

Big Data Analytics Capabilities and Marketing Performance of Deposit Money Banks in Calabar, Nigeria

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Abstract

This study investigated the influence of big data analytics capabilities on the marketing performance of deposit money banks in Calabar, Cross River State, Nigeria. It focused on three dimensions of big data analytics capabilities, namely technological capability, managerial capability, and personnel expertise capability, and examined their effects on marketing performance. A cross-sectional survey design was employed, with the accessible population comprising 242 management and functional staff drawn from 20 deposit money banks operating in Calabar. Since the population was relatively small and accessible, a census sampling approach was adopted, and structured questionnaire was administered to all eligible staff. Data were analysed using descriptive statistics and multiple linear regression through the Statistical Package for the Social Sciences (SPSS). The regression model was statistically significant ($F = 253.528$, $p < .001$) and accounted for 76.2% of the variance in marketing performance ($R^2 = .762$). The results further showed that technological capability had a positive and significant effect on marketing performance ($\beta = .163$, $p = .015$), while managerial capability ($\beta = .445$, $p < .001$) and personnel expertise capability ($\beta = .342$, $p < .001$) also exerted positive and significant effects. Managerial capability recorded the strongest relative contribution among the three dimensions. The study concludes that the ability of deposit money banks to convert big data into marketing value depends not only on technological resources but also on effective managerial support and personnel expertise. The study recommends that deposit money banks should strengthen technological infrastructure, managerial support, and personnel expertise through appropriate resources, strategic direction, and staff training to improve customer acquisition, retention, responsiveness, and competitive advantage.

Keywords: Big Data Analytics Capabilities, Technological Capability, Nigerian Banking Sector, Customer Responsiveness, Customer Retention, Competitive Advantage.

Introduction

Prior to the era of big data analytics, banking operations relied largely on manual record-keeping, paper-based documentation, branch-level processing, and conventional information systems for storing and processing structured transaction data (Lawal & Adeyeye, 2026). However, these approaches often resulted in fragmented information, slow data processing, limited data accessibility, and difficulties in obtaining timely insights for decision-making (Dick, 2022). As transaction volumes increased and customer interactions became more complex, these limitations became more evident, and traditional

systems became increasingly inadequate for managing the growing volume, velocity, and variety of banking data (Edu, 2022). Meanwhile, the expansion of digital banking and internet and mobile transactions increased the volume and complexity of banking data. At the same time, heightened competition, changing customer expectations, and concerns over fraud created a greater need for advanced data-processing capabilities (Mikalef et al., 2020). These developments therefore encouraged banks to adopt big data analytics to integrate and analyze diverse data sources, generate timely insights, improve decision-making, understand customers, and enhance banking performance (Omonzejele et al., 2025). According to Osakue et al. (2026), big data analytics entail the use of advanced analytical techniques and technologies to process large and complex datasets and generate useful insights for organisational decision-making. They are increasingly popular among financial service organisations, but their effectiveness depends largely on the capabilities required to collect, manage, analyse, and utilise big data effectively, including technological infrastructure, managerial support, and personnel expertise (Dubey et al., 2019).

This suggests that big data analytics capabilities are indispensable to the effective functioning of big data analytics systems, as they provide the technological infrastructure, managerial support, and personnel expertise required to generate and utilise valuable data insights. Consequently, organisations are increasingly paying attention to these capabilities to maximize the value of their big data investments (Ertz et al., 2025; León et al., 2024; Chong et al., 2024). In this study, however, attention is specifically given to technological capability, managerial capability, and personnel expertise capability as the key dimensions of big data analytics capabilities. While technological capability entails the organization's ability to provide and effectively manage the infrastructure required to support big data analytics (Garmaki et al., 2023), managerial capability involves management's ability to provide support, align analytics activities with organizational goals, allocate resources, and establish appropriate governance (Asaolu & Akpa, 2025). Personnel expertise capability reflects employees' knowledge, skills, and expertise required to manage, analyze, interpret, and utilize big data effectively (Shokouhyar et al., 2020). These big data analytics capabilities have supported the performance of banking institutions by enabling them to process diverse data more effectively and generate timely insights for decision-making (He et al., 2023). They have also supported operational efficiency and improved customer experience by enabling banks to better understand and respond to customer needs (Lawal & Adeyeye, 2026). In addition, the capabilities have strengthened customer satisfaction and business performance by helping banks use data to understand customer expectations and improve service delivery (Singh & Del Giudice, 2019). More broadly, they have enabled financial service organisations to improve service agility and develop more customized financial products through effective use of data and analytics (Hasan et al., 2023).

However, despite the growing adoption of big data analytics in the banking sector, the contribution of big data analytics capabilities to marketing performance remains insufficiently established in the Nigerian banking context. Existing Nigerian banking studies

have mainly examined big data analytics in relation to organisational performance, operational efficiency, customer experience, and customer satisfaction (Omonzejele et al., 2025; Lawal & Adeyeye, 2026; Dick, 2022), rather than examining big data analytics capabilities as a distinct organisational capability influencing marketing performance. Consequently, there is insufficient empirical evidence on whether technological capability, managerial capability, and personnel expertise capability can enhance the marketing performance of deposit money banks. This constitutes a significant empirical gap because the adoption of big data technologies does not necessarily indicate that banks possess the organisational capabilities required to effectively exploit them for marketing purposes (Mikalef et al., 2020; Su et al., 2022; Chong et al., 2024). Without such evidence, deposit money banks may have limited basis for determining whether investments in technological infrastructure, managerial support, and personnel expertise can translate into improved customer acquisition, customer retention, responsiveness, and competitive advantage. The problem is particularly relevant in Calabar, Nigeria, where deposit money banks operate in an increasingly competitive environment characterized by changing customer expectations and growing digital banking interactions. It is against this backdrop and the identified empirical gap that this study examines the effect of big data analytics capabilities, specifically technological capability, managerial capability, and personnel expertise capability, on the marketing performance of deposit money banks in Calabar, Nigeria. Specifically, the study pursued the following objectives:

- i. To determine the effect of technological capability on the marketing performance of deposit money banks in Calabar.
- ii. To assess the effect of managerial capability on the marketing performance of deposit money banks in Calabar.
- iii. To examine the effect of personnel expertise capability on the marketing performance of deposit money banks in Calabar.

Literature Review

Big Data Analytics Capabilities in the Banking Sector

Big data analytics capabilities in the banking sector refer to the bank's ability to develop and utilise organisational resources and expertise to collect, process, analyze, and apply large and complex datasets for decision-making and business activities (Edu, 2022). They also represent the organisational capacity required to transform diverse banking data into useful insights that can support improved decisions and performance (He et al., 2023). Similarly, Hasan et al. (2023) emphasised that effective use of big data in banking depends on the ability of financial institutions to manage data and analytics resources while addressing associated operational and security challenges. Common to these views is the understanding that BDAC extends beyond the possession of analytics technologies because it involves the organisational capabilities required to effectively use data for business purposes. This capability has become increasingly important in banking as digital transactions, customer interactions, and the volume of available data continue to expand

(Lawal & Adeyeye, 2026; Awotunde et al., 2021). Consequently, banks are increasingly using big data analytics to improve data processing, understand customer needs, support decision-making, enhance service delivery, and strengthen organisational performance (Dick, 2022; Omonzejele et al., 2025; He et al., 2023). However, the effective use of these capabilities depends on factors such as appropriate technological infrastructure, management support, skilled personnel, adequate resources, and effective coordination of analytics activities (Shokouhyar et al., 2020; Garmaki et al., 2023; Chong et al., 2024). Therefore, possessing big data technologies alone may not enable banks to realise their full value, as the ability to combine technological resources, managerial support, and personnel expertise is essential for converting data into useful organisational outcomes (Mikalef et al., 2020; Dubey et al., 2019).

