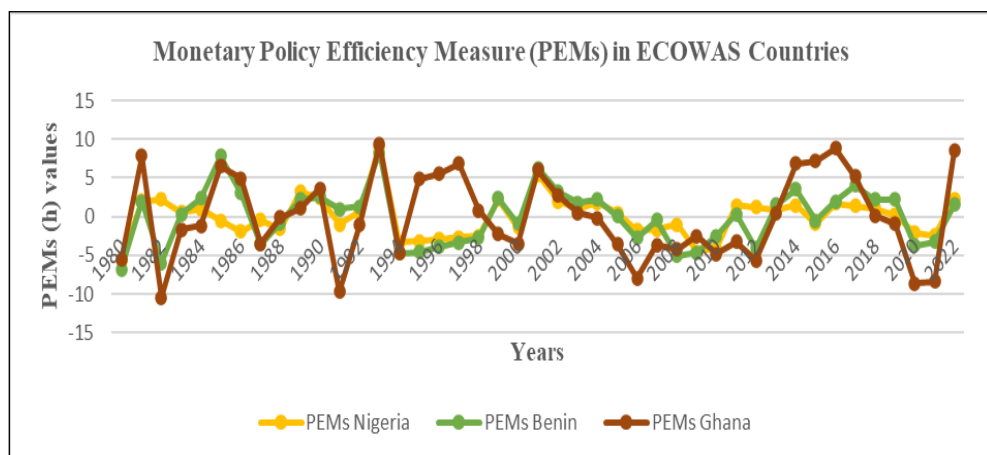


Figure 1: Monetary Policy Efficiency Trends in ECOWAS Region of SSA Countries (Nigeria, Benin and Ghana).

Source: Author's Computation.

According to Krause and Rioja (2006), a decreasing or lower value of the PEM (i.e. with PEMs h closer to or less than zero (0) values) is associated with more efficient and enhanced monetary policy and vice versa with increasing higher values greater than zero (0). The computed PEMs results for West African countries are displayed in Figure 4.1 for Nigeria, Benin and Ghana for over 42 years. At a glance, PEMs in all the three countries (Nigeria, Benin and Ghana) are very low in 1980 and 2022, ranging from 1.25 to 7.01 in Ghana, -1.21 to -0.75 in Benin and -5.63 to 2.26 in Nigeria. In the west African countries, result shows in all the three sampled countries unadjusted PEMs gradually decrease all over the periods under consideration with more decreasing values for (h) in Nigeria. This implies that monetary policy is more efficient in Nigeria and Benin than Ghana, with Benin constituting the second highest in efficiency after Nigeria. Consequently, as it is shown in Figure 1, PEMs (h) in all the three selected west African countries registered increased mixed fluctuations (i.e. both constant increases and falls in PEMs) between 1980 and 2001 periods and prior to the global financial crisis, while a continued constant falls and decreases became registered in

PEMs (h) in all the three countries from 2002 to 2011, this outcome perhaps may be as a result of the (2007/2008) global meltdown and financial crisis' impacts and experiences, thus showing that west African countries in SSA enjoy both policy efficiency and performance more during the period between 2002 and 2011 than the period between 1980 and 2001, and 2012 to 2016 or more.

This enhanced and more efficient policy and performance ability also continued with short falls in PEMs (h) from the periods of 2018 to 2022. This result outcome of such amplified and enhanced monetary policy perhaps, could be ascribed and attributed to the global impacts of the world pandemic and the economic recession. This is because the monetary policy in west African countries has been found to be more efficient and enhanced due to the impacts of global financial crisis and the covid-19 pandemic. Thus, prior to the global financial crisis and corona pandemic, monetary policy efficiency and performance has been both mixed with increases and falls (i.e. recorded frequent fluctuations in growth and trend) in all the three selected countries though with different magnitudes but remain very low from the period between 2002 and 2017 with decreased values ranging between -1.34 and 2.01 for all the countries in the region. In addition, there were sharp increases in PEMs in all the countries in 1982, 1986, 1993, 2001, 2015 and 2022 with sharp increase rising in Ghana than Nigeria and Benin. In Particular, there is evidence of a decreased PEMs in both Nigeria and Benin though with different magnitude than in Ghana. In overall, among the three selected countries in west Africa, our results based on the changes in PEMs (i.e. the difference between the starting and end periods) are 5.76 in Ghana, -0.46 in Benin and -3.37 for Nigeria respectively, thus suggesting an improvement and amplification in monetary policy efficiency in Benin and Nigeria. Finally, one could therefore conclude for improved policy efficiency in the ECOWAS member countries and the western African region economies, since an efficient policy is characterized by a decreasing and smaller values of h as defined and suggested by Krause and Rioja (2006).

2.2.2 Monetary Policy Efficiency Trends in the East African Community (EAC) Countries.

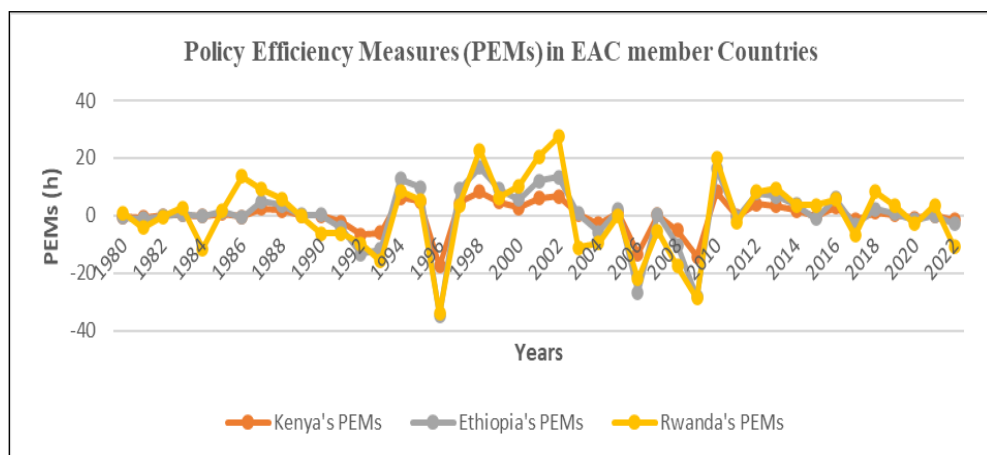


Figure 2: Trends of Policy Efficiency Measures in East African Community Region of SSA (Kenya, Ethiopia and Rwanda).

Source: Author's Computation.

The computed PEMs results for East African countries are shown in Figure 4.2 for Angola, Kenya and Rwanda for the period between 1980 and 2022. As it is shown in Figure 2, PEMs in all the three east African countries (i.e. Angola, Kenya and Rwanda) are also very low but with greater fluctuations in rises and falls than their counterparts in the west Africa between 1980 and 2022. This index for PEMs ranges from -17.44 to 8.33 in Kenya, -17.44 to 8.33 in Angola and -11.99 to 14.32 in Rwanda. The result shows that all the three sampled countries unadjusted PEMs gradually decrease all over the periods under consideration with more decreasing values for (h) in Kenya and Angola. This implies that monetary policy is more efficient in the east African countries. As it is shown in Figure 4.2, PEMs in all the three eastern countries registered increased fluctuations with both constant increases and falls between 1980 and 2003 prior to the global financial crisis, while a constant fall and decrease in PEMs was experienced and registered in the three eastern countries from 2002 to 2010, this outcome perhaps may be as a result of the global meltdown and financial crisis experienced in 2007/2008, showing that east African countries enjoys more policy efficiency and improvement in monetary

policy actions during this period (2002-2010) than between 1980 to 2001 and 2002 to 2012.

Also similar with policy improvement and performance are the periods between 2013 and 2022 with smaller PEMs values. This suggests that efficient policy and enhanced policy performance became more pronounced during and aftermath the global financial crisis with all the eastern countries having decreased PEMs (h) during these periods. This decreased PEMs results suggests that monetary policy performance and efficiency are better influenced by the global meltdown and pandemic in post 2000. Thus, prior to the global financial crisis and corona pandemic, monetary policy efficiency has been mixed both in increases and falls (i.e. recorded more fluctuations) in the east African countries with different magnitudes but remain very low in values from 2002 to 2010. In overall, our results based on the changes in PEMs (i.e. the difference between the starting and end periods) are -9.11, -9.11 and 2.33 respectively, thus suggesting an improvement policy performance and amplification in monetary policy efficiency in Kenya, Ethiopia and Rwanda. Finally, one could therefore assert for improved policy efficiency and performance in East African region, since an efficient policy is characterized by a decreasing and small values of h as suggested by Krause and Rioja (2006).

4. Methodology

The Aggregate Demand and Aggregate Supply (AD-AS) theory of Krause and Rioja (2006) provided the theoretical framework for this study. This is because the foregoing theory and model provides a better theoretical stance and approaches to examine the nexus between the financial development monetary policy efficiency in the developed and developing countries. This framework describes how the aggregate shocks affect the inflation and output gap in an economy. Similarly, in line with the study of Krause and Rioja (2006) and Cecchetti (1999), the AD-AS theory thus, lies on the assumptions that an economy performs better when a monetary policy action remains efficient and very optimal (H), all of which are based on both the magnitude condition and the ability of the aggregate supply shocks to offset the effects and influences of aggregate demand shocks during the conduct and timely implementation of effective and efficient monetary policy. The positive demand shocks increase the expected inflation and reduces the output gap. The aggregate shocks (or disturbances) in the AD - AS models are however, well described and defined in this study using the (2) standard equations in the model developed by Krause and Rioja (2006), and we derived the AD - AS general

models and equations for inflation and output gap for the monetary policy efficiency measure as follows in the equations (1) and (2):

$$\pi_t = f(d, s) = \alpha_{\pi d} d + \alpha_{\pi s} s \dots\dots\dots(1).$$

$$y_t = f(d, s) = \alpha_{y d} d + \alpha_{y s} s \dots\dots\dots(2).$$

Where π_t = denotes the deviation of inflation from its target level in equation (2); while y_t = remains the output gap as specified in eq. (1), while d and s = represent the aggregate shocks or disturbances which are the positive demand and supply shocks and their coefficients are all positive ($\alpha_{\pi d}, \alpha_{\pi s}, \alpha_{y d}$ and $\alpha_{y s} > 0$), but still depend on the responses of the monetary policy to aggregate shocks and the structure of the economy. The model assumes that the positive demand and supply shocks are uncorrelated and Krause and Rioja (2006) derived the actual variances and covariance of output and inflation in defining and deriving the monetary policy efficiency measure (H) of the monetary policy conduct of the central banks in SSA as follows in equations (3) and (4) respectively:

$$H = \sigma_{\pi}^2 \sigma_y^2 - (\sigma_{\pi y})^2 = (\alpha_{\pi d} \alpha_{y s} + \alpha_{\pi s} \alpha_{y d})^2 \sigma_d^2 \sigma_s^2 > 0 \dots\dots\dots (3).$$

The derived equation (3) above is thus assumed that under the optimal monetary policy rule (h), the effects of demand shocks or disturbances on inflation and output gap becomes fully neutralized (Clarida et al., 1999), implying that at optimal policy, the output and inflation demand shocks becomes zero; i.e. $\alpha_{y d} = \alpha_{\pi d} = 0$, and by consequence and further implication, it therefore means that inflation and output gap both depend exclusively on the magnitude of the aggregate supply shocks or disturbances, since both the aggregate output demand and inflation shocks are zeros i.e. $\alpha_{y d} = \alpha_{\pi d} = 0$, and therefore, substituting this value of output and inflation demand shocks $\alpha_{y d} = \alpha_{\pi d} = 0$ into equation (3) gives the equation (4) below:

$$H = \sigma_{\pi}^2 \sigma_y^2 - (\sigma_{\pi y})^2 = (0) \alpha_{y s} + \alpha_{\pi s} (0)^2 \sigma_d^2 \sigma_s^2 = 0 \dots\dots\dots (4).$$

Hence, the equation (4) above implies that at optimal monetary policy where $\alpha_{y d} = \alpha_{\pi d} = 0$, the monetary policy efficiency measure also equals zero 0, i.e. at H (optimal) = 0). In other words, the closer to zero 0 is H, the smaller are the effects

of aggregate shocks or disturbances particularly the demand shocks, and the more efficient is the monetary policy in SSA economies, since the efficiency of monetary policy is in fact appreciated relatively to its ability to offset the effects of aggregate demand shocks and vice versa with the farther to 0 is H, i.e. when the optimal policy (H) becomes farther to zero. Therefore, to undertake the estimation of $H = 0$, i.e. at the optimal monetary policy, the AD-AS model suggests the linearization and applications of the differential calculus to equation (3), which thus leads to two parts and components comprising the systematic part $2\ln(\alpha_{\pi d}\alpha_{ys} + \alpha_{\pi s}\alpha_{yd})$ which depends on the stance of actual policy and the disturbance component or part i.e. $(\sigma_d^2) + \ln(\sigma_s^2)$ which is a function of and depends on the aggregate disturbances or shocks as shown in equation (5).

Thus, taking the natural log of both sides of the equation (5) gives the equation (6) as follows:

$$\ln(H) = 2\ln(\alpha_{\pi d}\alpha_{ys} + \alpha_{\pi s}\alpha_{yd}) + \ln(\sigma_d^2) + \ln(\sigma_s^2) > 0 \dots\dots\dots (5).$$

Thus, the equation (5) above according to Krause and Rioja (2006), can also be written and stated in a more compact form in equation (6) as there is no consensus about the direct estimation of the aggregate disturbances (shocks), thus suggesting and implying that both the aggregate demand and supply shocks for country i in period t further becomes a combination of the country's specific effect (γ_i), common shocks (\emptyset_t) and the residual shocks (ϵ_{it}) as shown below in equation (6):

$$h_{it} = PEM_{it} + \gamma_{it} + \emptyset_{it} + \epsilon_{it} \dots\dots\dots (6).$$

Where γ_i is a country specific effect, \emptyset_t denotes a time varying common components or shocks, and ϵ_{it} is the residual or disturbance term and shock, and the PEM_{it} is identified as the adjusted monetary policy efficiency measure (h) which is not directly observable. Hence, since $h_{it} = PEM_{it} = H$ at optimal policy, it further indicates that the closer to 0 is H or PEM_{it} , the smaller/lower are the effects of demand shocks and the more efficient is monetary policy and its ability performance in an economy and vice versa when H or PEM_{it} is farther to 0 zero, implying a larger effects of demand shocks and the less efficient is monetary policy measures (PEMs) and performances in an economy. Consequently, while a lower PEM (H) result indicates a more efficient monetary policy (MP), where a higher

PEMs result suggests a less efficient monetary policy of central banks in nations' economies (Samba & Mbassi, 2016; Krause & Rioja, 2006).

4.1 Model Specification

In order to capture the monetary policy efficiency measure (PEM) as suggested by Krause and Rioja (2006), and the relative impacts of financial development and macroeconomic performance on monetary policy efficiency, we included and added the financial development and macroeconomic performance measures based on the model of Samba and Mbassi (2016) and derived the model for this study. Thus, following the model of Samba & Mbassi (2016), we derived the generic model of policy efficiency and its nexus with financial development and macroeconomic variable performance for SSA countries as follows in equations (7):

$$PEM_{it} = h_{it} = \beta_0 + \beta_1 LFD_{it} + \beta_2 LOP_{it} + \beta_3 LDISC_{it} + \beta_4 LFID_{it} + \beta_5 LFMD_{it} + \beta_6 GCF_{it} + \beta_7 GDPGR_{it} + \beta_8 Fin_Crisis_{it} + \gamma_i + \varnothing_t + \epsilon_{it}$$

..... (7).

Where γ_i = is a country specific effect, \varnothing_t = denotes a time varying common components or shocks, and ϵ_{it} = is the residual or disturbance term and shock, while the PEM_{it} = is identified as the adjusted monetary policy efficiency measure and it is not directly observable (i.e. the net of shocks). FD = Financial sector development, FID = Financial institution development, FMD = Financial market development, OP = Oil price, DISC = Discomfort index, GCF = Gross capital formation, GDPGR = GDP Growth rate and, Fin_crisis = Dummy for global financial crisis.

4.2 Descriptive Statistics of the Variables

Table 1 showed the descriptive statistics of the average mean values, the median and the standard deviations values of the regression variables of the 12 selected SSA economies. The variables mean lies within the maximum and minimum values, with the maximum values ranging between 0.53 and 311.1 and -84.16 to 14.9 for the minimum values, thus showing a good level of consistency. The discomfort index for instance had the highest mean value of 83.193 and the lowest mean value of 0.096 with the financial market development index. As regards the data symmetricity and the variables variabilities, the results showed that the mean

and median values of the observed variables are not far and significantly varied from each other, thereby, suggesting that the variables distributions are nearly symmetrical and mirrored image of other variables. Therefore, this indicated an existence of low variability and presence of normal distribution across the variables. Specifically, the total financial development index (FD) in addition with financial institutions and market development index exhibited the lowest variability in the series with standard deviation values of 0.113 respectively for both financial development (FD) and financial institution (FID) index, 0.116 value for market development index (FMD), followed by the GDPGR and GCF with a standard deviation value of 1.020 and 1.320; while both policy efficiency (PEMs) and discomfort index measures had the highest variability and deviations as series with higher values of 159.71 and 86.99.

Table 1: Descriptive Statistics of the Variables

Variables	PEM (h)	LFD	LFID	LFMD	LOP	LDISC	CRISIS	LGCF	GDPGR
Mean	0.989	0.162	0.235	0.096	47.950	83.193	0.372	6.270	5.250
Median	0.220	0.120	0.200	0.040	37.892	65.426	0.000	1.510	1.050
Maximum	311.07	0.590	0.640	0.530	142.08	722.78	1.000	8.640	5.740
Minimum	-84.162	0.030	0.050	0.000	11.210	0.100	0.000	14.90	3.673
Std. Dev.	159.71	0.113	0.113	0.116	30.225	86.997	0.484	1.320	1.020
Skewness	2.102	1.931	1.623	1.748	0.841	3.162	0.529	3.499	2.878
Kurtosis	2.883	2.264	2.262	2.747	2.685	7.855	1.280	6.197	1.903
Jarque-Bera	172.54	549.81	336.41	425.04	62.955	560.46	87.68	479.71	2.055
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
Sum	510.21	83.37	121.25	49.55	247.42	429.28	192.0	3.230	2.710
Sum Sq. Dev.	131.36	6.588	6.612	6.897	470.47	389.77	120.6	8.990	5.320
Observations	516	516	516	516	516	516	516	516	516

Source: Author's Computation.

Key Notes: **LFD** = Financial Development Index; **LFID** = Financial Institution Development Index; **LFMD** = Financial Market Development Index; **LDISC** = Discomfort Index i.e. proxy for Macroeconomic Performance (economic and welfare condition) as defined by Arthur Okun (1899-1980); **PEMS** = Policy Efficiency Measures as defined by Krause & Rioja (2006); **LGCF** = Gross Capital Formation proxy for Investment; **LOP** = Oil Price growth; **GDPGR** = GDP Growth Rate proxy for macroeconomic performance.

This implied that the PEMs, DISC and OP exhibited the highest levels of variabilities in the overall datasets, followed by the GDPGR, GCF and the FD components (FID and FMD). The skewness looks at the spread of the data and how close and far these data values are to their average means. It is a measure of asymmetry of the distribution of the series around its mean. This is because the closer the data values to the mean, the closer the standard deviation to zero and the more the series are normally distributed. The skewness statistics for instance, revealed that all variables in the data sets are positively skewed since about six of the variables observed are closer to zero 0, thus implying symmetrical distributions among the key variables, except for the PEMs that is asymmetrical and farther to zero, 0 i.e. (greater than zero). Thus, with a threshold of three 3, all the variables were found to be platykurtic, indicating the distributions to be flat relative to the normal. Hence, while the kurtosis of two (2) of the variables namely, the DISC and GCF are very closer to the threshold and exceeded three (3), those of the remaining six (6) intervening variables namely, OP, PEMs, GDPGR, FD, FID and FMD do not exceed the threshold value of three and are less than three (3), indicating that most variable series followed a platykurtic distribution except for DISC and GCF which were found to be leptokurtic and greater than three (3) the threshold values.

This implied that all variable series and dataset are greatly peaked relative to the normal distribution (mesokurtic distribution) and are very close to the threshold value. Hence, for the Jarque-Bera statistics which serves as a goodness of fit test to check whether the observed series have the appropriate skewness and kurtosis that are compliant or conform with normal distribution, the study found most variable series exhibiting probability values of (0.000) which are lower than the 0.05 threshold probability value and the 5% required level of significance. This indicates that most variable series are normally distributed and random in nature during the period of study. And since the Jarque-Bera Statistic is a standard measure of whether a variable series is normally distributed or not, we reject the null hypothesis and accept the alternative that all variable series in the study are normally distributed and significant at 0.05 (5%) level of significance.

4.2 Correlation Matrix and Coefficients

Table 2: Correlation Coefficients of the Variables

	PEM(h)	LFD	LFID	LFMD	LDISC	LGCF	LOP	GDPGR	CRISIS
PEM(h)	1								
LFD	0.007	1							
LFID	0.023	0.095	1						
LFMD	0.012	0.089	0.076	1					
LDISC	0.001	0.069	0.072	0.069	1				
LGCF	0.004	0.339	0.339	0.553	0.210	1			
LOP	0.010	0.253	0.279	0.209	0.429	0.434	1		
GDPGR	0.108	0.158	0.210	0.032	0.052	0.123	0.061	1	
CRISIS	0.008	0.177	0.187	0.162	0.635	0.315	0.443	0.212	1

Source: Author's Computation.

Table 2 above displays the result of the degree of association among the chosen variables for this study. This is pertinent in establishing the nature of multicollinearity problems that may be present in the model. Thus, with PEMs as the dependent variable, it is observed that all the regressors in particular the financial development and macroeconomic performance indicators are positively correlated with PEMs during the period of study. In terms of the degree of association, the result showed a weak relationship among the variables as all the regressors are found to be weakly correlated with the dependent variable with the correlation index ranges from 0.007 to 0.108 for PEMs, 0.095 - 0.158 for log of financial development index (FD), 0.076 - 0.210 for log of financial institution index (FID), 0.032 - 0.069 for financial market development index (FMD), 0.052 – 0.210 for log of discomfort index (LDISC), 0.123 – 0.434 for gross capital formation (GCF), 0.061 – 0.443 for the natural logarithm of oil price (LOP) and 0.212 for GDPGR.

It is apparent from Table 2 above that there exists a low correlation among all the regressors and the endogenous variables. Specifically, the correlation between the log of PEM and logs of financial development components remains positive and stands at 0.007, 0.023 and 0.012 respectively. Hence, by implication there exists low degree of relationships among the endogenous (dependent) and exogenous (independent) variables; and this indicates that there is no suspicion of

high multicollinearity presence, thereby suggesting that including these variable series in the same model would likely not produce spurious, bias and inconsistent regressions. Therefore, the results suggest that the correlation coefficients between the endogenous and exogenous variables are moderate and can co-exist in the same model.

4.3 Unit Root Analysis

The need to ascertain whether mean reversion and non-stationarity is a characteristic of each variable based on Fisher - Augmented Dickey-Fuller (ADF), Fisher - Phillips-Perron (PP), Im, Pesaran, and Shin (IPS) and Levin, Lin and Chu (LLC) panel unit root tests became paramount in this study. This was conducted at both intercept and trend specifications of unit roots on the levels of the series. By comparing the Panel ADF, PP, IPS and LLC tests statistics in addition with their critical values, the results show that all the variable series are stationary at levels. The essence of both tests (common and individual unit root tests) is to guide against biased, spurious and inconsistent panel regression results since such biased results could be misleading, inaccurate, inconsistent and unreliable for policy makers (Baltagi, 2005). The results showed that all the considered variables are stationary at both levels $I(0)$ and first difference $I(1)$. In other words, all the variable series are stationary and integrated of level orders zero (0) and one (1), i.e. a combination of $I(0)$ and $I(1)$. Hence, having established that all variables are mixed and integrated of orders zero $I(0)$ and one $I(1)$ i.e. stationary at both level form and first difference, then it is appropriate to apply the Dynamic Ordinary Least Squares (DOLS) and Fully Modified Ordinary Least Squares (FM-OLS) estimation techniques both developed by Stock and Watson (1993) and Phillips and Hansen (1990) to determine the magnitude of impacts of the regressors on the dependent variable (PEMs) once all variables ($k = 9$) are found to be cointegrated using the Pedroni Panel Residual Cointegration test and technique.

