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DIGITAL TRANSFORMATION AND BUSINESS MODEL INNOVATION: INSIGHTS FROM MULTINATIONAL COMPANIES IN SOUTH-SOUTH NIGERIA

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ABSTRACT: This study examined the effect of digital transformation on business model innovation among multinational companies in South-South Nigeria. Utilizing a quantitative approach with a cross-sectional survey, data were collected from a sample of 384 respondents with digital expertise. Analysis revealed that digital transformation significantly drives business model innovation, with big data analytics having the strongest influence, highlighting the value of data-driven decision-making. Digital assets play a key role in developing new business models, while digital agility and networking capabilities support flexibility and collaboration. With 62% of business model innovation explained by digital transformation variables, the study recommends investing in digital infrastructure, fostering agility, enhancing collaboration, and leveraging advanced analytics to stay competitive.

Keywords: Business Model Innovation, Digital Resources, Digital Transformation

INTRODUCTION

In today's rapidly evolving business landscape, digital transformation has emerged as a critical factor in the competitive success of multinational companies. As industries are reshaped by technological advancements, traditional business models are being challenged, necessitating a fundamental shift toward innovation and adaptability. The convergence of digital technologies—such as cloud computing, artificial intelligence, big data analytics, and the Internet of Things (IoT)—is revolutionizing how companies create, deliver, and capture value. This transformation is not merely about the adoption of new technologies; it is about leveraging digital assets to redefine business models and achieve sustainable competitive advantages. Research indicates that the advancement of technologies, particularly digital technologies, has led to enhanced performance, value generation, and innovation in business models (Ranta *et al.*, 2021). Business model innovation enables organisations to recognise environmental hazards and opportunities, generate revenue, and enhance their resilience during crises (Centobelli *et al.* 2020). Business model innovation is fundamental to digital transformation, as organisations endeavour to incorporate digital resources into all facets of their business. This entails reconfiguring customer experiences, rethinking value chains, and investigating novel revenue models. The use of digital platforms enables multinational corporations to optimise operations, enhance supply chain efficiency, and cultivate stronger relationships with customers and partners. Likewise, big data analytics offers critical insights into consumer behaviour and market dynamics, allowing companies to make data-informed decisions that enhance growth and profitability.

Digital technologies and industry offer novel opportunities and advantages for industrial enterprises to enhance product quality, process dependability, flexibility, and productivity (Dana *et al.,* 2022; Salamzadeh *et al.,* 2022). Digital technologies have enabled substantial transformations in business models. Innovations in business models primarily manifest through the utilisation of digital technologies, facilitating a wider array of business models than previously offered by a corporation (Li, 2020). Digital technologies serve as drivers for transformative product and service breakthroughs. Digital transformation is not an isolated endeavour; its successful execution relies heavily on extensive digital technologies and information (Li & Fei, 2023). For multinational corporations, digital transformation is not a uniform process; it necessitates the customisation of digital strategy for various markets while ensuring global consistency. As these organisations traverse the intricacies of many geographical, cultural, and regulatory landscapes, they must utilise digital resources to develop their business models. Digital resources, including digital platforms, technological agility, data analytics skills, and digital networking, empower organisations to improve operational efficiency, customer engagement, and market responsiveness. By doing so, they optimise current processes and generate new value propositions, allowing them to maintain a competitive advantage in challenging marketplaces. Properly managing and leveraging digital resources is crucial for organizations to maintain a competitive edge and effectively implement digital transformation strategies.

Most exceptional companies cannot independently fulfil all innovation processes; they require collaboration with multiple companies. In a dynamic and complex network environment, the integration of external partners' digital knowledge and resources has become essential for the success of digital transformation in any organisation. Enterprises within a social network are interdependent and complementary, facilitating knowledge sharing and resource acquisition through their connections. Current research demonstrates that the formation of network connections allows firms to acquire resources through relational ties, underscoring the significance of enterprise connectivity (Xie *et al.,* 2021). Consequently, network embeddedness could be a significant determinant in digital transformation. The rapid advancement of mobile Internet and cloud computing is transforming the global landscape and serving as a new catalyst for organisations to attain high-quality development. While numerous studies affirm the beneficial effects of digital transformation on enterprise performance (Di & Varriale, 2020; Li, 2022), other research posits that digital transformation does not inherently enhance enterprise performance (Kohtamaki *et al.,* 2020; Ahmadova *et al.,* 2021), as it introduces operational risks, including data security concerns (Corbett, 2018). Furthermore, throughout the execution of digital transformation, the firm requires organisational structure optimisation, technical enhancement, and resource reallocation, all of which are protracted and expensive endeavours. In practice, numerous organisations are reluctant to undergo transformation, confronting a quandary characterised by the choice between a perilous transition and stagnation leading to decline.