Marketing Performance of Commercial Banking Institutions

Marketing performance in commercial banking concerns the results achieved from a bank's efforts to attract customers, maintain customer relationships, respond to market demands, and compete effectively within the banking industry (Mikalef et al., 2020). From a customer perspective, it reflects how effectively a bank expands its customer base and maintains existing relationships by delivering services that correspond with customers' expectations (Dick, 2022; Lawal & Adeyeye, 2026). From a competitive perspective, it concerns the bank's capacity to respond to market changes and create value that strengthens its position relative to competing institutions (Qaffas et al., 2023; Mikalef et al., 2020). These aspects make marketing performance an important consideration for commercial banks because banking customers can increasingly compare services, switch providers, and interact with banks through digital channels (Hasan et al., 2023; He et al., 2023). As a result, banks need to understand customer preferences and market developments while responding quickly to emerging opportunities and competitive pressures (Edu, 2022; Lawal & Adeyeye, 2026). The growing use of data analytics has further strengthened this need because banks can use customer and transaction information to understand customer behaviour, improve service responsiveness, and support more informed marketing decisions (Dick, 2022; Omonzejele et al., 2025). Thus, marketing performance can be viewed through outcomes such as customer acquisition, customer retention, customer responsiveness, and competitive advantage, which collectively indicate how effectively commercial banks translate their market and customer activities into desirable business outcomes.

Technological Capability and Marketing Performance

Technological capability refers to a bank's ability to establish, maintain, and effectively use the technological resources needed to support big data analytics activities (Shokouhyar et al., 2020). It encompasses the capacity of an organisation to provide an appropriate technological foundation for collecting, integrating, processing, storing, and analysing large volumes of data (Garmaki et al., 2023). Similarly, Dubey et al. (2019) associate

technological capability with the technological resources that enable organisations to develop and apply analytics capabilities effectively. Common to these perspectives is the idea that technological capability provides the foundation through which banks can turn available data into useful information for organisational activities. In commercial banking, this capability is increasingly important because banks handle large amounts of transaction, customer, and interaction data across multiple digital channels, thereby requiring reliable technological resources to process and utilise such information effectively (Hasan et al., 2023; He et al., 2023).

A bank with stronger technological capability can process customer and market information more efficiently, thereby supporting better understanding of customer needs and more timely marketing decisions (Dick, 2022; Lawal & Adeyeye, 2026). It can also facilitate the use of analytics to identify customer opportunities, monitor changing preferences, and improve responses to market developments (Edu, 2022; Mikalef et al., 2020). Consequently, technological capability may strengthen marketing performance by providing banks with the technological foundation required to attract and retain customers, respond to customer needs, and compete more effectively. This argument is supported by Shokouhyar et al. (2020), who found that technological aspects of BDAC contributed significantly to organisational outcomes. Similarly, Mikalef et al. (2020) established that technological capability forms an important component of BDAC and contributes to competitive performance through organisational capabilities. Therefore, it is hypothesized that:

H₁: Technological capability has a significant effect on the marketing performance of deposit money banks in Calabar, Nigeria.

Managerial Capability and Marketing Performance

Managerial capability represents the ability of organisational managers to provide direction, coordinate resources, and establish the conditions necessary for the effective use of big data analytics. It encompasses management support, strategic alignment, resource allocation, and the coordination of analytics-related activities to ensure that data-driven initiatives contribute to organisational objectives (Asaolu & Akpa, 2025; Garmaki et al., 2023). Rather than merely referring to the availability of managerial personnel, managerial capability concerns how effectively management integrates analytics into organisational processes and decisions. This capability is particularly relevant to banking institutions because the value derived from big data depends not only on analytical resources but also on management's ability to align them with business priorities and respond to changing market conditions (Mikalef et al., 2020; Chong et al., 2024).

Managerial capability can therefore contribute to marketing performance by ensuring that insights generated from customer and market data are translated into appropriate marketing decisions and actions. Effective managerial direction can help banks identify changing customer preferences, coordinate customer-focused strategies, allocate resources to promising market opportunities, and respond more quickly to competitive

pressures. Evidence from Ferraris et al. (2019) indicates that managerial capabilities form an important component of BDAC and are associated with improved firm performance, while Chong et al. (2024) similarly demonstrated that managerial capability, as part of the broader BDAC bundle, contributes to competitive advantage and firm performance. Furthermore, Mikalef et al. (2019) found that BDAC-supported dynamic capabilities contribute to innovation, suggesting that managerial capacity to mobilise analytics resources can help organisations respond effectively to changing market conditions. These findings provide a basis for expecting managerial capability to influence marketing performance among commercial banking institutions. Hence, it was hypothesized that:

H₂: Managerial capability has a significant effect on the marketing performance of deposit money banks in Calabar, Nigeria.

Personnel Expertise Capability and Marketing Performance

Personnel expertise capability refers to the capacity of an organisation to deploy employees with the knowledge and skills required to work with data, interpret analytical information, and apply insights to business activities. It encompasses the analytical knowledge, technical competence, and practical expertise needed to derive useful information from big data and support data-driven organisational decisions (Dubey et al., 2019; Garmaki et al., 2023). Thus, the value of big data analytics depends not only on the availability of analytical infrastructure but also on whether employees possess the expertise needed to transform data into actionable business knowledge. This is particularly important in banking, where employees are required to interpret large volumes of customer and transaction data and use the resulting insights to support responsive and competitive business decisions (Hasan et al., 2023; He et al., 2023).

Personnel expertise capability can consequently contribute to marketing performance by enabling banks to understand customer needs, respond more effectively to market changes, and make informed decisions that strengthen their competitive position. Empirical evidence from Dubey et al. (2019) showed that BDAC, which included personnel expertise capability, technological capability, predictive capability, and managerial capability, had a significant positive effect on competitive advantage. Similarly, Garmaki et al. (2023) identified talent capability as a core component of BDAC and found that BDAC contributed to firm performance through organisational learning. Popovič et al. (2018) also demonstrated that BDA capability involving people's expertise facilitated improved decision-making and enhanced high-value business performance. These findings suggest that personnel expertise provides an important human foundation through which banks can convert analytics resources into market-related value. Hence, it was hypothesized that:

H₃: Personnel expertise capability has a significant effect on marketing performance of deposit money banks in Calabar, Nigeria.

Theoretical Framework

This study is anchored on the Dynamic Capabilities Theory developed by Teece et al. (1997). The theory explains how organizations can adapt to changing environments by developing and reconfiguring their internal capabilities to address emerging opportunities and challenges. According to the theory, firms need more than valuable resources because they must also possess the ability to integrate, renew, and redeploy those resources as their operating environments change (Teece et al., 1997). Accordingly, dynamic capabilities are commonly associated with an organization's ability to sense opportunities and threats, seize opportunities, and reconfigure resources and capabilities to maintain effective performance (Teece, 2007).

The Dynamic Capabilities Theory has received considerable empirical support in studies examining big data analytics and organisational performance. For instance, Mikalef et al. (2019) found that big data analytics capabilities strengthen firms' innovation capabilities through dynamic capabilities, while Mikalef et al. (2020) reported that BDAC enhances competitive performance through dynamic and operational capabilities. Similarly, Mikalef et al. (2021) showed that organisations can leverage big data analytics to develop sensing, seizing, and transforming capabilities, although organisational inertia can constrain this process. More recently, research has shown that BDA-enabled dynamic capabilities can support marketing exploration and exploitation, which subsequently enhance market and financial performance (Saeed et al., 2023).

The theory is relevant to this study because big data analytics capabilities represent organisational capabilities that enable deposit money banks to respond to changing customer needs and competitive conditions through effective use of data. Specifically, technological capability provides the infrastructure needed to generate and process useful information, while managerial capability enables banks to coordinate analytics activities, align them with organisational goals, and allocate resources appropriately. In addition, personnel expertise capability provides the knowledge and skills required to analyze, interpret, and utilise data in responding to changing market conditions. Consistent with Dynamic Capabilities Theory, these capabilities can help banks sense changes in customer needs and market conditions, seize emerging marketing opportunities, and reconfigure their marketing activities in response to such changes (Teece, 2007; Mikalef et al., 2020). The theory therefore provides a suitable framework for explaining how technological capability, managerial capability, and personnel expertise capability influence the marketing performance of deposit money banks in Calabar, Nigeria.

