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Leveraging Digital Information for Strategic Agility: The Role of AI, Big Data Analytics, and Blockchain in Re-Shaping Strategic Planning and Execution

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ABSTRACT

The evolving business landscape, organizations are increasingly turning to digital technologies to enhance their strategic agility and competitiveness. This seminar paper explores the pivotal role played by artificial intelligence (AI), big data analytics, and blockchain technology in transforming traditional strategic planning and execution processes. By harnessing the power of AI algorithms, organizations can efficiently analyze vast amounts of data to gain valuable insights into market trends, customer behaviors, and competitor strategies. Big data analytics enables organizations to extract actionable intelligence from diverse data sources, facilitating informed decision-making and adaptive strategies. Additionally, blockchain technology offers unprecedented transparency, security, and traceability in strategic operations, revolutionizing supply chain management, financial transactions, and contract execution. Through real-world case studies and theoretical frameworks, this paper examines the synergistic impact of AI, big data analytics, and blockchain on strategic agility, highlighting their potential to drive innovation, foster agility, and mitigate risks in dynamic environments. Furthermore, it discusses the organizational challenges and ethical considerations associated with the adoption of these technologies, emphasizing the need for robust governance mechanisms and responsible use practices. By embracing digital information technologies strategically, organizations can enhance their ability to anticipate market shifts, respond swiftly to disruptions, and capitalize on emerging opportunities, thereby re-defining the future of strategic planning and execution in the digital age.

List of Abbreviations

A.S.T – Adaptive Structuralism Theory
A.I. – Artificial Intelligence
I.T. – Information Technology
S.M.Es – Small to Medium Sized Enterprises

1.0 INTRODUCTION

In today's rapidly evolving business environment, strategic agility has emerged as a critical factor for organizational survival and success. The ability to swiftly adapt to market changes, anticipate disruptions, and capitalize on emerging opportunities is what distinguishes industry leaders from followers (Sprigg HR, 2021).

According to Omol (2023), the unprecedented pace of technological advancements, coupled with increasing global competition and shifting consumer expectations, demands a strategic approach that is both flexible and forward-looking. In essence, strategic agility enables organizations to navigate this complex landscape, ensuring they remain competitive and relevant (Hall, 2023).

In order to underscore the potential for strategic agility, the advent of digital technologies has significantly amplified its relevance. Plekhanov et a; (2023) observed that when businesses use digital technologies to create new or modify existing business models and processes or to support the transformation of the organizational structures, resources, or relationships with internal and external processes is referred to as digital transformation.

In lieu of traditional means of conducting business, Artificial Intelligence (AI), Big Data Analytics, and Block chain are at the forefront of digital transformation (revolution), offering tools that can transform traditional strategic planning and execution processes. AI, with its predictive analytics and machine learning capabilities, provides insights that can foresee market trends and customer behaviors, enabling more informed decision-making (Lown, 2024).

In addition, big data analytics harnesses the power of massive datasets to uncover patterns and opportunities that were previously indiscernible, offering a deeper understanding of the business environment (Kumar, 2023). Further, block chain technology, known for its security and transparency, can streamline operations, reduce fraud, and enhance trust in transactions (Afrin and Pathak, 2023). Together, these technologies offer a potent combination for enhancing strategic agility, providing organizations with the tools to make faster, more accurate, and more effective strategic decisions.

Aldoseri et al (2024) opines that the transformative potential of AI, Big Data Analytics, and block chain extends beyond mere operational improvements; it fundamentally reshapes the strategic planning and execution landscape. By integrating these technologies, organizations can achieve a level of dynamism and responsiveness that was previously unattainable.

This digital transformation enables a more agile strategic approach, where decisions are data-driven, operations are efficient, and execution is secure and transparent (Kolosky, 2024). The implications for strategic management are profound, as these technologies provide the means to not only adapt to the current business environment but also to shape it.

Given the critical role of strategic agility in the current business environment and the transformative potential of digital technologies, this paper seeks to explore the following research question: How do AI, Big Data Analytics, and Block chain technology contribute to enhancing strategic agility in organizations?

Specifically, the objectives of this paper are to: Analyze the role of AI, Big Data Analytics, and Block chain in strategic planning and execution processes. This paper will also present the identified challenges and opportunities presented by these technologies for strategic management. In addition, the study will also offer recommendations for integrating AI, Big Data Analytics, and Block chain into strategic planning and execution.

1.1 General Objective

The study will be guided by the aim; -

To investigate the transformative impact of Artificial Intelligence (AI), Big Data Analytics, and Block chain technologies on enhancing strategic agility within organizations, focusing on how these digital innovations can reshape strategic planning and execution processes to foster a more adaptable, responsive, and competitive business environment.

1.2 Conceptual Framework

The study will employ the following conceptual framework; -

i). Digital Technologies as Enablers

Artificial Intelligence (AI): AI's role in automating and enhancing decision-making processes is foundational to modern strategic agility. Through machine learning and natural language processing, AI applications can sift through data, recognizing patterns and predicting outcomes far beyond human capability. Davenport (2018) emphasizes that these technologies do not just streamline operations but fundamentally transform how strategic decisions are informed, enhancing efficiency and the customization of customer interactions. This leads to a more agile, responsive strategic posture that can adapt to new information and opportunities quickly.