Table 3: Results of the Individual Unit Root Tests

Variables	Augmented Dickey Fuller (ADF) Fisher			Phillip and Perron (PP) Fisher			Decision
	Level	First Difference	<i>P - Values</i>	Level	First Difference	<i>P - Values</i>	
PEM (h)	221.68	None	0.000***	375.060	None	0.000***	I(0)
LFD	21.107	None	0.000***	36.684	None	0.000***	I(0)
LFID	25.559	202.17	0.000***	30.738	360.51	0.000***	I(1)
LFMD	35.835	174.775	0.000***	49.791	292.45	0.000***	I(1)
LDISC	5.278	84.325	0.000***	5.159	159.93	0.000***	I(1)
LGCF	151.92	None	0.000***	275.34	None	0.000***	I(0)
LOP	194.35	None	0.000***	277.41	None	0.000***	I(0)
GDPGR	152.73	None	0.000***	229.98	None	0.000***	I(0)
CRISIS	4.533	124.97	0.000***	4.617	257.52	0.000***	I(1)

Source: Author's Computation. All variables are estimated at both trend and intercept.

Table 4: Results of the Common Unit Root Tests

Variables	Levin, Lin and Chu (LLC)			Im, Pesaran and Shin (IPS)			Decision
	Level	First Difference	<i>P - Values</i>	Level	First Difference	<i>P - Values</i>	
PEM (h)	-10.529	None	0.000***	- 14.284	None	0.000***	I(0)
LFD	-10.525	None	0.000***	- 13.719	None	0.000**	I(0)
LFID	-3.849	-9.890	0.000***	-0.460	-13.257	0.000***	I(1)
LFMD	-0.170	-11.678	0.000***	-0.748	-12.520	0.000***	I(1)
LDISC	1.004	3.959	0.062*	0.312	-1.355	0.088*	I(1)
LGCF	-3.848	None	0.000***	- 10.217	None	0.000***	I(0)
LOP	-12.534	None	0.000***	- 12.868	None	0.000***	I(0)
GDPGR	-9.474	None	0.000***	- 11.062	None	0.000***	I(0)
CRISIS	1.329	-13.597	0.000***	3.062	-9.450	0.000***	I(1)

Source: Author's Computation. All variables are estimated at both trend and intercept.

Note: ***, ** and * represent 1%, 5% and 10% level of significance respectively.

4.4 Pedroni's Panel Residual Cointegration Test

The results of the cointegration using seven-test statistics of Pedroni Residual Cointegration as shown in Table 5 confirms that there is a long - run relationship among all the nine variable measures and regressors which are the monetary policy efficiency measure (PEM) of the central banks i.e. (h), the macroeconomic performance measures (i.e. the discomfort index and GDP growth rate), real investment growth (i.e. gross capital formation), oil price growth, the global financial crisis, financial development, financial institution and the financial market development index measures in the 12 selected sub - Saharan African countries. Based on this result, we reject the null hypothesis that assumes no cointegration at 1%, 5% and 10% significant levels, and conclude that there is a long run relationship and an existence of cointegration among financial sector development, macroeconomic performance and monetary policy efficiency in SSA countries, suggesting that in the long run, all variables tend to co-move and converge together. This finding is in conformity with studies by Samba and Mbassi (2016) on the macroeconomic policy efficiency and financial development nexus in the CEMAC countries.

Table 5: Pedroni's Panel Residual Cointegration Tests and Results

Dimensions	Individual Intercept	Individual Intercept & Trend	No Intercept & Trend
Test Statistic	Coefficients (Prob – Values)	Coefficients (Prob – Values)	Coefficients (P – Values)
Panel v-Statistic	-4.6972 (0.0732) *	-6.0416 (0.0822) *	-3.9070 (0.0600) *
Panel rho-Statistic	-2.7870 (0.0245) **	-2.8802 (0.0020) **	-4.8182 (0.0000) ***
Panel PP-Statistic	-13.676 (0.0000) ***	-13.766 (0.0000) *	-12.995 (0.0000) ***
Panel ADF-Statistic	-3.9977 (0.0000) ***	-2.9290 (0.0017) ***	-4.3540 (0.0000) ***
Group rho-Statistic	-2.6526 (0.0040) ***	-1.2564 (0.1004) *	-3.6315 (0.0001) ***
Group PP-Statistic	-28.970 (0.0000) ***	-29.230 (0.0000) ***	-30.577 (0.0000) ***
Group ADF-Statistic	-8.9165 (0.0000) ***	-8.3725 (0.0000) ***	-10.066 (0.0000) ***

Source: Authors Computation. **Notes:** ***, ** and * indicate significance at 1%, 5% and 10% levels with p-values in brackets ().

4.4 Empirical Results and Discussion

The result in Table 6 showed that the financial sector development indicators all have the negative hypothesized coefficients signs and were all statistically significant across the regional trade blocs between EAC and ECOWAS countries in Africa. This result implies that a deeper development in financial sector amplifies the policy efficiency and monetary policy actions in the EAC and ECOWAS trade blocs region, thereby indicating that the overall effects of financial development (FD) on monetary policy efficiency is negatively significant with no variations in hypothesized signs, since financial development (FD) in the sub-group trade blocs takes a negative sign without variations across the sub group. This corroborates previous empirical findings and results in the study conducted by Samba and Mbassi (2016). As regards the magnitudes of the coefficients, the result suggests a positive impact on the policy efficiency in east and west Africa countries, and it had a positive significant effect on monetary policy efficiency in ECOWAS and EAC with the coefficient values of (5.767 and 7.487), thus implying that a one percent change or increase in financial development leads to about 5.77% and 7.49% respectively. The implies that policy efficiency improvement is more dominant in Eastern African Community regions (EAC) than those of the Economic Community of West African States (ECOWAS) Western and Southern economies (WA and SA).

Also, while the financial institution development was positively significant in explaining policy efficiency of the central banks in EAC, it was found insignificant in the ECOWAS trade bloc but with the negative hypothesized coefficient signs, i.e. both had the expected negative hypothesized signs, suggesting that financial institution development index (FID) is a key determinant and critical predictor of monetary policy efficiency actions of the central banks in EAC and ECOWAS sub-groups and countries. The financial market development (FMD) just like the financial institution development (FID) exerted a negative significant impact on policy efficiency in ECOWAS but insignificant in the EAC countries, suggesting that a one percent increase in financial institution development leads to about 18.9% decline in policy efficiency. This implies that a deeper financial institution development would significantly enhance and improve the monetary policy efficiency measures in ECOWAS and EAC sub-African regions. Consequently, for the effect of the macroeconomic performance proxied by the discomfort index (DISC), the effect was found mixed with hypothesized coefficient signs of positive and negative values.

This foregoing implies that while the discomfort index exerted a positive significant impact on policy efficiency in ECOWAS countries, it was statistically insignificant in EAC countries. Hence, the result suggests that while the discomfort index impeded (dampened) policy efficiency in the EAC countries, it rather declined and decreased the policy efficiency of the monetary policy actions in ECOWAS sub-region. This result and findings corroborate the previous findings of Samba & Mbassi (2016) and Krause and Rioja (2006). In other words, while financial institution development exerted a positive significant effect and improvement in policy efficiency of ECOWAS member countries, it has rather stagnated or dampened the policy efficiency of the EAC member countries. Also relevant in this study is the effect of the global financial crisis dummy on policy efficiency. It thus suggests that a one percent increase in financial crisis dummy leads to about 27.14% declines in policy efficiency of the central banks in ECOWAS region. Similar to this are the key variables of oil price and gross capital formation which both had the expected signs in the hypothesized coefficients.

This therefore, suggests that a one percent increase in oil price and gross capital formation leads to about 8.9% and 3.4% improvements, increases and enhancements in the monetary policy efficiency and the central bank's ability performance. It thus, implies that both the oil price and gross capital formation variables improved the policy efficiency and exerted a positively significant effect on the monetary policy efficiency and performance in the ECOWAS and EAC sub regions and member countries.

Table 6: System Generalized Method of Moments Regression Estimates and Empirical Results.

Dependent variable: Policy Efficiency Measure (PEMs) (h)

Regions:	ECOWAS COUNTRIES	EAC COUNTRIES
Method: System GMM Estimator		
Regressors	(1)	(2)
FD_t	-576.72 (-2.5497) **	-748.65 (-1.7784) *
FID_t	-151.27 (-1.3572)	-414.82 (-1.8558) *
FMD_t	-189.20 (-1.7668) *	335.18 (1.4129)
$DISC_t$	-0.2281 (-3.8475) ***	0.0762 (2.1901) **
GCF_t	-0.0344 (-1.7516) *	- 0.0017 (-0.1398)
OP_t	-0.0889 (-1.7291) *	- 0.0584 (-0.8429)
$GDPGR_t$	0.0595 (4.8855)	- 0.0168 (-0.7348)
$CRISIS_t$	-27.139 (-3.6798) ***	0.0349 (0.0063)
R-Square (R^2)	0.6066	0.6929
Adjusted - R^2	0.6047	0.6823
F-Statistic	2.4683	5.3339
D-W	2.0121	1.9928
No of Obs.	129	129
Countries	3	3

Source: Author's Compilation using E-views, 2024. The **t-statistics** and **F-statistic** of Wald test in parenthesis- **Notes:** *** denotes statistical significance at 1% level, ** at 5% level, and * at 10% level.

7. Concluding Summary

This study has shed light on the nexus between financial sector development and the monetary policy efficiency of the central banks in the East African Community and Economic Community of West African States. The study concludes that both financial development and macroeconomic performance variables significantly determined the policy efficiency in SSA, suggesting that while policy efficiency has improved significantly in some countries like Nigeria,

Benin, South Africa, Malawi, Mauritius, and Cameroon, it has on the other hand stagnated and dampened in countries like Chad and Equatorial Guinea. These empirical results thus, substantiate the existing literature on financial development and monetary policy efficiency with emphasis on a global financial crisis as a dampening factor in the SSA countries. These empirical evidences thus, confirmed that financial development, macroeconomic variable performance and the global financial crisis all acted as determinants and significant drags to the benefits of financial development and the macroeconomic performance to the monetary policy efficiency of the central banks in SSA countries. This study therefore, recommends the need for monetary authorities to adequately put in place several macroeconomic policies, strategies, implementations and reforms that would enhance both financial sector development and improve the macroeconomic performance in the developing countries, since a deeper development of financial sector and deeper financial system plays a vital role in enhancing policy efficiency whether developed or developing economies.

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NEW TYPES OF BUSINESS DEVELOPED DURING THE COVID-19 PANDEMIC

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Abstract

The COVID-19 pandemic has led to an unprecedented worldwide crisis, triggering a momentous and lasting disruption of traditional business models throughout all sectors of the world economy. The crisis created an imperative to reconsider deeply rooted operational paradigms in an immediate manner, compelling organizations to adopt rapid innovation and strategically enacted changes to their operations. As a result, this created a momentous emergence and radical restructuring of new business models, ultimately fueled by revolutionized consuming patterns, swift and mass adoption of advanced digital technologies, and adaptive reforms in government-regulated decision-making paradigms worldwide. The paper presents a systematic and critical discussion of several landmark and representative business categories either having emerged from ground levels or undergoing significant and transformative growth as a result of pandemic impact repercussions. The study rests firmly on recent academic literature, strong empirical evidence, and relevant industry reports. The study discusses an in-depth review of virtual and hybrid events venues, e-commerce and delivery services, remote working solutions, telemedicine and e-health initiatives, educational technology (EdTech), digital fitness and well-being, and virtual tourism and entertainment

industries. For each category, we illustrate their distinguishing features, major growth and transformation drivers, underlying broad technological foundations, changing adoption trends among end-users, pertinent regulatory impacts, and provide a critical analysis of their potential long-term effects on the composition and operations of the world economy.

Keywords: COVID-19, entrepreneurial innovation, digital evolution, online commerce, telehealth, telecommuting, educational technology, virtual gatherings, pandemic effects, commercial adaptation, digital market, crisis leadership, consumer trends, regulatory framework

JEL Classification: L26, L21, O33

Introduction

The sudden and devastating worldwide spread of the COVID-19 pandemic early in 2020 was an unprecedented crisis in terms of its size and intensity, having consequences far greater than its immediate acute public health impact (Baldwin & Weder di Mauro, 2020; Nicola et al., 2020). The pandemic brought about a profound and lasting shift in the worldwide economic order, with projections about its impact touching on almost all sectors of industry and a compelling need to rapidly review and redefine practiced business methods (Donthu & Gustafsson, 2020).

The near-universal imposition of restrictive lockdown measures, scrupulous observation of social distancing procedures, and drastic restrictions on domestic and external travel generated a real and perceived disruption worldwide (Gössling et al., 2020; Fernandes, 2020). The era of profound and protracted disruption served as a vital and inescapable stimulus to innovation, as it forced organizations in all sectors of industry to hasten change to their very business frameworks, reimagine strategically their critical business processes, and, in a large number of instances, inspire and implement fundamentally new business models as a solution to manage the complex and often survival-threatening issues brought about by the pandemic (Seetharaman, 2020; Reeves et al., 2020).

This paper offers a systematic and critical review of the mainstream and representative types of businesses having undergone substantial and frequently rapid growth or having appeared afresh over this crisis period of transformation. Our investigation rests on an assumption that these changes were brought about by the synergetic and often complementary convergence of highly diverse patterns of consumption and choice (Sheth, 2020), by the rapid and far-reaching adoption of

increasingly sophisticated digital technologies in all areas of business processes and customer engagement (Brynjolfsson et al., 2020), and by active as well as reactive measures taken by government institutions and international agencies worldwide in their policy-making processes to counteract the changes brought about by this ongoing crisis (OECD, 2020).

Through an in-depth discussion of these new and changing paradigms of business based on a meticulous review of recent academic literature, hard empirical evidence drawn from industry data, and industrial analyses, as well as reflecting on a sophisticated sense of underlying technological and societal changes, this research tries to provide a comprehensive and nuanced picture of adaptation measures taken by businesses in the private sector. Additionally, we seek to provide a critical evaluation of prospective long-term consequences of these pandemic-forced changes in shaping the future course of the world economy by examining both the opportunities as well as challenges faced in this journey (McKinsey & Company, 2020).

1. Virtual and Hybrid Event Platforms: Redefining Interaction and Engagement Strategies.

The abrupt and near prohibition on in-person events, instituted through public health measures to stem the rapid spread of SARS-CoV-2, dramatically accelerated the progress, growth, and widespread adoption of new virtual and hybrid event platforms (Smith & Jones, 2021; Wang & Lee, 2022).

The digital infrastructure has also evolved significantly, shifting from its early usage largely limited to video conferencing to delivering end-to-end and immersive solutions appropriate to a broad spectrum of events ranging from high-end corporate events to academically oriented conferences, critical trade shows, and significant personal social events (Li et al., 2022; Anderson & Keller, 2021).

Industry-leading players like Zoom, Hopin, and Airmee significantly expanded their functionalities by consolidating their technical infrastructure, enhancing user interaction and engagement, and scaling up their infrastructure in response to unforeseen loads. These platforms enabled multiple types of virtual interaction and added interactive functionalities such as real-time polls and survey tools to gauge engagement, advanced Q&A formats with live moderation, virtual breakout rooms to enable meaningful discourse among groups of participants, and networking functionality underpinned by advanced algorithms like machine-learning-based matchmaking and virtual lounges promoting casual networking activity (Smith & Jones, 2021; Gupta & Hernandez, 2021).

The platforms also accelerated their revenue strategies by introducing tiered-ticket pricing with access to high-end virtual content accompanied by varied functionalities, sponsorships of virtual booths offering opportunities for exhibits and lead generation, and e-commerce functionalities enabling participants to purchase relevant items or services directly in the virtual environment (Li et al., 2022; Patel & Raymond, 2023).

Furthermore, with the easing of public health restrictions worldwide, hybrid formats of events became an innovative option, successfully combining physical and virtual participation into an integrated model. This model extends seamless interaction and equitable engagement between modalities and possibly marks a lasting, transformative shift toward more accessible, flexible, and inclusive formats, with greater reach and scalability to a worldwide audience (Smith & Jones, 2021; Wang & Lee, 2022; Gupta & Hernandez, 2021).

Recent academic studies have increasingly investigated the effectiveness and ongoing usability of these platforms in promoting vital socio-economic activities, improving meaningful professional and social relationships, and potentially reducing environmental consequences associated with traditional face-to-face encounters (Smith & Jones, 2021; Li et al., 2022; Patel & Raymond, 2023; Anderson & Keller, 2021).

2. Delivery Services and Internet-Enabled E-commerce: Improvements in Internet-Facilitated Delivery Systems & Virtual Retail

The enforced globalization of lockdown measures, coupled with overall public health mandates promoting social distancing, created a broad and collective shift in necessary consumption patterns, leading to heightened demand for online shopping platforms and, consequently, resulting in unprecedented and rapid growth in e-commerce operations (Hasanat et al., 2020; Garcia et al., 2022). Leading corporations operating in this virtual marketplace—major corporations in particular, such as Amazon; expansive platforms like Shopify extending to independent vendors; as well as niche sites like Etsy—benefited from unparalleled and often superior increases in individual market shares (Pantano et al., 2020). Furthermore, these corporations actively increased their service provision by diversifying into new product lines, improving their store pages, and significantly enhancing their logistical structures to suit mounting demands.

While this was ongoing, a strong and enduring increase in customer preference for convenient, contactless, and secure alternatives in delivery boosted growth and awareness of specialized food and grocery delivery services. Notable among these

were companies like DoorDash, Instacart, and Uber Eats, which experienced notable growth through widespread industry integration (Kim, 2021). The delivery operations upgraded their functioning mechanisms, devised improved logistical strategies, and implemented new safety procedures to accommodate changing consumer needs in a restrictive setting.

Academic studies are increasingly focusing on the long-term consequences of these inevitable and possibly permanent changes on the complex dynamics of physical retail markets, shifts in post-pandemic consumption behavior, and profound changes in international supply lines and logistical infrastructure (Hasanat et al., 2020; Garcia et al., 2022; Pantano et al., 2020).

3.Remote Work Technologies: Enabling the Distributed Workforce

The broad and frequently transformative shift toward remote working arrangements in multiple industries, prompted by public health mandates and corporate initiatives designed to prioritize employee well-being, has accelerated significant innovation in the creation, enhancement, and widespread adoption of technologies designed to facilitate virtual teamwork, maintain productivity, and support seamless interaction among geographically distributed team members (Brynjolfsson et al., 2023).

Businesses offering advanced collaboration platforms—such as Slack, Microsoft Teams, and Asana—saw historic levels of adoption as organizations sought tools to ensure business continuity in remote work environments (Kumar & Patel, 2021). These platforms integrated scheduling, file sharing, video conferencing, and task management tools to support productivity across time zones.

Moreover, the sudden shift to remote working raised concerns about cybersecurity, especially when employees accessed sensitive data from personal devices or unsecured networks. In response, there was a surge in demand for robust cybersecurity infrastructure including Virtual Private Networks (VPNs), multi-factor authentication systems, and endpoint detection and response (EDR) tools tailored to remote contexts (Sharma & Singh, 2021).

Recent academic work suggests these changes are not temporary adjustments but long-term shifts that will influence organizational behavior, workforce expectations, and the very structure of office-based work in the future (Brynjolfsson et al., 2023; Kumar & Patel, 2021).

4. Telemedicine and Digital Healthcare Solutions:

The COVID-19 pandemic has significantly accelerated broad-scale deployment and integration of telemedicine and digital healthcare solutions into healthcare delivery platforms, mainly as a result of public health actions taken to reduce face-to-face encounters between patients and healthcare providers in an attempt to contain risks related to viral spread (Bashshur et al., 2020; Johnson et al., 2021). Key players in this rapidly changing arena—such as Teladoc with its virtual medical consultations, Doctor On Demand with immediate access to doctors, and Amwell with its comprehensive telehealth services—scaled their operations, upgraded their technical infrastructures, and significantly expanded their service portfolios. These developments reconfigured both access to and delivery of various medical consultations and healthcare services using innovative remote healthcare platforms (Contreras et al., 2020).

One of the major leaps in this field was the integration of telemedicine platforms into conventional electronic health record (EHR) systems, enabling seamless and secure data transfer between virtual providers and in-person healthcare professionals. This integration ensured continuity of care and a more holistic picture of patient health (Keesara et al., 2020). Additionally, temporary—and in some jurisdictions, permanent—regulatory adjustments implemented by government agencies and healthcare organizations removed telemedicine restrictions and introduced reimbursement schemes for virtual consultations. These policies contributed to a more integrated, effective, and potentially more equitable model of healthcare delivery, expanding geographical access and improving healthcare inclusion for historically underserved populations (Wosik et al., 2020; Mehrotra et al., 2020).

5. Educational Technology (EdTech): The Future of Learning and Skill Building:

The sudden and frequently turbulent shutdown of physical schools globally, spanning all educational levels from primary through tertiary education, forced an unfavorable and difficult transition to digital forms of learning. The transition pushed these schools into embracing digital platforms in order to continue delivering important educational services and academic programs. Key players in the Educational Technology (EdTech) space, including Coursera with its repositories of massive open online courses (MOOCs), Khan Academy with its free educational resources, and Byju's with its personalized solutions, recorded

unprecedented and sometimes exaggerated increases in their followings. The developments well addressed the expanding need for convenient and engaging remote educational services as well as digital learning materials. The platforms also played a pivotal and increasingly dominant role in facilitating individualized courses, professional certifications, and skill-based training programs specifically designed to enable reskilling and upskilling of those hard hit by the widespread economic impacts and concurrent employment losses brought about by the pandemic. The crisis also highlighted the important role EdTech plays in education in times of unexpected crises, as well as its potential in increasing diverse educational opportunities to a more geographically dispersed population, bridging geographical divides and facilitating flexible modes of learning (Williamson et al., 2020; Nguyen et al., 2022). The crisis, however, glaringly lit up the persistent and widespread issues underpinning the digital divide and its associated challenges by, on the other hand, highlighting an immediate imperative of universal access to stable infrastructure, connectivity, and digital competencies training to ensure that the plurality of EdTech's benefits are available to all learners regardless of their socio-economic background or geographical location.

6. Digital wellness and fitness platforms: Personalizing health and wellness.

The worldwide spectacle of extended closures of physical gyms, fitness studios, and conventional well-being establishments, coupled with an increasing social awareness of the need to enhance physical as well as mental well-being in times of isolation and stress, has spurred immense growth and increased user activity in the rapidly evolving arena of digital fitness and well-being platforms (Smith & Johnson, 2021). Digital tools and services like Peloton, with its interactive home workout sessions, Calm, with its guided meditation and sleeping assistance, and Headspace, focusing on mindfulness and mental well-being, recorded phenomenal increases in subscription levels and usage by providing personalized and easily adoptable fitness routines to follow in-house, guided meditation sessions, stress management tools, individualized sleeping assistance, and an immense variety of mental well-being aids prepared for remote adaptation and application (Brown & Taylor, 2020; Zhang et al., 2021). Additionally, various platforms incorporated new technologies such as real-time interaction with certified personal instructors, personalized workout routines based on individual fitness levels and goals, gamification features with a goal towards increased user interaction and compliance, and compatibility with wearable instruments to track development and provide real-time feedback (Adams & Patel, 2022; Liu & Zhang, 2022). A

convergence of increasing academic research reinforced by continuous evidence consistently identifies the long-term significance and immense potential of digital well-being platforms in promoting overall health activities, enhancing overall well-being, and promoting health-conscious choices, with far-reaching consequences extending beyond the pandemic's challenges, thereby marking the onset of an era based on greater personalization and digitally mediated methods of health and well-being management (Lobo et al., 2020; Roberts & Wong, 2022; Mitchell & King, 2021).