Review of Empirical Studies and Conceptual Framework

The empirical literature on big data analytics and big data analytics capabilities (See Table 1) shows that existing studies have largely established the importance of data analytics in improving organisational and business outcomes. Nigerian studies (Omonzejele et al., 2025; Lawal & Adeyeye, 2026; Dick, 2022; Odeh & Usman, 2026; Ibidun et al., 2023; Umar & Monday, 2025; Asaolu & Akpa, 2025) demonstrate that big data analytics, data analytics,

and big data capabilities contribute to organisational performance, operational efficiency, customer experience, customer satisfaction, competitiveness, and market responsiveness. However, these studies have generally examined big data analytics, adoption, or capabilities in relation to outcomes other than marketing performance, while only limited attention has been given to big data analytics capabilities as a distinct organisational capability. Thus, despite evidence that data-driven practices can improve organisational outcomes, the specific contribution of technological capability, managerial capability, and personnel expertise capability to marketing performance remains insufficiently established.

International studies provide stronger evidence on the capability perspective of big data analytics. For instance, Shokouhyar et al. (2020), Ferraris et al. (2019), Mikalef et al. (2020), Su et al. (2022), Garmaki et al. (2023), Chong et al. (2024), León et al. (2024), and Dubey et al. (2019) demonstrate that BDAC can influence organisational performance, competitive performance, supply chain agility, competitive advantage, innovation, and other organisational outcomes. These studies also show that BDAC involves combinations of technological, managerial, personnel, predictive, data, and related organisational capabilities. However, most of these studies were conducted outside Nigeria and across manufacturing, SMEs, pharmaceutical, supply chain, and other business contexts rather than deposit money banks. Consequently, their findings provide useful conceptual and empirical evidence on BDAC but cannot fully establish how these capabilities influence marketing performance within Nigerian banking institutions.

More importantly, the empirical evidence linking BDAC specifically with marketing performance remains limited. Qaffas et al. (2023) found that big data analytics talent capability contributes to marketing performance through business intelligence infrastructure, while Mikalef et al. (2020) established that BDAC strengthens marketing capabilities through dynamic capabilities. However, these studies examined indirect relationships and were conducted outside the Nigerian banking sector. Similarly, Chong et al. (2024) examined market performance in relation to BDAC, but the study was conducted among Malaysian manufacturing firms. Thus, existing evidence has not sufficiently established the direct effect of BDAC as an integrated capability on marketing performance within Nigerian deposit money banks.

This limitation is also evident in the Nigerian banking literature. Omonzejele et al. (2025), Lawal and Adeyeye (2026), and Dick (2022) examined big data and analytics in Nigerian banking but concentrated on organisational performance, operational efficiency, customer experience, customer satisfaction, and related outcomes. Although these studies confirm the growing relevance of data analytics to banking performance, they do not specifically conceptualise and test technological capability, managerial capability, and personnel expertise capability as dimensions of BDAC in explaining marketing performance. Therefore, what remains insufficiently understood is whether Nigerian deposit money banks can convert these organisational capabilities into improved marketing performance.

This gap provides the basis for examining the effect of big data analytics capabilities on the marketing performance of deposit money banks in Calabar, Nigeria.

Table 1: Review of empirical studies on big data analytics capabilities and marketing performance

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
1	Omonzejele et al. (2025)	To examine the influence of big data storage, visualization, and analytics on the organisational performance of Zenith Bank Plc in Delta State, Nigeria	The study adopted a cross-sectional survey design using primary data collected from 32 management staff of Zenith Bank branches in Delta State. Census sampling was used, and the data were analysed using linear regression	The study found that big data storage, visualization, and analytics each had a positive and significant effect on organisational performance. The findings indicated that effective use of big data supports operational efficiency, data-driven decision-making, and organisational growth	The study focused on organisational performance rather than marketing performance. It also examined big data through storage, visualization, and analytics, without specifically measuring big data analytics capabilities and their effect on marketing performance.
2	Lawal and Adeyeye (2026)	To assess the extent to which big data adoption improves operational efficiency and customer experience in the Nigerian banking sector	The study adopted a survey design involving 150 bankers selected through stratified sampling from three Nigerian geopolitical zones. Data were collected using a structured questionnaire	The study found that big data adoption improves operational efficiency, particularly through enhanced decision-making. Big data analytics also enhances customer experience through	The study focused on operational efficiency and customer experience rather than marketing performance. It also examined the adoption and effects of big data without specifically measuring big data analytics

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
			and analysed using descriptive statistics	personalized banking services, while supporting banks' responsiveness to changing customer demands and market competition	capabilities and their effect on marketing performance
3	Dick (2022)	To examine the influence of big data descriptive analytics on the performance of commercial banks in Rivers State, Nigeria	The study adopted a cross-sectional survey design involving 168 respondents selected from commercial banks using simple random sampling. Primary and secondary data were collected, with primary data obtained through a structured questionnaire. Data were analysed using descriptive statistics and simple linear regression	The study found that big data descriptive analytics significantly enhances customer satisfaction and economic growth. It concluded that descriptive analytics helps commercial banks understand customer expectations and improve performance	The study focused on customer satisfaction and economic growth rather than marketing performance. It also examined descriptive analytics as a specific form of big data analytics without measuring big data analytics capabilities and their effect on marketing performance
4	Edu (2022)	To examine how big data analytics capabilities can be deployed to improve financial service agility	The study adopted a quantitative survey design involving 485 banking professionals. Data were	The study found that distinctive BDA usage, supported by IT capabilities and other organisational resources,	The study focused on financial service agility rather than marketing performance. It also examined BDA capabilities

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
			analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) to examine the relationships between BDA usage, IT capability development, and financial service agility	enhances financial service agility. It also identified technologies such as data mining, predictive modelling, data visualization, and streaming analytics as useful for financial knowledge gathering and developing customized financial products	in relation to service agility without specifically assessing their effect on marketing performance. Additionally, the study was not conducted in Nigeria, leaving a country-context gap
5	Odeh and Usman (2026)	To examine the effect of big data analytics on the performance of multinational companies in Nigeria	The study adopted a cross-sectional survey design involving 325 employees selected using cluster sampling. Data were collected through a structured questionnaire and analysed using regression analysis with SPSS version 27	The study found that text analytics, video analytics, and audio analytics positively and significantly influence organisational performance. It concluded that big data analytics enhances decision-making, operational performance, and competitive advantage	The study focused on organisational performance rather than marketing performance. It also measured big data analytics through text, video, and audio analytics, rather than specifically assessing big data analytics capabilities and their effect on marketing performance
6	Ibidun et al. (2023)	To examine the effect of big data analytics and its six dimensions on	The study adopted a survey design involving 676	The study found that the six dimensions of big data	The study focused on competitive advantage

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
		the competitive advantage of healthcare service organisations	employees selected using purposive, proportionate, and random sampling techniques. Data were collected through an adapted questionnaire and analysed using regression analysis	analytics (agility capability, data-driven decision-making, business intelligence, IT capability, IoT application software, and cloud computing) significantly influence competitive advantage	rather than marketing performance. Although it examined multiple dimensions of big data analytics capabilities, it did not specifically investigate their effect on marketing performance. The study was also conducted in the healthcare sector, leaving a sectoral gap regarding banking.
7	Umar and Monday (2025)	To examine the effect of data analytics on the competitiveness of small and medium-scale enterprises in FCT, Abuja, Nigeria	The study adopted a descriptive research design involving 278 employees and managers of SMEs selected using cluster and simple random sampling. Data were collected through a questionnaire and analysed using inferential statistics and regression analysis	The study found that the adoption of data analytics tools significantly enhances operational efficiency and market responsiveness, thereby improving the competitiveness of SMEs	The study focused on SME competitiveness rather than marketing performance. It examined the adoption of data analytics tools rather than specifically assessing big data analytics capabilities and their effect on marketing performance in the banking sector

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
8	Asaolu and Akpa (2025)	To examine the effect of big data capabilities on the competitive advantage of selected fast-moving consumer goods firms in Oyo State, Nigeria.	The study adopted a survey research design involving 398 staff of selected FMCG firms. Data were collected using a validated questionnaire and analysed using descriptive statistics and multiple regression analysis.	The study found that the dimensions of big data capabilities (technological capabilities, infrastructure flexibility, personnel expertise and management capabilities) had a significant combined effect on competitive advantage. It concluded that developing big data infrastructure, analytics expertise, and data-driven practices can strengthen firms' competitive position.	The study focused on competitive advantage rather than marketing performance. Although it examined big data capabilities, it did not specifically investigate their effect on marketing performance in the banking sector.
9	Shokouhyar et al. (2020)	To examine the effect of big data analytics capabilities (BDAC) on supply chain sustainability and assess the relationship between BDAC and the dimensions of supply chain sustainability.	The study adopted a survey design involving 188 usable responses from managers of pharmaceutical companies in Iran. Data were collected using a standard BDAC questionnaire and the UN	The study found that BDAC (infrastructure flexibility, predictive capability, management capability, and personnel expertise capability) significantly influenced pharmaceutical supply chain	The study focused on supply chain sustainability rather than marketing performance. Although it specifically examined BDAC through infrastructure flexibility, management capability,