Despite the significant potential of digital transformation to drive business model innovation and enhance competitiveness, many multinational companies face challenges in effectively leveraging digital resources to achieve sustainable growth. These challenges include the complexities of integrating new digital technologies, aligning digital strategies with existing operations, and managing diverse market demands across different regions. Additionally, the rapid pace of technological advancements creates pressure for companies to innovate their business models to stay relevant continuously. A lack of clear understanding about how digital assets, digital agility, networking, and data analytics capabilities can be strategically managed often leads to underutilization of these resources, resulting in missed opportunities and

diminished competitive advantage. Nevertheless, despite the benefits of digital transformation, the transition has resulted in certain extraordinary impediments, including the escalation of cyberattacks, data breaches, and insufficient digital resources (Oloyede *et al.*, 2023). Furthermore, researchers have observed a deficiency in digital resources and a lack of understanding of the precise effects of digital technologies on economic growth, employment, and trade in Africa (Fernandez-Portillo *et al.*, 2020, Mayer *et al.*, 2020). The study by Udegbunam *et al.*, (2023) also identified some specific factors hindering the adoption of digital transformation in Nigeria. These obstacles include an infrastructure deficit that restricts equitable access to digital services, a deficiency in digital skills among staff members, and the theft and vandalism of infrastructure that exacerbates difficulties. Therefore, a broad strategy is needed to accelerate digital transformation and enhance business model innovation of companies in Nigeria. This study investigates the role of digital resources in driving business model innovation among multinational companies operating in South-South Nigeria. The specific objectives are to assess the effects of digital assets, digital agility, digital networking capability, and big data analytics capability on business model innovation within these companies.

LITERATURE REVIEW

Conceptual Review

Digital Transformation

Digital transformation refers to the process of integrating digital technologies into all areas of a business, fundamentally changing how the organization operates and delivers value to its customers. It involves adopting new digital tools, processes, and business models that enable companies to respond more effectively to market demands, improve efficiency, enhance customer experiences, and create new opportunities for growth. Digital transformation is not just about technology adoption, but also about reshaping organizational culture, processes, and strategies to leverage the full potential of digital resources. This transformation often encompasses areas such as automation, data analytics, artificial intelligence, cloud computing, and digital platforms, ultimately enabling businesses to become more agile, innovative, and competitive in the digital age. Digital transformation is a pivotal business development that instigates social shifts, hence modifying established patterns of human activity, behaviour, communication, and daily routines. These changes are frequently described as significant because of their implications for the transformation of current corporate structures and tactics aimed at securing a competitive edge under altered conditions (Slavkovic *et al.*, 2023). Private enterprises generally exhibit greater agility in digital transformation, but public entities are under pressure to adhere to digitalisation trends in service delivery, leading to widespread societal changes. The effects of digitisation are evident in the enhancement or total transformation of business processes, the expeditious execution of operations, the emergence of new employee training requirements, the establishment of novel job designs with updated descriptions that include digital competencies, and the substitution of human labour with machinery, resulting in workforce reduction.

Digital transformation enhances the efficiency of people and material capital, hence enhancing company performance. Digital transformation automates decision-making, reduces low-value roles, and encourages skill enhancement (Trenerry *et al.*, 2021). Research indicates that intellectual capital plays a more significant role in value development and enhancement than financial capital, facilitating the appreciation of human capital and the improvement of

economic profits (Ainunnisa, 2021). Secondly, the digital technology-based platform can enhance the connectivity between enterprises, users, and the supply chain, while also facilitating the allocation of production factors based on real-time information. This capability aids enterprises in optimising production plans and significantly minimising material loss and resource waste (Wang *et al.,* 2022). Ultimately, digital technology facilitates the interconnection among enterprises, allowing for the timely acquisition of asset information, promoting the reutilization of idle assets, addressing the challenge faced by small enterprises in acquiring high-value machinery, and consequently enhancing the efficiency of internal asset utilisation and performance (Li & Fei, 2023).

Business Model Innovation

The business model (BM) can be defined and assessed through the following components: customer segmentation, value propositions, channels, customer relationships, revenue streams, key resources, core activities, strategic partnerships, and cost structure (Nielsen, 2023). With the emergence of new products and technologies, business models required updates and transformations into a more focused framework that accounted for innovation, leading to the concept of Business Model Innovation [BMI] (Saebi *et al.,* 2017). Understanding the concept of a business model is crucial to understanding how an organisation creates, provides, and obtains value (Onobrakpeya & Ubueme, 2024). Business model innovation entails the creation, design, and implementation of new or substantially enhanced business models that deliver value to customers, enterprises, and stakeholders. It entails reevaluating a company's methods of product or service delivery, customer engagement, and revenue generation. Business Model Innovation (BMI) entails the creation or alteration of a company's existing activity system (Zott & Amit, 2010), enhancing or refining at least one value dimension (Henley & Song, 2020), characterised by deliberate, innovative, and significant modifications to the essential components of a firm's business model and the interconnections among these components (Nunes *et al.,* 2024). Prior research highlights the dynamic aspect of BMI, defining it as an iterative process (Kajanus *et al.,* 2014) and a continuous learning endeavour (McGrath, 2010), wherein enterprises refine their business models through perpetual enhancement (Kraus *et al.,* 2020). Business model innovation (BMI) involves intentional, intricate, and continuously evolving alterations to the core elements of the business model by transforming analogue, physical entities, processes, or material content into primarily (or solely) digital formats (Christofi *et al.,* 2024; Trischler & Li-Ying, 2023).

Digital Resources

Digital resources refer to the technological assets, capabilities, and tools that organizations use to leverage digital technologies to achieve strategic objectives. These resources include both tangible and intangible assets such as digital platforms, software, big data, cloud infrastructure, intellectual property, algorithms, digital content, and online networks. Digital resources also encompass a company’s digital skills and capabilities, such as the ability to analyse data, manage digital infrastructure, and implement new technologies. These resources enable businesses to enhance operational efficiency, innovate their products or services, engage with customers in new ways, and drive growth in a digitally connected world. Resources encompass a company's ownership and administration of various assets and competencies (Barney, 1991). Assets refer to the tangible and intangible resources owned by a corporation, while capabilities are inside the organization's human, informational, or structural capital, acting as the integrative mechanism that enables the effective utilisation of these assets (Verhoefa *et al.,* 2021). In the quest for digital transformation, restructuring a company's value generation and delivery

processes often necessitates the acquisition, development, or access to novel digital assets and capabilities. Verhoefa *et al.*, (2021) study delineates the essential digital resources and competencies necessary for digital evolution: digital assets, digital agility, digital networking capability, and big data analytics capability.

