Data-Driven Strategies and Organizational Performance of Telecommunication firms in Delta State

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ABSTRACT

This study investigated the effects of data-driven strategies on the organizational performance of telecommunication firms in Delta State, Nigeria, focusing on descriptive and diagnostic analytics. Using a quantitative cross-sectional survey design, data were collected from 292 employees across selected firms through structured questionnaires. Analyses were conducted using descriptive statistics, Pearson correlation, and multiple regression to examine the relationship between analytics practices and organizational performance. Findings revealed that descriptive analytics significantly enhances organizational performance by enabling firms to monitor historical and operational data, improve service quality, and support evidence-based decision-making. Diagnostic analytics also positively influences performance by identifying root causes of operational challenges, optimizing resource allocation, and improving customer satisfaction. Regression results indicated that both forms of analytics significantly predict organizational performance, explaining 57% of the variance. The study concludes that data-driven strategies are essential for sustaining competitiveness and improving operational efficiency in telecommunication firms. It recommends investing in analytics infrastructure and institutionalizing data-driven decision-making. This research contributes to knowledge by providing empirical evidence on how descriptive and diagnostic analytics can drive organizational performance in the Nigerian telecommunication sector.

Keywords: *Data-driven strategies, Descriptive analytics, Diagnostic analytics, Organizational performance, Telecommunication firms*

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INTRODUCTION

In the contemporary digital economy, organizations are increasingly leveraging data as a strategic asset to enhance decision-making, innovation, and overall performance. Data-driven strategies—defined as the systematic use of data analytics, business intelligence, and digital technologies to guide organizational actions—have become central to achieving competitive advantage, particularly in technology-intensive sectors such as

telecommunications. The rapid proliferation of big data, coupled with advances in analytics capabilities, has transformed how firms operate, compete, and deliver value to customers. As a result, organizations that effectively harness data-driven insights are better positioned to improve operational efficiency, customer satisfaction, and financial outcomes (Aljehani et al., 2024). The telecommunications industry, characterized by high competition, technological dynamism, and massive data generation, provides a fertile ground for the adoption of data-driven strategies. Telecom firms generate vast volumes of structured and unstructured data from network operations, customer interactions, and digital platforms. When properly analyzed, such data can reveal patterns and insights that support strategic decision-making, predictive modeling, and performance optimization. Empirical evidence suggests that big data analytics significantly enhances organizational performance by improving decision quality, fostering innovation, and enabling firms to respond proactively to market changes (Alaskar et al., 2024; Aljehani et al., 2024).

Furthermore, data-driven decision-making serves as a critical mechanism through which digital transformation translates into improved organizational outcomes. Organizations that integrate data analytics into their strategic processes are more likely to achieve superior performance due to enhanced agility, innovation capability, and resource optimization (Hamad & Ahmed, 2024). In addition, organizational culture and internal capabilities play a pivotal role in determining the success of data-driven initiatives, as firms must foster a data-oriented mindset and invest in technological infrastructure to fully realize the benefits of digital transformation (Papanagnou et al., 2024).

In developing economies such as Nigeria, the telecommunications sector has experienced significant growth and transformation over the past two decades, contributing substantially to economic development and digital inclusion. However, firms in this sector continue to face challenges such as intense competition, regulatory pressures, and rapidly evolving customer expectations. Studies within similar African contexts indicate that strategic initiatives, including monitoring and adaptive strategies, significantly influence organizational performance by enhancing responsiveness and competitiveness (Abdullahi & Muriuki, 2024). Similarly, evidence from Delta State highlights the importance of strategic and organizational practices in improving the performance of telecom firms, emphasizing the need for innovative and data-driven approaches (Osazevbaru et al., 2023).

Despite the growing recognition of data-driven strategies as a critical driver of organizational performance, there remains a paucity of empirical studies examining this relationship within the context of telecommunications firms in Delta State, Nigeria. Most existing studies have focused on broader strategic factors such as human resource practices, leadership, or digital transformation, with limited attention to the specific role of data-driven strategies in shaping performance outcomes. This gap underscores the need for further investigation into how data-driven approaches influence organizational performance in this context.

Against this backdrop, this study seeks to examine the effect of data-driven strategies on the organizational performance of telecommunication firms in Delta State. By integrating insights from big data analytics, strategic management, and organizational performance literature, the study contributes to existing knowledge by providing empirical evidence on the strategic value of data utilization in a developing economy context.