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
			online self-assessment instrument for supply chain sustainability. Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS 3 was employed for data analysis.	sustainability in Iran	predictive capability and personnel expertise capability, it did not investigate their effect on marketing performance. Additionally, the study was conducted in Iran, leaving a country-context gap.
10	Ferraris et al. (2019)	To examine the effect of big data analytics capabilities on firm performance and the mediating role of knowledge management in this relationship.	The study adopted a quantitative research design involving 88 Italian SMEs. Data were analysed using Structural Equation Modelling (SEM) to examine the relationship between BDA capabilities, knowledge management, and firm performance.	The study found that firms with stronger technological and managerial BDA capabilities achieved higher performance. Knowledge management orientation also significantly strengthened the effect of BDA capabilities on firm performance.	The study focused on overall firm performance rather than marketing performance. Although it examined technological and managerial BDA capabilities, it did not specifically investigate their effect on marketing performance. Additionally, the study was conducted among Italian SMEs, leaving a country and sectoral context gap regarding

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
					deposit money banks in Nigeria.
11	Mikalef et al. (2020)	To examine the relationship between big data analytics capability (BDAC) and competitive performance, including the mediating roles of dynamic and operational capabilities.	The study adopted a quantitative survey design involving 202 CIOs and IT managers from firms in Norway. Data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM).	The study found that BDAC, comprising technological, managerial, and predictive capabilities, contributes to competitive advantage. However, the effect was indirect, with dynamic capabilities fully mediating the relationship between BDAC and operational capabilities, including marketing and technological capabilities.	The study focused on competitive performance rather than marketing performance as the outcome. Also, the study did not specifically examine the effect of BDAC on marketing performance of banks. Additionally, the study was conducted in Norway, leaving a country-context gap.
12	Su et al. (2022)	To examine the effect of big data analytics capabilities (BDAC) on organisational performance and the mediating role of dual innovations in this relationship.	The study adopted a quantitative survey design involving 309 respondents from Chinese manufacturing firms. Data were collected through questionnaires and analysed to test the direct and indirect relationships between BDAC, dual	The study found that BDAC, comprising tangible capabilities, human skills, and intangible resources, has a significant positive effect on organisational performance. Dual innovations also positively mediate the relationship between BDAC	The study focused on organisational performance rather than marketing performance. Although it specifically examined BDAC through tangible capabilities, human skills, and intangible resources, it did not investigate their effect on

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
			innovations, and organisational performance.	and organisational performance.	marketing performance. Additionally, the study was conducted in the manufacturing sector in China, leaving country and sectoral context gaps.
13	Garmaki et al. (2023)	To examine how big data analytics capability contributes to firm performance and identify the resources and sub-capabilities that constitute BDA capability.	The study adopted an exploratory qualitative design based on classic grounded theory. Data were generated and analysed through interviews using an iterative process of data collection, analysis, comparison, and theme development, supported by relevant literature.	The study developed a BDA capability model comprising technological capability, management capability, talent capability, and external partnership capability. It found that BDA capability contributes to firm performance through the mediating role of organisational learning.	The study focused on firm performance rather than marketing performance. Although it developed and identified specific dimensions of BDA capability, it did not specifically examine their effect on marketing performance. Additionally, its qualitative, exploratory approach did not empirically test the relationship between BDA capabilities and marketing performance.
14	Chong et al. (2024)	To examine the relationships among big data analytics	The study adopted a quantitative survey design	The study found that BDAC, comprising personnel	Although BDAC was assessed as a higher-order capability

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
		capability, competitive advantage, market performance, and operational performance in manufacturing firms.	involving 191 members of the Federation of Malaysian Manufacturers. Data were analysed using Structural Equation Modelling (SEM).	expertise, managerial capability, technological capability and intangible resources, positively influences competitive advantage and firm performance. Differentiation advantage was also found to be an important determinant of market performance.	comprising personnel expertise, managerial capability, technological capability and intangible resources, the study did not specifically examine its direct effect on marketing performance of banks. Additionally, the study was conducted in the Malaysian manufacturing sector, leaving country and sectoral context gaps.
15	Wang et al. (2018)	To examine the development, architectural design, and component functionalities of big data analytics and identify the capabilities and potential benefits of BDA for healthcare organisations.	The study adopted a qualitative content analysis of 26 big data implementation cases in healthcare organisations. The analysis was used to identify BDA capabilities and map their associated organisational benefits.	The study identified five BDA capabilities: analytical capability for patterns of care, unstructured data analytical capability, decision support capability, predictive capability, and traceability. These capabilities were associated with IT infrastructure, operational,	The study identified BDA capabilities but focused on their potential benefits in healthcare organisations rather than examining their effect on marketing performance. It also relied on content analysis of implementation cases rather than empirically

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
				organisational, managerial, and strategic benefits.	testing the relationship between BDA capabilities and marketing performance. The study was not in the Nigerian banking sector
16	León et al. (2024)	To examine the effect of big data analytics capabilities on innovation performance and business performance	The study adopted a quantitative research design involving 91 companies. Data were analysed using correlation analysis and canonical correlation analysis to examine the relationships among BDAC, innovation performance, and business performance	The study found that BDAC (technological capability, data capability, predictive capability, and managerial capability) significantly contribute to business performance.	The study focused on business performance rather than marketing performance. Although it examined specific BDAC dimensions, it did not specifically test the causal effect of BDAC on marketing performance. The study was not in the Nigerian banking sector
17	Popovič et al. (2018)	To examine the impact of big data analytics on high-value business performance in the manufacturing sector	The study adopted an interpretive qualitative approach using a comparative case study of three manufacturing companies with different levels of BDA usage.	The study found that BDA capability, comprising data sourcing, access, integration and delivery, analytical capabilities, and people's expertise, alongside	The study focused on high-value business performance rather than marketing performance and did not empirically test the causal effect of BDA capabilities on

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
			Data were analysed to examine the relationships between BDA capability, organisational readiness, organisational design, and business performance	organisational readiness and design, facilitates improved decision-making and enhances high-value business performance.	marketing performance. Additionally, the study was conducted in the manufacturing sector outside Nigeria, leaving both country and sectoral context gaps regarding Nigerian deposit money banks.
18	Qaffas et al. (2023)	To examine the effect of big data analytics talent capability on business intelligence infrastructure and firm performance	The study adopted a quantitative survey design involving 272 IT managers and big data analysts from Chinese firms. Data were analysed using Structural Equation Modelling and Partial Least Squares (PLS-SEM) with SmartPLS 3.0.	The study found that big data analytics talent capability positively and significantly influences business intelligence infrastructure, which in turn contributes to financial and marketing performance.	The study examined the indirect effect of big data analytics talent capability on marketing performance through business intelligence infrastructure, rather than the direct causal effect of broader big data analytics capabilities on marketing performance. Additionally, the study was conducted in China and outside the banking sector, leaving country and sectoral context gaps regarding

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
					Nigerian deposit money banks.
19	Dubey et al. (2019)	To examine how big data analytics capability influences supply chain agility and competitive advantage, and the moderating effect of organisational flexibility on these relationships.	The study adopted a quantitative survey design using 173 usable questionnaire responses. The research framework was grounded in the dynamic capabilities view and contingency theory, with hypotheses tested using survey data.	The study found that BDAC, comprising technological capability, predictive capability, managerial capability, and personnel expertise capability, has a positive and significant effect on supply chain agility and competitive advantage.	The study focused on supply chain agility and competitive advantage rather than marketing performance, and did not test the causal effect of BDAC on marketing performance. Additionally, the study was conducted in the supply chain context outside Nigeria and outside the banking sector, leaving country and sectoral context gaps regarding Nigerian deposit money banks.
20	Ertz et al. (2025)	To examine the effect of big data analytics on firm sustainable performance, including its economic, social, and environmental dimensions	The study adopted a quantitative research design using secondary data from 522 firms listed on the US S&P500 and Canadian S&P500/TSX60 indices. Ordinary Least Squares (OLS)	The study found that BDA has a direct, positive, and significant effect on overall firm sustainable performance and its economic, social, and environmental dimensions. Prescriptive	The study focused on firm sustainable performance rather than marketing performance and conceptualized BDA as predictive and prescriptive analytics rather

SN	Author(s)	Study Objectives	Methodology	Key Findings	Gap(s)
			regression was used to analyse the relationships between predictive and prescriptive analytics and firm sustainable performance.	analytics also produced moderately stronger effects on sustainable performance than predictive analytics.	than broader big data analytics capabilities. It therefore did not test the causal effect of broader BDAC on marketing performance in the Nigerian banking context.