7. Virtual Tourism and Online Entertainment: Experiencing the World through Digital Media

The common suspension of international travel and conventional recreational activities, prompted by far-reaching and often long-lasting travel restrictions, border shutdowns, and public health warnings against unnecessary travel, has accelerated the development and growing popularity of virtual tourism programs (Gössling et al., 2020). These innovative virtual sites have made digitally mediated and often virtualized encounters with world-famed destinations, major museums, historic sites, and celebrated tourist sites possible through their deployment of cutting-edge technologies including high-definition 360-degree video, interactive virtual reality (VR) simulation, and interactive augmented reality (AR) tools (Tussyadiah et al., 2018; Jung et al., 2021). At the same time, both well-known as well as new web-based entertainment providers—variants ranging from streaming services like Netflix, Disney+, and Amazon Prime Video to web gaming sites, virtual concerts, and virtual cultural events—have seen large-scale and often spectacular growth in subscriber bases and overall viewer activity, thus serving to meet increased customer demand for convenient and varied in-home entertainment opportunities over many months of suspended travel and social isolation (Chen et al., 2023; Verma & Sanyal, 2021). Modern academic writing increasingly sees these digital technologies as more than temporary stopgaps to physical activities; instead, these technologies are viewed as viable long-term substitutes and useful supplements to traditional tourism and recreational activities, with exciting new modes of cultural exploration, recreational pleasure, and even scholastic progress accessible to a world audience (Tussyadiah et al., 2018; Chen et al., 2023; Li et al., 2022).

8.Conclusion

The COVID-19 pandemic has deeply reshaped the global business environment, significantly accelerating the speed of digitalization in almost all sectors of the economy and promoting rapid progress and large-scale adoption of new business models (Brynjolfsson et al., 2020; Seetharaman, 2020). The primary categorizations of emergent and adapted business types extensively and critically examined in this paper—virtual and hybrid event platforms, e-commerce and delivery services, remote working technologies, telemedicine and digital healthcare solutions, EdTech, digital fitness and wellness platforms, and virtual tourism and online entertainment—represent critical domains in which profound and oftentimes transformative changes occurred in direct response to the unprecedented challenges and rapidly evolving customer needs brought about by the pandemic (OECD, 2020; McKinsey & Company, 2020). The rapid and pervasive adoption of cutting-edge digital technologies was the foundational pillar undergirding these far-reaching changes, highlighting the increasing and perhaps necessary role of organizational dexterity, technological adoption, and digital literacies in maintaining business resilience, facilitating innovation, and achieving long-term growth in an increasingly interdependent and volatile world environment (Hassan et al., 2021; Lee et al., 2021). While immediate and urgent needs created by the pandemic may very well have subsided incrementally across many parts of the world, these innovative business types and the very changes in consumer behaviors created and solidified over this transformative period are highly likely to have enduring and far-reaching effects, marking a significant and perhaps irreversible shift towards more digitally integrated, dexterous, and hybrid solutions across various sectors that will continue shaping the future course of the world economy (Baldwin & Weder di Mauro, 2020; Sheth, 2020). Future academic exploration must continue to rigorously examine the long-term viability, scalability, ethical considerations, and wider societal implications of these pandemic-fueled innovations in the evolving contexts of post-pandemic reality, with particular emphasis on issues of digital equity, data privacy, and the potential for both beneficial and disruptive effects on pre-existing economic and social structures (Mikalef et al., 2021; Sharma et al., 2022).

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PUBLIC PERCEPTION BEHAVIOUR TOWARDS CONTACT TRACING FOR COVID-19

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Abstract

This study examined public perception behaviour towards contact tracing for COVID-19 in Ibadan, Metropolis. Descriptive survey research design was adopted in the study. The study made use of the multi-stage sampling technique. Rose, Spinks and Canhoto formula for the unknown population was used to select 400 participants who participated in the study. The protection motivation theory (PMT) underlies the investigation. The tools utilised for the research were pre-tested before real distributions on the subjects. Descriptive statistics, including percentages, tables, and frequency counts, were used to analyse the collected data. Furthermore, the research responds to ethical

considerations pertaining to confidentiality, fabrication, and anonymity. It was established from the study that the majority of the participants highly complied with all rules and regulations posed by public health officials during COVID-19. Sharing personal information with a third party was a major threat to the participants, while fear of stigmatisation contributed to the greater challenge of sharing personal information associated with contact tracing during COVID-19. The study concluded that adhering to rules and regulations and the absence of stigmatisation by public health officers will reduce the spread and rate of COVID-19 as well as other contagious diseases or pandemics that may spring up in the future. Based on the above findings, recommendations were made.

Keywords: *Public perception, Public behaviour, Contact tracing, COVID-19*

JEL Classification: I12; I18, D83,C83

1. Introduction

After being discovered in Wuhan, China, in December 2019, the coronavirus disease—also referred to as COVID-19—spread quickly to Nigeria and almost every other nation on the earth. Current research indicates that a new and hazardous coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) is responsible for the sickness. Along with MERS, H5N1, H1N1, and SARS, this virus belongs to the coronavirus family. In addition to close contact with an infected individual and contaminated surfaces, COVID-19 is an infectious respiratory disease that may be spread by the mouth, nose, and eyes (Mohajan, 2020).

A laboratory test may detect the signs of COVID-19, which include fever, coughing, and dyspnoea. The virus might take anything from one to fourteen days to incubate. The infection may cause major respiratory difficulties or even death if left untreated, particularly in elderly adults and those with underlying chronic illnesses (Sharma et al., 2020). Additionally, it has been shown that some infected individuals are only viral carriers and may not exhibit any symptoms, while others may only have moderate symptoms like a headache, fever, cough, and so forth (Sauer, 2020). The disease could be contracted through coughing and sneezing and so on. However, on March 11, 2020, the illness was subsequently deemed a worldwide pandemic (Calota-Toma & Gurgu, 2022).

The process of finding potential connections of a person with the virus or people and then gathering additional data concerning those individuals is known as contact tracing. According to the World Health Organisation (WHO) (2020), contact tracing involves identifying, assess as well as managing people who are liable to an infectious disease as well as stopping them from spreading the disease to other people. This may be seen as a tactic to stop or slow the spread of an infectious illness (WHO, 2023). However, the public's perspective of contact tracing as a way to stop the spread of contagious diseases remains different because of its impact on their personal aspects, such as privacy invasion and stigmatisation, as explained by Protection Motivation Theory (PMT).

A contact could be traced through one's residential address, workplace address, next of kin, co-workers or co-travellers, school address, religious places of worship, traditional and community leaders, or any other person or persons that could provide any information to assist tracers. Naturally, human beings are dependent on each other to perform their routine chores. In the process of purchasing from a supermarket, making a phone call in a public phone booth, and having a meal in a restaurant, contact can be traced through the receipts they make at pay points and through people they encounter in the course of the transactions. For any contact to be traced, enquiries about the contacts are made. The demographics of the contacts and the current location of the contacts must be known. Individuals who are, for various reasons, being traced might also devise their own means of evading being caught, particularly if the purpose of tracing might stigmatise them. Prior to the information technology era, contact tracing was based on a person-to-person contact approach. But with the advent of information technology, contact tracing has been made much easier. Among other things, digital contact tracing makes use of mobile technology resources like cameras, smart devices, and mobile apps, as well as digital technologies like the internet. It is pertinent to note that more than half of the countries of the world battled with COVID-19 and the ways to curb its spread. The Nigerian COVID-19 agency promotes contact tracing as one of the ways to stop the spread of the disease, whereby people who call or visit designated testing centres reporting symptoms of COVID-19 are tested in accordance with the state's protocols. Countries such as China implemented stringent use of face masks in conjunction with social distancing, among other strategies, to stop the pandemic's spread. Like any other infectious illness, COVID-19 may be stopped from spreading through contact tracing, which is an intensive type of tailored containment (Simon et al., 2020).

Contact tracing often fails to take into consideration certain critical challenges, like privacy concerns of people being traced and stigmatisation as well as misconceptions. Contact tracing could also be regarded by individuals as actions that could lead to describing or regarding them as worthy of disgrace or disapproval in society, thus leading to avoidance and discrimination. The pandemic has been around now for about four years, and pertinent questions like "What is the attitude of the public towards contact tracing in view of the critical essence of the task and the challenges that attend it?" are due to be asked. However, there are several challenges to be considered for contact tracing, like privacy concerns of people being traced and stigmatisation and misconception, the general attitude of the public towards contact tracing, and the low level of training and capacity of public health officials complicating the practice of contact tracing. Several studies on COVID-19 have been conducted (Adedokun et al., 2020; Samuel et al., 2021; Cresswell et al., 2021; Dzandu, Pathak & de Cesare, 2022), but there is limited study in Nigeria that adopted a theoretical framework and addressed the socio-psychological issues deploying all information paraphernalia to identify and arrest suspected contacts, thus creating a lacuna the present study intends to fill. Hence, it is on this premise that the present study sought to examine public perception behaviour towards contact tracing for COVID-19 in Ibadan Metropolis.

1.1 Objectives

The main objectives of the study were to examine public perception behaviour towards contact tracing for COVID-19 in Ibadan, Oyo State, while the specific objectives were to:

1. To examine the personal factors on the intention of the public to comply with contacttracing for COVID-19,
2. To investigate the public perception of the severity of privacy concerns and stigmatisationassociated with contact tracing for COVID-19,
3. To investigate the perceived vulnerability of the public to privacy issues andstigmatisation in contact tracing.

1.2 Research questions

The current study was driven by the following research questions.

1. What are the intentions of the public to comply with contact tracing for COVID-19?
2. How severe does the public perceive their privacy concerns and stigmatisation associatedwith contact tracing for COVID-19?

3. How vulnerable do the public perceive themselves in respect of infringement privacy issues and stigmatisation in contact tracing?

1.3 Research hypothesis

The study's hypotheses were as follows: 9+

H₀₁: There is no significant relationship between the personal factors of respondents and threat appraisal towards contact tracing for COVID-19.

H₀₂: There is no significant relationship between the personal factors of respondents and coping appraisal towards contact tracing for COVID-19.

2. Review of related studies

This section reviewed empirical related works in order to have a grasp of knowledge of past studies in relation to the present topic being investigated. To do this, several databases like PUBMED, JMIR, ELSEVIER, SPRINGER, HEBSCOHOST and so on were searched to retrieve relevant information. The literature review was presented using research questions guiding the study.

2.1 Intention of the public to comply with contact tracing for COVID-19

Specifically, China's health informatics community—which encompasses consumer health informatics, public health informatics, clinical research informatics, and clinical informatics—has taken steps to use health information technology for a variety of purposes, including monitoring, detecting, preventing, and managing epidemics. COVID-19 poses a grave risk to global healthcare systems, and several governments around the world have put in place extensive and stringent preventative and control measures during the COVID-19 epidemic in Wuhan in order to promptly contain the spread of the disease. Factors related to contact tracing compliance during COVID-19 were examined by Randall, Dalal, & Dowden (2023) in New York, USA. The sample had 601 participants who completed the online survey; each responder received \$4.74. According to the study, one of the factors linked to higher intentions to comply with the COVID-19 pandemic was trust in contact tracers. The importance of trust in contact tracing was also reaffirmed by the qualitative result. Similarly, Liccardi, Alekseyev, Woltz, McLean, & Zurko (2022) examined public readiness to take part in COVID-19 contact monitoring in the United States. With a total population of 2157, the research used stratified random sampling, focusing on race and ethnicity. According to the study, Black respondents were significantly more willing than White respondents to participate in contact tracing. In addition, Juneau, Briand, Collazzo, Siebert, & Pueyo (2023) published research on effective COVID-19

contact tracking. The research is a systematic review that used observational techniques to examine 343 publications. The research concluded that, particularly in Hong Kong, contact tracing was a useful strategy for improving COVID-19 management. The aforementioned results were corroborated by Davis et al. (2021), who examined contact tracing as a flawed method of limiting the spread of COVID-19 in the UK and found that, when properly implemented and followed, contact tracing can help control outbreaks like COVID-19 by at least 15%. The authors also confirmed that contact tracing is not the only effective way to control outbreaks like COVID-19.

Furthermore, Karabay, Ensari & Yurtkoru (2022) reported in an empirical study on Covid-19 impact among university students using an online survey for data collection during lockdown with a sample of 299 undergraduates. It was discovered from the study that the undergraduates adhered to Covid-19 distance policy and that female undergraduates feel less secure regarding new normal conditions. Furthermore, de Oliveira, Guimarães & Silva (2023) noted in their study on strategy and resilience on Covid-19 crisis among four small scale firms and found that the most crisis faced was tracing contact person in the firm which eventually increase the number of contacted people. Agyapon-Ntra & McSharry (2023) reported on global analysis and effectiveness on Covid-19 response policy and revealed that fatigue and compliance to contact tracing accounted for over 85% death in 2020 compared to 40% less in 2021. Jacobs & Okeke (2022) evaluated Nigeria's response to the first wave of the pandemic and found that the country implemented several measures to stop the disease's spread, such as travel restrictions, social distancing, contact tracing, isolation, and quarantine, all of which were meant to reduce the rate of infection and death. However, the absence of Nigeria's health database was responsible for the slow on infected people's ability to recall. Ekong, Chukwu & Chukwu (2020) affirmed the importance of digital, like mobile phone calls, to complement COVID-19 contact tracing in Nigeria, which was adopted to reduce contact with COVID-19, but stigmatisation posed a big challenge.

This section examined the adherence to contact tracing for COVID-19 in Nigeria. However, a dearth of research was recorded in Nigeria, particularly in Oyo State (Jacobs & Okeke, 2022; Ekong, Chukwu & Chukwu, 2020). The majority of the research presented in this study was carried out in the United States, Hong Kong, and the United Kingdom. I think the study's conclusions will shed more light on the public's willingness to accept any illnesses that could appear in Nigeria in the near future.

2.2 Public perception on severe concern and stigmatisation associated with COVID-19 contact tracing

Stigmatisation is described as the activities that involve both identifying as well as marking undesirable characteristics, traits and other activities. A systematic review of social stigma during the COVID-19 pandemic in Iran was carried out by SeyedAlighi et al. (2023). Data were collected from eligible articles using databases such as Scopus, PubMed, Embase, and Web of Science up until August 2022. The risk of bias was evaluated using the Newcastle-Ottawa Scale. The study found that 76 studies were suitable for inclusion in the study, of which 22 studies revealed the widespread social stigma owing to COVID-19 disease, with isolation being the most common reported stigma. In addition, 20 studies found that most respondents experienced stigma owing to COVID-19 disease, which was regarded as high, representing 100% of respondents in two studies. Furthermore, participants in 16 studies attested that blaming was the second most prevalent form of stigma, after avoidance, psychological pressure, verbal abuse, and labelling. Similarly, Siddiqi & Khan (2022) investigated COVID-19 perception, social stigma and suffering in Bangladesh. The study used a mixed-method approach, with a particular focus on qualitative data collection techniques. An online survey done using Google Forms mode was used to gather quantitative data. The population of the study consisted of 53 respondents, 32 were found to be useful for data analysis. The results showed that fear of infection, societal prejudice, social status loss, and restriction from conventional health treatments are the main causes of the stigmatisation perception of COVID-19.

Furthermore, Zhang, Yao & Ran (2021) reported in their study on public stigmatisation of COVID-19 among China population. The study adopted a cross-sectional online survey between May 7th and 25th 2020, in China with a population of 1212 respondents who actually completed the online survey. The data was examined using both univariate and multivariate methods to look at the relationships between COVID-19 and public stigma. The study found that about 31.8% of the respondents agreed with the fact that stigmatisation towards people with COVID-19 exists. It was also reported that people's perceptions, such as dangerousness, fear, anger, and responsibility, were found to be positively associated with public stigmatisation.

Ramaci, Barattuci, Ledda, & Rapisarda (2020) also examined how health professionals perceived social stigma during COVID-19. The study adopted a correlational type of research design involving 260 healthcare personnel working in a southern hospital in Italy. The questionnaire was designed to gather data from the

participants. According to the research, stigmatisation has a significant impact on staff performance. It was also noted that stigmatisation can affect staff members' adherence to COVID-19. Esiaka et al. (2022) used a cross-sectional design with 332 Nigerian men and women to investigate the perceived risk of COVID-19 stigmatisation among Nigerians. The research found that individuals who felt more vulnerable to illnesses reported being stigmatised and at greater risk for COVID-19.

The review in this section was done empirically focusing on stigmatisation perception associated with COVID-19 contact tracing. Many of the studies reviewed were conducted in Bangladesh (Siddiqi & Khan, 2022); China (Zhang, Yao & Ran, 2021); Italy (Ramaci et al., 2020) and Iran (SeyedAlinaghi et al., 2023). The dearth of research regarding stigmatisation perception regarding COVID-19 contact tracing was reported in Nigeria (Esiaka et al., 2022), although, other studies in relation to COVID-19 were conducted to the fullest in Nigeria. Therefore, the outcome of this study will contribute to the phenomena being investigated as well as serve as a reference point in the near future when there is another disease outbreak.

2.3 Vulnerability of public perception to infringement of privacy issues and stigmatisation in contact tracing

This section focuses on vulnerability to infringement of privacy issues as well as COVID-19 contact tracing stigmatisation. During COVID-19, Megnin-Viggars, Carter, Melendez-Torres, Weston, & Rubin (2020) investigated the factors that facilitated and hindered contact tracing. The study adopted a systematic review of the rapid type to identify primary research-based papers, narrated in the English language. The research indicated that distrust, fear of stigmatisation, and privacy concerns were the main obstacles or vulnerabilities to contact tracing that violated privacy concerns and stigmatised people with COVID-19. Wang et al. found that contact susceptibility was the second most important factor for people in low- to lower-middle-income countries and the third most important factor for people in upper-middle- to high-income countries. The study was conducted in 2022 using an online discrete choice experiment, and participants were chosen from all over the world. The data was analysed using a mixed-logit model and class talent. The research also stated that vulnerability and efficiency were regarded as crucial characteristics of COVID-19 contact tracking.

Williams et al. (2020) examined at the general public's perceptions of COVID-19 contact monitoring using apps in the UK. The participants were 27 who reside in the UK and 18 years and above were targeted for the study using a qualitative study of focus group type. Data was gathered through online video conferencing.

Vulnerability linked to stigma and privacy concerns was found to be more beneficial. Furthermore, the study found that among participants who said they would not use the app, privacy, stigma, and uptake concerns were especially significant. The review above displayed vulnerability associated with privacy and stigmatisation issues regarding COVID-19 contact tracing. Although literature in this area was limited, connoting that much work relating to privacy and stigmatisation in COVID-19 contact tracing had not been done, especially in Nigeria and particularly in the Oyo state part of the country. This paper will be novel in the area of diseases and related fields in Nigeria, as this is expected to contribute immensely to knowledge in relation to future viruses or diseases.

2.4 Theoretical framework

The foundation of this research is the Protection Motivation Theory (PMT), which was created by Rogers in 1975 and essentially explains how people are driven to respond in a self-protective manner to a perceived danger to their health. Roger anticipated that the application of PMT would diversify over time, and this has been the case for forty years. PMT has been used to examine a variety of behaviour, including the administration of the influenza vaccination (Ling et al., 2019), sun protection and cancer prevention during the H1N1 pandemic, as well as infectious illnesses and skin cancer. The idea essentially elucidates the mental process that modulates conduct when confronted with danger. According to PMT, humans use a process of risk and coping appraisal to assess possible responses. While the coping appraisal process takes into account the effectiveness of the response, the difficulty of implementing the response (such as response cost), and the perceived self-efficacy of enacting the coping response, the threat appraisal process focusses on assessing the threat's severity and likelihood (i.e., vulnerability) of occurring. The PMT posited that when facing a threatening event, some people focus on the threat itself, while others focus on their efforts to act against such a threat. This actually affects people's intention to take precautionary action as well as results in adaptive behaviour against the threat. Therefore, stigmatisation, privacy concerns, and compliance are regarded as threats to COVID-19 contact tracing as far as this study was concerned. Many studies have been conducted in relation to COVID-19 have adopted PMT, such as Prasetyo et al. (2020); Khazae-Pool et al. (2020); Rad et al. (2021); Yildirim et al. (2021) and so on. Hence, making this theory suitable for the present study.

3. Methodology

Since the descriptive survey research design of correlational type is the most often used method in the humanities, particularly in information research and librarianship, it was chosen (Quadri & Idowu, 2016). The authors also reiterated that questionnaires are a major source of data for this type of survey. The study used multi-stage sampling techniques. Ibadan North Local Government (INLG) was selected in the initial phase. In the second stage, all the twelve (12) wards at the INLG were selected, while in the third stage, an accidental as well as convenience sampling method, was used to select participants from schools, LG offices, hospitals and malls across the 12 wards in the INLG area of Oyo State.

The study employed Rose, Spinks & Canhoto's (2015) formula used for unknown population sample size determination. The formula is given below:

$$n = 4pq/d^2$$

$$4 \times 0.5 \times 0.5 / (0.05)^2$$

$$1/0.0025 = 400$$

Where n = indicates the sample that will be selected from the unidentified population.

p = 0.5 is the population proportion that has the same characteristic.

q = 1- p also represents 0.5.

d = 0.05 is the error margin set for the study that is, the degree of precision.

The error margin accounts for the likelihood of mistakes in the research and selection, indicating that the study is, to a certain degree, 95% error-free and has a 5% error probability. As a result, 400 participants in all were selected. The instrument utilised to obtain the data was a structured questionnaire. Twelve (12) research assistants, each covering one (1) ward, were taught by the researcher to help distribute the data. A face validity test, which examines the suitability of the questionnaire items, was applied to the instrument. To make sure the items in the variable are dependable, the instrument's reliability test was carried out. The reliability was conducted using 20 questionnaires administered to participants in Akinyele Local Government area of Oyo State. This study area is different but similar to the study area. The study reliability test yielded the following intention to comply with contact tracing .708; Severity associated with privacy concerns .743; Severity associated with stigmatisation .812; Vulnerability associated with privacy

concerns .717; Vulnerability associated with stigmatisation .888. The instrument items were critically scrutinised by experts in the field of information science and librarianship, bearing in mind the study objectives. The collected data was examined using descriptive statistics, such as frequency counts, tables, and percentages. The study also conforms with ethical guidelines; participant confidentiality, anonymity, and data falsification were all protected.

4. Results and discussion

A total of 400 questionnaires were distributed to participants in 12 wards in INLG of Oyo State, Nigeria; 381 were duly completed and returned. This, therefore, represents a 95.25% rate of return; this is in consonance with Bryman (2012), who noted that a 60% response rate for a survey is acceptable. The findings and discussion of results are presented below. The public's intentions to cooperate with contact tracking for COVID-19 were the focus of the first study question. To achieve this, a 5-point Likert scale including Strongly agree, Agree, Undecided, Disagree, and strongly disagree was used. Table 1 below presents the results:

Table 1: Intention to comply with contact tracing during COVID-19

Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
I intend to comply with all the rules and regulations given by public health officials on COVID-19.	239 (62.7%)	130 (34.1%)	6 (1.6%)	5 (1.3%)	1 (0.3%)	381 (100.0%)
I cannot cope with seeing my personal information in the public domain on the COVID-19 issue.	148 (38.8%)	138 (36.2%)	27 (7.1%)	47 (12.3%)	21 (5.5%)	381 (100.0%)
I consider sharing my personal information with a third party as a threat.	165 (43.3%)	97 (25.5%)	33 (8.7%)	59 (15.5%)	27 (7.1%)	381 (100.0%)

Kindly note that Strongly Agree and Agree were aggregated to be Agree, while Strongly Disagree and Disagree were aggregated to be Disagree.