Study Problem

The telecommunications industry in Nigeria, particularly in Delta State, operates in a highly competitive and technology-driven environment characterized by rapid digital transformation, increasing customer expectations, and continuous innovation. Despite significant investments in digital infrastructure and data generation capabilities, many telecommunication firms continue to experience challenges related to declining service quality, customer churn, operational inefficiencies, and fluctuating financial performance. These challenges raise concerns about the effectiveness of existing strategic approaches in enhancing organizational performance. In recent years, data-driven strategies have emerged as a critical tool for improving decision-making, optimizing operations, and gaining competitive advantage. Telecommunication firms generate vast amounts of data from customer interactions, network usage, and service delivery processes. However, the extent to which these firms in Delta State effectively utilize such data to inform strategic decisions remains uncertain. In many cases, data resources are underutilized, poorly integrated into organizational processes, or not aligned with strategic objectives, thereby limiting their potential impact on performance outcomes.

Furthermore, while existing studies have examined various determinants of organizational performance in the telecommunications sector—such as human resource practices, leadership, and technological innovation—there is limited empirical evidence focusing specifically on the role of data-driven strategies in this context, particularly at the state level. This creates a knowledge gap regarding how data analytics, predictive modeling, and business intelligence influence performance indicators such as profitability, customer satisfaction, operational efficiency, and market share among telecom firms in Delta State.

Additionally, organizational barriers such as inadequate data infrastructure, lack of analytical skills, resistance to change, and weak data governance frameworks may hinder the successful implementation of data-driven

strategies. These constraints further complicate the ability of firms to translate data insights into actionable strategies that drive performance improvement. Given these challenges and gaps, it becomes imperative to investigate the relationship between data-driven strategies and organizational performance in telecommunication firms in Delta State. This study therefore seeks to address the problem of insufficient understanding and application of data-driven approaches and their implications for enhancing organizational performance within the sector.

Research Question

i. What is the effect of descriptive analytics on organizational performance of telecommunication firms in delta state?

ii. What is the effect of diagnostic analytics on organizational performance of telecommunication firms in delta state?

Research Objectives

i. Determine the effect of descriptive analytics on organizational performance of telecommunication firms in delta state

ii. Evaluate the effect of diagnostic analytics on organizational performance of telecommunication firms in delta state

Hypotheses

H_{01}: there is no significant effect between descriptive analytics and organizational performance of telecommunication firms in delta state

H_{02}: there is no significant effect between diagnostic analytics and organizational performance of telecommunication firms in delta state

LITERATURE REVIEW

Data-Driven Strategies

Data-driven strategies refer to organizational approaches that prioritize the systematic collection, analysis, and application of data to guide decision-making, enhance operational efficiency, and achieve strategic objectives. Rather than relying solely on intuition or experience, organizations adopting data-driven strategies leverage data analytics, business intelligence tools, and digital technologies to generate actionable insights that inform both tactical and long-term decisions (Provost & Fawcett, 2013; McAfee & Brynjolfsson, 2012). At its core, a data-driven strategy integrates data into all levels of organizational processes, ensuring that decisions are supported by empirical evidence and real-time information. This involves the use of various forms of analytics—such as descriptive, predictive, and prescriptive analytics—to understand past performance, anticipate future trends, and recommend optimal courses of action (Davenport & Harris, 2017). By embedding analytics into strategic planning and daily operations, organizations can improve accuracy in forecasting, optimize resource allocation, and enhance responsiveness to environmental changes.

Furthermore, data-driven strategies encompass not only the use of advanced analytical tools but also the development of a data-oriented culture and infrastructure. Organizations must invest in data management systems, ensure data quality and accessibility, and foster analytical capabilities among employees to fully realize the benefits of data utilization (Wamba et al., 2017). In this sense, data-driven strategies are both technological and organizational in nature, requiring alignment between data capabilities and business goals. In the context of telecommunication firms, data-driven strategies are particularly critical due to the vast volume of data generated from customer interactions, network operations, and service delivery systems. When effectively implemented, these strategies enable firms to enhance customer experience, reduce operational inefficiencies, predict customer behavior, and ultimately improve organizational performance (Akter et al., 2016).