Source: Authors' literature review

Taken together, the 20 studies reviewed establish that the value of big data analytics depends not merely on technological adoption but on the organisational capabilities required to effectively acquire, manage, analyze, and utilise data. Across the reviewed studies, these capabilities are associated with improved organisational and market-related outcomes, including performance, efficiency, competitiveness, customer experience, innovation, and market responsiveness. However, the evidence remains fragmented across different sectors, outcomes, and geographical contexts. In particular, Nigerian banking studies have largely focused on organisational, operational, and customer-related outcomes, while international studies have provided stronger evidence on the capability perspective but mainly outside the banking sector. The literature therefore provides support for examining big data analytics as an organisational capability, but leaves insufficient evidence on how technological capability, managerial capability, and personnel expertise capability jointly contribute to marketing performance among deposit money banks in Nigeria. This unresolved issue provides the basis for the conceptual framework of the present study.

Drawing from the identified gaps in the empirical literature, this study examined how big data analytics capabilities relate to the marketing performance of deposit money banks in Calabar, Nigeria. Big data analytics capabilities constituted the independent variable and were represented by technological capability, managerial capability, and personnel expertise capability. Technological capability refers to the bank's capacity to maintain and use the technological resources needed to support data collection, storage, processing, integration, and analysis (Shokouhyar et al., 2020; Garmaki et al., 2023). Managerial capability concerns the ability of bank management to provide direction and support for analytics activities, commit relevant resources, align analytics initiatives with organisational objectives, and coordinate their use within the bank (Ferraris et al., 2019; Asaolu & Akpa, 2025). Personnel expertise capability concerns the employees' knowledge

and skills for handling, analysing, interpreting, and applying data to support organisational activities and decisions (Dubey et al., 2019; Qaffas et al., 2023).

Marketing performance constituted the dependent variable and was represented by customer acquisition, customer retention, customer responsiveness, and competitive advantage. Customer acquisition concerns the bank's ability to attract new customers by identifying and responding to market opportunities and customer needs. Customer retention reflects the ability to maintain existing customer relationships and encourage continued use of banking services. Customer responsiveness concerns how effectively the bank identifies and responds to customers' changing needs, expectations, and preferences. Competitive advantage reflects the bank's ability to achieve a stronger market position by providing superior value and responding effectively to competitive pressures. These dimensions reflect the customer- and market-oriented outcomes that can potentially be strengthened through effective use of data and analytics (Dick, 2022; Lawal & Adeyeye, 2026; Mikalef et al., 2020; Qaffas et al., 2023).

The conceptual framework therefore proposes that the three dimensions of big data analytics capabilities contribute to marketing performance among deposit money banks. Specifically, technological capability, managerial capability, and personnel expertise capability are expected to provide the resources and organisational capacity through which banks can use data more effectively to attract customers, retain existing customers, respond to customer needs, and strengthen their competitive position. As presented in Fig. 1, the framework consequently provides the basis for empirically examining the effect of each BDAC dimension on the marketing performance of deposit money banks in Calabar, Nigeria.

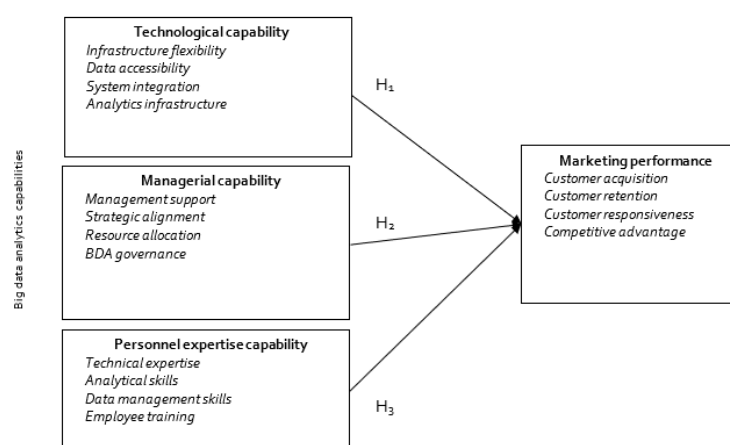


Figure 1: Conceptual model of the study

Source: Independent variable parameters were adapted from Shokouhyar et al. (2020); Dubey et al. (2019); Garmaki et al. (2023); and Qaffas et al. (2023). Dependent variable parameters were adapted from Mikalef et al. (2020); Qaffas et al. (2023); Dick (2022); and Lawal and Adeyeye (2026).

Materials and Methods

Research Design

This study employed a cross-sectional survey design to investigate the effect of big data analytics capabilities on the marketing performance of deposit money banks in Calabar, Cross River State, Nigeria. The design allowed data to be obtained from respondents within the selected banking institutions during a defined period, thereby providing a snapshot of the existing relationship between the study variables. It was considered appropriate because the study examined technological capability, managerial capability, and personnel expertise capability as they naturally existed within the banking institutions, without introducing any experimental manipulation. Furthermore, the design supported the collection of quantitative information from a sizeable number of respondents and enabled the application of statistical techniques to determine the effect of big data analytics capabilities on marketing performance.

Population, Sample and Sampling Technique

The target population comprised 242 management and functional staff of 20 deposit money banks operating in Calabar, Cross River State, Nigeria. The population was established through onsite enquiries conducted by the corresponding author at the participating banks, based on the number of eligible staff in management, IT, analytics, operations, marketing, and customer-service functions. These personnel were considered suitable because their roles provided direct or informed knowledge of technological infrastructure, managerial support, data and analytics activities, customer management, and marketing-related operations relevant to the study. The participating banks were selected based on their operation as deposit money banks in Calabar and the availability of eligible personnel within these functional areas. The identities of the banks were not disclosed because institutional consent to identify them was not obtained.

Management and functional staff were selected as respondents because their responsibilities exposed them to the organisational capabilities and activities examined in the study. Management staff were considered knowledgeable about strategic direction, resource allocation, managerial support, and organisational decisions, while functional staff provided practical knowledge of technology use, data and analytics activities, customer service, banking operations, and marketing activities. Staff whose responsibilities did not provide sufficient involvement in these areas were excluded from the defined population.

The 242 eligible staff constituted the accessible population, and a census sampling technique was adopted because the population was relatively small, identifiable, and accessible to the researcher. Accordingly, all 242 eligible staff were targeted rather than drawing a smaller sample. This approach provided complete coverage of the defined respondent population and eliminated sampling selection within the accessible population. The individual staff members constituted the units of observation, while the participating

deposit money banks provided the organisational setting within which the relationship between big data analytics capabilities and marketing performance was examined.

Data Collection and Survey Administration

Primary data were collected using a structured questionnaire administered to the 242 eligible management and functional staff of the participating deposit money banks in Calabar. The questionnaire was designed to obtain quantitative responses relating to technological capability, managerial capability, personnel expertise capability, and marketing performance. All constructs were measured using a five-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5).

The questionnaires were administered directly to eligible respondents within the participating banking institutions. Prior to completion, respondents were provided with appropriate information concerning the purpose of the study and the nature of the information required. The researcher facilitated the distribution and retrieval of the questionnaires and followed up where necessary to ensure that questionnaires administered to the identified respondents were completed and returned.