Table 1 revealed that almost all the participants, 369 (96.8%) agreed that they intend to comply with all rules and regulations given by the public health officials on COVID-19, while only 6 (1.6%) of the participants disagreed and were undecided, respectively. In addition, 286 (75.0%) of the participants agreed that they could not handle seeing their personal information in the public realm on the COVID-19 problem, compared to just 21 (5.5%) who disagreed and 27 (7.1%) who were unsure. The table also shows that about 262 (68.8%) of the participants agreed that sharing my personal information with a third party is considered a threat, whereas 27 (7.1%) of the participants disagreed with the statement and 33 (8.7%) undecided.

The second research question examined how severely the public perceives their privacy concerns and stigmatisation associated with contact tracing for COVID-19. To establish this, a 5-Likert scale of Strongly agree, Agree, Undecided, Disagree, Strongly disagree was adopted and the result is presented in Tables 2 and 3 below.

Table 2: Severity associated with privacy concerns in times of contact tracing for COVID-19

Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
Often times, contact tracing exposes one's private life to the public domain.	165 (43.3%)	153 (40.2%)	23 (6.0%)	36 (9.4%)	4 (1.0%)	381 (100.0%)
Seeing my personal details, I consider private with a third party makes me uncomfortable.	158 (41.5%)	152 (39.9%)	16 (4.2%)	45 (11.38%)	10 (2.6%)	381 (100.0%)
The thought of me divulging the names of the people I have come in contact with is unbearable.	131 (34.4%)	128 (33.6%)	59 (15.5%)	43 (11.3%)	20 (5.2%)	381 (100.0%)

Please take notice that Strongly Disagree and Disagree were merged to get Disagree, while Strongly Agree and Agree were combined to get Agree.

Table 2 reported that a majority, 318 (83.5%) of the participants agreed that contact tracing exposes one's private life to the public domain, while only 40 (10.4%) disagreed. To ascertain whether participants will be comfortable seeing the

personal details they consider as private with a third party, more than half, 310 (81.4%) of the participants agreed to the statement, while the least, 55 (13.9%) disagreed with the statement and 16 (4.2%) were undecided. In addition, the table revealed that 259 (68.0%) of the participants felt that it is unacceptable to even contemplate disclosing the identities of the people they had met, while 63 (16.5%) disagreed with the assertion.

Table 3: Severity associated with stigmatisation in times of contact tracing during the COVID-19 pandemic

Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
The thought of me being rejected by my colleagues would cause me too many problems.	166 (43.6%)	163 (42.8%)	15 (3.9%)	30 (7.9%)	7 (1.8%)	381 (100.0%)
The thought of me being quarantined would make me bothered, devastated and stigmatised for COVID-19.	133 (34.9%)	118 (31.0%)	20 (5.2%)	75 (19.7%)	35 (9.2%)	381 (100.0%)
The thought of me planning to evade being caught by publichealth officials is understandable.	127 (33.3%)	120 (31.5%)	29 (7.6%)	85 (22.3%)	20 (5.2%)	381 (100.0%)

Please take notice that Strongly Disagree and Disagree were merged to get Disagree, while Strongly Agree and Agree were combined to get Agree.

Table 3 above reported that a large proportion, 329(86.4%) of the participants agreed that the thought of being rejected by their colleagues would cause them too many problems if they discovered their COVID-19 status, while only 37 (9.7%) of them disagreed and 15 (3.9%) of them were undecided to the statement. In addition, the table also shows that 251(65.9%) of the participants were of the view that they would be bothered, devastated, and stigmatised if they were quarantined for COVID-19, while 110 (28.9%) of them acknowledged that they were not bothered or devastated by any stigmatisation if they are quarantined because of COVID-19, and only 20 (5.2%) of the participants were undecided on the statement. Table 3 showed that although just 29 participants (7.6%) were unsure

about the statement, 147 participants (64.8%) agreed that their idea of trying to avoid being discovered by public health authorities is reasonable. The public's impression of privacy violations and stigmatisation related to COVID-19 contact tracking is the subject of the third research question. The results are shown in Tables 4 and 5 below. To achieve this, the 5-Likert scale of Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree were used.

Table 4: Vulnerability associated with privacy concerns in times of contact tracing during COVID-19

Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
I worry about exposing crucial personal information to the public.	157 (41.3%)	144 (37.9%)	14 (3.7%)	31 (8.2%)	34 (8.9%)	380 (100.0%)
I would be glad if information given to public health officials is treated as private.	188 (49.5%)	157 (41.2%)	13 (3.4%)	16 (4.2%)	6 (1.6%)	380 (100.0%)
I feel uncomfortable giving out the information I consider private to public health officials.	131 (34.5%)	121 (31.8%)	26 (6.8%)	81 (21.3%)	21 (5.5%)	380 (100.0%)

Please take notice that Strongly Disagree and Disagree were merged to get Disagree, while Strongly Agree and Agree were combined to get Agree.

Table 4 above revealed that a large number, 301 (79.2%) of the participants attested that they are worried about exposing crucial personal information to the public, while only 14 (3.7%) were undecided. It was also reported that almost all the participants, 345 (90.7%) agreed that they would be glad if the information given to the public health officials was treated as private, although 13 (3.4%) of them were undecided about the statement. The table further reported that most 252 (66.3%) of the participants claimed that they are not comfortable giving out information they consider as private to public health officials, while 102 (26.8%) of the participants were comfortable giving out information they considered as private, and just 26 (6.8%) were undecided.

Table 5: Vulnerability related to stigmatisation in times of contact tracing during COVID-19

Statements	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total
I do not have a problem with anyone who has tested positive for COVID-19.	114 (30.2%)	124 (32.8%)	22 (5.8%)	31 (8.2%)	34 (8.9%)	378 (100.0%)
I worry about being contacted by public health officials.	100 (26.4%)	117 (30.9%)	26 (6.8%)	67 (17.7%)	69 (18.1%)	379 (100.0%)
Seeing my personal profile with the public health officials would affect my status.	107 (28.3%)	104 (27.5%)	31 (8.2%)	62 (16.4%)	74 (19.6%)	378 (100.0%)

Please take notice that Strongly Disagree and Disagree were merged to get Disagree, while Strongly Agree and Agree were combined to get Agree.

Table 5 clearly indicated that a majority, 238 (68.0%) of the participants agreed that they do not have a problem with anyone who has tested positive for COVID-19, while 65(17.1%) disagreed with the statement and only a few, 22 (5.8%), were undecided. It was further revealed from the table that a little above half 217 (57.3%) of the participants were so worried about being contacted by public health officials, while 136 (35.8%) of the participants affirmed that they were not worried about being contacted by the public health officials regarding contact tracing during COVID-19. In addition, 211 (55.8%) of the participants agreed that seeing their personal profile with public health officials would affect their status, and 136 (36.0%) of them disagreed, while only 31 (8.2%) were undecided regarding the statement.

5. Discussion of findings

The study found that the public agreed that they comply with rules and regulations posed by health officials, which is capable of reducing COVID-19 contact tracing, and that sharing personal information with the public is seen as a threat. The results of Juneau et al. (2023) and Davis et al. (2021), who discovered that adherence to COVID-19 contact tracing recommendations may reduce outbreaks by at least 15% in Hong Kong and the UK, were supported by this result.

Furthermore, quarantine, social distance, contact monitoring, travel restrictions, and isolation were all reiterated by Jacob & Okeke (2022) as strategies to prevent or slow the COVID-19 pandemic's development in Nigeria. In contrast, Randall, Dalal & Dowden (2023) observed that confidence in contact tracers was considered one of the variables linked with intent to comply with Covid-19. This implies that it is pertinent to comply with advice from health workers to curtail the spread of any form of disease or infection. This is expected to reduce the death rate and risk of transmitting it to other people. The study also reported that contact tracing exposes one's private life to the public domain and that some participants are uncomfortable seeing their personal information with a third party as well as divulging the same. The findings of this study corroborated that of Megnin-Viggars et al. (2020), who discovered that privacy concerns and mistrust were highlighted as barriers to contact tracing during COVID-19. In furtherance, Williams et al. (2020) also reported that concern over privacy is significant in COVID-19 contact tracing. As far as stigmatisation was concerned, it was revealed in the study that the thought of being rejected by colleagues would cause too many problems if they discovered their COVID-19 status and that the participant will be bothered, devastated, and stigmatised if they are quarantined as well as thought of being evaded by health officials. The finding was consistent with that of SeyedAlighi et al. (2023), who confirmed that the most prevalent social stigma associated with COVID-19 was isolation. Furthermore, according to Zhang, Yao & Ran (2021); Siddiqi & Khan (2022), the perception of COVID-19 stigmatisation occurs because of fear of infection, exclusion from conventional health treatments, social life discrimination, loss of social standing, anger and blame, and dangerousness. It could be deduced that exposing public information regarding COVID-19 may lead to traumatising, stigmatisation, and rejection in the community. Privacy concerns should be critically looked into not only during COVID-19 and future pandemics or outbreaks.

The study further found that participants are worried about exposing crucial personal information in public and that respondents will be glad if public information given to health officials is treated as private as well as claiming that they are not comfortable giving out information they consider as private to the public health officials. This finding is corroborated by Megnin-Viggars (2020), who found that privacy of information and fear of stigmatisation were problems for vulnerable contact tracing infringing and privacy to COVID-19. Regarding their vulnerability to stigmatisation during contact tracing during COVID-19, the participants confirmed that they have no issues with anyone who has tested positive

for the virus. However, they were extremely concerned that they would be contacted by public health officials and that their status would be impacted by their personal profile with the officials. Wang et al. (2022) and Williams *et al.* (2020) both endorsed the results.

6. Conclusion

The study concluded that there was a high level of intention to comply with all rules and regulations posed by public health officials on COVID-19, but the few that did not comply noted that they could not cope with seeing their personal information in the public domain, especially information concerning the COVID-19 pandemic, as well as sharing personal information with a third party is a major threat. Furthermore, providing personal information related to contact tracing during COVID-19 was severely hampered by the fear of stigmatisation. It is imperative to note that following the rules and regulations given by public health officials regarding contact tracing during COVID-19 can reduce the spread of the disease, which equally reduces the death rate.

7. Recommendations

The research recommended the following in light of the findings:

1. Public health officers with the government conjunction should provide motivations such as rewards/incentives to the public who are willing to comply with the rules and regulations towards increasing the behavioural intention of the public for contact tracing in Covid-19.
2. Proper and adequate training should be given to the stakeholders by the government in order to carry out the processes of contact tracing that would not cause any form of stigmatisation to the public.
3. Public health officers should endeavour to treat the personal information of the public as private so as to increase the level of trust between the public and the public health officers.

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APPLICATIONS AND LIMITATIONS OF ARTIFICIAL INTELLIGENCE IN EDUCATION (AIED) IN THE POST-PANDEMIC ERA: A REVIEW

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Abstract

This review explores Artificial Intelligence's (AI) transformative impact on education, particularly after the COVID-19 pandemic. AI has revolutionized the traditional educational ecosystem, providing personalized learning experiences, streamlining administrative tasks, and enhancing instructional methods. The pandemic accelerated the adoption of AI technologies, with tools like Google Classroom becoming essential for remote learning. AIED applications are classified into learner-centered, teacher-centered, and institutional system-centered categories, each contributing to improved educational outcomes. However, the emergency of AIED also presents challenges such as ethical concerns, data security, and the need for robust teacher training. The review identifies four key research questions addressing the applications, student engagement, supportive roles to teachers, and limitations of AIED in the post-pandemic era. Despite its limitations, the review concludes that AIED holds significant benefits in enhancing education through responsible and equitable implementation, recommending comprehensive teacher training, ethical standards, and equitable access to AI tools to mitigate challenges and maximize benefits.

Keywords: *Artificial Intelligence (AI), Artificial Intelligence in Education (AIED), post-pandemic era*

Jel Classification: I23, O33, L86, J24, D83

1. Introduction

Artificial Intelligence (AI) is revolutionizing various sectors across the globe, with education being no exception. AI enhances learning experiences and streamlines educational processes by transforming traditional educational paradigms. Meanwhile, AI is currently gaining traction with exceptional velocity in post-pandemic times. Still, it is worthy of note that its evolution is not recent, rather traceable to John McCarthy in the 1950s, who coined the phrase “Artificial Intelligence” and defined it as “the science and engineering of making intelligent machines (Heeg & Avraamidou, 2023). AI started evolving in the 1950s, but its trajectory seems recently transformative in all sectors like never before. Kim et al. (2018) noted that computing and information technology have continuously evolved, enhancing AI. Popenici and Kerr (2017) describe AI as computing systems that could be engaged in human-like processes, such as learning, adapting, synthesizing, self-correcting, and using data for complicated processes. It is a

technological innovation that can operationalize computer-driven Intelligence to provide solutions to man's problems. AI is the summation of computers, computer-connected technologies, and machinery, as well as innovation and development of ICT, making it possible for computers to have the performance of near or human-like functions (Kim et al., 2018). Slimi (2023) equally noted that AI is a vast aspect of computer science focused on developing intelligent computers that can carry out assignments requiring human intelligence. From a technical perspective, AI is a computer technology that enables computer systems to simulate human Intelligence (Liang et al., 2021; Pokrivcakova, 2019). It is the connectedness that exists amongst computer components and technologies that yields efficient and effective performance. AI has revolutionized the way man engages in different tasks and situations seamlessly.

Onaolapo and Onifade (2021) contended that AI has systematically revolutionized different industries, including medicine, education, energy, agriculture, finance, manufacturing, etcetera. Practically, AI can be deployed in all human sectors and endeavors. AI is the world's newest trend, positively 'ravaging' the world. It has proven more efficient in several undertakings, while its contributions during the COVID-19 pandemic, in particular, are phenomenal in keeping the world in motion (Vaishya et al., 2020). The impact of AI in Education (AIED) was massively felt as the world went through uncharted terrain as revealed by the United Nations Educational, Scientific and Cultural Organization (UNESCO), that 60.2 million educators and about 1.37 billion students, almost 80% of the global population of learners were forced out of the classroom across the world (UNESCO, 2020). However, remote learning has become a feasible alternative since the pandemic disrupted global education using AI or machine learning (ML) to achieve its objectives (Shaikh et al., 2022). Teachers adapted quickly to teach remotely throughout the pandemic, and virtual classroom settings are becoming a norm even in the post-pandemic era. Hence, in supporting remote learning during the pandemic, Google released over 50 new software solutions, including Google Classroom, which is being utilized by schools throughout the globe (Chaudhry & Kazim, 2022). Undoubtedly, the pandemic sped the usage of AI in Education (AIED) during and post-pandemic. Today, various digital/social media platforms have introduced AI. WhatsApp, Bing, and a host of others feature prominently among digital media tools learners are leveraging to proffer solutions to assignments, essays, calculations, and many more in this post-pandemic era. This was equally corroborated by Chaudhry and Kazim (2022) that several IT companies, including Amazon, Facebook, Microsoft, and Google, have integrated

AI and machine learning (ML). This phenomenal growth and development underscore the speed and rate of adoption of ML and AI tools for instructional engagements by individuals and institutions of learning. It continues to evolve with different AI applications/tools springing up post-pandemic.

The term AIED describes the application of algorithms and technology to enhance student learning outcomes and fortify the learning process (Fitria, 2023). AI in Education (AIED), the central focus of this review, is seen as an intelligent tutoring system that assists in organizing operational data and system knowledge to improve operator performance (Hwang, 2003). It must be emphasized that AIED applications have been made possible by the accelerated development of computing technologies (Hwang et al., 2020). The application of AI in Education (AIED) is growing in prominence due to the fast advancement of AI technology (Fitria, 2023). The AIED is a fast-growing innovation, and one of the newest areas of educational technology that is actively developing is AI in Education (Zawacki-Richter et al., 2019). Meanwhile, it should be noted that AIED's ultimate objective is to assist education, not to advance AI. Thus, the fundamental integration of AIED into the teaching-learning processes is the enhancement of learning outcomes (Chaudhry & Kazim, 2022).

Chaudhry and Kazim (2022) use the purpose lens to classify what AIED seeks to achieve into four domains: (i) AIED aims to lessen the workload on educators without compromising student achievement. (ii) AIED offers pupils individualized learning experiences according to their backgrounds and situations. (iii) AIED also transforms assessment by improving learner comprehension, and (iv) AIED improves understanding through intelligent tutoring systems (ITS). From the foregoing, the advent of AI in Education (AIED) is revolutionary and phenomenal. AI in Education (AIED) transforms learning environments by promoting creative teaching strategies, improving administrative efficiency, and personalizing learning. It automates tasks like assessment and grading, offering interactive learning experiences. AI in Education (AIED) frees teachers to concentrate on instructional rather than administrative engagement.

However, the engagement of AIED has come with mixed feelings despite its plethora of benefits. Some concerns or limitations are copyrights, cybersecurity, ethics, and plagiarism of AI-generated content (Bonsu & Baffour-Koduah, 2023; Imran & Almusharraf, 2023; Sallam, 2023). Divergent views also exist about artificial Intelligence's capacity to regulate student conduct, boost social interaction, and optimize educational effectiveness. Students raise anxieties about programming faults, traditional occupations, implementation expenses, and the

absence of interpersonal interactions (Al-Tkhayneh et al., 2023). The position of Evstratov and Guchenkov (2020) is instructive, which states that the flawless operation of AI is still unattainable owing to hazards such as algorithmic mistakes or malfunctions caused by overloaded mechanisms. If so, the lack of accountability and responsibility for AI mistakes is still a big issue plaguing this novel innovation. Who bears the consequences of whatever errors that arise needs to be addressed as AIED continues to be deployed in all human sectors and education. From the foregoing, it has been observed that there are limited reviews on AI in Education (AIED); hence, this study focuses on exploring reviews on the applications and limitations of AI in Education (AIED) in the post-pandemic era. This study, therefore, raises four research questions which guided this study. The research questions are as follows:

- (i) What are the applications of AI in Education (AIED) in the post-pandemic era?
- (ii) Why are the students engaging AI in Education (AIED) in the post-pandemic era?
- (iii) What are the supportive roles of AI in education (AIED) for teachers in the post-pandemic era?
- (iv) What are the limitations inhibiting the applications of AI in Education in the post-pandemic era?

2. Methodology

Four research questions were posed in this study, and the results, which were based on a survey of the literature, are attempted to be presented in the sections below.

3. Findings and Discussion

3.1 What are the applications of AI in Education (AIED) in the post-pandemic era?

AI in Education (AIED) aids learners in identifying knowledge gaps, providing targeted assistance, and freeing teachers from administrative tasks, thereby enhancing their ability to provide effective instruction (Guan et al., 2020). The applications of AI in Education are classified into three, which play pivotal roles in the teaching and learning ecosystem. Baker et al.(2019) classified them as learner-centered AIED, teacher-centered AIED, and institutional system-centered AIED. A learner-centered AI can help learners study with the help of an adaptive or personalized learning management system. A teacher-centered AIED allows

teachers to monitor student progress and offer proactive intervention by automating administrative duties, assessments, plagiarism detection, and feedback. Lastly, administrators and decision-makers can benefit from AIED solutions' insights in an institutional system, such as enrollment and attrition trends across disciplines or institutions (Guan et al., 2020).

AI has applications in many areas of education, such as learning analytics, chatbots, automated grading, intelligent tutoring systems, student performance prediction, campus safety, admissions and recruiting, financial assistance, and curriculum creation. AI can forecast student performance, offer real-time feedback, and design individualized learning routes based on student's interests, abilities, and shortcomings. In addition, it can evaluate student data, automate grading, and instantly respond to frequently asked queries. AI may also assist in determining whether students qualify for financial aid and provide guidance for creating new courses and initiatives (Igbokwe, 2023, p.302; Smith, 2021, 2022). In addition, AI essentially facilitates effectiveness in teaching and learning. Its application has had a significant influence on the educational landscape. This includes enhanced efficiencies, customization/personalization in learning, smart content, and enhanced educational administration (Timms, 2016). Sourcing educational materials has become a thing of the past due to the instrumentality of AI and the internet, which grant users unfettered access to unlimited open sources at their fingertips (Olawuyi & Adedara, 2015). This saves the cost and consequences of traveling from pillar to pole. The integration of AIED has also broken the barriers of time and space by transforming teaching-learning processes. Hwang et al. (2020) summarize four key applications of AIED and opine that AI plays critical roles in education from the standpoint of educational applications, including those of an intelligent tutee, learning partner, intelligent tutor, and policy advisor. Those categorizations are as follows, as demonstrated in Fig.1 and explained below by Hwang et al. (2020):

Intelligent Tutor: This describes the broadest class of AIED applications. Intelligent tutoring systems, customized and adaptive learning systems, and recommendation systems are a few of its examples.

Intelligent Tutee: Research in this area is uncommon because most AI-based learning environments emphasize assisting students more than allowing them to volunteer as tutors or advisors.

Intelligent Learning Tool or Partner: The device can help learners collect and analyze data efficiently and effectively, enabling them to focus on critical points.

Policy-making advisor: In recent years, AI approaches have been used to inform and guide the creation of laws or policies.

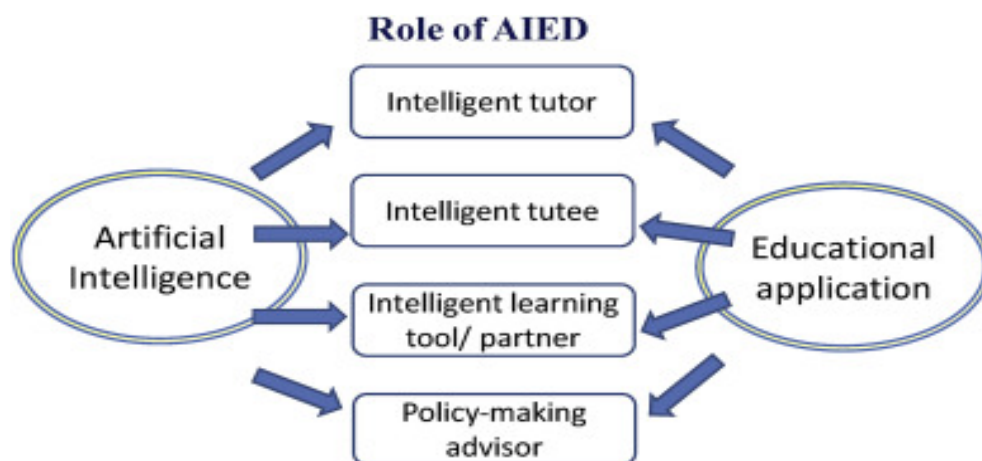


Fig. 1. Framework for the roles of AIED (Hwang et al., 2020)

3.2 Why are the students engaging in AI in Education (AIED) in the post-pandemic era?

Before the advent of AI and sundry contemporary instruction technologies, students learned in academic faculties via physical engagements between instructors and learners. However, AI has replaced the conventional physical learning approach in education by streamlining teacher-student interactions and minimizing physical contact and communication (Onaolapo & Onifade, 2021). AI enhances student engagement and provides users an interactive learning experience with real-time feedback. Slimi (2023) opined that AI makes it easy for learners to learn independently because learners can become autonomous and free to access required data anytime and anywhere without restrictions. With AI, a typical student can learn at their own pace. AIED can customize and personalize curriculum according to learners' academic learning abilities, expectations, and strengths (Mikropoulos & Natsis, 2011). AIED makes intelligent learning possible by tailoring lesson plans to African students based on their aptitudes and interests (Onaolapo & Onifade, 2021). AI offers a remarkable and uncommon potential to

improve learner-support interactions and scaffold students' comprehension in novel ways. AI applications can assist young people in assimilating to different perspectives (Rudolph, 2023).

Sharma (2021) asserted that AI applications get engaged on an increased basis for academics in chatbots, platforms for engagements, personal knowledge development, and automatic systems for assessments. Guan et al. (2023) corroborate AI makes creating course outlines easy, in tandem with the learners' knowledge choices, using data mined from various sources, including educational attainments, extra-curricular engagements, and individualized interests. Students can also engage AI to simplify their courses to a form that is easy to understand and relate to. Thus, if ethically applied by learners, AIED is a great weapon in supporting effective learning. Students are engaging in AIED to fill the gaps that the absence of tutors may create and learn at their own pace.