Big Data Analytics: The vast volumes of data generated by contemporary enterprises hold the key to unlocking market trends, consumer behaviors, and operational insights. Mayer-Schönberger & Cukier (2013) argue that big data analytics extends beyond mere volume, incorporating variety, velocity, and veracity to provide a holistic view of the strategic landscape. This comprehensive analytical capability is instrumental in supporting real-time decision-making and strategic agility, offering a nuanced understanding of complex market dynamics.

Blockchain: Tapscott & Tapscott (2016) highlight blockchain's pivotal role in enhancing transactional security, transparency, and efficiency. By facilitating smart contracts, blockchain technology

reduces operational friction, ensures the integrity of transactions, and automates contractual agreements. This capability is crucial for organizations aiming to streamline operations and build trust in their transactions, contributing significantly to operational agility.

ii) Strategic Agility Dimensions

Sensing Capability: Teece, Peteraf, & Leih (2016) describe sensing capability as an organization's proficiency in identifying external opportunities and threats. This involves not just gathering data but analyzing and interpreting it to guide strategic decision-making. Enhanced sensing capability allows organizations to anticipate and react to changes in the business environment swiftly.
Decision-making Velocity: Doz & Kosonen (2010) discuss the importance of speed in the context of strategic decisions. The ability to make and implement decisions rapidly is a critical aspect of strategic agility, allowing organizations to capitalize on opportunities and mitigate threats effectively.
Resource Fluidity: Jacobides (2007) emphasizes the significance of resource reconfiguration in responding to strategic needs. An agile organization must be able to pivot resources—be they capital, human, or technological—to where they are most needed, without undue delay or bureaucracy.
Leadership Unity: Hitt, Keats, & DeMarie (1998) highlight the necessity of a unified leadership approach to foster a culture of agility. Leaders must be aligned in their strategic vision and supportive of agile methodologies to enable quick, effective strategic moves.

iii) Strategic Planning and Execution

Strategic Analysis: Porter (1985) underscores the value of environmental scanning and SWOT analysis in understanding the strategic environment. This analytical phase lays the groundwork for informed strategic planning.
Strategy Formulation: According to Mintzberg (1994), setting clear objectives and determining actions to achieve these objectives are central to strategic planning. This phase is critical for defining the strategic direction and allocating resources effectively.
Strategy Implementation: Kaplan & Norton (1996) discuss the importance of aligning organizational structure with strategic objectives and monitoring performance to ensure the successful execution of strategic plans.

iv) Outcome Variables

Organizational Performance: Barney (1991) identifies financial metrics, market positioning, and innovation rate as key indicators of organizational performance, which is enhanced by strategic agility.
Competitive Advantage: Porter (1985) describes competitive advantage as the unique value an organization creates, distinguishing itself from competitors through differentiation in products, services, or operations.

1.2.1 Hypothesized Relationships

H1: Sambamurthy, Bharadwaj, & Grover (2003) suggest that the integration of digital technologies enhances strategic agility by enabling more informed and responsive strategic decision-making.

H2: Doz & Kosonen (2010) argue that strategic agility leads to more effective strategic planning and execution, as it allows organizations to adapt quickly to changes.

H3: Teece (2007) posits that strategic planning and execution, when mediated by strategic agility, result in superior organizational performance and a sustainable competitive advantage.

This detailed exploration underscores the intricate relationships between digital technologies, strategic agility, and organizational outcomes. By leveraging AI, big data analytics, and blockchain, organizations can enhance their strategic agility, leading to more effective planning, execution, and ultimately, improved performance and competitive positioning.