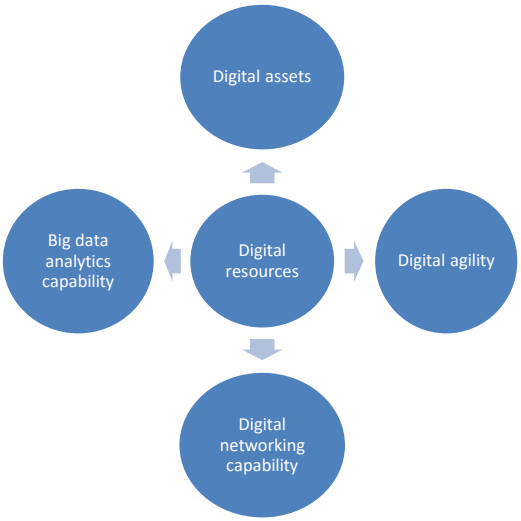

Figure 1 Dimensions of digital resources (Verhoefa *et al.*, 2021)

Digital Assets

Digital assets refer to any form of digital resource that holds value for an organization and can be utilized to support its business operations, strategies, and objectives. These assets include a wide range of items such as digital files, data, software, intellectual property (e.g., patents, trademarks), digital media (e.g., videos, images, graphics), and digital platforms (e.g., websites, mobile apps, cloud-based systems). Digital assets also extend to non-physical assets like algorithms, machine learning models, and customer data, which can be leveraged to enhance decision-making, personalize customer experiences, and improve operational efficiency. To effectively compete in the digital age, companies necessitate digital assets such as data storage, information and communication infrastructure, and related technologies (Verhoefa *et al.*, 2021). Modern businesses are making substantial investments in the creation and acquisition of digital technologies, including both hardware and software, to enable functionalities such as AI, Machine Learning, IoT, and robotics. Investments in technology and data form the essential foundation for utilising existing organisational skills and resources to increase value for consumers. Customer journey data, a type of big data, can be utilised as a digital asset, allowing companies to leverage their data analytics capabilities for customised services and solutions (Verhoef *et al.*, 2016).

Digital Agility

Digital agility denotes an organization's capacity to swiftly and efficiently adapt to changes and opportunities within the digital environment by using technology, processes, and competencies. It entails the ability to adjust to emerging digital trends, adopt cutting-edge technologies, and alter corporate strategy promptly. Digital agility refers to an organization's capacity to identify and leverage market opportunities presented by digital technologies (Lee *et al.*, 2015). In today's unpredictable markets, businesses must demonstrate flexibility in three key areas: (1) enabling frequent changes in organisational roles, (2) adapting to evolving customer needs and

emerging digital technologies, and (3) addressing heightened competition due to blurred market boundaries and reduced entry barriers (Chakravarty *et al.,* 2013; Lee *et al.,* 2015). To resolve these issues, companies must cultivate digital agility to continually adapt and reorganise their digital resources and competencies (Eggers & Park, 2018). This requirement will also impact the organisational structure. Digital transformation requires digital agility to integrate digital assets with conventional organisational resources, fundamentally altering company operations. Digital agility enables the ongoing recognition and utilisation of market opportunities, promoting the reconfiguration and creation of products, services, and business models that enhance customer value (Karimi & Walter, 2015; Teece, 2010). This competency becomes progressively vital as a company progresses through the more advanced stages of digital transformation—from digitisation to digitalisation and from digitalisation to digital transformation.

Businesses must locate, process, and integrate diverse data to leverage current or prospective market demand, hence delivering products and services that meet client needs. Alibaba and Amazon collect consumer behavioural data to analyse customer preferences and introduce pertinent items via big data technology (Zhou *et al.,* 2023). Organisational agility has been assessed in the literature on the velocity of market perception and the responsiveness of operational modifications. Yi and Cao (2022) indicated that digital capabilities assist organisations in incorporating decision-supporting data elements into the production and operational process chain and proficiently analysing data along the chain to attain market agility. Outdated business operations may impede digitisation and diminish resilience; conversely, business divisions can bolster resource integration and sharing by incorporating technology innovations, thus enhancing corporate agility. The combined utilisation of IT resources (Gao & Li 2017), integration of cross-functional departmental data (Qi & Liu, 2023), and enhanced management capabilities (Cui *et al.,* 2021) can enhance the operational agility of the organisation. Scholars Akter *et al.,* (2016) assert that the utilisation of digital technologies, including the Internet of Things, enhances access to diverse data types in business operations, increases the transparency of operational processes, and fosters the co-creation and sharing of knowledge resources, thereby promoting agility in operational adjustments.