3.3 What are the supportive roles of AI in education (AIED) for teachers in the post-pandemic era?

Teachers spend approximately 20-40% of their time on engagements that can easily be subjected to automation (Bryant et al., 2020). Technological tools have become a topical issue in teaching engagement (Farhan, Rajab & Rashid, 2021). The technology could easily allow tutors/facilitators to automate their teaching tasks. AI can reduce the stress and time that teachers use to pass down knowledge to their students. Onaolapo and Onifade (2021) revealed that using AI, for instance, Tutoring Software, robots, and humanoids, has shown the advantages associated with enhancing learners' learning experience with Autistic Spectrum Disorder (ASD). Jaksic and Ansaf (2023) noted an increased sensitization of AI concerning its capacity to complement teachers' techniques and establish effective means of examining learners, which is advantageous to both teachers and learners. In addition, AI offers flexibility in teachers' class schedules, reducing stress from classroom attendance, marking scripts, and sundry assignments, enhancing the overall teaching experience and quality in academic institutions (Onaolapo & Onifade, 2021). Integrating AIED is supportive and complementary, and such is never a replacement for teachers. Jaksic and Ansaf (2023) identified areas that AIED applications impacted, including content, teaching methods, assessments, and communication. Fitria (2023) asserted that AI can only do regular tasks like assigning assignments and correcting answers; it cannot take a teacher's job in the classroom. It can assess students, supervise learners, and simplify course contents based on individual capabilities and demographic factors. AI helps educators pinpoint areas of focus by assisting them in recognizing their students' needs and

learning patterns, maximizing outcomes, and choosing the best teaching strategies (Jabar & Yousif, 2011). Teachers are becoming aware of the pivotal roles that AIED plays in supporting teaching-learning processes; hence, they are using AIED tools to concentrate their energy on instructional engagements.

3.4 What are the limitations inhibiting the applications of AI in Education in the post-pandemic era?

The advent of AIED is an excellent innovation heralded by the Fourth Industrial Revolution (4IR), from which every level of education has immensely benefited globally. Undoubtedly, AI has significantly advanced human existence and transformed several spheres, including education and industry. Although it has many promises, there are obstacles and some negatives (Opesemowo & Ndlovu, 2024). Meanwhile, there are mixed feelings about AIED's benefits and limitations. Some limitations relate to copyrights, cybersecurity, ethics, and plagiarism (Bonsu & Baffour-Koduah, 2023; Imran & Almusharraf, 2023; Sallam, 2023). In addition, Fitria (2023) revealed another limitation of AIED by asserting that AI cannot generate the comprehensive emotional connections necessary for students to learn and grow. Then, the degree of support teachers receive from AI is also inadequate since they are lifelong learners who must continually adjust to changing circumstances. Pedro et al. (2019) identified six limitations confronting AIED as challenges of creating a thorough AI policy for sustainable development, guaranteeing equity and inclusion in education, educating educators about AI-powered learning, creating inclusive and high-quality data systems, elevating the profile of AI research, and assuring ethics and openness in data gathering, use, and distribution. Opesemowo and Ndlovu (2024) enumerated some limitations also of AIED, including a lack of imagination and problem-solving abilities, an inability to defend logic, bias in data and algorithms, a lack of emotional Intelligence, and worries about data security and privacy. Igbokwe (2023) listed several other limitations confronting AI in education: a lack of ethical and legal guidelines, a lack of technological know-how and funding, worries about job displacement, issues with interoperability and compatibility across various AI systems, and a propensity for over-reliance on AI.

Al-Tkhayneh et al. (2023) studied the advantages and disadvantages of using AIED among a sample of 184 students selected through a stratified sampling method in AI Ain City on the benefits and drawbacks of AIED. The study's findings demonstrated that AI can improve learning experiences, process data, and manage tasks. However, students raised concerns about behavior control, efficiency gains, less reliance on teachers, the possible loss of traditional jobs,

implementation costs, programming errors, and classroom relationships. In another related study conducted on the limits of AIED, Selwyn (2024) outlines the drawbacks, including the potential for AI to exacerbate social injustices against students from underrepresented groups, the financial losses associated with machine-readable curriculum, and the environmental and ecological consequences of data-intensive AI. Moreover, Akinwalere and Ivanov (2022), commenting on the current state of AIED submitted that even though significant efforts have been made during the last 20 years to advance, enhance, and modernize the digital competencies of educators, researchers, and administrators, the problems currently appear to be considerably more complicated. This suggests that more must be done to balance the benefits and limitations of AIED. Some other limitations of AIED, as identified, are listed hereunder in Table 1:

Table 1: Extant Literature Showing Limitations of Artificial Intelligence in Education (AIED)

S/N	AIED Limitations	Sources/Authors
1	Lack of care in teaching-learning processes	(Holmes et al., 2019)
2	Student privacy/Learners' data integrity	(Chan & Zary, 2019)
3	Ethical Issues	(Stahl & Stahl, 2021)
4	Digital divide and Unequal opportunities for all students	(Olateju et al., 2024)
5	Long-term effects on teacher roles	(Holmes et al., 2019)
6	Data privacy concerns	(Curzon et al., 2021)
7	Limited Pedagogical Understanding by AI Developers	(Pedro et al., 2019)
8	Disinformation, fabricated sources, and outdated knowledge	(Sinatra & Hofer, 2023)
9	Lack of capacity to replace teachers	(Popenici & Kerr, 2017)
10	Algorithmic bias and loss	(Luan, 2020)
11	Implementation cost/Financial pressure	(Popenici & Kerr, 2017)
12	Educators' inadequate knowledge and skills to effectively utilize AI tools	(Olateju et al., 2024)
13	Lack of robust evaluation metrics in AI-powered educational assessments	(Owan et al., 2023)
14	Lack of technical infrastructure in schools	(McCarthy et al., 2016)
15	Epistemic trust erosion, misleading or wrong outcomes	(Sinatra & Hofer, 2023)

Conclusion and Recommendations

Artificial intelligence, augmented reality (AR), and virtual reality (VR) have brought about significant changes in several sectors, including education (Al-Shahrani & Asiri, 2015; Alghamdi et al., 2024; Ramadan & Alshahrani, 2021). Hence, integrating artificial intelligence (AIED) in education post-pandemic has completely changed the educational landscape. By delivering real-time feedback, streamlining administrative duties, and enabling personalized and adaptive learning, AIED systems have improved learning experiences. By increasing accessibility, efficiency, and customization of education to meet individual requirements, these technologies have benefited educators, students, and educational institutions. Additionally, the transition to AI-driven education has increased teacher efficiency, given administrators helpful information for decision-making, and given students the freedom to learn at their speed. However, there are concerns about the limitations of AIED that demand urgent attention, such as the ethical usage of AI, bias in data and algorithms, lack of emotional Intelligence, and worries about data security and privacy. Meanwhile, the identified limitations of AIED do not negate its benefits; instead, there is a need for concerted efforts by all education stakeholders on responsible applications of AIED to mitigate whatever challenges come along with the usage of AI within the educational ecosystem. Based on the findings of the study, these recommendations are made as follows:

- To guarantee that AI is seamlessly incorporated into education, thorough teacher training is essential for optimizing AI's benefits and integrating these technologies into instructional strategies.
- Promoting confidence and responsible AI use requires establishing strong ethical standards and regulations to address data privacy, bias, and ethical use of AI in education.
- Ensuring that all students have equitable access to AI-powered instructional tools, irrespective of their socio-economic status, is imperative in closing the digital divide.
- A holistic learning environment that fosters both intellectual and emotional development must strike a balance between AI applications and human engagement.

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SMARTPHONE ADDICTION AS PREDICTORS OF SUICIDAL BEHAVIOUR AMONG UNDERGRADUATES

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Abstract

This study examined suicidal behaviour through smartphone addiction among undergraduate students in the University of Ibadan. A quantitative research methodology was used in the study, and 300 students from different university faculties were chosen at random. The primary tool used to gather data was a questionnaire, and PPMC and regression analysis were used to examine the results. It was established from the study that almost 94.3% of the respondents attested to the fact that they used smartphones frequently and that smartphone addiction significantly contributed to suicide behaviour among undergraduates. Also, a substantial positive link was related to smartphone addiction and suicide behaviour among the students, whereas female undergraduates were prone to greater suicidal behaviour ($t = 0.629$, $df = 294$;

p<0.05) than their male counterparts. The study concluded that undergraduates' addictions to smartphones could eventually lead to suicidal behaviour putting into consideration other factors among them. The study, therefore, recommended strengthening students' support services, such as counselling and other behavioural modification units, to help students struggling with smartphone addictions and mental health issues.

Keywords: *smartphone addiction, suicidal behaviour, depression, anxiety, undergraduate student.*

JEL Classification: I12; I18, I21, I31, D91, C83, I10; I19

1. Introduction

Suicidal behaviour in youth is a medical condition that includes a variety of ideas and behaviour associated with the thinking of suicide. It is a multi-faceted phenomenon that typically unfolds in stages, with thoughts about suicide being an early and critical component in the progression towards actual suicide attempts (Chen *et al.*, 2020). Suicidal behaviour can manifest in various ways, ranging from fleeting and passive thoughts of death to persistent and active considerations of suicide as a solution to life's challenges or emotional pain. Numerous risk factors impact young people's suicidal thoughts. A history of self-harm, drug misuse, exposure to trauma or violence, social isolation, bullying, emotional health issues (such as bipolar disorder, depressive symptoms, or nervousness), and issues with relationships or family are a few of these reasons. Nowadays, suicide is the second leading cause of death for youth worldwide, with over 20 suicide attempts for every instance of self-harm (WHO, 2019). Suicidal deaths are indicated by intentions of suicide and efforts to end one's life (Klonsky *et al.*, 2016). According to studies conducted in the US, UK, China, Indonesia, and Saudi Arabia, between 9 and 37% of young people had previously intended to commit suicide (Eskin *et al.*, 2019; Akram *et al.*, 2020). Numerous interpersonal and personal elements, as well as complex processes, have been connected by research to the onset of suicidal behaviour and attempts (Klonsky & May, 2014). A recent study demonstrated, however, that young people's smartphone addiction is associated with their plans to commit suicide (Chen *et al.*, 2020). Smartphone addiction, also referred to as nomophobia or the difficulty caused by smartphone usage, has become a major challenge in the current digital era. It is characterised by excessive and compulsive smartphone use, often at the price of one's emotional and physical well-being.

Without a doubt, suicide is a serious public health concern that can have disastrous results. Suicidal ideation, which includes suicidal ideas, thoughts, or even plans, is a warning sign that often comes before real suicide attempts. University students, in particular, face an elevated risk of experiencing such ideation, although the prevalence can vary significantly across studies due to diverse reporting periods. Similar to this, smartphones are now used by a huge number of people and are an essential part of their lives, especially by young people like college students. These devices offer a range of functionalities that provide convenience and enjoyment. They not only help maintain social connections but also contribute to enhancing interpersonal relationships and overall quality of life (Alasa & Quadri, 2022; Quadri, Quadri & Oluwasina, 2015). However, alongside these benefits, the phenomenon of mobile phone addiction has emerged. Overuse of phones is known as smartphone addiction, and it always leads to social isolation, an intolerance for other people, and an inability to contribute to society (Choi *et al.*, 2015). People who overuse their phones may experience a variety of negative outcomes, including suicidal thoughts and attempts, among many other things.

Each country has a different rate of mobile phone addiction among college students; in places like Malaysia, China, and Saudi Arabia, rates have been reported to range from 14% to 48% (Aljomaa *et al.*, 2016; Lei *et al.*, 2020). This wide variation underscores the significance of the issue and its global impact on young adults. It is noteworthy that mobile phone addiction is becoming more widely acknowledged as a mental health concern because it can lead to some medical challenges, including insomnia (Loleska & Pop-Jordanova, 2021), signs of depression (Jun, 2016), and/or attitudes that indicate intentions to commit suicide (Chen *et al.*, 2020). Such health issues can have a substantial impact on individuals' overall well-being and functioning. Although there are many benefits to mobile phones in terms of connection and convenience, the growing number of college students who are addicted to their phones is cause for serious worry. With varying rates of occurrence in different countries, the potential health risks associated with this addiction highlight the need for greater awareness and intervention strategies to address this emerging mental health challenge. Newswire Law and Event (2024) reported that a teenager committed suicide after falling in love with an AI chatbot through a smartphone in the United States of America. Determining the risk and protective variables of suicidal thoughts is essential to lowering suicide attempts and the fatalities and disabilities that result from them in young people. Previous research (Chen *et al.*, 2020) has primarily examined adolescents. However,

preliminary investigations reported that most of the similar research conducted was in Korea, China, the United States, and Malaysia, and limited or no study of this nature was conducted in Nigeria. Research on smartphone addiction and suicidal conduct among students at Nigerian higher education institutions is anticipated to grow as a consequence of these findings. Hence, attention and effort should be concentrated on university students, considering their high involvement in smartphone addiction, which can lead to suicidal ideation in African settings. Consequently, based on this assumption, the current research looked at smartphone addiction as a predictor of suicidal conduct among college students.

Objectives of the study

The following are the main objectives of this study:

1. To determine the extent of smartphone addiction among University of Ibadan undergraduates.
2. To examine the impact of smartphone addiction on University of Ibadan students' suicide ideation behaviour.

Research questions

The research questions for the study were as follows:

1. What is the prevalence of smartphone addiction among undergraduates at the University of Ibadan?
2. What is smartphone addiction's influence on suicidal behaviour among undergraduates of the University of Ibadan?

Research hypothesis

This research developed the following hypotheses.

1. Suicidal conduct among University of Ibadan students is not significantly positively correlated with smartphone addiction.
2. Suicidal conduct among University of Ibadan students is not significantly correlated with smartphone addiction..
3. The University of Ibadan undergraduate population does not significantly vary by gender in terms of smartphone addiction.

2. Literature review

The World has embraced technology to stive in every facet of human endeavours including the use of smart devices for day-to-day activities, most especially by students for academic activities or pursuit (Zaman & Gherasim, 2010). Research suggests that individuals experiencing smartphone addiction may resort to compensatory internet use as a coping strategy. The classical features of

addiction, such as the need for escape and developing tolerance, play a role. This unhealthy coping strategy is used as a way to divert oneself or as an escape from unpleasant feelings and difficulties in life. As a result, excessive reliance on smartphones as coping mechanisms may significantly contribute to an increased risk of suicidal behaviour, creating a complex interplay between psychological factors and technology-related behaviour (Garcia-Oliva & Piqueras, 2016). The term "compensatory internet use" describes people's propensity to use the internet as a coping strategy as noted by Iacob, Parvu & Chiru (2023). Traditional addiction traits explain how smartphone addiction manifests as excessive phone use among college students. Escape, a fundamental aspect of addiction, implies that undergraduates may use their phones as a means of diverting attention from stressors, negative emotions, or real-life challenges. Another traditional characteristic, tolerance, is that students may need to use their phones more often over time in order to get the same degree of comfort or diversion, which might increase their dependence on this coping mechanism. This growing use pattern reinforces the link between smartphone addiction and its mental repercussions (Ong & Thompson, 2019).

The maladaptive nature of this coping mechanism becomes evident when individuals consistently turn to their phones to avoid confronting and addressing the root causes of their distress (Paun, 2022). Rather than seeking constructive solutions, they immerse themselves in the digital realm, fostering a temporary escape but failing to address the underlying issues (Thompson, 2019). Furthermore, the correlation between suicidal conduct and smartphone addiction highlights the seriousness of the psychological effects. Individuals caught in this cycle may find themselves trapped in a vicious circle, wherein excessive phone use becomes a default response to any negative emotional state. In addition to failing to provide true closure, this dependence on a digital escape route may intensify depressive and hopeless thoughts, raising the possibility of suicide action. According to the strain theory of suicide and empirical data, poor coping mechanisms when dealing with stressful situations may cause stress, which in turn can lead to dissatisfaction and suicidal thoughts (Ong & Thompson, 2019). Both longitudinal and cross-sectional research have proven the favourable association between addictions that are connected to the internet and intentions to commit suicide (Chen *et al.*, 2020). Suicidal thoughts were more positively connected with internet addiction among teens and young adults than suicide conduct, per a thorough investigation (Steinbuechel *et al.*, 2018). Another thorough investigation found that young

individuals who engage in suicide behaviour often use online forums (Daine *et al.*, 2013).

The significant connection between smartphone addiction and a complex series of psychological repercussions was documented by Li *et al.* in 2024. The study revealed that smartphone addiction exerts an impact on daytime sleepiness, which in turn contributes immensely to the manifestation of depressive symptoms. This intricate interplay within the psychological landscape significantly elevates the overall risk of suicidality. Similarly, Yang *et al.* (2019) findings indicated that insufficient sleep and daytime sleepiness during adolescence were markedly associated with subsequent depression. The implications of the findings extend to the formulation of targeted interventions, particularly in the realm of adolescent mental health. Monitoring and managing sleep duration among adolescents emerges as an integral component, with a specific emphasis on mitigating daytime dozing. However, the study also recognised the intricacy of the connection between daytime drowsiness and depression symptoms, which led to a need for further research.

Furthermore, Huang *et al.*, (2022) conducted a study on suicidal ideation as it associated with excess smartphone usage among Chinese students through 439 population of Chinese student with binary logistics regression employed to analyze the data. It was reported from the study that suicidal ideation was correlated significantly on excessive smartphone usage among the students with (OR: 2.60, $p = 0.025$) value. Also, Oh & Heo (2024) examined the link among smartphone overdependence, suicidal behaviour and depression adolescents in South Korean with 54,948 adolescents who participated in the study. The relationships were determined through multiple logistic regression among the variables in the study. It was revealed from the study that risk behaviour of the adolescents partly mediated the link among depression and smartphone overdependence ($Z = 6.86$, $p < .001$); suicidal ideation with ($Z = 7.04$, $p < .001$), while suicidal planning ($Z = 4.59$, $p < .001$). Similarly, Wolf (2023) investigated the relationship among mobile phone as well as suicidal ideation among undergraduates with 81 undergraduates who form the study population. The questionnaire was the main instruments adopted to collect data and hypothesis were formulated and tested through linear regression models. The study found that there is no significant protective effect exist between mobile phone use and suicidal ideation among the undergraduates.

Kim, Kwak & Kim's (2023) study pointed out that smartphone use and mobile phone addiction may be an avoidance of negative events and emotions. Experimental research by Chen & Peng (2016) also confirmed that smartphone use

will significantly reduce individual self-control. Therefore, smartphone addiction may influence emotional well-being by disrupting an individual's emotional regulation ability. Further research suggested that individuals with higher smartphone use intensity experience more negative emotions in their daily leisure activities (Li *et al.*, 2022). Individuals highly addicted to smartphones are also often confronted with more interpersonal problems, anxiety and depression as a consequence, which could lead to suicide (Chen *et al.*, 2020). Addiction to smartphones has a strikingly strong correlation with negative feelings such as anxiety and sadness, and it may accurately predict teenagers' levels of depression three years later (Jun, 2016). Addiction to smartphones may thus expose teenagers to a greater number of unpleasant emotions and less happy ones, impairing their emotional equilibrium.

It is also crucial to keep in mind that, despite the fact that smartphone addiction has been the subject of numerous studies, none of them have revealed that the researchers or university ethics committees felt compelled to offer psychological support to the "phone addicts" that the research had identified. This is an important indicator of the level of functional impairment linked to "addictive" smartphone use. To avoid downplaying the seriousness of mental illness, it is crucial to distinguish between extreme psychopathology, like addiction, and zeal, intense engagement, or a lack of adaptive self-control and coping mechanisms (Panova & Carbonell, 2018).

3. Theoretical framework for the study

Bandura's (1977) social learning theory (SLT) serves as the anchor for this investigation. SLT makes the following assumptions, by Bandura (1977): (i) behaviour is learnt from the environment using observational learning; and (ii) the cognitive process of learning takes place in a social context and can only be completed via observation. Therefore, because of the assumption of SLT advanced by Bandura (1977), this study is premised on the assumption that suicide behaviour is a behaviour that can be learnt through observation and/or interaction with the social environment. Furthermore, this study confirms that human cognition is important in the adoption of suicide behaviour based on the potential influence of self-esteem, self-image and, ultimately, information pushed through smartphone addiction and internet access. Bandura (1977) & Joan (1992) state that the following six fundamental ideas make up social learning theory.

Observational Learning: Human behaviour is described by social learning theory as the outcome of continuous bilateral connections among psychological, mental, and external factors (Bandura, 1977). So, observational learning, often known as "modelling," considers how each person may learn from others by seeing their conduct, attitudes, and the results of those actions. Some research participants could get information about suicide from their acquaintances in the neighbourhood and use their smartphone addiction to retrieve the information.

Determinism in reciprocity: Since an individual's conduct is influenced by their surroundings, the environment impacts an individual's behaviour; thus, behaviour, cognition, and the environment all have an impact on one another.

Environment: Every person lives and works in their environment, which includes elements that interact to affect the likelihood of engaging in a specific behaviour as well as opportunities for social support. When asked about the factors that facilitate or motivate suicide behaviour, study participants' perceptions of the relationship between suicide behaviour and smartphones included access to smartphones.

Expectations: Every action has consequences or anticipated outcomes, and they often operate as incentives for behavioural objectives. The predicted outcomes are what those who are examined using smartphones to avoid life's realities and poor self-esteem are hoping to achieve. In this study, some of the responses included social anxiety being overcome, the reality of life not being disturbing any longer, the satisfaction of the desires of life and no worries lifestyle, among others.

Self-Efficacy: The conviction that one can complete a task and sustain that effort over time is known as self-efficacy. Increased self-efficacy correlates with heightened motivation to engage in practice, even in the face of obstacles or limitations, and fosters a more favourable perception of the practice itself. Self-efficacy can be improved in an individual through modelling, practice, information, and social support. This study found that social support improved the self-efficacy of certain respondents. The results from the addiction to smartphone use may also enhance some respondents' self-efficacy in continuing the suicide behaviour with respect to smartphone addiction.

Reinforcement: This is how someone reacts to a certain activity, which often dictates whether the conduct is likely to be continued or repeated.

Positive reinforcements are often referred to as "rewards," whereas negative reinforcements may include punishment or no reaction at all. According to this research, several participants said they planned to stop using their smartphones, which might make them more likely to commit suicide because of the negative experiences they have with them. However, others who had no such undesirable experiences said they were satisfied with smartphone use and therefore would continue exploring smartphone usage given the instance of opportunity that comes along with it.

It can be hypothesised, based on the SLT principles (Bandura, 1977), that undergraduates who live in an environment where suicide behaviour is commonplace and unregulated have the chance to watch and learn from the person who committed the act among their sphere of influence (friends, peers, family, the internet, social media idols, etc.); their observations may raise their expectations by changing their values and perceptions of the behaviour (e.g., seeing suicide behaviour as a way to escape real Peers who share their mindset and persistent smartphone addiction may boost their self-efficacy, or their capacity to participate in or maintain their activity.

Cognitive-behavioural model

Davis (2001) created a cognitive-behavioural paradigm to examine internet addiction in relation to smartphone addiction. Maladaptive cognition, which is at the start of the pathogenic chain of Internet addiction and necessary for its expression, is the central component of this model, as shown in Figure 1. Inappropriate cognition includes aspects of self-perception and cognitive interpretation of the outside world, such as negative self-evaluation, poor self-efficacy, and self-doubt, the latter of which frequently manifests as an excessive amount of focus on networks and a disdain for reality. According to the cognitive-behavioural paradigm, students' sensitivity and life experiences have an impact on Internet addiction. At the distal end of the etiology chain, the two influencing elements are crucial for the emergence of Internet addiction. An undergraduate's susceptibility rises if they have drug abuse issues, social anxiety brought on by their peers and environment, or depressive symptoms. Although self-efficacy and self-control lessen excessive mobile phone addiction, the expected result increases the likelihood of developing such an addiction (Pourrazavi, Allahverdipour, Jafarabadi, & Matlabi, 2014).