A total of 242 questionnaires were administered, corresponding to the entire accessible population under the census approach. All 242 questionnaires were returned and considered usable for analysis, resulting in a 100 percent usable response rate. The unusually high response rate was facilitated by the census approach, the direct administration of the questionnaires to identified eligible staff, and follow-up during the data-collection process. Nevertheless, the possibility of response-related bias cannot be completely excluded, since respondents may differ in their willingness to participate or in how they perceive and report organisational practices. The study therefore recognizes that the responses represent the perceptions of the participating staff during the period of data collection.

Instrument Development, Validity and Reliability

The questionnaire items were adapted from established measures used in previous empirical studies. The measurement parameters for the dimensions of big data analytics capabilities were adapted from Shokouhyar et al. (2020), Dubey et al. (2019), Garmaki et al. (2023), and Qaffas et al. (2023), while the measures of marketing performance were adapted from Mikalef et al. (2020), Qaffas et al. (2023), Dick (2022), and Lawal and Adeyeye (2026). The adapted items were contextualized to reflect the operations and circumstances of deposit money banks in Calabar while retaining the underlying conceptual meaning of the original measures.

The questionnaire was subjected to content validity assessment before its administration. Experts in the Department of Marketing, University of Calabar, reviewed the instrument to determine the relevance, clarity, adequacy, and appropriateness of the items in measuring the constructs and addressing the research objectives. Their assessment also considered

whether the wording of the items was sufficiently clear and appropriate for respondents working within the banking environment. Based on the observations and recommendations of the experts, necessary modifications were made to the wording, sequencing, and presentation of selected questionnaire items before the final instrument was administered. In addition to expert assessment, a pilot study was conducted involving 30 personnel of a microfinance bank in Calabar that was excluded from the main study. The pilot participants were selected because they operated within the financial services sector and were therefore sufficiently familiar with banking-related activities and organisational processes relevant to the questionnaire. Their exclusion from the main study helped to prevent contamination of the main respondents while allowing the researcher to assess the clarity, suitability, and consistency of the instrument.

The pilot study was also used to determine the internal consistency reliability of the measurement scales. Cronbach's alpha coefficient was employed for this purpose, with a coefficient of 0.70 or above considered an acceptable indication of internal consistency. As presented in Table 2, the Cronbach's alpha coefficients were 0.729 for technological capability, 0.746 for managerial capability, 0.802 for personnel expertise capability, and 0.775 for marketing performance. Since all coefficients exceeded the recommended threshold of 0.70, the measurement scales demonstrated satisfactory internal consistency and were considered sufficiently reliable for the main survey.

Table 2: Summary of reliability test (Cronbach's alpha)

Construct	Number of Items	Cronbach's Alpha
Technological capability	4	0.729
Managerial capability	4	0.746
Personnel expertise capability	4	0.802
Marketing performance	4	0.775
	16	

Source: Researchers' analysis via SPSS (2026)

Ethical Considerations

The study observed appropriate ethical principles in the collection and handling of data from human respondents. Before questionnaire administration, respondents were informed about the purpose of the study, the academic nature of the research, and the type of information required from them. Participation was voluntary, and respondents were not compelled to provide information against their willingness.

Respondents were also assured that the information provided would be treated with confidentiality and used strictly for academic purposes. No information that could unnecessarily identify individual respondents was required in the questionnaire. The identities of the participating deposit money banks were similarly not disclosed because institutional consent to identify the banks was not obtained. Completed questionnaires and

the information obtained from respondents were treated confidentially and were used solely for the purposes of the study.

Data Analysis Techniques

The data collected from the respondents were first coded and entered into the Statistical Package for the Social Sciences (SPSS) for analysis. The analysis began with descriptive statistics, including frequencies, percentages, means, and standard deviations, which were used to describe responses relating to technological capability, managerial capability, personnel expertise capability, and marketing performance. Following the descriptive analysis, multiple linear regression was employed to test the study hypotheses and determine the extent to which the three dimensions of big data analytics capabilities individually and collectively influence marketing performance among deposit money banks in Calabar, Cross River State. This technique was appropriate because the study sought to examine the effects of multiple independent variables on a single dependent variable within the same regression model. Accordingly, the regression model was specified as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where:

Y = Dependent variable (Marketing performance)

a = The intercept

$\beta_1, \beta_2, \beta_3$ = Coefficients of the independent variable

X_1, X_2, X_3 = Parameters of independent variable (Technological capability, managerial capability and personnel expertise capability)

e = Error margin (5 percent)

Regression Diagnostic and Assumption Tests

Before interpreting the multiple linear regression results, the assumptions of normality, multicollinearity, and homoscedasticity were assessed. Normality was evaluated using the Skewness and Kurtosis statistics of the regression residuals, with absolute Skewness values within ± 2 and Kurtosis values below ± 7 considered acceptable. Multicollinearity was assessed using tolerance and Variance Inflation Factor (VIF) statistics. The VIF values ranged from 2.417 to 4.416, while tolerance values ranged from 0.226 to 0.414 (see Table 6), indicating that multicollinearity was not problematic. Homoscedasticity was assessed using a plot of standardised residuals against predicted values, with no substantial evidence of heteroscedasticity observed. Overall, the diagnostic results indicated that the assumptions were adequately satisfied, supporting the use of multiple linear regression for testing the study hypotheses.

Analysis and Findings

A total of 242 copies of the questionnaire were administered to management and functional staff of deposit money banks in Calabar, Cross River State. Following the

fieldwork, all 242 questionnaire copies were retrieved, and each was screened for completeness and suitability for analysis. The screening confirmed that all returned questionnaire copies contained sufficiently complete responses and were therefore retained for analysis, resulting in a 100 percent usable response rate. Accordingly, the empirical analysis was based on the 242 valid questionnaires obtained from the study respondents.

Table 3: Descriptive statistics of the study's variables

	No. of items	N	Mean	Std. Deviation
Technological capability	4	242	3.4866	1.30633
Managerial capability	4	242	3.0124	1.28986
Personnel expertise capability	4	242	3.2810	1.09486
Marketing performance	4	242	3.0279	.66748
Valid N (listwise)		242		

Source: Researchers' analysis via SPSS (2026)

The descriptive statistics in Table 3 are based on responses measured on a five-point Likert scale, with 5 representing Strongly Agree and 1 representing Strongly Disagree. The results show that the mean scores for technological capability ($M = 3.4866$) and personnel expertise capability ($M = 3.2810$) are above the criterion mean of 3.0, indicating a generally positive assessment of these capabilities among the surveyed deposit money banks in Calabar. However, managerial capability ($M = 3.0124$) and marketing performance ($M = 3.0279$) are only marginally above the criterion mean, suggesting relatively moderate perceptions of managerial capability and marketing performance.

Technological capability recorded the highest mean score ($M = 3.4866$) among the study variables, indicating that respondents generally perceived their banks to have relatively adequate technological capabilities to support big data analytics activities. Personnel expertise capability followed with a mean of 3.2810, suggesting that respondents also viewed the availability of relevant employee knowledge and skills positively, although to a lesser extent. Managerial capability recorded a lower mean of 3.0124, which indicates that management support and related managerial capabilities were perceived as present but only marginally above the neutral level. Similarly, marketing performance recorded a mean of 3.0279, suggesting a moderate level of marketing performance among the surveyed deposit money banks.

The standard deviation results indicate varying degrees of dispersion in respondents' assessments. Technological capability recorded the highest standard deviation ($SD = 1.30633$), indicating considerable variation in respondents' perceptions of the technological capabilities available within their banks. Managerial capability also showed substantial variation ($SD = 1.28986$), while personnel expertise capability recorded a comparatively lower dispersion ($SD = 1.09486$). Marketing performance had the lowest standard deviation ($SD = 0.66748$), indicating greater consistency in respondents' assessments of marketing

performance. Overall, the descriptive results suggest that while technological and personnel capabilities were viewed relatively positively, managerial capability and marketing performance remained comparatively moderate, providing a useful basis for further examination of the relationships among the study variables through inferential analysis.

Hypothesis One

Ho: Technological capability has no significant effect on marketing performance of deposit money banks in Calabar, Nigeria.

Hypothesis Two

Ho: Managerial capability has no significant effect on marketing performance of deposit money banks in Calabar, Nigeria.

Hypothesis Three

Ho: Personnel expertise capability has no significant effect on marketing performance of deposit money banks in Calabar, Nigeria.