Digital Networking Capability

Digital networking capability refers to an organization’s ability to effectively utilize digital technologies and platforms to connect, collaborate, and engage with internal and external stakeholders, including customers, suppliers, partners, and other relevant networks. This capability involves the use of digital tools such as social media, cloud-based collaboration platforms, Internet of Things (IoT) networks, and enterprise resource planning (ERP) systems to enhance communication, streamline operations, and share information in real time. The networking capability is a crucial resource that facilitates the exchange of knowledge among diverse actors (Inigo *et al.,* 2020), hence improving the knowledge management capacity of employees for value creation and sustainable performance (Ben & Chen, 2020). Organisations must collaborate and sustain professional networks and robust social relationships with one another (Collins & Clark, 2023). The networking capabilities of organisations are crucial, as they empower them to access resources that would otherwise be challenging to obtain (Ben & Chen, 2020). The networking competence denotes a firm's capacity to build formal or informal ties with a minimum of two separate organisations aiming to utilise each other's strengths (Yang *et al.,* 2018). In this context, de Almeida *et al.,* (2021) formulate an integrative framework derived from a systematic literature review to elucidate how organisations might leverage collaborative skills to adopt various green practices and attain enhanced sustainable

performance. Furthermore, they have delineated eleven fundamental attributes that enhance collaborative competency and its relationship with sustainability. They identified 10 essential aspects of collaborative capability and their correlation with sustainability. Khatami *et al.,* (2021) assert that collaborative networks, such as entrepreneurial ecosystems, significantly contribute to sustainable innovation. Managers can leverage networking capabilities to engage with firms, thereby improving their work-related competencies (Inigo *et al.,* 2020) through a deeper comprehension of diverse tools and techniques for value creation (product innovation) and attaining sustainable performance (de Almeida *et al.,* 2021). Networking augments the expertise of collaborators across many fields, hence facilitating sustained high performance (Tolstoy & Agndal, 2010). This sustainable performance may encompass the three primary domains, social, economic, and environmental, as the criteria for sustainable performance necessitate environmental stewardship, social awareness, and economic stability (Gupta *et al.,* 2014). The networking skills enable organisations to generate value via knowledge sharing among partners (Ju *et al.,* 2023). Consequently, networking is regarded as both an organisational competency and a strategic tool through which organisations facilitate effective knowledge transmission, foundational for innovation (Bao *et al.,* 2021; Ju *et al.,* 2023).

The capacity for digital networking allows organisations to cultivate robust partnerships, broaden their reach, penetrate new markets, and collaboratively generate value with stakeholders. It enables organisations to utilise external resources, get insights, and foster innovation through collaborations, so enhancing responsiveness, decision-making, and competitive positioning within the digital ecosystem. The competency of digital networking, which signifies a company's ability to connect and coordinate many individuals to meet their shared needs via digital channels, is becoming increasingly essential in digital environments. As businesses operate in contexts increasingly influenced by digital technology, they recognise the necessity of adopting a network-centric approach to collaboratively create value with diverse digitally networked organisations (Koch & Windsperger, 2017; Libert *et al.,* 2016). A recent survey revealed that 75% of executives said their competitive advantage arises not from internal factors but from the strength of their chosen partners and ecosystems (Accenture, 2017). This discovery may clarify why almost one-third of organisations have doubled their contacts within just two years (Accenture, 2018).

Big Data Analytics Capability

Big data is characterised as data that is too huge, rapid, and intricate to be effectively managed by conventional methods or software within a reasonable timeframe (Sahut *et al.,* 2022). BDA encompasses the processes of specifying, capturing, storing, accessing, and analysing datasets to interpret their content and use their value for decision-making (Zhang *et al.,* 2022a). Munir *et al.,* (2023) characterised big data analytics skills as the organization's ability to leverage data management, infrastructure, and human resources to enhance business competitiveness. Big data analytics capabilities are to acquiring knowledge from internal or external partners and deriving market insights via big data solutions (Horng *et al.,* 2022). Cetindamar *et al.,* (2022) posited that big data analytics capabilities refer to an organization's proficiency in integrating, constructing, and reconfiguring information resources and business processes to respond to swiftly evolving environments. Research emphasises that BDA technologies are complex; therefore, organisations must focus on cultivating unique, distinctive competencies rather than solely on technology (Gupta & George, 2016).

Theoretical Framework

The research utilises the resource-based perspective (RBV) to elucidate the impact of digital resources on business model innovation (refer to Figure 1). Barney's (1991) Resource-Based View advocates for the recognition of knowledge as a competitive asset. The theory posits that a firm's competitive advantages stem from its valued and unique resources and capabilities. The Resource-Based View (RBV) is recognised as a functional theory elucidating the effects of big data on knowledge generation in marketing, as it delineates how a corporation amalgamates tangible and intangible resources along with human expertise to achieve distinctive competitive advantage in the marketplace (Erevelles *et al.,* 2015). The data revolution is transforming market dynamics and behaviours. The Resource-Based View (RBV) asserts that competitive advantage arises from the unique combination of resources that hold economic worth, are subject to scarcity, and are difficult to imitate. This approach elucidates the benefits and differences of enterprises by viewing an enterprise as a collection of resources, focussing on the attributes and strategic elements of those resources. Teng *et al.,* (2022) asserted that the Resource-Based View (RBV) is an effective framework for evaluating the strategic importance of information technology (IT) resources. The RBV theory asserts that a firm's capacity to achieve unique innovation results in the market is linked to its ownership of distinctive resources and capabilities that possess value, rarity, non-imitability, and irreplaceability (Barney, 1991). Mikalef *et al.,* (2020) contend that although the notion of IT capacity assumes resources can be readily replicated, the current literature on IT competence recognises that the ability to utilise and allocate IT-related resources efficiently can confer a competitive advantage and differentiate organisations in a competitive landscape.