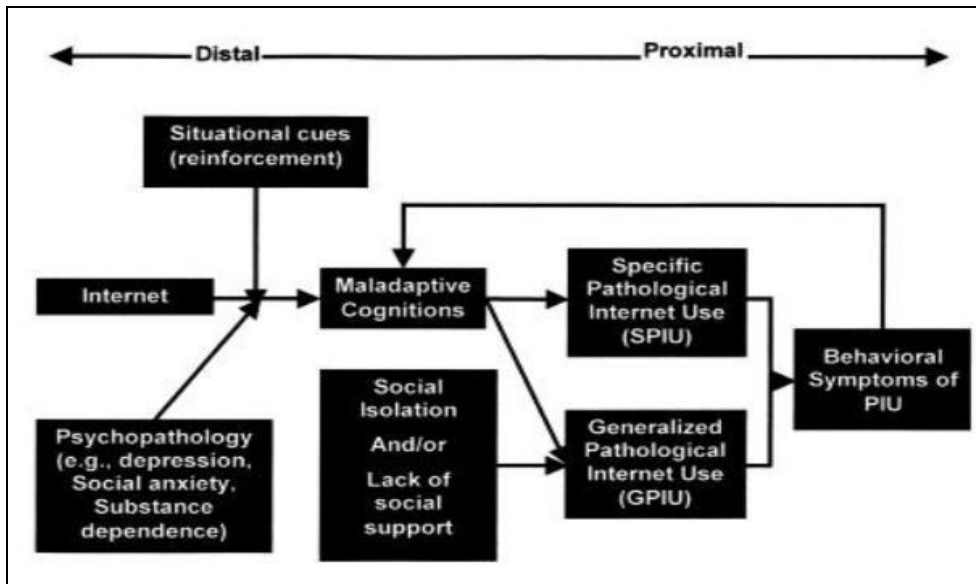


Figure 1: A cognitive-behavioral model (Davis, 2001, p. 4)

4. Methodology

This study used a quantitative research design. This study approach will provide a detailed analysis of the interrelationships among the variables. It accurately evaluated how the dependent variable—student suicidal behaviour—was impacted by the independent variable, smartphone addiction.

Population and sample: The study population comprised 300 undergraduates randomly selected at different faculties (Arts, Science, Social Sciences and Education) at the University of Ibadan, which formed the study sample. The instrument was validated using Cronbach's Alpha at a .05 level of significance. A pre-test was conducted on 30 respondents from another institution. The reliability scale's internal consistency yielded 0.75 for smartphone addiction, while suicidal behaviour yielded 0.78. This study used a structured questionnaire as its main tool for gathering data from the participants. The questionnaire is called "Smartphone Addiction and Suicidal Behaviour-SASB," and it was self-developed after reviewing related studies. It has three sections: A, B, and C. Respondents are questioned in Section A on their age, gender, education, and religion. The incidence of smartphone addiction among students is examined in Section B. The

effect of smartphone addiction on suicidal conduct in undergraduates is examined in Section C. and the researchers, assisted by trained research assistants, administered the questionnaire to the undergraduates. The data was analysed using regression analysis for study 2, PPMC for the research hypothesis, and descriptive statistics such as frequency counts, percentages, tables and charts.

Ethical consideration

Before the research was carried out, the appropriate authorities' consent was acquired. In particular, permission was requested from the Dean of Students, who assumed responsibility for the student's studies at the university. Before the respondents were given the paper-pencil questionnaire, their signed and verbal agreement was sought. This study was conducted with strict adherence to the Declaration of Helsinki, which regulates the ethics of studies involving human beings in the social sciences and humanities.

5. Result and discussion

A substantial majority of the participants, 214 (72.3%), were female, and more than half of them, 272 (91.9%), were between the ages of 18 and 25 (Table 1). The majority of respondents, 247 (83.4%), practise Christianity. Ultimately, a quarter of the participants, 91 (30.7%), were in their second year of study.

Table 1: Demographic information of the respondents

Variable		Frequency (%)
Gender	Male	82 (27.7%)
	Female	214 (72.3%)
Age	18-25 years	272 (91.9%)
	26-30 years	19(6.4%)
	31 years above	5 (1.7%)
Religion	Christianity	247 (83.4%)
	Islam	49(16.6%)
Academic Level	First-year	70(23.6%)
	Second year	91(30.7%)
	Third year	52(17.6%)
	Fourth-year	73(24.7%)
	Fifth year	10(3.4%)

Research question one: What is the prevalence of smartphone addiction among undergraduate students at the University of Ibadan? To determine this, figure 1 below presents the result.

Figure 2 indicates that a significant majority of respondents, 279 (94.3%), frequently use their smartphones. This is followed by 15 (5.1%) who use their smartphones occasionally and only 2 (0.7%) who rarely engage with their devices. This implies that undergraduates use their smartphones frequently.

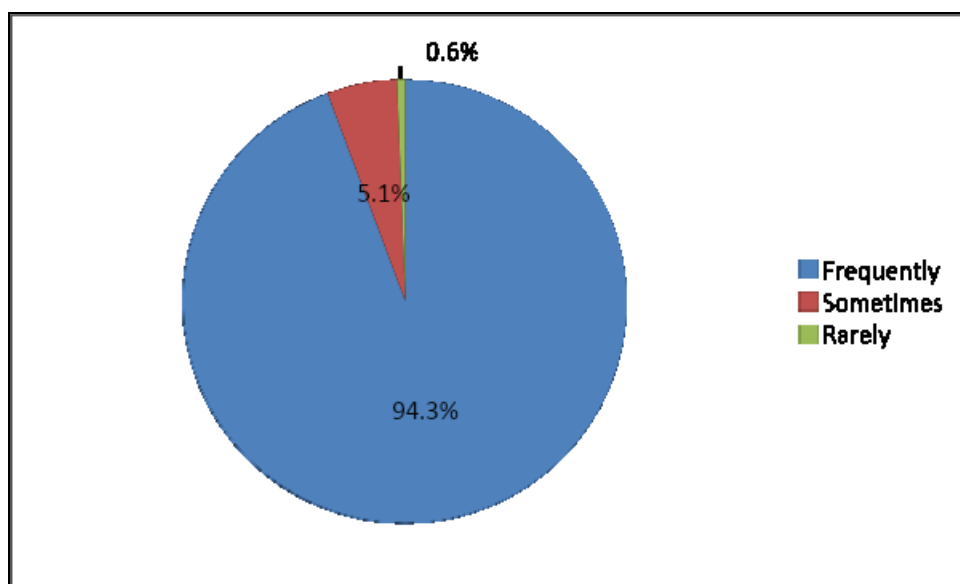


Fig. 2. Pie chart showing the prevalence of smartphone addiction among undergraduate

Research question two: Does smartphone addiction influence suicidal behaviour among undergraduates of the University of Ibadan?

Table 2 below displays the t-ratio, specified value, unstandardised regression weight (β), standardised error of forecast ($SE\beta$), t-ratio, and significant level of the t-ratio related to smartphone addiction. The findings demonstrated that smartphone addiction has a substantial impact on suicide conduct among undergraduate students at the University of Ibadan, which accounts for 44.7% of the total ($\beta=.447$, $t=8.5648$, $p<0.05$).

Table 2: Regression showing smartphone addiction influence on suicidal behaviour

Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.386	.754		11.117	.000
	Smartphone Addiction	.374	.044	.447	8.564	.000

Hypothesis 1: Suicidal conduct among University of Ibadan students is not significantly positively correlated with smartphone addiction. Tables 3a and b presented the results.

Table 3a below shows a substantial positive correlation between smartphone addiction and suicidal behaviour among University of Ibadan students. ($R=463.000$, $df=247$, $P<0.05$). This suggests that among University of Ibadan students, higher levels of smartphone addiction were linked to an increased chance of experiencing suicidal thoughts or actions. A moderately significant correlation between smartphone addiction and suicidal conduct is shown by Table 3b's Cramer's V value of 0.347.

Table 3a: Positive association between smartphone addiction and suicidal behaviour

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	463.000 ^a	247	.000
Likelihood Ratio	258.512	247	.295
Linear-by-Linear Association	27.943	1	.000
N of Valid Cases	296		

a. The predicted count for 271 cells (96.8%) is less than 5. .00 is the lowest expected count.

Table 3b: Cramer's value

	Value	Approximate Significance
Nominal by Phi	1.251	.000
Nominal Cramer's V	.347	.000
N of Valid Cases	296	

Hypothesis 2: Suicidal conduct among University of Ibadan students is not significantly correlated with smartphone addiction

Table 4 shows a linear correlation between smartphone addiction and suicidal conduct among University of Ibadan students. Suicidal conduct among University of Ibadan students is significantly positively correlated with smartphone addiction, according to the data ($r = .308$; $p < 0.05$). Consequently, the hypothesis is dismissed.

Table 4: PPMC showing the relationship between smartphone addiction and suicidal behaviour

Variables	Mean	Std. Dev.	N	R	P-value	Remarks
Smartphone addiction	20.878	3.749				
			296	.308	0.000	Sig
Suicidal behaviour	14.7466	2.526				

Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 3: The University of Ibadan undergraduate population does not significantly vary by gender in terms of smartphone addiction

There was a significant gender difference in suicidal behaviour among University of Ibadan students ($t=0.629$, $df=294$, $p<0.05$), as shown in Table 5 below. With a mean difference of 0.22305 between the two groups, the table indicates that the female participants' mean was higher at 14.808450 than the male participants' at 14.5854. This means that female undergraduates of the University of Ibadan demonstrate higher suicidal behaviour than males. Therefore, the hypothesis is rejected.

Table 5: Gender difference in smartphone addiction

	Gender	N	Mean	Mean difference	t	Df	Sig
Suicidal Behaviour	Male	82	14.5854	0.22305	0.629	294	.002
	Female	214	14.8084				

5. Discussion of findings

The results of the first research question indicated a significant prevalence of smartphone addiction among undergraduate students. The findings are consistent with those of Lepp, Barkley, & Karpinski (2014), who found that college students' academic performance and mental health were adversely affected by excessive smartphone use. Children who are more reliant on their phones often get worse marks and have less positive academic outcomes, according to the research, which found a negative association between smartphone addiction and academic accomplishment. Additional support for this claim was offered by Sunday, Adesope, & Maarhuis (2021), who verified that smartphone addiction had a detrimental effect on students' learning and general academic performance. They found that increased smartphone usage in school correlates with a heightened negative impact on both learning and academic outcomes. The proportion of undergraduates who regularly utilise their smartphones stands at approximately 94.3%, while 5.1% use their smartphones infrequently, and 0.7% do so rarely. Furthermore, the study underscored the negative effects of smartphone addiction on mental health, indicating that greater smartphone usage correlated with elevated psychological distress, encompassing symptoms of anxiety, depression, and stress.

The second research question revealed that smartphone influence significantly contributes to suicide behaviour among undergraduates, contributing 44.7% ($\beta=0.447$, $t=8.5648$, $p<0.05$). This is consistent with research by Shinetstseg *et al.* (2022) and Wang *et al.* (2024) that found heavy mobile phone users in China and Korea were much more likely to have suicidal thoughts and attempt suicide than youths who use smartphones generally. This implies that those with severe smartphone addiction exhibit suicidal behaviour and may be more susceptible to suicide thoughts and actions.

The findings of the first hypothesis showed a strong positive correlation between smartphone addiction and suicidal thoughts and behaviours among University of Ibadan students ($R=0.463$, $df=247$, $P<0.05$). This suggests that undergraduates with higher levels of smartphone addiction are more likely to have suicidal thoughts or behaviours. This is in line with Wang *et al.*'s (2024) findings, which found a significant correlation between a higher risk of suicidal behaviour and mobile/smartphone addiction. Furthermore, Raihana *et al.* (2022) conducted a study on smartphone addiction among undergraduates in Malaysia, uncovering a robust and affirmative correlation between smartphone addiction and depression. Additionally, the research indicated a moderate significance of smartphone addiction in relation to physical activity. Ismail *et al.* (2020) provided further

support for the previously indicated conclusion, showing that among Malaysian university students, internet and smartphone addictions are significantly positively correlated with anxiety, stress, depression, and suicidal thoughts.

The findings of the second hypothesis in table 4 showed that smartphone addiction ($r = .308$; $p < 0.05$) has a significant positive relationship with suicidal behaviour among undergraduates. Research by Hu *et al.* (2022) that examined mobile phone addiction among Chinese university students contrasts with this finding. Their study indicated that mobile phone addiction did not significantly influence suicidal behaviour among students who had high levels of online social support. In addition, Oh & Heo (2024) study is also in agreement with the present research who found that there is link risk behaviour between variables such as depression, smartphone overdependence, suicidal ideation as well as suicidal planning.

The findings from hypothesis three indicated a substantial gender disparity in suicide conduct among students at the University of Ibadan ($t=0.629$, $df=294$, $p<0.05$). It was also shown that female students exhibited more suicidal conduct than their male counterparts. The outcome contradicted the findings of Wang *et al.* (2022), who determined that gender did not impede mobile phone addiction related to suicide attempts or ideation among university students in China. This discrepancy may be attributed to cultural differences, varying social expectations, or differences in help-seeking behaviors between genders in different cultural contexts.

6. Conclusion

This study has established a significant positive correlation between smartphone addiction and suicidal behavior among undergraduate students at the University of Ibadan. The findings demonstrate that higher levels of smartphone addiction are associated with an increased likelihood of experiencing suicidal thoughts or behaviors. The research reveals that students with smartphone addiction tend to experience various negative psychological outcomes, including depression, diminished well-being, and disrupted sleep patterns. These factors may serve as potential mediators in the relationship between smartphone addiction and suicidal behavior. Beyond the primary findings, the literature review consistently indicates that excessive smartphone use negatively impacts academic performance, creating additional stressors that may contribute to poor mental health outcomes. Gender differences emerged as a significant factor in this study, with female undergraduates demonstrating higher levels of suicidal behavior compared to their

male counterparts. This gender disparity highlights the need for gender-specific approaches in addressing mental health issues among university students. Mental health interventions should be tailored to address the unique challenges and risk factors experienced by different genders.

The implications of these findings underscore the urgent need for universities to develop comprehensive strategies that address smartphone addiction and its relationship with suicidal behavior. These strategies should include awareness programs about healthy smartphone use, accessible mental health services, and targeted interventions for high-risk groups. Additionally, educational policies should incorporate guidelines for responsible technology use that promote both academic success and psychological well-being.

7. Recommendations

The following recommendations were made:

1. Ministries and agencies involved in the well-being of students should consider developing and implementing policies that regulate smartphone use within educational settings, establishing guidelines for usage during class/lecture hours.

2. Mental health advocacy groups should work with community stakeholders to reduce stigma surrounding mental health issues and promote help-seeking behaviors among university students

3. Strengthening student support services, such as counselling centres and student-friendly centres in terms of behavioural modification, to provide specialised support for students struggling with smartphone addiction and mental health issues is crucial.

4. Develop gender-specific intervention programs that address the unique challenges faced by male and female students regarding smartphone use and mental health, considering the gender differences identified in this study.

5. Universities should conduct regular assessments of smartphone usage patterns and mental health status among students to identify at-risk populations and monitor trends over time. Non-governmental organizations should collaborate with educational institutions to develop and implement awareness campaigns highlighting: The connection between excessive smartphone use and mental health issues, healthy digital habits and responsible media consumption, recognition of warning signs for smartphone addiction and suicidal behaviour.

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Conflict of interest

There are no conflicts of interest.

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FREQUENCY OF PLAYING VIDEO GAMES AMONG STUDENTS AND THE MOST FREQUENTLY USED MEDIA

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Abstract

Video games are an easily accessible medium that most adolescents prefer and choose as their favorite way of activities and entertainment. Current research determines whether playing video games by adolescents is good or bad, as it can affect the development different types of abilities that can lead to better success in school or possibly, due to excessive use, can have the totally opposite effect. It also examines whether there are differences in the examined phenomena between adolescents of different gender and age, as well as what is the dominant type of media through which these games are played. The sample consisted of 400 adolescents aged 12 to 19. The research was conducted online through Google forms. Data were processed in the SPSS program, using appropriate techniques. The results showed that male adolescents played video games more often than girls, as well as older adolescents compared to younger ones. However, younger adolescents who play video games perform

better in school. Mobile phones are the most commonly used medium for playing video games. The implications of the results are reflected in the provision of relevant information to economic entities present in the video game market in order to more successfully develop appropriate video games and attract more customers. Also, educational institutions may consider ways in which video games could be used in teaching, given that they provide a number of benefits over traditional ways of learning. Subsequent research can be extended to the adult population, to explore if they have a higher frequency of playing video games, as well as whether and how much they contribute to their success in the workplace.

Key words: *video games, adolescents, school success, learning, mobile phones*

JEL Classification: A210

Introduction

Playing video games is certainly present in people of all ages, and is most dominant among adolescents. While it can, on the one hand, represent a useful basis for developing various aspects of intelligence, faster problem solving, creating and planning strategies, it can also represent a major type of modern addiction that is spreading at lightning speed among young people. The negative effects are reflected in the extensive time spent in front of the screen (which is very dangerous in itself), as well as in alienation from other people, a vague experience in forming one's own identity, and ultimately the creation and life in completely parallel realities. Therefore, this type of activity is interesting for research by experts of various profiles such as psychologists, psychotherapists, teachers, and video game producers. Each of them should contribute from their own field of expertise to preventing possible abuses of playing video games, and to using this type of activity, which is very receptive to young people, as a suitable tool in education, schools, learning new skills and various forms of entertainment. In this way, limiting the time spent in these activities and its rational use will lead to optimal results for children and young people, as well as for their parents and teachers, the entire system of upbringing and education, and ultimately, society as a whole. The following section presents an overview of the most current scientific articles in this field and contribution of this specific research.

Literature Review

Although Japan is considered the cradle of video games, they actually originated in the United States in the early 1970s. These games were not similar to today's games at all and were known as arcade games, because they were played on the device "Arcade", which initially allowed to play only one video game on it, but later with the development of removable memory, was possible to delete and write more games on it. In the eighties of the XX century, with the development of video game technology, they got better graphics, better sound quality and large companies such as Atari, Nintendo and Sega were founded.

With the development of the Internet and better connections, video games became even more popular, because players could play against each other even when they were not in the same room. Also, with the development of mobiles, new games are starting to appear, which makes them even more popular and accessible.

The value of the video game market in 2020 was about 156 billion dollars, in 2021 178 billion, assuming that in the coming years this market will grow and reach a value of about 269 billion dollars in 2025 (Statista, 2021). This research also showed that the market for video games for personal computers and consoles is being saturated, while the market for video games for mobile phones is growing unstoppably and taking the lead within this industry.

Even 97% of adolescents in the United States aged 12 to 17 play video games, and boys do so more often because 60% of males play video games every day compared to females with a percentage of 39% (Lenhart et al., 2008). The results of this research showed, the medium most used for playing video games are video consoles, followed by mobile phones and computers. The similar situation is in Iran, where more than 93% of boys play video games (Allahverdipou et al., 2010), and most used media are computers – 71% and video consoles – 16%.

Males generally spend much more time playing video games. Thus, in the United States, men on average spend twice as much time per week playing video games, preferring physically oriented video games as opposed to females who have a preference for traditional logic video games (Greenberg et al., 2010). This is confirmed by another research according to which boys play video games more than two hours on average per week compared to girls (Ogletree & Drake, 2007). About 40% of the U.S. population regularly play video games, while about 53% of adults, of whom one in five plays video games every day (Lenhart et al., 2008). A study conducted in 20 high schools in Belgium showed that boys play video games more often than girls observed on a weekly basis and that the percentage of those

who do not play video games is higher among girls (21.5%) compared to (4.7%) boys (Bourgonjon et al., 2010).

A study conducted among adolescents aged 12 to 19 confirmed that men play video games more (MFS, 2005). So even 61% of boys play video games at least once a week compared to 15% of girls. This to some extent coincides with the results according to which men in general spend more time playing video games at once or twice a day, but women still do it more often - play several times a day at shorter time intervals (Dindar, 2018). A large number of studies have confirmed that male adolescents play video games more than female ones (Greenber et al., 2010; Phan et al., 2012; Willoughby, 2008) while the opposite results were obtained by researchers according to which females do this more often, as well as younger respondents do (Borowiecki & Bakhshi, 2018). As for the media used for playing video games, there is convincingly in the first place a computer with 61.1%, in second place are consoles with 30.5% and then mobile phones and mp3 players with 8.4% (Bourgonjon et al., 2010). Such a sequence was also obtained in a sample of 341 respondents in a study conducted in the United States in late 2011 (Phan et al., 2012).

Paul Guy James conducted research and wrote a book about the good sides of video games and how they can be used in the learning process. During video games, players get a lot of data and information that can encourage them to further explore these areas, which motivates them to learn. Also, while playing video games, people often have to collaborate with other players or teams to progress through the game, which develops their ability to work in a team, so they can benefit from it in companies that nurture teamwork and team spirit. The great advantage of video games that are played in teams is that the players exchange their knowledge, skills and experiences, which further educates them. The mentioned author came to the conclusion that most players do not want short and easy video games, so companies have to make more complex and difficult video games in order to motivate as many people as possible to play them. Namely, the complexity of the video game additionally motivates the players and is very important because when there is no motivation, the game becomes obsolete. If video game is too easy and predictable then important components of entertainment such as uncertainty and curiosity are lost (Friedman, 1995). The complexity of the video game itself is a motivating factor because it allows players to assess their effectiveness (Klimmt-Hartmann et al., 2005). There are a lot of video games that are played online, so children can interact with other players, which can improve their communication skills. Playing video games significantly affects the development of

communication skills, adaptability and resourcefulness, which is very important for final year students in a situation of job applying (Barr, 2017).

Students' sense of self-efficacy is an important predictor of future success during schooling (Ketelhut, 2007). Numerous studies have confirmed that academic self-efficacy influences the choice of student activities and the amount of effort invested during video games playing (Mikropoulos & Natsis, 2011). Students who have more pronounced sense of self-efficacy are more likely to opt for more challenging tasks and will persist longer in difficult situations (Ketelhut, 2007; Zimmerman, 2000).

Interestingly, the ability to learn and develop certain abilities is greater from 3D games compared to those in 2D, because the higher cognitive load in 2D games reduces the ability of players to accept educational content (Young et al., 2009). While playing video games, people face different tasks and problems they have to solve in order to move to higher levels of the game, which in general increases their ability to solve problems and tasks. The research confirmed that video games help schools and companies by developing some skills and expanding players' knowledge, so that schools and companies can get better students and workers. In addition, higher education institutions must follow trends in order to improve the educational process (Gostimirović & Gostimirović, 2022). Also, the covid-19 pandemic has influenced the use of information technologies to hold classes online (Randjelovic et al., 2022). The conclusion of this researcher is that video games can be used in a lot field of education because people are more motivated to learn through them, so they represent better learning tools than traditional schools or jobs (Gee et al., 2003). Video games provide an engaging environment that motivates students to learn more than traditional schools (Foster, 2008; Papastergiou, 2009). Also, video games are, by their nature, an active form of learning since feedback is received immediately, which is usually more effective than passive learning (Michael, 2006). In addition, higher education institutions must follow trends in order to improve the educational process (Gostimirović & Gostimirović, 2022). Also, the covid-19 pandemic has influenced the use of information technologies to hold classes online (Randjelovic et al., 2022).

Scuire, who researched the attitude of educational institutions towards video games, agrees with these results, and believes that these potentials have not been sufficiently used at all. This researcher claims that the cognitive potentials of video games have been largely ignored by educators. During the research, he came to the conclusion that educators pay too much attention to the social component in analyzing video games, while completely neglecting the educational component of

video games. Namely, the mentioned author believes that video games are one of the most popular digital media through which knowledge can be transferred and education can be performed. Also, video game players can develop creativity, as there are many video games where various virtual settlements and worlds can be built. Fabricatore believes that video games are not sufficiently used in the learning process. He thinks that video games could be used even better by working on their design, graphics and customization for children, so that real educational video games could be obtained (Fabricatore, 2000).