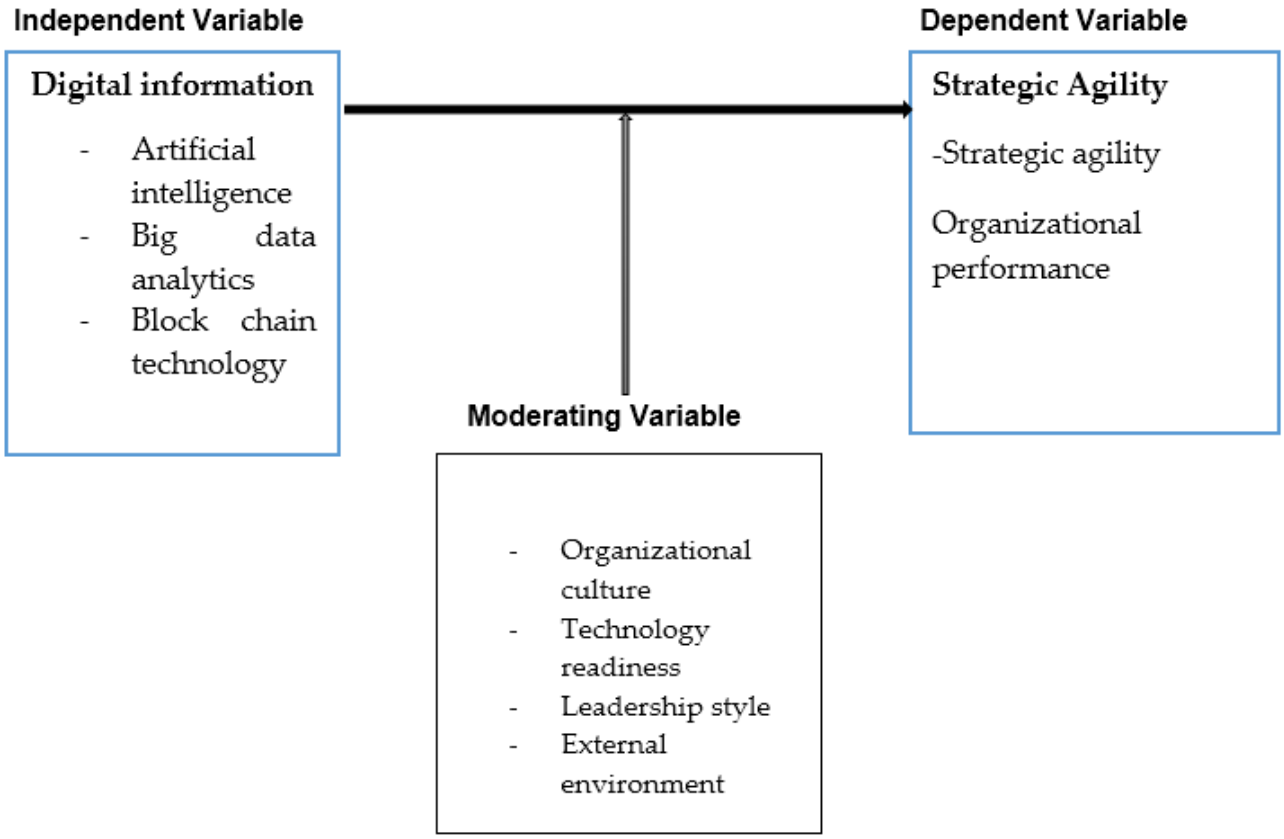

Figure 1. Conceptual Framework
Source; Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988)

1.3 Definition of Key operational terms

i) Strategic Agility

Strategic agility refers to an organization's ability to remain flexible, adapt quickly, and change strategies in response to market dynamics, technological advances, and competitive pressures. It encompasses the capacity to identify and seize opportunities more swiftly than rivals, adjust strategic direction, and reallocate resources effectively to areas with the highest potential impact.

ii) Artificial Intelligence (AI)

Artificial Intelligence (AI) is a branch of computer science concerned with creating systems that can perform tasks that would typically require human intelligence. These tasks include learning, reasoning, problem-solving, perception, and language understanding. In the context of strategic planning and execution, AI can analyze large volumes of data to identify patterns, predict future trends, and provide decision-makers with insights that inform strategy.

iii) Big Data Analytics

Big Data Analytics involves examining large and varied data sets — or big data — to uncover hidden patterns, unknown correlations, market trends, customer preferences, and other useful business information. The analytical findings can lead to more effective marketing, new revenue opportunities, better customer service, improved operational efficiency, competitive advantages over rival firms, and other business benefits.

iv) Block chain

Block chain is a decentralized, distributed ledger technology that records transactions across multiple computers in a way that ensures security, transparency, and immutability. It enables parties to transact directly with one another without the need for a central authority. In strategic planning and execution, blockchain can enhance security, improve supply chain transparency, and create more efficient processes by automating contracts and reducing fraud.

v) Strategic Planning and Execution

Strategic Planning and Execution refers to the process by which an organization defines its strategy or direction and makes decisions on allocating its resources to pursue this strategy, including its capital and people. It involves setting goals, determining actions to achieve the goals, and mobilizing resources to execute the actions. A key component of strategic planning and execution is the ability to adapt to changing circumstances while maintaining a focus on core strategic goals.

Literature Review

2.0 Concurrence

The current landscape of strategic management strongly aligns with the necessity for organizations to adopt strategic agility. This agility enables them to swiftly respond to market changes, anticipate disruptions, and seize emerging opportunities, distinguishing industry leaders from followers. The integration of digital technologies, particularly Artificial Intelligence (AI), Big Data Analytics, and block chain, amplifies this potential, transforming traditional strategic planning and execution processes. These technologies offer predictive analytics, deep insights from massive datasets, and secure, transparent operations, thereby fundamentally reshaping the strategic landscape to foster a more agile, informed, and efficient approach to decision-making and execution.

In the dynamic business environment of the 21st century, strategic agility has become a cornerstone of sustainable competitive advantage. Organizations are increasingly required to be swift and flexible in their strategic planning and execution processes to effectively respond to market changes, anticipate disruptions, and capitalize on emerging opportunities. The advent of digital technologies as seen in the preamble to this, that is; Artificial Intelligence (AI), Big Data Analytics, and Block chain has catalysed this transformation, offering new paradigms for strategic management.

2.1 The Role of AI in Enhancing Strategic Agility

AI technologies, with their capability for predictive analytics, automation, and decision-making, are revolutionizing strategic planning and execution. AI systems can analyze vast amounts of data to forecast market trends, identify potential disruptions, and suggest strategic responses. This predictive capability enables organizations to be proactive rather than reactive, a key component of strategic agility.