Independent variables: Technological capability, managerial capability and personnel expertise capability

Dependent variable: Marketing performance

Test statistic: Multiple linear regression

Decision criteria: Accept the alternative hypothesis if ($P < .05$) and reject the null hypothesis, if otherwise.

Table 4: Model summary of the effect of big data analytics capabilities on marketing performance of deposit money banks in Calabar, Nigeria

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873 ^a	.762	.759	.32791

a. Predictors: (Constant), Technological capability, managerial capability and personnel expertise capability

Source: Researchers' analysis via SPSS (2026)

Table 5: ANOVA^a of the effect of big data analytics capabilities on marketing performance of deposit money banks in Calabar, Nigeria

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	81.783	3	27.261	253.528	.000 ^b
	Residual	25.591	238	.108		
	Total	107.374	241			

a. Dependent Variable: Marketing performance

b. Predictors: (Constant), Technological capability, managerial capability and personnel expertise capability

Source: Researchers' analysis via SPSS (2026)

Table 6: Coefficients^a of the effect of big data analytics capabilities on marketing performance of deposit money banks in Calabar, Nigeria

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.360	.067		20.363	.000		
	Technological capability	.083	.034	.163	2.445	.015	.226	4.416
	Managerial capability	.230	.025	.445	9.045	.000	.414	2.417
	Personnel expertise capability	.209	.049	.342	4.284	.000	.257	4.379

a. Dependent Variable: Marketing performance

Source: Researchers' analysis via SPSS (2026)

Interpretation

Tables 4, 5, and 6 present the multiple regression results for the effect of big data analytics capabilities on marketing performance. Table 4 indicates a strong overall relationship between the predictors and marketing performance ($R = 0.873$), with the model explaining 76.2% of the variation in marketing performance ($R^2 = 0.762$). The ANOVA result in Table 5 shows that the model is statistically significant ($F = 253.528$, $p < .001$), indicating that the three dimensions of big data analytics capabilities jointly have a significant effect on marketing performance.

Table 6 shows that technological capability has a positive and significant effect on marketing performance ($B = 0.083$; $\beta = 0.163$; $t = 2.445$; $p = .015$). The first null hypothesis is therefore rejected. Managerial capability also has a positive and significant effect ($B = 0.230$; $\beta = 0.445$; $t = 9.045$; $p < .001$), leading to the rejection of the second null hypothesis. Its standardised coefficient indicates the strongest relative contribution among the three predictors. Personnel expertise capability similarly has a positive and significant effect on marketing performance ($B = 0.209$; $\beta = 0.342$; $t = 4.284$; $p < .001$), resulting in the rejection of the third null hypothesis.

From these results, all three dimensions significantly and positively influence marketing performance, with managerial capability making the strongest relative contribution ($\beta = 0.445$), followed by personnel expertise capability ($\beta = 0.342$) and technological capability ($\beta = 0.163$). The findings therefore support the view that effective utilization of big data analytics requires technological, managerial, and personnel capabilities.

Discussion of Findings

Technological Capability and Marketing Performance

The first finding established that technological capability has a positive and significant effect on marketing performance of deposit money banks in Calabar, Nigeria ($\beta = 0.163$, $p = .015$). This result implies that the technological foundation available to banks plays a meaningful role in their ability to achieve better marketing outcomes. When banks possess appropriate infrastructure for handling and processing data, they are better positioned to obtain useful customer information, respond to changing customer needs, and strengthen their market position. The finding is consistent with Shokouhyar et al. (2020), who reported that the technological component of big data analytics capabilities contributes significantly to organisational outcomes. It also agrees with Mikalef et al. (2020), who identified technological capability as an important element of BDAC and demonstrated its contribution to competitive performance through organisational capabilities.

Although technological capability received the highest descriptive rating among the three capability dimensions, it produced the smallest standardised regression coefficient ($\beta = 0.163$). This suggests that the availability of technological infrastructure alone may not be sufficient to generate substantial improvements in marketing performance. Banks may possess adequate analytics technologies, but the value derived from such technologies depends on management's ability to direct and coordinate their use and employees' capacity to interpret and apply the resulting information. Thus, the comparatively weaker regression effect of technological capability may reflect the complementary nature of the three capabilities: technology provides the infrastructure, while managerial capability and personnel expertise determine how effectively that infrastructure is deployed and converted into marketing value. The finding therefore reinforces the view that investments in technology need to be accompanied by appropriate managerial support and human expertise to achieve stronger marketing outcomes.

Managerial Capability and Marketing Performance

The second finding revealed that managerial capability has a positive and significant effect on marketing performance of deposit money banks in Calabar ($\beta = 0.445$, $p < .001$). Notably, managerial capability recorded the largest standardised coefficient among the three dimensions, indicating that it made the strongest relative contribution to marketing performance. This suggests that management's ability to provide direction, allocate resources, coordinate analytics activities, and align big data initiatives with organisational objectives is particularly important in converting analytics capabilities into marketing-related outcomes.

The finding is consistent with Ferraris et al. (2019), who identified managerial capabilities as an important component of BDAC and associated them with improved firm performance. It also supports Chong et al. (2024), who established that managerial capability, as part of the broader BDAC configuration, contributes to competitive

advantage and firm performance. Furthermore, Mikalef et al. (2019) found that dynamic capabilities supported by big data analytics can promote innovation, suggesting that organisations require the managerial capacity to mobilise and coordinate analytics resources in response to changing market conditions. The consistency of the present finding with these studies reinforces the argument that the value of big data analytics extends beyond technological resources and depends substantially on managerial capacity to organise and deploy those resources effectively.

Personnel Expertise Capability and Marketing Performance

The third finding showed that personnel expertise capability has a positive and significant effect on marketing performance of deposit money banks in Calabar ($\beta = 0.342, p < .001$). This indicates that employees' knowledge, analytical skills, and ability to work with data contribute significantly to the capacity of banks to generate marketing value from big data analytics. The finding suggests that the availability of analytics technologies does not, by itself, guarantee improved marketing outcomes because employees must possess the expertise required to interpret data and translate analytical insights into meaningful organisational actions.

The result is supported by Dubey et al. (2019), who found that BDAC, including personnel expertise alongside technological, predictive, and managerial capabilities, significantly enhances competitive advantage. Similarly, Garmaki et al. (2023) identified talent capability as an important component of BDAC and demonstrated its contribution to firm performance through organisational learning. Popovič et al. (2018) likewise found that BDA capability involving personnel expertise facilitates better decision-making and contributes to high-value business performance. The present finding therefore reinforces existing evidence that human expertise constitutes an essential component of BDAC because employees provide the knowledge and analytical capacity required to transform available data and technological resources into useful business and marketing outcomes.

Conclusion and Recommendations

Conclusion

This study examined the effect of big data analytics capabilities on the marketing performance of deposit money banks in Calabar, Nigeria. The study was undertaken in response to the growing importance of organisational capabilities in enabling banks to derive meaningful value from their increasing volumes of data. Based on data collected through a cross-sectional survey and analysed using multiple linear regression, the findings demonstrated that technological capability, managerial capability, and personnel expertise capability all have positive and statistically significant effects on marketing performance. Among the three dimensions, managerial capability exerted the strongest relative influence, followed by personnel expertise capability and technological capability. The findings therefore indicate that the marketing performance of deposit money banks is significantly associated with their capacity not only to possess technological resources but

also to provide effective managerial support and maintain the personnel expertise required to exploit those resources.

The study should, however, be considered in light of its methodological boundaries. The investigation was conducted among eligible management and functional staff of 20 deposit money banks in Calabar, Cross River State, and the data were collected at a single point in time. Consequently, the findings may not necessarily reflect the circumstances of deposit money banks operating in other locations or banking environments. Moreover, although the regression results demonstrate statistically significant effects, the cross-sectional design does not permit definitive conclusions about changes in these relationships over time. Despite these limitations, the study provides empirical evidence that the development of technological, managerial, and personnel expertise capabilities constitutes an important factor in enhancing the marketing performance of deposit money banks. Future research could extend the investigation to other geographical settings and financial institutions and could employ longitudinal or other research designs to examine how these capability–performance relationships evolve over time.