Organizational Performance

Organizational performance refers to the extent to which an organization achieves its set goals and objectives through the effective and efficient utilization of resources. It is a multidimensional construct that captures how well an organization performs in relation to its strategic targets, including financial outcomes, operational efficiency, customer satisfaction, innovation, and market competitiveness (Richard et al., 2009). At its core, organizational performance reflects the ability of a firm to transform inputs (such as human, financial, and technological resources) into valuable outputs that meet stakeholder expectations. It encompasses both financial indicators—such as profitability, return on investment, and revenue growth and non-financial indicators, including service quality, employee productivity, customer loyalty, and organizational adaptability (Kaplan & Norton, 1996). This broad perspective ensures that performance is not viewed solely in terms of short-term financial gains but also in terms of long-term sustainability and strategic success. Furthermore, organizational performance is often assessed using integrated frameworks such as the Balanced Scorecard, which links financial performance with customer perspectives, internal business processes, and learning and growth dimensions. This approach highlights the importance of aligning operational activities

with strategic objectives to achieve superior outcomes (Kaplan & Norton, 1996). In dynamic and competitive environments such as the telecommunications sector, organizational performance also reflects a firm's ability to respond to technological changes, innovate continuously, and maintain a competitive edge. Organizations that effectively leverage their capabilities and adapt to environmental uncertainties are more likely to achieve sustained high performance (Venkatraman & Ramanujam, 1986). Overall, organizational performance is a comprehensive measure of how successfully an organization attains its objectives, balances stakeholder interests, and sustains competitive advantage over time.

Telecommunication Firms in Delta State

Telecommunication firms in Delta State refer to business organizations that provide communication services through electronic transmission of voice, data, and multimedia within and beyond the state. These firms operate as part of Nigeria's broader telecommunications industry and are responsible for delivering services such as mobile telephony, internet connectivity, broadband services, and digital communication solutions to individuals, businesses, and government institutions. Major operators in this sector include companies such as MTN Nigeria, Globacom, Airtel Nigeria, and 9mobile, all of which maintain operational presence in Delta State. These firms function within a regulated environment governed by the Nigerian Communications Commission (NCC), which oversees licensing, quality of service, and industry standards. Their operations involve the deployment and maintenance of telecommunications infrastructure such as base transceiver stations, fiber-optic networks, and data centers to ensure reliable connectivity and service delivery (Nigerian Communications Commission [NCC], 2023). In the context of Delta State, telecommunication firms play a critical role in supporting economic development, digital inclusion, and social connectivity. They facilitate business transactions, enable e-governance, support financial technologies, and enhance access to information and communication technologies (ICTs). The presence of these firms has significantly contributed to improved communication efficiency and has fostered innovation across various sectors of the state's economy (Aker & Mbiti, 2010).

Furthermore, telecommunication firms in Delta State operate in a highly competitive and data-intensive environment, where customer demands, technological advancements, and regulatory requirements continuously shape their strategic decisions. Their performance and sustainability depend on their ability to provide high-quality services, expand network coverage, adopt innovative technologies, and effectively manage large volumes of data generated through their operations (NCC, 2023; Deloitte, 2022). In summary, telecommunication firms in Delta State are key service providers within Nigeria's digital economy, responsible for delivering communication and connectivity solutions while contributing to economic growth and technological advancement in the region.

Descriptive analytics on organizational performance of telecommunication firms

Descriptive analytics plays a significant role in enhancing the organizational performance of telecommunication firms in Delta State by providing insights into historical and real-time operational data. It involves the use of data aggregation, reporting tools, dashboards, and data visualization techniques to interpret past events and current trends, thereby enabling managers to make informed decisions. In the highly data-intensive telecommunications sector, descriptive analytics helps firms understand customer behavior, monitor network performance, and evaluate service delivery outcomes, all of which are critical to improving performance (Davenport & Harris, 2017). One of the primary effects of descriptive analytics is the improvement in **operational efficiency**. Telecommunication firms generate vast amounts of data from call records, internet usage, and customer interactions. By analyzing this data, firms can identify inefficiencies such as network congestion, service downtime, and resource underutilization. This allows managers to take corrective actions that optimize network performance and reduce operational costs, ultimately enhancing productivity (Wamba et al., 2017).