AI-driven predictive analytics provide organizations with foresight into market dynamics, consumer behaviour, and emerging trends. This supports strategic decision-making by highlighting potential opportunities and threats (Chen et al., 2022).

AI also automates routine strategic tasks, freeing up human resources to focus on more complex decision-making and innovation (Barynnis et al, 2019). This enhances organizational efficiency and agility.

2.2 Big Data Analytics' Contribution to Strategic Planning

Big Data Analytics offers deep insights by processing and analysing large datasets, facilitating informed strategic decisions. The capacity to understand customer preferences, operational inefficiencies, and market trends in real-time is invaluable for strategic agility.

Leveraging big data, organizations can gain a comprehensive understanding of their operating environment, allowing for more accurate and timely strategic decisions (Davenport, 2020).

By analysing real-time data, companies can quickly adapt their strategies to meet changing market demands, maintaining a competitive edge (Le, 2021).

2.3 Block chain's Impact on Strategic Execution

Block chain technology offers a secure, transparent, and efficient framework for executing strategic initiatives, particularly in operations and supply chain management. Its decentralized nature ensures trust and accountability, critical in agile strategic management.

Block chain enhances strategic execution by providing a transparent and efficient record of transactions. This is particularly beneficial in complex supply chains, where ensuring the integrity and authenticity of products is crucial (Liu et al., 2021).

By facilitating secure and transparent collaboration between partners, block chain technology enables organizations to execute strategic initiatives with greater speed and efficiency (Sahoo et al., 2022).

2.4 Challenges and Opportunities

While AI, Big Data Analytics, and Block chain offer significant advantages for strategic agility, their integration presents challenges. These include technological complexity, data privacy concerns, and the need for organizational culture shifts to embrace digital transformation. However, the opportunities these technologies present for innovation, efficiency, and competitive advantage are immense, outweighing the challenges.

2.5 Recommendations for Integration

The recommendations suggested here below, each addresses a critical aspect of integration, ensuring that these technologies not only offer competitive advantages but also align with organizational goals and ethical standards. It includes; investment in technology literacy and skills development, adopt a data – driven culture, ensure robust data governance frameworks, and foster strategic partnership with technology providers.

2.5.1 Invest in Technology Literacy and Skills Development

Organizations must prioritize the development of technology literacy and skills across all levels of the workforce to harness the full potential of AI, Big Data Analytics, and Blockchain. This involves:

i). Customized Training Programs: Design and implement training programs tailored to the specific needs of different roles within the organization. For instance, executives might require strategic insights on leveraging AI for decision-making, while IT staff need

deep technical knowledge of AI algorithms and data analysis techniques.

ii). Continuous Learning Opportunities: Establish continuous learning environments through workshops, seminars, and online courses that keep the workforce updated on the latest technological trends and applications. Encouraging certifications in these technologies can also validate the skills and knowledge acquired.

iii). Cross-Functional Teams: Form cross-functional teams that bring together tech specialists and business function experts. This encourages the exchange of ideas and ensures that technological solutions are aligned with strategic business objectives.

2.5.2 Adopt a Data-Driven Culture

The transformation into a data-driven organization is fundamental in today's digital era. This culture shift requires:

i). Leadership Commitment: Leadership must champion the use of data in strategic decision-making, demonstrating trust in data-driven insights over intuition or tradition. This sets a precedent for the rest of the organization to follow.

ii). Embrace Experimentation: Encourage a culture of experimentation where data-driven hypotheses are tested, and outcomes are learned from, regardless of success or failure. This fosters innovation and adaptability—key components of strategic agility.

iii). Democratize Data Access: Ensure that employees across the organization have access to relevant data, empowering them to make informed decisions. This involves investing in user-friendly data analytics platforms that facilitate easy access and interpretation of data.

2.5.3 Ensure Robust Data Governance Frameworks

With the increased reliance on data comes the responsibility of managing it ethically and securely. Implementing robust data governance frameworks involves:

i). Data Privacy and Security Policies: Develop clear policies on data privacy and security, in compliance with global standards such as GDPR. Regular audits and updates to these policies ensure they remain effective and relevant.

ii). Data Quality Management: Establish processes to maintain the accuracy, completeness, and reliability of data. This includes regular cleaning of data sets and validation of data sources, ensuring that strategic decisions are based on high-quality data.

iii). Ethical Use of AI: Develop ethical guidelines for the use of AI, ensuring that AI-driven decisions are transparent, explainable, and free from bias. This builds trust in AI systems both within the organization and with external stakeholders.

2.5.4 Foster Strategic Partnerships with Technology Providers

Building relationships with leading technology providers can offer several advantages such as:

i). Access to Cutting-Edge Technologies: Partnerships with tech companies give organizations early access to the latest technological innovations for example in enhancing the way they serve their customers leading to ultimate satisfaction and ensuring they stay ahead in a rapidly evolving digital landscape.

ii). Customization and Support: Technology providers can offer customized solutions that fit the unique needs of the organization and provide ongoing support for implementation and troubleshooting.

iii). Learning from Best Practices: Collaborating with technology experts allows organizations to learn from industry best practices and case studies, integrating these insights into their strategic planning and execution processes.