Many video games are in different languages, so children can learn a certain foreign language through the game. Video games can be used to learn foreign languages giving better results than traditional ways of learning (Vahdat & Behbahani, 2013). Namely, video games improve students' ability to memorize words, encourage interaction, improve communication skills and increase their motivation (Derakhshan & Khatir, 2015). In addition, children can learn a lot about foreign cultures and customs through video games, which increases their understanding and tolerance towards them. Video games often simulate real life situations, thus teaching adolescents how to react in case they find themselves endangered or in a dangerous situation (Wallander et al., 2010).

Playing video games can contribute to development of specific cognitive abilities, so certain video games can improve selective attention and visual discrimination (Green & Bavelier, 2006). Also, the results of others research show that video games can improve visual perception (Boot et al., 2008) and faster information processing in players (Jaeggi et al., 2011).

In addition to cognitive, motivational and social development (Granic et al., 2014), there are some other benefits and advantages of playing video games. A study conducted by a group of authors was found that those who played video games developed the ability to better perceive objects, time and space. This is especially true for those who play fast-paced video games in which tasks involves motor skills are and requires great attention and concentration. Based on previous research, it can be concluded that children and the people who play video games in general develop better perception and better notice details (Wallander et al., 2010). This conclusion is supported by a study in which the participants in the experiment received first one image, and then a modified version of the same image. Their task was to find the difference between the two images. The results showed that participants in the experiment who played video games achieved better results and found these details faster than those who did not play video games (Clark et al., 2011).

Methodology

The aim of this research is to determine the frequency of playing video games among adolescents aged 12 to 19 years. This research should answer the questions of the frequency of playing video games among adolescents in Serbia in relation to gender, age and how it affects their school success. It also investigates which medium is most used for playing video games..

In order to get answers to these questions, the following research hypotheses were set:

1. Male adolescents play video games more often than female adolescents (H1);
2. Older adolescents play video games more often than younger ones (H2);
3. Mobile phones are the most used medium for playing video games (H3).

Data were processed in the SPSS program, using non-parametric techniques such as: Kruskal-Wallis test and Man-Whitney-U test,. The Mann–Whitney–U test was used to examine the difference in scores between two groups of subjects, while the Kruskal–Wallis test was used to examine the difference in scores between multiple groups of subjects. Respondents filled out a questionnaire that was specially constructed for the needs of this and earlier researches, online via Google form. The questionnaire consists of 20 questions measuring the frequency of playing video games on a seven-point Likert-type scale. Reliability ranged from 0.75 to 0.85 Cronbach's alpha. The sample consists of 400 respondents of different gender, which is uniform in terms of age, considering that 200 respondents represent elementary school students from 5th to 8th grade and 200 respondents represent secondary school students from 1st to 4th grade. When it comes to gender, there are more females – 209, versus 191 male adolescents.

Results and discussion

The sample in this research consists of 400 respondents aged 12 to 19, that is, adolescents. In the sample, younger adolescents (primary school students) are equally represented, 50%, as well as older adolescents (secondary school students) in the same percentage. Male adolescents make up 47.75%, while the females are 52.25%, which shows the approximate uniformity and representation of both gender in the sample.

Table 1. Frequency of playing video games among asolescents

	Primary school		High school	
	Frequency	Percent	Frequency	Percent
Never	17	8.5	4	2
Once a month	33	16.5	9	4.5
Once a week	60	30	16	8
Two or three times a week	47	23.5	24	12
Every day for 1 hour	25	12.5	54	27
Every day for 2-4 hours	10	5	58	29
Every day for more than 5 hours	8	4	35	17.5
Total	200	100	200	100

Source: Auauthor's calculations

The research showed that male adolescents play video games more often than female adolescents, thus confirming the first hypothesis (H1). Namely, using the Mann-Witney-U test to examine the difference in scores between the two groups of subjects, statistically significant differences in the frequency of playing video games by gender were obtained (Table 2).

Table 2. Results of Mann-Whitney U test – significance of geneder differences

	Frequency of playing video games
Mann-Whitney U	2040.000
Asymp. Sig. (2-tailed)	.000

Source: Auauthor's calculations

Male adolescents play video games more often than female adolescents ($U = 2040,000$; $p < 0.05$) (Table 3). Some of the potential reasons may be that the majority of video games are adapted to the male population, as well as that, in general, male adolescents spend much more time at the computer and have more preferences towards competition and competing with others.

Table 3. Geneder differences in frequency of playing video games

	Gender	N	Mean Rank	Sum of Ranks
Frequency of playing video games	Males	200	94.07	5924.00
	Females	200	65.32	3199.00
	Total	400		

Source: Auauthor's calculations

The results of the current research are consistent with a group of studies according to which adolescent boys play video games more often than adolescent girls (Bourgonjon et al., 2020; Greenberg et al., 2020; MFS, 2005; Ogletree & Drake, 2007; Phan et al., 2020 ; Willoughby, 2008) but they are not in line with the research according to which the females play video games more often (Dindar, 2018).

As for the Serbia and the frequency of playing video games, there are statistically significant differences in the scores between younger adolescents ($\chi^2=13.243$; $p < 0.05$) and older adolescents ($\chi^2=13.586$; $p < 0.05$) (Table 4).

Table 4. Results of Kruskal-Wallis test – statistical significance of the obtained differences

	Frequency of playing video games in Serbia – High school students	Frequency of playing video games in Serbia – Primary school students
χ^2	13,243	13,586
df	5	5
Sig.	.002	.003

Group variable: Serbia
Source: Auauthor's calculations

More precisely, students of the second year of high school (MR= 92.27) spend the most time playing video games, then the students of the first year (MR= 90.15), followed by students of the eighth (MR= 90.11) and seventh grade of primary school (MR= 86.45) (Table 5). The average frequency of playing video games was registered among students in the final years of high school, namely students in the third (MR= 79.65) and fourth year (MR= 75.86), while this tendency is least prevalent in the youngest registered group of students in the 5th (MR= 65.42) and 6th grade (MR= 69.86) of primary school.

Table 5. Differences between adolescents of different ages

	Grade	N	Mean Rank
Primary school	Fifth grade	50	65.42
	Sixth grade	50	69.86
	Seventh grade	50	86.45
	Eighth grade	50	90.11
	<i>Total</i>	200	
High school	First year	50	90.15
	Second year	50	92.27
	Third year	50	79.65
	Fourth year	50	75.86
	<i>Total</i>	200	

Source: Auauthor's calculations

Our third hypothesis (H3) that mobile phones are the most used medium for playing video games was tested with the Kruskal-Wallis test. The results showed that there are statistically significant differences in the scores of both group of respondents, older adolescents ($X^2=12.67$; $P < 0.05$), younger adolescents ($X^2=8.352$; $P<0.05$), so it is, in total, confirmed (Table 6).

Table 6. Results of Kruskal-Wallis test – statistical significance of the obtained differences

	The medium on which video games are played – Primary school	The medium on which video games are played – High school
χ^2	8.352	12.67
df	4	4
Sig.	.003	.002

Group variable: medium on which video games are played

Source: Auauthor's calculations

By far, high school students spend the most time playing video games on mobile phones (MR= 98.95), then on consoles (MR= 78.86), while playing video games on a computer is the least prevalent among them (MR= 69.67). Elementary school students also play video games on mobile phones mostly (MR= 85.76), followed by computers (MR= 78.47), while consoles are in third place (71.73) (Table 7).

Table 7. Differences in medium on which video games are played

	Medium	N	Mean Rank
Primary school	Mobile phones	91	85.76
	Computers	69	78.47
	Consoles	40	71.73
	<i>Total</i>	200	
High school	Mobile phones	110	98.95
	Computers	41	69.67
	Consoles	49	78.86
	<i>Total</i>	200	

Source: Auauthor's calculations

The obtained results are not in accordance with the previous research results according to which computers are mostly used for playing video games (Allahverdiipo et al., 2010; Bourgonjon et al., 2020; Phan et al., 2020), i.e. video consoles (Lenhart et al., 2008). A potential reason why mobile phones are the most used medium for playing video games is because they are also the most accessible and prevalent among adolescents. Namely, a large number of adolescents own mobile phones, but do not own computers and video consoles, so they use them to play video games. As for video consoles, they are in second place among older adolescents, considering that at that age adolescents gather more often to socialize and compete. Besides, adolescents who are of legal age can rent them independently from others, unlike younger respondents who do not have this possibility without parental consent. Video consoles are in the last place among younger adolescents because they less often own them compared to mobile phones and computers, and they are most often used for social video games and competition with other players.

Conclusion

Since their inception, video games have undergone a lot of changes and from the original idea of being used to train people to react in the right and fast way in the event of potential dangers and disasters, they have come to be used as a means of entertainment. From the previous research, the conclusions can be drawn that, since their inception or from the very beginning, video games have been underestimated as a learning tool, and yet they are still not sufficiently used.

Namely, by playing video games, both children and the elderly, could get a lot of information that can be useful to them at school or at work. Besides, this information can awaken the desire in video game players to acquire additional knowledge about certain things on which the games are based, thus representing powerful motivational tool for learning. Considering that there is a wide range of games, and that everything from history and mythology to medicine and mechanics is represented in them, by playing video games a person can gain additional knowledge in many areas. That's why video games represent one of the best methods for learning, both because of the contents themselves, and because they represent a basic and generally accepted form of entertainment for children and young people, which should be used. Therefore, their further development could provide a powerful tool for education, since learning process is best through fun and play. Given the fact that they are widespread, they can transmit information and educate broad social communities.

A large part of the population occasionally or often plays video games (over 90% according to the results of many researches), so companies that engage in this activity have the opportunity to make high profits. Video game development companies invest a lot of money to develop video games that will meet customer expectations and attract new customers. Of course, this is accompanied by a high rate of risk, since the development of quality video games requires tens of millions of dollars and more, so if the developed video game does not attract a sufficient number of players, the company can suffer large losses and go bankrupt.

The most often used medium for playing video games is the mobile phone, far ahead of computers and consoles. The price of mobile phones that can be used for playing video games is lower than computers and video consoles, which is one of the reason they are the most common among adolescents. That is why the largest number of adolescents own mobile phones, while only a smaller number own computers and consoles.

The possible limitation of this research, which was favorable to the current epidemiological situation, may be the fact that only respondents who have Internet communication participated in it, so subsequent research on this topic could be expanded by filling out live questionnaires, that is, in schools, as well as by increasing the sample.

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INVESTIGATING THE SURVIVAL STRATEGIES OF SOUTH AFRICAN LEGACY NEWSPAPER IN THE 4IR

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Abstract

Newspapers have traditionally relied on advertising as their primary funding source. The rapid decline in advertising sales and corresponding dropping of revenue from readers who once paid for newspapers' news but are increasingly using internet and mobile platforms have severely hurt the newspaper industry, causing it to enter an unheard-of economic crisis and resulted in laying off of thousands of media workers. In order to strive to stay relevant in a fast-evolving media landscape that is increasingly dominated by digital and social media as well as cutting-edge technology globally, this study analyses the business models, strategies, tactics, and techniques they have adopted. A non-probability selection technique was used to select a sample of

23 South African media executives, researchers, and analysts for the qualitative data technique. The results showed patterns and differences in the business structures, methods, and tactics. The research's findings show that the four newspapers must immediately review and adjust their business models and strategies in order to remain financially viable. They must also provide highly qualified, exclusive investigative journalism to counter misinformation and disinformation that, according to analysts, are being spread by certain social media platforms and are contributing to the demise of legacy newspapers. Finally, they must concentrate on identifying and paying attention to niche audience markets, embrace digital transformation while preserving "old" business models that help them fight off the intense competition for readers and advertisers. Lastly, they must look for new and different revenue streams outside of advertising and depend more and more on audience revenues to remain in business.

Keywords: *newspapers, business models, business strategies, digital and social media*

JEL Classifications: O32, D40

1. Introduction

Hundreds of newspapers have shuttered, and tens of thousands of media workers have been laid off as a result of the financial and economic crisis that has been wreaking havoc on mainstream legacy newspapers for the past two decades. Newspapers used to be monopolies that generated double-digit earnings above those of the majority of businesses. This particular argument was brought up by Littau (2019), a media expert from the United States, who clearly stated that "for decades, newspaper conglomerates lapped up profits and failed to adapt". The economic struggles of newspapers are in part due to their inability to innovate in the face of quickly developing and altering new technologies like the internet, whose technological advancements led to the emergence of digital and social media, as well as because of changes in how audiences consume news (Bell, 2016; Picard, 2017). The aim of the study is to investigate the lived experiences of the four media companies as they tackle the rising competition for the revenues and attention of audiences emanating from digital and social media in the past decades.

Abernathy (2020) observed that 'News deserts' have been created in several nations and cities as a result of the economic problem facing legacy newspapers that has worsened following the emergence of digital and social media in the 2000s

and after COVID-19''. According to Menke *et al.* (2018), 'media convergence' arose alongside digitalization, dramatically altering and escalating competition in a media business sector where the stakes were already high. In order to create dominant media players, Ittefaq *et al.* (2021) note that media convergence required the technological operations of the hitherto distinct industrial operations of broadcasting, computing, telecommunications, and traditional media to be combined. This would indicate that media convergence had significantly disturbed the business operations of legacy newspapers, and what appears to be an escalating economic and financial crisis of mainstream newspapers in South Africa indicates that these newspapers have not been exempt from this global upheaval (Ittefaq *et al.*, 2021).

New global media platforms such as Google and Facebook emerged in the midst of all of these technological shifts, exponentially increasing the information flood, fragmenting the web between those with access to information and those without it, and heralding the demise of humanity's shared culture and values (Wadbring & Bergstrom, 2021; Zuniga & Cheng, 2021). According to Myllylahti (2018), media companies are still "trapped" in the attention economy governed by the two technical platforms. As a result, the decline in advertising revenue for legacy newspapers was perceived as endangering not only the viability of newspapers but also of modern liberal democracy (Myllylahti, 2018).

Just in the past ten years, at least 5,000 media posts have been lost in South Africa (Daniels, 2018). This equated to around 50% of the editorial personnel across the country (Daniels, 2018). The Mail and Guardian, South Africa's premier investigative weekly newspaper, saw its circulation drop to about 20,000 copies from 55,000 in 2013 (Patel, 2018), illuminating the industry's precarious fragility.

The South African National Editors' Forum (SANEF), a grouping of editors and media experts in the country, has encouraged the owners of these media institutions to act immediately to protect their financial and economic health and maintain media jobs (SANEF, 2020). SANEF made this intervention as several South African media publishers, both regional and national, announced job cuts of more than 600 workers and plans to close at least three newspapers and five magazines (Mahlaka, 2020). This was during an escalating economic crisis for the sector that appeared to be exacerbated by COVID-19. This study main focus is getting a deeper understanding into how four South Africa mainstream newspapers are strategically responding in the 4IR.

2. Literature review

According to media analysts like Bell (2016), Ingram (2018), and Abernathy (2020), the economic crisis of legacy newspapers has worsened in the years following the development of digital and social media in the 2000s, as well as following COVID-19, leading to the creation of "news deserts" in some nations and cities.

The internet was created in the 1970s by the U.S. Air Force and American colleges as a worldwide connected "information highway" of interconnected computers that could withstand a nuclear strike. Digital and social media are direct offshoots of the internet (Gabbatt 2020). The World Wide Web and its subsequent versions, Web 1.0 (which allowed for the uploading of text-based content to the internet) and Web 2.0 (which introduced social media and digital media and allowed for the sharing of multi-media content like videos and graphics), came after the internet's inception (Sfetcu, 2017).

Anderson *et al.* (2014), a "tectonic shift" that signalled an "electronic ocean" of news content and a "revolution" that would "devour" newspapers' businesses and journalism was instead emerging in the media landscape at the time. Scholars like Zeng *et al.* (2019), who have praised the internet as a force that was "democratising journalism" by transforming regular people into "citizen journalists,". These individuals would create "user-generated content" to address a long-standing criticism of legacy newspapers from media commentators: that they were mainly unresponsive and unaccountable.

According to Levine (2017) and Rumney (2020), the internet simultaneously sparked an "information explosion" and an "information overload." They claimed that this information abundance was undermining people's ability to pay attention while making it difficult for others to make wise decisions about their life. We have reached an era of data deluge, as Alexander *et al.* (2016) noted. More than 200 billion emails are sent daily, over 2.5 quintillion bytes of data are produced daily by modern computing systems, and the volume of scholarly research published worldwide doubles every nine years (Alexander *et al.*, 2016).

Due to the overwhelming amount of information in the "attention economy," some people are finding it difficult to make sense of their lives and jobs (Zeng *et al.*, 2019). Olsen *et al.* (2021) came to the conclusion that the information overload was destroying people's ability to pay attention for long periods of time. Indeed, according to Carson and Muller (2017), "everyone" is now a publisher as a result of the internet.

The emergence of the internet coincided with a brand-new technological advancement known as digitalization. Picard (2017) describes digitalization as the

process of changing content production, storage, distribution, and consumption from an analogue to a digital base. As a result, media content production time and cost were drastically reduced thanks to digitalization, which also sped up the development of the multi-media formats we use today.

According to Chyi & Terenboim (2017), media convergence occurred alongside digitalization, dramatically altering and escalating rivalry in a media business market already characterised by high stakes. In order to create dominant media players, Ittefaq *et al.* (2021) note that media convergence required the technological operations of the hitherto distinct industrial operations of broadcasting, computing, telecommunications, and traditional media to be combined. Ittefaq *et al.* (2021) defined media convergence as a cultural shift and an integrative process in which content flows across multiple media platforms, prompting cooperation between different media industries, and resulting in the migratory behaviour of media audiences.

This would indicate that media convergence had significantly disrupted the business operations of legacy newspapers, and what appears to be an escalating economic and financial crisis of major newspapers in South Africa demonstrates that these newspapers have not been exempt from this global disruption (Mahlaka, 2020). New global media platforms like Google and Facebook emerged in the midst of all of these technological shifts, exponentially increasing the information flood, fragmenting the web between those with access to information and those without it, and heralding the demise of humanity's shared culture and values (Wadbring & Bergstrom, 2021; Zuniga & Cheng, 2021).

Google and Facebook controlled more than 60% of the \$181 billion in worldwide online advertising (McDuling & Mason, 2017). By the end of 2018, according to Ingram (2018), who published an online post titled "The Facebook Armageddon," Facebook and Google would have 85% of the global market for digital advertising. Myllylahti (2018), explain that media companies are still "trapped" in the attention economy governed by the two technical platforms. As a result, the decline in advertising revenue for legacy newspapers was perceived as endangering not only the viability of newspapers but also the modern form of liberal democracy.

The influential South African National Editors' Forum (SANEF), an association of editors and media scholars in the nation, has appealed to the owners of these media institutions to take immediate action to protect their financial and economic health and save media jobs as South African mainstream newspapers and other legacy media, such as radio and television stations, appear to share these

sentiments (SANEF, 2020). SANEF made this intervention as a number of regional and national media publishers in South Africa announced job cuts of more than 600 workers and plans to shut down at least three newspapers and five magazines (Mahlaka 2020) in an escalating economic crisis for the sector that appeared to be exacerbated by COVID-19.

South African Newspapers

Isolezwe (The Eye of the Nation)

In order to serve the news and information needs of the Zulus, the single largest black ethnic group in South Africa and who make up 22.7% of the population, Independent Media SA created Isolezwe (The Eye of the Nation) in 2002 (Wasserman & Ndlovu, 2015). Its readership quickly outpaced that of long-running English and Afrikaans newspapers (Moodie, 2012).

Mail and Guardian

For nearly 40 years, The Mail and Guardian, often known as the M&G in South Africa, has been the nation's top investigative newspaper (Ntibinyane, 2018). It is part of the so-called "alternative press" that formerly worked clandestinely under the more than 40 years of strict apartheid racial segregation and white supremacist rule in South Africa, which came to an end in April 1994 with the election of a black majority government (Ntibinyane, 2018).

Grocott's Mail

With its founding in 1870, Grocott's Mail, a weekly newspaper produced by Rhodes University in Makhanda, in the Eastern Cape region, claims to be the "oldest independent newspaper in South Africa" (Vale, 2016). Thomas Henry Grocott, who was born in Liverpool, England, and completed his newspaper apprenticeship there before starting his own publication, started it and worked there for ten years (Vale, 2016). Businessman R W Murray Junior approached him in 1864 about moving to South Africa to work for the Great Eastern Star newspaper, which was published at the time in Grahamstown (Vale, 2016).

Daily Maverick 168

During the height of COVID-19, a weekly newspaper called The Daily Maverick 168 was published. This publication defied the global trend of media owners who were switching from print to digital media products and services (Charalambous, 2020). A business called Daily Maverick, which has been

operating an online investigative website since 2009, owns the newspaper (Charalambous, 2020).

Survival Strategic Management

Ronda and Guerras (2012), the word "strategy" is derived from the Greek word "strategos," which literally means a "general in command of an army". As a result, compared to other well-established academic fields, the idea of strategic media management is relatively new and becoming more fragmented (Grant & Madsen, 2017; Strachan, 2019). A common thread among these definitions of strategic media management is that it is an all-encompassing strategy used by media firms to use their resources, skills, leadership, and market power to gain a competitive advantage or superior performance, despite the fact that there is no consensus on the concept's meaning due to the fact that it has been interpreted differently by scholars from diverse fields such as economics, marketing, sociology, and psychology (Grant & Madsen, 2017).

The merger of not just the disputed definitions of strategic media management but also of its conceptual understandings and numerous, if occasionally conflicting, theories has since been frequently demanded by a number of experts in the field (Leiblen *et al.*, 2018; Oliver, 2018). However, Mintzberg (1987) noted that the different definitions should not be blamed but rather praised because they allowed academics and practitioners to develop their own acceptable and relevant meanings in "this tough field".

The so-called Five Ps of strategy were established by Mintzberg (1987) in his analysis. These include strategy as a Plan, which has some "conscious or purposefully intended" action; a Ploy, in which a strategist may be trying to outwit an opponent; a Pattern, which may seek to bring about change or consistency in behaviour, "whether or not intended;" a Position, which defined an organization's location and relationships with its environment and other stakeholders; and a Perspective, in which strategy encapsulates "an ingrained way of perceiving the world" by the strategist. He argued that a more complete definition of strategy therefore combined all five Ps, noting that while plans and positions could be changed, "perspectives are immutable" due to the fact that once established, they had a tendency to "become so deeply ingrained in the behaviour of an organisation that the associated beliefs can become subconscious in the minds of its members" (Mintzberg, 1987). The competitive position of the company and whether or not it would concentrate on specialised markets were key factors in the Five Ps of strategy.

This study places the more general category of strategic management, from which the former derives the majority of its concepts and understandings, beneath the heading of survival strategic media management. Drucker (1975), who is frequently cited as the creator of strategic management (Cherunilam, 2015), seems to have encapsulated what it includes more succinctly than most academics. According to Drucker (1975), strategic management has "no choice but to anticipate the future, try to shape it, and balance short- and long-term objectives. If someone desires long and hard enough, the future won't magically happen. Now is the time for decisions. It now poses a risk. The time for action is now. It requires immediate resource allocation and work (Cherunilam, 2015). According to Porter (1985), businesses must decide between three generic strategies: being a leader by offering less expensive goods and services than competitors (the cost leadership strategy); supplying goods and services that are distinctive from competitors; or producing specialised goods and services for a market (the focus strategy). Each of the three tactics was intended to improve a company's operational efficiency. These strategies could be put into practice by using analytical tools that look at a company's SWOT (Strengths, Weaknesses, Opportunities and Threats) or PESTEL (Political, Economic, Social, Technological, Ecological, and Legal factors), which both scan the business environment for any changes that might have an impact on a firm's performance (Whittington *et al.*, 2020).

3. Methodology

A non-probability selection technique was used to select a sample of 23 South African media executives, researchers, and analysts for the qualitative data technique. The respondents were chosen based on their in-depth knowledge and comprehension of the topic under study. The media executives, editors, and journalists who create the newspapers are considered in this study as well as independent media scholars and analysts who track trends in the print media and study their publications (Saunders *et al.*, 2019). A total of 23 participants were interviewed using semi-structured questions. Among these were 19 members of the media and 4 outside specialists.