Recommendations

Based on the findings of the study, the following recommendations were made:

- i. Deposit money banks should strengthen their technological capability by investing in reliable systems for collecting, integrating, processing, and analysing customer data, while conducting periodic reviews of system performance and data quality. Banks should also ensure that their customer-data platforms are properly integrated across marketing and customer-service functions to facilitate timely access to customer insights and improve acquisition, retention, and responsiveness.
- ii. Deposit money banks should strengthen managerial capability by establishing clear management oversight for big data analytics through designated analytics governance teams or committees responsible for coordinating resources, setting priorities, and aligning analytics initiatives with marketing objectives. Regular management reviews of analytics outputs should also be conducted to ensure that customer insights are translated into timely marketing decisions and actions.
- iii. Deposit money banks should continuously develop personnel expertise capability by implementing structured training programmes in data management, analytics, and customer-data interpretation at least quarterly, complemented by practical exercises and periodic skills assessments. This would enhance employees' ability to interpret and apply customer information effectively, thereby improving customer engagement, retention, and competitive advantage.

References

- Asaolu, O., & Akpa, V. O. (2025). Big data capabilities and competitive advantage of selected fast-moving consumer goods firms in Oyo State, Nigeria. *International Research Journal of Economics and Management Studies*, 4(5), 18-29.
- Awotunde, J. B., Adeniyi, E. A., Ogundokun, R. O., & Ayo, F. E. (2021). Application of big data with fintech in financial services. In *Fintech with artificial intelligence, big data, and blockchain* (pp. 107-132). Singapore: Springer Singapore.
- Chong, C. L., Abdul Rasid, S. Z., Khalid, H., & Ramayah, T. (2024). Big data analytics capability for competitive advantage and firm performance in Malaysian manufacturing firms. *International Journal of Productivity and Performance Management*, 73(7), 2305-2328. <https://doi.org/10.1108/IJPPM-11-2022-0567>
- Dick, A. N. (2022). Big data: Descriptive analytics and performance of commercial banks in Port Harcourt, Rivers State, Nigeria. *BW Academic Journal*, 21-31.
- Dubey, R., Gunasekaran, A., & Childe, S. J. (2019). Big data analytics capability in supply chain agility: The moderating effect of organizational flexibility. *Management Decision*, 57(8), 2092-2112. <https://doi.org/10.1108/MD-01-2018-0119>
- Edu, A. S. (2022). Positioning big data analytics capabilities towards financial service agility. *Aslib Journal of Information Management*, 74(4), 569-588. <https://doi.org/10.1108/AJIM-08-2021-0240>
- Ertz, M., Latrous, I., Dakhlaoui, A., & Sun, S. (2025). The impact of big data analytics on firm sustainable performance. *Corporate Social Responsibility and Environmental Management*, 32(1), 1261-1278. <https://doi.org/10.1002/csr.2990>
- Ferraris, A., Mazzoleni, A., Devalle, A., & Couturier, J. (2019). Big data analytics capabilities and knowledge management: impact on firm performance. *Management Decision*, 57(8), 1923-1936. <https://doi.org/10.1108/MD-07-2018-0825>
- Garmaki, M., Gharib, R. K., & Boughzala, I. (2023). Big data analytics capability and contribution to firm performance: The mediating effect of organizational learning on firm performance. *Journal of Enterprise Information Management*, 36(5), 1161-1184. <https://doi.org/10.1108/JEIM-06-2021-0247>
- Hasan, M., Hoque, A., & Le, T. (2023). Big data-driven banking operations: Opportunities, challenges, and data security perspectives. *FinTech*, 2(3), 484-509.
- He, W., Hung, J. L., & Liu, L. (2023). Impact of big data analytics on banking: A case study. *Journal of Enterprise Information Management*, 36(2), 459-479.
- Ibidun, A., Egbuta, O. U., & Akinlabi, B. H. (2023). Big data analytics and competitive advantage: Evidences from healthcare services organizations in Lagos State, Nigeria. *Journal of Information, Technology and Data Science*, 7(1), 22-46. <https://doi.org/10.53819/81018102t4149>
- Lawal, S. A., & Adeyeye, V. A. (2026). Adoption of big data in improving efficiency and customers experience in banking sector of Nigeria: A boost in the 21st century. *American Seasoned International Journal of Humanities and Social Science*, 6(1), 70-83.
- León, O., de la Fuente, D., Fernandez-Vazquez, S., & Puente, J. (2024). Big data analytics capabilities: direct and mediating relationships with innovative and business performance. *Journal of Management Analytics*, 11(2), 182-201. <https://doi.org/10.1080/23270012.2024.2328522>
- Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J. (2019). Big data analytics capabilities and innovation: The mediating role of dynamic capabilities and moderating effect of the environment. *British Journal of Management*, 30(2), 272-298. <https://doi.org/10.1111/1467-8551.12343>
- Mikalef, P., Krogstie, J., Pappas, I. O., & Pavlou, P. (2020). Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities. *Information & Management*, 57(2), 103169. <https://doi.org/10.1016/j.im.2019.05.004>

- Mikalef, P., van de Wetering, R., & Krogstie, J. (2021). Building dynamic capabilities by leveraging big data analytics: The role of organizational inertia. *Information & Management*, 58(6), 103412. <https://doi.org/10.1016/j.im.2020.103412>
- Odeh, J. A., & Usman, M. (2026). Impact of big data analytics on the performance of multinational companies in Nigeria: A case study of Guinness Nigeria Plc. *African Journal of Management and Business Research*, 22(1), 165-189. <https://doi.org/10.62154/ajmbr.2026.022.01018>
- Omonzejele, F. E., Ogosi, F. I., & Okifo, R. (2025). Exploring the influence of big data storage, visualization, and analytics on organisational performance: A case of Zenith Bank Plc, Delta State. *Pioneer Journal of Business and Management*, 2(1), 1-9.
- Osakue, I., Muhyaddin, S., Kuka, C., Leyva-Hernández, S. N., Onyeagwibe, V., & Hernández-Arzaba, J. C. (2026). Adoption and impact of big data analytics in the food industry in South-Western Nigeria. *Businesses*, 6(2), 32-51. <https://doi.org/10.3390/businesses6020032>
- Popovič, A., Hackney, R., Tassabehji, R., & Castelli, M. (2018). The impact of big data analytics on firms' high value business performance. *Information Systems Frontiers*, 20(2), 209-222. <https://doi.org/10.1007/s10796-016-9720-4>
- Qaffas, A. A., Ilmudeen, A., Almazmomi, N. K., & Alharbi, I. M. (2023). The impact of big data analytics talent capability on business intelligence infrastructure to achieve firm performance. *Foresight*, 25(3), 448-464. <https://doi.org/10.1108/FS-01-2021-0002>
- Saeed, M., Adiguzel, Z., Shafique, I., & Kalyar, M. N. (2023). Big data analytics-enabled dynamic capabilities and firm performance: Examining the roles of marketing ambidexterity and environmental dynamism. *Business Process Management Journal*, 29(4), 1204-1226. <https://doi.org/10.1108/BPMJ-01-2023-0015>
- Shokouhyar, S., Seddigh, M. R., & Panahifar, F. (2020). Impact of big data analytics capabilities on supply chain sustainability: A case study of Iran. *World Journal of Science, Technology and Sustainable Development*, 17(1), 33-57. <https://doi.org/10.1108/WJSTSD-06-2019-0031>
- Singh, S. K., & Del Giudice, M. (2019). Big data analytics, dynamic capabilities and firm performance. *Management Decision*, 57(8), 1729-1733. <https://doi.org/10.1108/MD-08-2019-020>
- Su, X., Zeng, W., Zheng, M., Jiang, X., Lin, W., & Xu, A. (2022). Big data analytics capabilities and organizational performance: The mediating effect of dual innovations. *European Journal of Innovation Management*, 25(4), 1142-1160. <https://doi.org/10.1108/EJIM-10-2020-0431>
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350. <https://doi.org/10.1002/smj.640>
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- Umar, S., & Monday, B. (2025). Data analytics and competitiveness of small and medium scale enterprises in FCT, Abuja-Nigeria. *Abuja Journal of Business and Management*, 3(1), 67-81.
- Wang, Y., Kung, L., & Byrd, T. A. (2018). Big data analytics: Understanding its capabilities and potential benefits for healthcare organizations. *Technological Forecasting and Social Change*, 126, 3-13. <https://doi.org/10.1016/j.techfore.2015.12.019>