Consequently, investing in technology literacy, cultivating a data-driven culture, enforcing robust data governance, and fostering strategic partnerships, organizations can effectively integrate AI, Big Data Analytics, and Blockchain into their strategic planning and execution. These recommendations not only enhance strategic agility but also ensure that the integration of these technologies is ethical, secure, and aligned with the organization's long-term goals. This comprehensive approach to integration lays the groundwork for sustained competitive advantage in the digital era.

2.6 Inconcurrence

While the potential of AI, Big Data Analytics, and Blockchain in enhancing strategic agility is widely acknowledged, there exists a gap in understanding and applying these technologies effectively across all sectors. Many organizations face challenges in integrating these technologies into their strategic management processes due to various barriers, including technical complexity, data privacy concerns, and the significant investment required for infrastructure and skills development. Consequently, there's a discrepancy between the theoretical benefits of these digital technologies and their practical implementation within strategic management frameworks.

The transformative potential of AI, Big Data Analytics, and Blockchain for strategic agility is broadly recognized. However, a significant gap remains in the application of these technologies across different sectors. Despite their theoretical benefits, practical implementation lags due to various barriers.

2.6.1 Technical Complexity and Integration Challenges

The inherent complexity of AI, Big Data Analytics, and Blockchain poses significant challenges for organizations. Many lack the technical expertise to deploy these technologies effectively (Smith et al., 2021).

In addition, integrating new digital technologies with legacy systems is a daunting task for many organizations. This often requires substantial modification of existing IT infrastructure, which can be costly and time-consuming (Johnson & Marakas, 2019).

2.6.2 Data Privacy and Security Concerns

As organizations rely more on data-driven strategies, concerns about data privacy and protection have escalated. The adoption of Big Data Analytics and Blockchain often raises questions about the secure handling of sensitive information (Davenport, 2020).

Ensuring compliance with international data protection regulations such as GDPR adds another layer of complexity to the adoption of these technologies (Brown & Popovič, 2021).

2.6.3 Investment in Infrastructure and Skills Development

The deployment of AI, Big Data Analytics, and Blockchain technologies requires significant upfront investment in both infrastructure and skills development. This can be a prohibitive factor for small to medium-sized enterprises (SMEs) (Feng, 2022).

2.7 Skill Gap

There is a noticeable skill gap in the market when it comes to professionals who are proficient in these technologies. This exacerbates the challenge of adopting and leveraging these technologies for strategic agility (Wang et al., 2023).

2.7.1 The Discrepancy between Theoretical Benefits and Practical Implementation

There seem to be a discrepancy between the anticipated benefits of integrating digital technologies and the tangible results achieved. This gap can be attributed to the aforementioned challenges, leading to disillusionment and skepticism among stakeholders (Smith et al., 2021).

The pace at which organizations can adapt to and learn new technologies significantly affects their ability to harness the potential of AI, Big Data Analytics, and Blockchain. The steep learning curve and the need for cultural adaptation within organizations can slow down the process of integration (Johnson & Marakas, 2019).

2.7.2 Recommendations for Bridging the Gap

First, engaging in strategic partnerships with technology providers and academic institutions can help organizations navigate the complexities of digital technology integration (Davenport, 2020).

Secondly, investing in education and training programs to develop a workforce skilled in AI, Big Data Analytics, and Blockchain is crucial. Tailored training programs can address the skill gap and empower employees to leverage these technologies effectively (Brown & Popovič, 2021).

Thirdly, adopting a phased approach to the integration of these technologies can help organizations manage the transition more effectively. An agile implementation strategy, characterized by iterative development and frequent evaluation, can mitigate risks associated with large-scale technological transformation (Feng, 2022).

Hence, the gap between the theoretical potential of AI, Big Data Analytics, and Blockchain and their practical application in strategic management is significant. Overcoming this gap requires a comprehensive approach that addresses technical complexities, data privacy concerns, and investment challenges. By focusing on strategic partnerships, workforce development, and agile implementation strategies, organizations can navigate these challenges and more effectively leverage digital technologies for strategic agility.

2.8 Requirement for mitigation

The following will be considered as the requirement for mitigations of the identified gap (s);

2.8.1 Fostering a Culture of Continuous Learning and Adaptability

Organizations need to embed a culture that values continuous learning and adaptability to rapidly evolving digital landscapes. This involves leadership modeling a growth mindset and encouraging innovation and experimentation among all employees (Davenport, 2020).

In addition, utilizing digital learning platforms can facilitate ongoing education and skill development. These platforms offer accessible resources for employees to stay abreast of the latest in AI, Big Data Analytics, and Blockchain (Smith et al., 2021).

2.8.2 Investing in Training and Development Programs

Tailored training programs are essential for developing the skills required to leverage AI, Big Data Analytics, and Blockchain effectively. Such programs should focus on both the technical aspects and strategic applications of these technologies (Johnson & Marakas, 2019).

Encouraging cross-functional learning initiatives can enhance collaboration between IT and business units, ensuring a unified approach to digital transformation (Wang et al., 2023).

2.8.3 Developing Strategic Partnerships

Establishing strategic partnerships with technology providers and consultants can offer several benefits, including access to expert knowledge, advanced tools, and best practices in technology integration (Feng, 2022).