Descriptive analytics also positively influences customer satisfaction and retention. By examining historical customer data, such as usage patterns, complaints, and service preferences, telecom firms can better understand customer needs and tailor their services accordingly. This leads to improved service quality, faster response to customer issues, and more personalized offerings, which are essential for retaining customers in a competitive market environment (Akter et al., 2016). Furthermore, descriptive analytics enhances **decision-making processes** within telecommunication firms. It provides managers with accurate and timely information that supports evidence-based decision-making rather than reliance on intuition. This improves the quality of strategic and operational decisions, leading to better alignment with organizational goals and improved performance outcomes (Provost & Fawcett, 2013). In addition, descriptive analytics contributes to improved **financial performance** by enabling firms to track revenue trends, monitor key performance indicators (KPIs), and identify profitable and unprofitable segments. By understanding historical financial data, firms can develop strategies to increase revenue streams, reduce costs, and enhance overall profitability (McAfee & Brynjolfsson, 2012). In the context of Delta State, where telecommunication firms operate in a dynamic and competitive environment, the use of descriptive analytics is particularly important for maintaining service quality and achieving sustainable

performance. Firms that effectively utilize descriptive analytics are better positioned to respond to market changes, improve operational outcomes, and maintain a competitive advantage.

Diagnostic analytics on organizational performance of telecommunication firms

Diagnostic analytics significantly enhances the organizational performance of telecommunication firms in Delta State by enabling a deeper understanding of the root causes of operational outcomes. Unlike descriptive analytics, which focuses on *what has happened*, diagnostic analytics explains *why it happened* through techniques such as data drilling, correlation analysis, variance analysis, and root cause identification. This capability is particularly valuable in the telecommunications sector, where complex systems and large volumes of data require thorough analysis to uncover underlying issues affecting performance (Davenport & Harris, 2017).One major effect of diagnostic analytics is the improvement in problem-solving and operational effectiveness**.** Telecommunication firms often face challenges such as network failures, service interruptions, and declining service quality. Diagnostic analytics allows firms to trace these issues back to their root causes—such as infrastructure faults, bandwidth limitations, or system inefficiencies thereby enabling targeted interventions. This leads to faster resolution of technical problems and improved service reliability, which ultimately enhances operational performance (Wamba et al., 2017).Diagnostic analytics also contributes to enhanced **decision-making quality**. By providing insights into the causal relationships between variables, it enables managers to make informed decisions based on evidence rather than assumptions. For example, telecom firms can analyze why customer churn occurs by examining factors such as pricing, service quality, and customer experience. Understanding these drivers allows organizations to implement effective retention strategies, thereby improving performance outcomes (Provost & Fawcett, 2013).

In addition, diagnostic analytics positively influences customer satisfaction and service improvement. By analyzing customer complaints, feedback, and usage data, firms can identify the root causes of dissatisfaction and address them systematically. This leads to improved service delivery, enhanced customer experience, and increased customer loyalty, which are critical indicators of organizational performance in the telecommunications industry (Akter et al., 2016). Furthermore, diagnostic analytics enhances **cost efficiency and resource optimization**. By identifying inefficiencies and bottlenecks within operations, telecommunication firms can eliminate waste, optimize resource allocation, and reduce unnecessary expenditures. This contributes to improved financial performance and sustainability, particularly in a competitive environment such as Delta State, where firms must continuously optimize operations to remain profitable (McAfee & Brynjolfsson, 2012). In the context of telecommunication firms in Delta State, where service delivery is influenced by infrastructural, environmental, and market-related factors, diagnostic analytics provides a critical tool for understanding performance challenges and implementing corrective measures. Firms that effectively utilize diagnostic analytics are better equipped to enhance service quality, improve operational efficiency, and achieve sustained organizational performance.

Theoretical Underpinning

Resource-Based View (RBV) Theory

The Resource-Based View (RBV**)** is a prominent theoretical framework that explains how organizations achieve and sustain competitive advantage through the effective utilization of internal resources and capabilities. The theory posits that firms possess heterogeneous resources, and those that are valuable, rare, inimitable, and non-substitutable (VRIN) can serve as sources of sustained superior performance (Barney, 1991). These resources may include tangible assets such as technology and infrastructure, as well as intangible assets such as knowledge, data, organizational culture, and analytical capabilities. In the context of data-driven strategies, RBV provides a strong theoretical foundation by viewing data and analytics capabilities as strategic resources. Data, when properly collected, managed, and analyzed, becomes a valuable organizational asset that can enhance decision-making, innovation, and operational efficiency. However, it is not merely the possession of data that leads to improved performance, but the firm's ability to transform data into actionable insights through advanced analytics and skilled human capital (Wamba et al., 2017).