Review of Empirical Studies

Wang *et al.* (2024) examine the role of big data analytics skills in facilitating social innovation and the mediating effect of knowledge ambidexterity on this connection. This study indicates that among 354 high-tech enterprises in China, big data analytics management, technology, and staff capabilities positively influence social innovation. Furthermore, both knowledge exploration and knowledge exploitation serve a mediating function in this process. Moreover, polynomial regression and response surface analysis indicate that social innovation rises when knowledge exploration and knowledge exploitation are closely aligned, but diminishes when they are misaligned.

Alaskar *et al.* (2024) examined the essential function of organisational ambidexterity capabilities in the relationship of big data analytics, strategic innovation capabilities, and innovation performance. The research employed a quantitative methodology to gather data from 172 Saudi IT and telecommunications companies. Subsequently, it utilised structural equation modelling via Smart-PLS to evaluate the hypotheses. The research indicated that big data analytics and strategic innovation capabilities significantly influence organisational ambidexterity, thus affecting innovation performance.

Liu *et al.* (2024) examined the influence of digital capabilities on business model innovation, highlighting the crucial mediating function of dynamic capabilities—encompassing perceiving, seizing, and reconfiguring resources—in converting digital strengths into new business models. The research gathered 262 questionnaires from entrepreneurs in the Pearl River-West River Economic Belt, including Guangzhou and Nanning, China. The study employed The PROCESS Model 5 to analyse the moderation and mediation model. Digital capabilities positively influence the innovation of organisations' business models. Furthermore,

the relationship between digital capabilities and business model innovation is facilitated by dynamic capability. The results demonstrate that organisational inertia influences the connection between digital capabilities and business model innovation.

Dung and Dung (2024) examined the correlation between digital technology (DT) and the extent of internationalisation in small- and medium-sized firms (SMEs). The research utilised partial least squares structural equation modelling (PLS-SEM) to evaluate the hypotheses using cross-sectional data from 495 SMEs in Vietnam. The findings offer a new insight into the essential function of DT in BMI. Nonetheless, digital transformation presents issues for small and medium-sized enterprises about the extent of the internationalisation process. This study integrates internationalisation theory, specifically the Uppsala model and the resource-based view, to investigate the influence of digital transformation on the internationalisation of SMEs, mediated by business model innovation.

Zhang *et al.* (2024) investigated the relationship between organisational agility and digital capacity in fostering digital transformation in SMEs, while also assessing top management support as a moderating variable within the context of SMEs' internal characteristics. The findings demonstrate that both organisational agility and digital capability positively affect the digital transformation of SMEs, with organisational agility exerting a considerable influence on digital capability. Moreover, the results indicate that digital capacity functions as a mediator between organisational agility and the digital transformation of SMEs. Furthermore, executive support serves as a mitigating factor in these interactions to some degree.

Tariq *et al.* (2024) investigated the impact of networking capabilities on improving sustainable performance via the productivity of knowledge workers and digital innovation. Data were gathered from 308 knowledge workers in the information technology sector and analysed via the Hayes Process Macro bootstrapping technique to evaluate the proposed hypotheses. Results demonstrate that the productivity of knowledge workers and digital innovation, both individually and sequentially, mediate the relationship between networking capabilities and the sustainable (economic and environmental) performance of SMEs; however, they do not serve as mediators between networking capability and the social performance of SMEs.

Salamzadeh *et al.* (2023) investigated the impact of business model innovation on crisis management, focussing on the mediating roles of entrepreneurial capability, resilience, and business performance. The research employed a quantitative descriptive survey as the data collection approach. The structural equation model utilising the partial least squares method and Smart PLS 3 software was employed for the structural analysis of the questionnaire. The results indicated that innovation in company models may enhance crisis management. The elements of entrepreneurial capability, resilience, and business performance served a mediating function.

Wang *et al.* (2023) examined the influence of digitalisation on business performance in the context of business innovation. This study employed an ordinary least squares regression model and an intermediary to examine the relationship within the sequence of digital capacity, business model innovation, and firm performance. The inquiry focused on 1,663 A-share businesses listed in Shanghai and Shenzhen across the software and information technology service industries. The findings indicated that digital capabilities can be categorised into three dimensions based on their hierarchical relationship: (1) fundamental digital capabilities, (2) digital operational capabilities, and (3) digital integration capabilities, all of which had a significant positive impact on enterprise performance. Moreover, business model innovation

had a substantial positive impact on company performance, influenced by the prior determinants of digital capabilities. Business model innovation amplified the beneficial effects of fundamental digital capabilities, digital operational capabilities, and digital integration capabilities on corporate performance.

Zhucui *et al.* (2023) examined the influence of digital competence and organisational agility on the green innovation performance of manufacturing enterprises, focussing on the moderating effect of knowledge inertia. The dynamic capability theory is applied to SPSS 27.0, utilising data from a substantial sample of 383 middle and senior managers in manufacturing firms. The findings indicate that digital capability enhances green innovation performance; knowledge inertia moderates the inverted U-shaped relationship between digital capability and green innovation performance; and two facets of organisational agility, namely market agility and operational adjustment agility, partially mediate the connection between digital capability and green innovation performance.

Slavkovic *et al.* (2023) examined the influence of digital capabilities on digital transformation, focussing on the mediating role of digital citizenship. A survey was conducted among managers engaged in several businesses across Serbia. The PLS-SEM approach was employed to examine the relationships in the proposed model, based on a total sample of 224 valid questionnaires. Findings indicate that digital skills substantially enhance change management, information and data literacy, and information security management. The findings further validate that digital citizenship mediates the association between digital capabilities and both change management and risk management.