Engaging in co-innovation projects with tech firms can lead to the development of bespoke solutions that align closely with the organization's strategic needs (Brown & Popovič, 2021).

2.8.9 Implementing Robust Data Governance and Cybersecurity Measures

Implementing comprehensive data governance policies is crucial for managing the vast amounts of data utilized by AI and Big Data Analytics. Such frameworks should ensure data quality, compliance, and ethical use (Davenport, 2020).

As reliance on digital technologies grows, so does the vulnerability to cyber threats. Organizations must adopt advanced cybersecurity measures to protect sensitive data and infrastructure. This includes encryption, blockchain for secure transactions, and AI-driven security systems for threat detection and response (Smith et al., 2021).

Bridging the gap between the potential and practical application of AI, Big Data Analytics, and Blockchain in strategic management requires a multifaceted approach. By fostering a culture of learning and adaptability, investing in skill development, forming strategic partnerships, and implementing robust governance and security measures, organizations can effectively mitigate the challenges associated with these digital technologies. These strategies not only facilitate the integration of AI, Big Data Analytics, and Blockchain into strategic planning and execution but also enable organizations to harness their full potential for enhanced strategic agility.

2.10 Suggestions for policy prescriptions

Organizations should adopt the following policy prescriptions to harness the benefits of digital technologies for strategic agility:

i). Establish a dedicated digital transformation team responsible for integrating AI, Big Data Analytics, and Block chain into strategic planning and execution processes.
ii). Formulate clear policies on data management, privacy, and security to build trust among stakeholders and ensure compliance with regulatory standards.
iii). Encourage cross-functional collaboration and open innovation to leverage diverse insights and expertise in deploying digital technologies.
iv). Allocate resources for research and development in digital technologies to stay ahead of technological advancements and market trends.

2.10.1 Significance of the Policy

The study is hoped to yield substantial benefits for organizations, including:

a) Enhanced decision-making speed and accuracy, leading to better strategic outcomes and competitive advantage.
b) Greater operational efficiency and cost savings through process automation and optimization.
c) Improved stakeholder trust and transparency, contributing to a stronger brand reputation and customer loyalty.
d) Increased capacity for innovation and adaptation to market changes, ensuring long-term sustainability and success in the digital era.

In summary, the transformative potential of AI, Big Data Analytics, and Block chain in enhancing strategic agility is immense. By adopting targeted policies and addressing the challenges associated with digital technology integration, organizations can leverage these tools to achieve a competitive edge and navigate the complexities of the modern business environment more effectively.

2.11 Conclusions from the theoretical information and empirical research findings

The integration of AI, Big Data Analytics, and Blockchain into strategic management processes significantly enhances an organization's strategic agility. These technologies enable more informed decision-making, improve operational efficiency, and ensure secure and transparent execution of strategies. Theoretical frameworks such as Adaptive Structuration Theory (AST) and empirical research findings from various case studies underscore the transformative impact of these digital technologies on strategic agility. However, realizing their full potential requires addressing the challenges of integration and operationalization.

METHODOLOGY

3.0 Introduction

This chapter will present the systematic steps that will be use by the researcher during the process of data collection. It contains the study design, area of the study, population of the study, sample size, sampling procedure, research instruments, reliability and validity, data collection instruments, data processing and analysis, limitations of the study and ethical consideration.

3.1 Research Design

Kothari (2004) observes that research design is a blue print, which facilitates the smooth sailing of the various

research operations, thereby making research as efficient as possible hence yielding maximum information with minimum expenditure of effort, time and money. The design is suitable when gathering data from a relatively large number of cases at a particular time. It will involve collecting information by administering questionnaires to a sample of individuals that describes events, then organizes, tabulates, depicts and portrays the variables (Kothari, 2004).

The study will use a case study design. The case will be of multiple organizations that have integrated these technologies into their strategic processes. This study design is chosen because it will help us gain insights into practical applications, benefits, and challenges. For qualitative data, the researcher will use phenomenology because it will involve describe realities of the selected firms. For quantitative data, the researcher will develop and distribute surveys to a broader range of organizations to quantify the adoption, outcomes, and challenges of using these technologies in strategic planning and execution. The study survey will involve self-administered questionnaire and interviews for key informants. In addition, the study will apply simple random and purposive sampling technique to select the sample.

3.1.1 Study Population

Target population is defined as that population to which a research wants to generalize the results of the study, (Mugenda & Mugenda, 2003). The study will focus on different organization's and business firms employing strategic planning and execution. In this study, the target population will be 700.

3.2 Sample Size

The sample size from the above population will be selected using Kreijcie and Morgan (1970) table of sample size determination that suggests a sample size of 248 basing on the population of 700. Sample size of 248 participants will be selected. The study will consider 15 organizations that employs the integration of AI, big data analytics, and block chain in strategic planning and execution. This number allows for a comprehensive exploration of each case within your capacity. There will be 30 interviews with industry experts, C-level executives, and IT professionals. This size is manageable and likely to yield rich, varied insights into the research questions.