The enormous amount of data was put together by this researcher using the theme analysis and the electronic programme Atlas.ti. The researcher also examined newspaper archives and data gathered from visits to two of the four publications. The study's triangulation was strengthened by the documentation, the majority of the historical press coverage of the operations of the newspapers, the researcher's observations, and interviews with participants, the literature review,

and member checks. Because of its organic approach to coding and theme development and the active role of the researcher in these processes, thematic analysis was utilised in this study.

4. Results and discussion

The analysis of the four newspapers' operations from a thematic and BMC perspective reveals both similarities and differences in the business models, approaches, and strategies they have used to compete in a rapidly changing media environment increasingly dominated by social and digital media, as well as major international technology platforms like Apple, Amazon, Facebook, Google, YouTube, and Twitter. Except for the Daily Maverick 168, whose circulation was increasing at the time of the study, all of the other three newspapers had gone through what Daniels (2020) has called a catastrophic shrivelling of their businesses and journalism. Indeed, the 2020 demise of Grocott's Mail, the only "commercial and community newspaper" for Makhanda town, where an estimated 80,000 people live, highlighted the precarious nature of the newspaper industry in the new "media regime" (Nelson, 2019) that is more and more characterised by discontinuous economic and social conditions.

The study's results clearly show that the Daily Maverick 168 scored strongly on each of the nine pillars of its BMC, particularly on its innovative business tactics of diversifying and boosting revenue in order to establish a multifaceted business model for itself. The crucial role that the Daily Maverick Company's management and leadership played in establishing the ideal conditions that had permitted both innovation and experimentation also stands out strongly from the examination of the company's main themes, sub-themes. The media company achieved this by allocating 70% of its annual budget to the newsroom and hiring a diverse team of skilled and experienced journalists to produce its high-calibre investigative news content. This strategy attracted a number of lucrative business partnerships, including those of its Maverick Insiders, as well as its advertising and philanthropic revenues, all of which were obtained from various organisations that wanted to associate themselves with the media company. Jenkins and Nielsen (2020) point out that the media landscape of the twenty-first century requires innovative thinking from media executives and journalists who must be acutely aware of the vastly changed and still rapidly developing media climate and must, as a result, implement new and varied business strategies and be not afraid to experiment with what works or does not work for their news firms.

While the Mail and Guardian (M&G) also received high marks for its BMC, its overall business model strategy - as revealed by the analysis of its themes and sub-themes - had been seriously undermined by its rush to "harvest" higher reader income from dwindling audiences of its printed newspaper at a time when most South Africans were experiencing rising economic hardships due to the country's ongoing recession and the multifaceted challenges of COVID-19. The M&G made the choice to raise the cover price of the printed edition, which caused a substantial decline in circulation and a corresponding decline in advertising revenues. While admirable, the company's parallel strategy to invest in new digital media and data-driven news products and services had struggled to gain traction in the market primarily due to readers' resistance to pay for online news, which most audiences consider to be "inferior" to news in printed newspapers. (Chyi & Ng, 2020; Puijk *et al.*, 2021).

The M&G found it difficult to reverse the initial decision made by newspapers worldwide to provide readers with free online news, and the newspaper's efforts to attract more digital readers to its paywall website were also hampered by South Africa's comparatively higher data costs compared to other countries (Wasserman, 2020). Lacking sufficient funding, the M&G's choice to lay off half of its very competent investigative reporters was likely its largest error. As mentioned by Picard (2017) and Nelson (2019), a newspaper's most valuable asset was its high-quality news coverage, which drew readers, advertisers, and other organisations looking to affiliate themselves with a reputable and trustworthy publication. Picard (2017) makes the claim that as a news outlet is obliged to rely more and more on non-original news agency content, the quality of its news content declines. This is because editorial spending and employee numbers are reduced. Because of this, circulations are dropping, which forces a decrease in advertising and support from other partnering businesses, creating a vicious cycle that has come to be known as the "economic suicide spiral".

In the case of the Daily Maverick 168, its dynamic hybrid business model, which was generating multiple revenue streams, demonstrated that high-quality content from its knowledgeable and talented editorial division was not only strengthening the media company's business model and attracting a variety of businesses whose operations were aligned in some way with the Daily Maverick, but it was also improving the financial bottom line of the media company, improving the Daily Maverick's societal value. In other words, this finding supports the idea that high-quality news content strengthens a newspaper's business model by enabling it to seek out and enter into beneficial business and social

partnerships in a continuous and beneficial cycle. High-quality news content not only attracts readers and advertisers to a media firm to make it profitable. Returning to the Daily Maverick 168, this newspaper's business plan took into account both the "network capability" put forward by Ritter in (2021) and the essential components of Porter's (1985) value chain. The Daily Maverick 168 had successfully established a vital network of Maverick Insiders (Ritter, 2021) and business alliances (for example, the newspaper's distribution partnership with Pick n Pay during the peak of COVID-19, when most businesses except supermarkets were closed). By including readers in the newspaper's initial design and creation and then maintaining close communication to obtain their ongoing comments, it had also turned readers into consumers who were a part of the "value-in-use" (Ritter, 2021) creation process.

According to the thematic analysis and BMC of Isolezwe, the newspaper's largest error was relying only on advertising and circulation revenues, almost blissfully unaware of the velocity of change around it and its potentially disastrous effects on the economy. Isolezwe discovered that its business model was nearly brought to its knees by a combination of the negative effects of COVID-19 and the failure to diversify both its business model and revenue model, despite being supported by the substantial resources of Independent Media SA, one of the "Big Four" media companies in South Africa whose news products and services dominate the country's media landscape.

Isolezwe was found wanting when businesses that advertised in its newspaper were suddenly forced to close down by the COVID-19 pandemic as the government shut the economy down to try to contain the spread of the deadly virus. Although Isolezwe had competitive advantages in that it published seven days a week and also published in the isiZulu language to South Africa's single largest ethnic group, the Zulus, it was nonetheless found wanting. However, the newspaper's circulation had already begun to decline a few years prior, sending indications that it needed to innovate and adapt to the changing media landscape of the twenty-first century. It failed to accomplish this since it only recently launched a website and solely offered its news content for free, making the same strategic error as newspapers which did the same at the beginning of social media and digital technology in the late 1990s and early 2000s. The cumulative effect of these errors has been a departure of highly qualified journalists, endangering its news coverage and its capacity to draw in advertisers who would have wanted to offer their products and services on it.

The tiny community and commercial *Grocott's Mail** had unsatisfactory ratings for almost all of the nine BMC pillars, and an examination of its principal themes and sub-themes reveals a business in dire financial straits. It relied on its limited circulation (when it was still a paid-for daily) and advertising revenues, with some experiments with a free online edition, due to a lack of suitable funding and operating in a town that was sapped by unemployment and poverty. Although other participants for the newspaper argued during this study that the news coverage was starting to resonate with the majority of Makhanda communities before it closed in 2020, the newspaper's business performance was seriously hampered by the lack of dedicated staff reporters on its payroll and its heavy reliance on freelancers and university students to become the providers of the bulk of its news coverage. Another challenge, admitted by Participant, was the newspaper's inability to properly define its target demographic. Participant stated that the newspaper preferred to become a communal unifier rather than give in to advertisers' continual demands to fragment its viewers. In retrospect, *Grocott's Mail*, which in general generated content of a high calibre, might have thought about publishing distinct newspapers or newsletters for the town's citizens in an effort to satisfy both its advertisers and its communitarian ideology.

The demise of *Grocott's Mail* also serves as a stark reminder of how markets cannot sustain journalism, which is a public good (Oye, 2020). As a result, some segments of the population are left without access to reliable news. According to Oye (2020), who has studied the public service journalism institutions in Britain, Canada, and Australia, new regulatory and legislative frameworks must be developed in order for these organisations to survive. If this isn't done, public broadcasters will continue to be ignored, which will support media environments where uneven access to pertinent, high-quality news and information is prevalent. Some citizens will be unable to obtain the news and information they need to engage actively in public life as a result, according to Oye (2020). The *Grocott's Mail* made a good public service attempt to try to simultaneously play a commercial and communal function, but in a world where successful newspapers are those who seek out and identify their niche readers, it was forced to close. Additionally, due in part to COVID-19, it was burdened by a lack of a clear target audience, rising printing costs, and diminishing advertising revenues. Participant of *The Grocott's Mail* also noted that the newspaper, which Rhodes University inherited in 2003, had reportedly been run poorly in the past, with staff members being unproductive and the publication frequently overspending. These issues

should have prompted management's intervention and have now played a role in the newspaper's eventual demise.

5. Recommendations

According to this analysis, generalist and mass-circulation newspapers are no longer relevant, and the four newspapers and those publishing under similar circumstances should instead focus on providing services to narrowly defined and targeted specialised markets. As digital and social media ushered in the economics of news plenty, the era of newspapers that had thrived on information and news scarcity for the previous six centuries and made extraordinary massive financial profits that dwarfed most sectors, came to an end. The inconsistent news content tastes of the current generation of so-called Facebook millennials, who increasingly highlight their individual differences and hobbies rather than the "community values" of the past, lend further credence to this suggestion.

The time when advertising was the dominant source of funding for newspapers is swiftly coming to an end, and publications will have to rely more on reading fees and other digitally-driven activities going forward. This recommendation highlights how vital it is for newspapers to do exhaustive and continuing audience research by diverse teams in order to recognise and keep track of the ever-changing news and information preferences and needs of their viewers. They must also adopt audience analytics and other data collection methods inspired by artificial intelligence if they want to keep in contact with their readers; otherwise, they run the risk of becoming extinct newspapers. Despite the apparent doom and gloom scenario some of the legacy newspapers examined are facing as a result of this research, there is some optimism for them.

The study's findings show that readers have higher faith in traditional newspapers and other news sources than in social media, which is blamed for spreading misleading information, misinformation, and outright false news noise. This indicates that traditional newspapers could benefit from the public's trust by listening to readers' concerns and giving them a voice in their publications, as well as by simultaneously addressing these concerns by offering solutions in the form of solutions journalism, which is news that readers can use, and explanatory journalism, which educates communities about the context and significance of events.

6. Conclusion

The study has identified new insights on how the companies could ease the economic crisis and financial that is affecting the newspaper companies. It may be claimed that the two other newspapers in this study, *Isolezwe* and *Grocott's Mail*, were unprepared for the rise of the highly disruptive digital and social media, with the exception of the *Daily Maverick Company* and, to a lesser extent, the *M&G*. The findings of this study, which examined the business models, strategies, and tactics they have to combat the hyper-competition that is developing in front of them, as well as how and whether or not these strategies are succeeding, allow for the drawing of this conclusion. The two newspapers consequently found themselves in the crosshairs of a brutal and rapidly evolving technology-driven news industry. In other words, newspapers will face tougher and more intense competition as they compete for readers' attention and advertising dollars in the 4IR era. Finally, the newspapers need to re- conceptualise, adapt and update their business models concentrate on identifying and paying attention to niche audience markets, a push to embrace digital transformation while preserving "old" business models that help them fight off the intense competition for readers and advertisers. Lastly, they must look for new and different revenue streams outside of advertising and depend more and more on audience revenues to remain in business which works in their own environments.

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THE ROLE OF AI-DRIVEN LINGUISTIC ANALYSIS IN CROSS-LINGUAL ADVERTISING IN KYRGYZSTAN'S ECONOMY

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Abstract

This paper explores the role of AI-driven linguistic analysis in the cross-lingual advertising landscape of Kyrgyzstan, emphasizing its impact on the country's economy. As Kyrgyzstan's advertising industry grows, AI technologies such as Neural Machine Translation (NMT), sentiment analysis, and content personalization are increasingly utilized to navigate linguistic and cultural diversity. By enhancing the accuracy and cultural appropriateness of translations, AI facilitates effective communication between brands and diverse linguistic groups. This study addresses challenges faced by traditional translation methods, including cultural misalignment and semantic errors, and demonstrates how AI tools can mitigate these issues by ensuring the preservation of emotional appeal and brand identity. Additionally, the paper analyzes various advertising texts in Kyrgyzstan, categorizing them based on linguistic shortcomings such as redundancy, exaggeration, and inappropriate register, and highlights AI's potential in improving linguistic quality. The study

also examines the ethical and psychological impact of advertisements, particularly in political and street advertising contexts. Ultimately, the paper asserts that AI-driven linguistic analysis is transformative for the cross-lingual advertising sector, offering a strategic advantage in the creative economy while contributing to Kyrgyzstan's economic development through improved marketing strategies.

Keywords: *AI-driven linguistic analysis, cross-lingual advertising, Kyrgyzstan, sentiment analysis, cultural adaptation, translation accuracy, advertising localization, machine learning, linguistic diversity, multilingual advertising.*

JEL Classification: M37, C88, O33, F63, Z13

Introduction

The intersection of artificial intelligence (AI) and advertising has been widely explored in recent years, particularly in the context of cross-lingual communication (Hagen, 2021; Gupta & Mishra, 2022). AI-driven linguistic analysis employs natural language processing (NLP) and machine learning (ML) to analyze, translate, and optimize advertising content for different linguistic and cultural markets. The rapid evolution of AI-powered tools, including neural machine translation (NMT), sentiment analysis, and content personalization, has enabled businesses to craft more effective, culturally adaptive advertisements (Sun et al., 2023).

As global markets expand, brands increasingly rely on AI to navigate the challenges of multilingual advertising (Mou & Wu, 2020). AI facilitates the automatic generation, adaptation, and translation of marketing content while maintaining semantic accuracy, emotional resonance, and cultural appropriateness (Casas-Tost, 2022). In the creative economy, where advertising plays a crucial role in brand identity and market competitiveness, AI-driven linguistic analysis offers a strategic advantage.

Cross-lingual advertising involves translating and localizing advertisements for diverse linguistic audiences. Traditional approaches to translation, such as word-for-word translation and human-mediated localization, often face challenges related to cultural adaptation, idiomatic expressions, and emotional impact (Venuti, 2018). AI-driven linguistic analysis overcomes these limitations by leveraging deep learning models trained on vast multilingual datasets (Gao et al., 2021).

1. Types of AI driven analysis in advertising

1) Neural Machine Translation (NMT) in Advertising

NMT has revolutionized translation by providing contextually aware, fluent, and idiomatic translations (Wu et al., 2016). Unlike statistical and rule-based translation models, NMT understands the nuances of language, improving the accuracy of advertising slogans, taglines, and promotional materials (Feng & He, 2022). For instance, slogans like "Have a break... Have a Kit Kat" have been successfully adapted using AI-powered localization strategies that preserve their intended meaning and persuasive effect across cultures (Munday, 2020).

2) Sentiment and Emotion Analysis

Emotional appeal is a key factor in advertising success (Liu & Zhang, 2021). AI-driven sentiment analysis identifies consumer emotional responses to advertising content, allowing marketers to adjust their messaging to resonate with target audiences (Cambria et al., 2022). By analyzing large datasets from social media, online reviews, and consumer feedback, AI helps advertisers craft campaigns that align with cultural values and audience preferences (Tian et al., 2023).

3) Personalization and Targeted Advertising

AI enables hyper-personalized advertising through data-driven insights (Kaplan & Haenlein, 2020). Machine learning algorithms analyze user behavior, preferences, and linguistic patterns to tailor advertisements to specific demographic groups. This personalization improves engagement rates and enhances the effectiveness of cross-lingual campaigns (Chatterjee & Kar, 2021).

2. Challenges in Cross-Lingual Advertising and AI Solutions

Despite its advantages, AI-driven linguistic analysis in advertising faces challenges, including translation errors, cultural misalignment, and ethical concerns (Pym, 2019).

1. Accuracy and Context Sensitivity

AI translation models, while advanced, still struggle with idioms, humor, and cultural references. For example, metaphors and puns often lose their impact when directly translated (Bellos, 2011). However, advancements in AI, such as contextual embeddings and transformer-based models (e.g., GPT and BERT), have improved contextual understanding and cross-cultural adaptation (Brown et al., 2020).

2. Cultural Sensitivity and Localization

Direct translation without cultural adaptation can lead to advertising failures (De Mooij, 2022). AI models trained on culturally diverse datasets help mitigate these risks by learning culturally appropriate phrasing, tone, and imagery (Wang et al., 2023).

3. Ethical and Bias Considerations

AI systems can reflect biases present in training data, leading to unintended stereotyping or exclusion in advertisements (Bender et al., 2021). Ensuring ethical AI deployment in cross-lingual advertising requires continuous refinement of training datasets and human oversight in campaign creation (Hovy & Spruit, 2016).

3. AI-Driven Linguistic Analysis in case of Kyrgyzstan's Economy

Kyrgyzstan's economy is expanding rapidly, with advertising playing a pivotal role in brand promotion and market growth (Jumagulov, 2022). Given the linguistic diversity in Kyrgyzstan, AI-powered advertising can enhance cross-lingual communication, helping businesses reach wider audiences. Currently, the Kyrgyz advertising industry relies heavily on translations from Russian and English, often leading to linguistic inconsistencies (Kadyrova, 2023). AI-driven linguistic analysis can bridge these gaps by providing accurate, culturally adapted translations that preserve meaning and emotional appeal. For example, AI can refine the translation of slogans like "Think Different" (Apple) or "The Best a Man Can Get" (Gillette) to maintain their persuasive impact in Kyrgyz and Russian.

4. Categorization of Examples and Linguistic Analysis

This section presents a linguistically driven analysis of advertising texts in Kyrgyzstan, focusing on language correctness, lexical compatibility, and stylistic features. Using AI-driven linguistic methods, advertisements are categorized based on their linguistic attributes, including redundancy, exaggeration, lexical errors, and stylistic inconsistencies. The analysis covers commercial, political, and street advertisements.

1. Redundancy and Semantic Emptiness in Advertising Texts

One of the common linguistic shortcomings in advertising texts is redundancy and the use of semantically empty phrases. Advertisements often contain overused, cliché phrases that fail to engage the audience. Examples include:

"Wonderful taste"

"Tremendous (heavenly) pleasure"

"Perfect purity"

"Radiant shine"

"Unsurpassed European quality"

"We are thinking about the future"

Linguistic Analysis: These phrases contribute little to the communicative effectiveness of advertising since they lack specific, concrete information. From an AI-based linguistic perspective, such expressions can be detected using natural language processing (NLP) tools that analyze frequency patterns and identify overused marketing jargon. Sentiment analysis models also reveal that these phrases generate neutral emotional responses rather than strong engagement.

2. Exaggeration and Unverifiable Claims

Advertising frequently employs exaggerated statements to persuade consumers, often leading to implausible or misleading claims. Some examples include:

"The best in the world!"

"The lowest prices!"

"Lose weight by 100%!"

Linguistic Analysis: These statements are problematic because they lack empirical support. AI-based linguistic verification tools can flag such claims as potentially misleading by cross-referencing with factual databases. Moreover, computational models that analyze discourse coherence can detect logical inconsistencies, such as the absurdity of losing "100% of body weight."

3. Bureaucratic and Impersonal Advertising Language

Many advertisements adopt a formal or bureaucratic tone that fails to engage the audience effectively. Examples include:

"We offer our customers a wide range of mattresses."

"To get rid of excess weight, strength training is necessary."

"A new approach to reducing body weight from the Swiss pharmaceutical company X."

Linguistic Analysis: These advertisements use passive structures and lack emotional appeal, making them less persuasive. AI-driven linguistic models can assess readability scores and detect overly formal or impersonal tones that reduce engagement. Sentiment analysis also reveals that such language evokes neutral or indifferent reactions rather than enthusiasm or interest.

4. Informal Language and Inappropriate Register

Some advertisements use colloquial expressions that are unsuitable for their target audience. A notable example is a jewelry store's slogan:

"Agat store is cheaper here anyway."

Linguistic Analysis: The use of the word "anyway" introduces an informal, conversational tone that may not align with the intended audience of a jewelry store, which typically includes mature and affluent customers. AI-driven sentiment analysis can evaluate the appropriateness of language based on contextual associations, highlighting misalignment in register and tone.

5. Effective Advertising Strategies and Stylistic Successes

Despite these shortcomings, some advertisements successfully employ linguistic techniques to enhance engagement. For instance, the jewelry store *Altyn* uses the slogan:

"Altyn is gold, not a store."

"Altyn has everything."

Linguistic Analysis: These slogans effectively utilize wordplay and metaphor—"gold" symbolizes value and prestige, reinforcing brand identity. AI-based text analysis tools, such as metaphor detection algorithms, can identify figurative language that enhances brand recall and emotional impact. Additionally, slogan length and phonetic balance contribute to memorability, aspects measurable through computational linguistic models.

6. Political Advertising and Persuasive Rhetoric

Political advertising in Kyrgyzstan frequently employs absolutization, idealization, and wordplay to shape public perception. Examples include:

"We know how to work! Буз уумейбуз!" (Social Democratic Party of Kyrgyzstan)

"Entrust the future of the country to the party of the working people!" (Communist Party of Kyrgyzstan)

"Millionaires are behind them, millions are behind us!" (Communist Party slogan using parallelism and contrast)

"Think about it... Do you need THOSE who don't need YOU?" (Use of capital letters for emphasis in political rhetoric)

Linguistic Analysis: AI-based rhetorical analysis tools can identify patterns of repetition, contrast, and parallelism, which enhance persuasion. Computational discourse analysis can also assess ideological framing and the emotional weight of these slogans, revealing their psychological impact on voters.

7. The "Language of the Streets" and Lexical Errors in Informal Advertising

Street advertisements in Kyrgyzstan often contain linguistic inaccuracies, spelling mistakes, and stylistic inconsistencies. Examples include:

"Puff pastry sams" (instead of "puff pastry samsas")

"Delicious ice cream" (with incorrect double "-nn-" spelling in original text)

"Car parking" instead of "Parking lot"

"Internet cafe" instead of "Internet café"

Linguistic Analysis: AI-powered spelling and grammar correction tools can automatically flag such errors, improving the overall linguistic quality of advertisements. Optical Character Recognition (OCR) technology can further assist in identifying and analyzing widespread linguistic mistakes in public advertising.

8. Ethical and Psychological Impact of Street Advertising

A significant portion of street advertising in Bishkek is dedicated to alcohol and tobacco promotion, with slogans such as:

"Vodka Smirnov No. 1. Honor is more expensive than profit!"

"Ayu – find your luck!"

Linguistic Analysis: AI-driven sentiment analysis can measure the emotional response elicited by such slogans, revealing their potential influence on consumer behavior. Additionally, discourse analysis can examine the subliminal messaging and ethical concerns surrounding the promotion of harmful substances.

Conclusion

This AI-driven linguistic analysis of Kyrgyz advertising texts highlights several key linguistic patterns:

Redundancy and Semantic Emptiness: Overused clichés weaken the impact of advertisements.

Exaggeration and Misleading Claims: Implausible statements reduce credibility.

Bureaucratic and Impersonal Language: Formal and passive structures fail to engage consumers.

Inappropriate Register: Mismatched tone and audience expectations undermine effectiveness.

Successful Linguistic Strategies: Wordplay, metaphors, and rhetorical techniques enhance memorability.

Political Persuasion: Absolutization and contrast are frequently used for ideological impact.

Lexical Errors in Street Advertising: Spelling and grammatical mistakes remain common.

Ethical Concerns: The prevalence of alcohol and tobacco advertisements raises social implications.

By integrating AI-powered linguistic analysis tools, advertisers and regulators can improve the quality, effectiveness, and ethical standards of advertising in

Kyrgyzstan. Future studies can further explore computational approaches to evaluating advertising language in multilingual contexts. AI-driven linguistic analysis offers transformative potential for cross-lingual advertising by improving translation accuracy, sentiment adaptation, and personalization. While challenges related to context sensitivity, cultural adaptation, and bias remain, continuous advancements in AI promise more effective advertising strategies. In Kyrgyzstan's growing creative economy, AI-driven approaches can help businesses expand their reach, enhance brand communication, and contribute to economic development.

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