Li and Fei (2023) examined network embeddedness, digital transformation, and enterprise performance, focussing on the moderating influence of top managerial cognition. This study examines middle and senior managers from 239 firms, employing hierarchical regression, bootstrap, and other analytical tools for empirical testing, leading to the following conclusions: Relational and cognitive embeddedness positively influence digital transformation. However, structural embeddedness exerts no substantial effect on it. Digital transformation substantially enhances company performance. Digital transformation serves as a crucial intermediary between relational embeddedness, cognitive embeddedness, and corporate performance. Cognitive embeddedness enhances organisational performance via digital transformation within the framework of top management cognition.

Aziz *et al.* (2023) investigated the impact of big data analytics skills on organisational performance within the Malaysian Banking Sector. Partial least squares structural equation modelling (PLS-SEM) was utilised to examine data obtained from 162 bank managers in Malaysia. The results confirm that BDAC comprises seven concrete and intangible resources, together with human capabilities, and it has a substantial impact on business performance in the banking industry.

METHODOLOGY

Research Philosophy and Design

The research philosophy for this study is positivism, which aligns with a quantitative research approach. Positivism emphasizes the use of observable, objective data to understand reality. The quantitative nature allows for testing hypotheses about relationships between digital transformation and business outcomes, leading to statistically generalizable insights. The

chosen research design is a cross-sectional survey. This design involves collecting data from employees of multinational companies at a single point in time to assess how digital transformation initiatives are being integrated into their business models. A cross-sectional survey is suitable here because it captures a snapshot of how digital resources are currently utilized, enabling an examination of their effect on business model innovation.

Population and Sample Size

The study focuses on employees of multinational companies located in South-South Nigeria, particularly those involved in digital transformation and innovation processes. These employees are crucial because they experience firsthand the effects of digital initiatives on business models and can provide insights into how digital resources are managed and leveraged for innovation. Given the lack of specific data on the total number of employees involved in digital transformation in multinational companies, the Cochran (1977) formula is used to determine the sample size. This formula is effective when the population size is unknown, relying on assumptions about the desired precision (margin of error), confidence level, and estimated proportion of the population with a particular behaviour—in this case, involvement in digital transformation and business model innovation activities. By using Cochran's formula, the study can ensure an adequate sample size that accurately reflects the population's characteristics.

The formula for the Cochran sample size calculation is as follows:

$n = z\text{^}2(PQ) / e\text{^}2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$

Where:

n = sample size

z = z-score corresponding to the desired level of confidence

p = estimated proportion of the population with the characteristic of interest

q = 1 - p

e = level of precision desired (margin of error)

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}$$

$$n = \frac{3.8416 \times 0.5 \times 0.5}{0.0025}$$

$$n = 384$$

Sampling Technique

The study employed a snowball sampling technique. Snowball sampling is a non-probability sampling method where initial respondents; who are knowledgeable and engaged in digital transformation and business model innovation; help identify additional participants. This

technique was chosen because the target population—employees involved in digital transformation efforts within multinational companies in South-South Nigeria—may be difficult to access directly. By leveraging existing networks, snowball sampling ensures that participants are familiar with digital resources and business model innovations, which is crucial for exploring the impact of digital transformation from an informed perspective. This method is particularly effective in specialized fields like digital innovation, where individuals with relevant expertise can refer others who share similar experiences or roles.

Sources of Data

The primary data for this study were collected using a structured questionnaire; specifically designed to capture insights relevant data. The questionnaire employed a five-point Likert scale response format, ranging from "Strongly Disagree" to "Strongly Agree,". This format was chosen for its clarity and ease of quantifying attitudes, making it suitable for the study's quantitative approach.

Validation and Reliability of Research Instrument

The research instrument was validated through face and content validity. Face validity involved ensuring that the questionnaire items appeared relevant and clear to experts, while content validity involved a systematic review to confirm that the instrument comprehensively covered all aspects of the topic, particularly elements related to the digital resources. To ensure the reliability of the research instrument, an internal consistency reliability test was conducted. This involved calculating the Cronbach's alpha coefficient for each section of the questionnaire to assess how closely related the items were as a group. A high Cronbach's alpha value indicates that the instrument is reliable, ensuring consistent responses across similar questions. This method was selected because it provides a reliable measure of internal consistency, essential for validating the accuracy and dependability of data collected on digital transformation initiatives.

Table 1: Reliability coefficients of study constructs

Dimension of study constructs	Items	Cronbach's Alpha
Digital assets	5	0.75
Digital agility	5	0.77
Digital networking capability	5	0.76
Big data analytics capability	5	0.73
Business model innovation	5	0.74

Source: Field Survey, 2024.

The reliability analysis in Table 1 shows that all study constructs—digital assets, digital agility, digital networking capability, big data analytics capability, and business model innovation—have Cronbach's Alpha values ranging from 0.73 to 0.77, indicating acceptable to good internal consistency. These values, all above the 0.70 threshold, suggest that the questionnaire items effectively and reliably measure their respective dimensions. This consistency enhances confidence in the data's accuracy, making it a reliable basis for the study.

Methods of Data Analysis

The data collected were analysed using descriptive and inferential statistical techniques to draw conclusions. Descriptive statistics, including basic percentages, were used to analyse the demographic characteristics of the respondents, providing a clear overview of the sample population. The inferential statistical method employed was multiple regression analysis, which was utilized to test the statistical significance of the relationships between variables. This analysis was conducted using SPSS for Windows, version 25, a robust software for handling complex data analyses.