3.2.1 Sample Size determination

The sample size above is selected basing on the recommendations of R.V.Krejcie and D.W. Morgan (1970). This is also supported by the following formula:

$$s = \frac{NP(P)(1-P)}{(NP-1)\left(\frac{B}{C}\right)^2 + P(1-P)}$$

Whereby; S=sample size
NP=Population size = 1000
P=Number expected to answer a certain way which is 50% that is 0.5.
B=Sampling error = 5% = 0.05
C=Confidence level. The level of confidence used by most researchers is 1.960

Therefore, by substituting the variables and calculating for the sample size, S,

$$s = \frac{700(0.5)(1-0.5)}{(700-1)\left(\frac{0.05}{1.960}\right)^2 + 0.5(1-0.5)}$$

$$S = \frac{175}{699X0.0006507751 + 0.25}$$

$$S = \frac{175}{0.7048917949}$$

$$S = 248.26$$

Approximately S = 248

The total sample size is approximately 248

The table below shows the number of respondents who will participate in the study.

Table 3.1: Sampling Methodological Matrix
N =700

Category of Respondents	Target Population	Sampling Techniques	Actual Sample Size
Companies/Organizations	15	Simple random sampling	48
IT professionals, C – level executives, & Industry experts	30	Simple random sampling	200
Total	45		248

Source: (Researchers, 2023)

3.3 Sampling Techniques and Procedure

This study will apply the simple random sampling technique. This probability sampling technique is used by the researchers to give equal chance to all variables in the population to be selected. Identify potential subjects in studies where subjects are hard to locate (Amin 2005). Amin, (2005) defines a sample as a portion of the population whose results can be generalized to the whole population under study. Sampling gives an idea when selecting elements in the researcher to draw the conclusion about the entire population.

3.4 Data Collection Methods /Instruments

Data collection methods will include use of closed ended questionnaires. Permission to conduct the study and collect data will be sought from the university dean of faculty to write a letter explaining the importance and significance of the study.

3.4.1 Questionnaires

The closed-ended questionnaires will be used because they increase the degree of reliability. The questionnaires will be developed using a five Likert scale to ease respondents' effort in filling/answering the questions ranging from Strongly Agree (SA), Agree (A), Undecided (UD) and Disagree (D) Strongly Disagree (SD) (Mugenda and Mugenda 1999). Each question will be developed to address a specific objective of the study. Questionnaires will be economical in terms of time and will be easy to fill and take less of the respondents' time and that of the researcher in administering and analyzing them.

3.5 Data Quality Control

3.5.1 Validity of Research Instruments

Validity of a measure is the extent to which it measures what you intend it to measure (Kenneth & Bruce, 2002). Content validity will be used. Mugenda and Mugenda (2003) note that, content validity is a measure of the degree to which the data collected using a particular instrument represents a specific domain of indicators or content of a particular concept.

And the formula to be used in calculating the content validity (CV) is:

$$\mathrm{CV} = \frac{\text{Number of valid items}}{\text{Total Number of items}} \times 100$$

3.5.2 Reliability of Research Instruments

Reliability, according to Miles and Huberman (1994), has to do with the extent to which the items in an instrument generate consistent responses over several trials with different audiences in the same setting or circumstances.

In order to guarantee reliability, the researcher will use experts in the field in executing a pre-test study on different categories of respondents once in an area that had similar characteristics as the study area. This will be to minimize errors and increase reliability of the data collected by taking corrective action based on the pre-test results.

3.6 Data Analysis

The data from the questionnaire will be processed and analyzed. The analysis will be done using a Pearson Correlation Coefficient. Each of the findings will be classified, analyzed and interpreted basing on the study objectives. This will be done in order to bring more clarity to study findings and make the research study understandable to the potential readers.

3.7 Ethical considerations

The researcher will secure permissions from the research department of the University, In order to maintain a high level of authenticity, the researcher will ensure that confidentiality is maintained both on individual and all the institution information that the research came across.

3.8 Limitations of the study

The researcher is anticipating encountering some limitations which may affect the effectiveness in carrying out the study. It includes but not limited to the following; -

1. Generalizability of Findings

Sample Representation: While the study aims to cover diverse industries and geographic locations, the findings may not be fully generalizable to all sectors or regions, especially if the sample lacks representation from some industries.

Organization Size: The impact and integration of AI, big data analytics, and block chain might differ significantly between small, medium, and large enterprises. The study's ability to generalize across these different contexts might be limited if the sample does not equally represent these segments.

2. Rapid Technological Changes

The fields of AI, big data analytics, and block chain are evolving rapidly. By the time the study is completed, new developments could have emerged, making some of the findings less relevant or outdated.

3. Subjectivity in Qualitative Analysis

Interpretation Bias: In qualitative components like case studies and interviews, the analysis is subject to the researcher's interpretation, which may introduce bias or limit the objectivity of the findings.
Participant Bias: Participants in expert interviews and case studies might have personal biases or interests

that could influence their responses, potentially skewing the data.

4. Quantitative Data Limitations

Response Rate: The effectiveness of the survey component depends on a high response rate. A lower than expected response rate could limit the statistical power of the quantitative analysis.
Survey Design: The design of the survey and the phrasing of questions could introduce bias or limit the depth of insights obtained, impacting the study's conclusions.

5. Technological Diversity and Complexity

The study encompasses three highly complex and diverse technological areas. The breadth required to adequately cover AI, big data analytics, and block chain within a single study might limit the depth of examination into each technology's specific strategic impact.