Model Specification

The following model specification was developed for the study:

$Y = F(X)$ ……(2)

$BMI = F(DAS, DAG, DNC, BDAC)$ ……(3)

$BMI = \beta o + \beta 1DAS + \beta 2DAG + \beta 3DNC + \beta 4BDAC + \varepsilon$ ……(4)

Where:

β_o = Constant Coefficient

β_1- β_3 = Coefficients

BMI = Business Model Innovation

DAS = Digital Assets

DAG= Digital Agility

DNC= Digital Networking Capability

BDAC = Big Data Analytics Capability

Limitations of the Study

A potential limitation of this study is the use of snowball sampling, which may introduce biases due to the reliance on initial contacts to recruit additional respondents, potentially leading to a sample that lacks full representativeness of the target population. Despite this, the method was chosen for its efficiency in accessing respondents with specific digital expertise, which might be challenging to identify through random sampling. SPSS was selected for data analysis due to its robust capabilities in handling large datasets, ease of use, and well-established suite of statistical tools, including multiple regression analysis for assessing relationships between variables. However, employing Structural Equation Modelling (SEM) could have provided a more comprehensive analysis of the relationships among the digital transformation variables and business model innovation, allowing for the examination of latent constructs and more complex interdependencies. Future research could benefit from SEM to validate the findings further and enhance the analytical depth.

RESULTS OF DATA ANALYSIS

This section is dedicated to the analysis of the data obtained from the participants.

Table 2: Response rate

S/N	Description of Response	Number	Ratio (%)
1	Total questionnaires administered	384	100
2	Questionnaires retrieved	361	94

Source: Field Survey (2024)

Table 2 presents the survey response rate, indicating that 384 questionnaires were administered, with 361 successfully retrieved, resulting in a response rate of 94%. This high response rate suggests a strong level of engagement and participation among the target respondents, enhancing the reliability and validity of the data collected. A 94% retrieval rate is generally considered excellent for survey-based research, indicating that the findings will be representative of the target population and minimizing the likelihood of non-response bias affecting the study's results.

Table 3: Sample demographics (n= 361).

Variable	Category	Number	Ratio (%)
Gender	Male	186	51.52%
	Female	175	48.48%
Age	18-28	77	21.33%
	29-38	87	24.10%
	39-48	89	24.65%
	49-58	87	24.10%
	59-68	21	5.82%
Marital Status	Single	160	44.32%
	Married	187	51.80%
	Divorced	14	3.88%
Education Level	SSCE	13	3.60%
	OND	55	15.24%
	HND/B.Sc.	215	59.56%
	Postgraduate degree	78	21.61%
Work Experience	1-5 years	12	3.32%
	6-10 years	78	21.61%
	11-15 years	55	15.24%
	16-20 years	54	14.96%
	21-25 years	61	16.90%
	26-30 years	53	14.68%
	31-35 years	20	5.54%
	36 and above	28	7.76%

Source: Field Survey, 2024.

The survey of 361 respondents shows a fairly even gender distribution with 51.52% males and 48.48% females. The majority of participants (72.5%) fall within the age range of 18–48 years, indicating a predominantly youthful demographic. Most respondents are married (51.80%),

with a significant proportion single (44.32%). In terms of education, 59.56% hold an HND/B.Sc., and 21.61% have postgraduate degrees, reflecting a well-educated sample. Work experience is distributed across various ranges, with notable clusters in 6–10 years (21.61%), 21–25 years (16.90%), and 11–15 years (15.24%), suggesting a mix of early and mid-career professionals.

Table 4 Effect of Digital Transformation on Business Model Innovation

Predictors	Standardised Coefficients			Collinearity Statistics		ANOVA[a]		Model Summary	
	Beta	T	Sig.	Tolerance	VIF	F	Sig.	R Square	Adjusted R Square
						147.352	.000[b]	.617	.613
(Constant)		6.403	.000						
Digital assets	.248	5.969	.000	.608	1.644				
Digital agility	.216	3.817	.000	.326	3.068				
Digital networking capability	.167	2.919	.004	.319	3.130				
Big data analytics capability	.289	5.995	.000	.449	2.225				

a. Dependent Variable: Business Model Innovation

b. Predictors: (Constant), Digital Assets, Digital agility, Digital networking capability, Big data analytics capability,

Source: Field Survey (2024)

Digital assets (Beta = 0.248, T = 5.969, Sig. = 0.000): Digital assets have a positive and statistically significant effect on business model innovation. The standardised coefficient (Beta) of 0.248 indicates that for every unit increase in digital assets, business model innovation increases by 0.248 standard deviations, holding other factors constant. This variable is significant at the 0.000 level, indicating a strong effect. This aligns with the findings of Liu *et al.*, (2024), who emphasised the critical role of digital capabilities in enabling business model innovation through dynamic capabilities like sensing, seizing, and reconfiguring resources. Digital assets, as a resource, provide a foundation for these capabilities, enabling firms to innovate and reconfigure their business models effectively in a digital context. Similarly, Wang *et al.* (2023) found that digital capabilities, such as digital integration, positively impacted business model innovation and performance, reinforcing the importance of digital assets in the innovation process.

Digital agility (Beta = 0.216, T = 3.817, Sig. = 0.000): Digital agility also has a positive and statistically significant effect. With a Beta of 0.216, this suggests that enhanced agility in digital processes contributes significantly to business model innovation. The T-value of 3.817 and Sig. value of 0.000 confirms the variable's significance. Zhang *et al.* (2024) also highlighted how organizational agility supports digital transformation, making the

alignment of these findings with your study evident. The importance of agility in fostering business model innovation is reinforced by other studies, such as Wang et al. (2024), where big data analytics and knowledge management also require agility to successfully leverage digital transformation.

Digital networking capability (Beta = 0.167, T = 2.919, Sig. = 0.004): Digital networking capability positively affects business model innovation, though to a slightly lesser extent compared to digital assets and agility. A Beta of 0.167 suggests a moderate effect size, and the variable is statistically significant with a Sig. value of 0.004. The result is in line with a study by Wang *et al.,* (2024), who discussed how networking capabilities and collaboration foster innovation. Digital networking capability facilitates engagement with external stakeholders, enabling firms to gather insights, co-create value, and adapt their business models accordingly. Tariq *et al.,* (2024) also emphasise the importance of networking capabilities in enhancing innovation, and their findings are consistent with our study's result.

Big data analytics capability (Beta = 0.289, T = 5.995, Sig. = 0.000): This is the strongest predictor among the variables, with a Beta of 0.289. It indicates that big data analytics has the most substantial positive effect on business model innovation, reinforcing the importance of data-driven decision-making. A T-value of 5.995 and a significant value of 0.000 denotes high significance. Alaskar *et al.,* (2024) also highlight the critical role of big data analytics in innovation performance, showing how analytics capabilities can enhance organisational ambidexterity, which directly influences business innovation. Furthermore, Liu *et al.,* (2024) emphasised that digital capabilities, including data analytics, are essential for business model innovation, and the mediating role of dynamic capabilities confirms the pathway your study suggests for big data analytics fostering business innovation.

Tolerance and Variance Inflation Factor (VIF) are used to check for multicollinearity: Tolerance values are all above 0.2, indicating no severe multicollinearity. VIF values range from 1.644 to 3.130, all below the threshold of 10, suggesting that multicollinearity is not a problem in this model. R Square = 0.617, indicating that approximately 62% of the variability in business model innovation can be explained by the digital transformation variables included in the model. The F-statistic value of 147.352 with a significance level of 0.000 indicates that the overall regression model is statistically significant. This means that the predictors (Digital assets, digital agility, digital networking capability, and big data analytics capability) collectively have a significant effect on business model innovation.

The study's findings align closely with the Resource-Based View (RBV) framework, which posits that unique resources and capabilities provide firms with sustainable competitive advantages. Digital assets support this framework by establishing a strong foundation for firms to sense, seize, and reconfigure resources dynamically, driving innovation in business models. This is consistent with Liu *et al.* (2024), who argued that digital capabilities serve as crucial resources that empower business model innovation. Digital agility further reinforces the RBV framework by enabling organizations to adapt quickly to digital transformation, promoting flexibility in utilizing resources to foster competitive advantage, as Zhang *et al.* (2024) observed. Digital networking capability, although moderate in effect, plays a vital role in building external collaborations, which enhance resource access and co-creation opportunities—paralleling findings by Tariq *et al.* (2024). Big data analytics capability, the most substantial predictor, underlines the strategic role of data as a resource that supports informed decision-making, which Liu *et al.* (2024) identified as pivotal for business innovation. These findings collectively underscore the importance of digital resources within the RBV

framework and resonate with prior studies by Wang *et al.,* (2023), who also highlighted the role of digital integration in boosting innovation and competitive performance. Through these comparisons, it becomes evident that digital resources are integral in fostering sustainable advantages and innovation, solidifying the study's contributions to understanding digital transformation's impact within a theoretical context.

Conclusion and Recommendations

The results highlight the significant role of digital transformation in driving business model innovation. Big data analytics capability has the strongest effect, suggesting that data-driven decision-making is essential for innovation. Digital assets, such as tools and platforms, support the development of new business models, while digital agility emphasises the need for flexibility and quick adaptation. Although digital networking capability is less impactful, it still contributes by enhancing connectivity and collaboration. Companies investing in these digital capabilities are better equipped to innovate and stay competitive in the evolving digital landscape. This study contributes to academic knowledge on digital transformation and Business Model Innovation (BMI) by extending the Resource-Based View (RBV) framework, specifically demonstrating how distinct digital resources drive BMI in the context of emerging markets. The findings highlight that digital assets, agility, networking capabilities, and big data analytics collectively play crucial roles in shaping innovative business models, reinforcing the notion that digital transformation is a key strategic asset. By focusing on South-South Nigeria, this research provides empirical evidence from an emerging market, where digital transformation is rapidly evolving yet under-researched. The identification of big data analytics as the most significant driver of BMI emphasizes the critical value of data-driven capabilities in emerging economies, thereby contributing to the growing body of literature that underscores the importance of digital resources for sustained competitive advantage. This study not only validates previous research in developed markets but also adapts and applies these insights to a different economic and cultural context, offering a nuanced understanding of how digital transformation influences innovation outside of traditional Western-centric studies. The study therefore recommended that:

i. Organizations should prioritize investment in digital infrastructure, technologies, and platforms to foster innovation in business models.
ii. Companies should cultivate digital agility by streamlining processes and fostering flexibility in adapting to changes in the digital landscape to improve business model innovation.
iii. Although digital networking capability has a moderate impact, enhancing collaboration and connections through digital networks can provide a competitive edge and stimulate business model innovation.
iv. As big data analytics has the most substantial effect, businesses should invest in advanced analytics tools and data-driven strategies to optimize decision-making processes and drive business model innovation.

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