6. Ethical and Privacy Considerations

Ethical and privacy concerns might limit the availability of detailed organizational data regarding the strategic use of AI, big data analytics, and block chain, impacting the richness of case study findings.

7. Resource Constraints

Conducting in-depth case studies and comprehensive surveys requires significant resources, including time, access to organizations, and financial resources. Constraints in any of these areas could limit the study's scope and depth.

3.8.1 Mitigation Strategies

While these limitations are significant, acknowledging them openly in your study can lend credibility to your work. Additionally, you can employ several strategies to mitigate these limitations, such as using triangulation in qualitative research to validate findings, ensuring the survey is rigorously designed and tested, and keeping abreast of the latest technological developments during the study to adjust the focus as necessary.

REFERENCES

Aldoseri, A., Al – Khalifa, K.N., & Hamouda, A.M. (2024). AI – Powered Innovation in Digital Transformation: Key Pillars and Industry Impact. https://www.mdpi.com/2071-1050/16/5/1790.

Afrin, N., & Pathak, A., (2023). Blockchain-Powered Security and Transparency in Supply Chain: Exploring Traceability and Authenticity through Smart Contracts. 10.5120/ijca2023923318.

Amin, M. E. (2005). Social Science Research: Conception, Methodology & Analysis. Kampala: Makerere University Printery.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120.

Baryannis, George & Dani, Samir & Validi, Sahar & Antoniou, Grigoris. (2019). Decision Support Systems and Artificial Intelligence in Supply Chain Risk Management. 10.1007/978-3-030-03813-7_4.

Brown, C. A., & Popovič, A. (2021). "Big Data Analytics in Strategic Management: Insights and Challenges." *Management Decision*, 59(8), 1763-1780.

Chen, Y., Li, C., and Wang, H (2022). Big Data and Predictive Analytics for Business Intelligence: A Bibliographic Study (2000–2021). https://doi.org/10.3390/forecast4040042.

Davenport, T. (2020). *Big Data at Work: Dispelling the Myths, Uncovering the Opportunities*. Harvard Business Review Press. https://www.academia.edu/92213131/Big_data_at_work_dispelling_the_myths_uncovering_th Davenport, T. H. (2018). *The AI Advantage: How to Put the Artificial Intelligence Revolution to Work*. MIT Press.

Doz, Y. L., & Kosonen, M. (2010). Embedding strategic agility: A leadership agenda for accelerating business model renewal. *Long Range Planning, 43*(2-3), 370-382.

Hall, B. (2023). Building Strategic Agility: Navigating challenges with strength and agility. https://www.forbes.com/sites/forbesbusinesscouncil/2023/06/21/building-strategic-agility-navigating-challenges-with-strength-and-agility/?sh=45d53e062bf7.

Hitt, M. A., Keats, B. W., & DeMarie, S. M. (1998). Navigating in the new competitive landscape: Building strategic flexibility and competitive advantage in the 21st century. *Academy of Management Executive, 12*(4), 22-42.

Jacobides, M. G. (2007). The inherent limits of organizational structure and the unfulfilled role of hierarchy: Lessons from a near-war. *Organization Science, 18*(3), 455-477.

Kolosky, C (2023). What is Digital Transformation? Examples and More. https://www.knack.com/blog/what-is-digital-transformation-examples-and-more/.

Lown, P. (2024). How AI insights improve decision making. https://sproutsocial.com/insights/ai-insights/.

Omol, J.E. (2023). Organizational digital transformation: from evolution to future. https://www.emerald.com/insight/content/doi/10.1108/DTS-08-2023-0061/full/html.

Plekhaniv, D., Franke, H., & Netland, T.H. (2023). Digital Transformation: A review and research agenda. https://www.sciencedirect.com/science/article/pii/S0263237322001219.

SpriggHR (2021). What is Strategic agility? https://sprigghr.com/referrals/.

Kaplan, R. S., & Norton, D. P. (1996). *The Balanced Scorecard: Translating Strategy into Action*. Harvard Business School Press.

Mayer-Schönberger, V., & Cukier, K. (2013). *Big Data: A Revolution That Will Transform How We Live, Work, and Think*. Houghton Mifflin Harcourt.

Mintzberg, H. (1994). *The Rise and Fall of Strategic Planning*. Free Press.

Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. Free Press.

Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS Quarterly, 27*(2), 237-263.

Tapscott, D., & Tapscott, A. (2016). *Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World*. Penguin.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319-1350.

Teece, D. J., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review, 58*(4), 13-35.e_opportunities.

Sahoo, S., Kumar, S., Sivarajah, U., Lim, W.M., Westland, J.C., and Kumar, A (2022). Blockchain for sustainable supply chain management: trends and ways forward. https://doi.org/10.1007/s10660-022-09569-1.

Smith, J., Thomas, E., & Zhao, L. (2021). "Predictive Analytics in Strategic Decision Making: A Business Intelligence Approach." *Journal of Business Research*, 117, 75-84.

Wang, Y., Singh, M., & Li, X. (2023). "Enhancing Strategic Agility through Blockchain-Enabled Supply Chains." *International Journal of Production Economics*, 230, 108-120.

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