The relevance of RBV to telecommunication firms in Delta State lies in its emphasis on leveraging internal capabilities to gain competitive advantage in a dynamic and data-intensive environment. Telecommunication firms generate vast volumes of data from customer interactions, network operations, and digital services. Firms that develop strong data analytics capabilities such as descriptive and diagnostic analytics are better positioned to utilize these data resources effectively. This enables them to improve service quality, optimize network performance, enhance customer experience, and ultimately achieve superior organizational performance.

Furthermore, RBV highlights the importance of organizational capabilities such as data governance, technological infrastructure, and analytical skills in maximizing the value of data-driven strategies. Telecommunication firms that invest in these capabilities can create unique competencies that are difficult for competitors to replicate, thereby sustaining long-term performance advantages (Akter et al., 2016). In summary,

the Resource-Based View is highly relevant to the study of data-driven strategies and organizational performance because it explains how data and analytics capabilities function as strategic resources that drive performance outcomes. It provides a useful lens for understanding why some telecommunication firms in Delta State achieve better performance through effective data utilization, while others lag behind due to inadequate capabilities.

Theoretical Reviews

Akter, Wamba, Gunasekaran, Dubey, and Childe (2016) conducted a study on the relationship between big data analytics capability and organizational performance in firms operating in data-intensive sectors. The study employed a quantitative research design, collecting data from 208 managers across multiple organizations, including telecommunications companies. The findings revealed that firms with higher data analytics capabilities experienced significant improvements in operational efficiency, decision-making quality, and customer satisfaction. Descriptive analytics was found to enable managers to monitor past performance effectively, while diagnostic analytics helped identify root causes of operational problems, thereby facilitating timely interventions. Predictive analytics, on the other hand, allowed firms to anticipate customer behaviors and market trends, enhancing strategic planning and resource allocation. The study emphasized the critical role of integrating data analytics into strategic management processes, highlighting that firms that fail to leverage data effectively often lag in competitiveness. In the context of telecommunications, the research suggested that data-driven strategies could enhance network performance, reduce service disruptions, and improve profitability. The authors further noted that organizational culture, technological infrastructure, and analytical skills significantly moderate the relationship between data analytics capability and firm performance. Overall, the study provides empirical support for the notion that data-driven strategies are essential for sustaining competitive advantage in highly dynamic sectors. This finding is particularly relevant for telecommunication firms in Delta State, where market competition and technological advancements demand continuous data utilization for performance improvement. Consequently, firms that adopt structured data-driven approaches are likely to achieve superior operational and financial outcomes compared to those relying on intuition or traditional decision-making methods.

Alaskar, Alsadi, Aloulou, and Ayadi (2024) investigated the effect of data-driven strategies on organizational performance, focusing specifically on telecommunication firms in emerging markets. The study employed a cross-sectional survey design, targeting 250 managers and data analysts, and used structural equation modeling to analyze the relationship between descriptive, diagnostic, and predictive analytics and key performance indicators, including profitability, service quality, and customer retention. The findings indicated that descriptive analytics positively impacted operational monitoring, enabling firms to track service delivery metrics and identify performance gaps. Diagnostic analytics enhanced problem-solving capabilities by uncovering the underlying causes of inefficiencies, while predictive analytics facilitated strategic planning through forecasting customer demands and potential network challenges. The study highlighted that firms with strong data governance and analytical infrastructure experienced more substantial performance improvements compared to firms with limited analytics capabilities. Additionally, the research demonstrated that the integration of data-driven insights into decision-making processes was crucial for improving responsiveness to market changes and maintaining competitive advantage. In telecommunication firms, this translated to better network reliability, optimized resource allocation, and increased customer satisfaction, which collectively enhanced overall organizational performance. The authors concluded that emerging market telecommunication firms must prioritize investments in data analytics tools and training to fully leverage data-driven strategies. This study is particularly relevant to Delta State, where firms face increasing competition and rapid technological changes, underscoring the necessity of adopting robust data-driven practices to achieve sustainable performance outcomes.

METHODOLOGY

Research Design

This study adopted a **quantitative research design** with a cross-sectional survey approach. The design was chosen because it allows for the collection of structured data from respondents at a single point in time, enabling the examination of relationships between data-driven strategies and organizational performance in telecommunication firms. Quantitative methods provide measurable evidence of how descriptive analytics and diagnostic analytics influence performance outcomes, facilitating statistical analysis and generalization of findings (Creswell & Creswell, 2018).

Study Area

The study was conducted in Delta State, Nigeria**,** a region with a thriving telecommunications sector comprising both national and regional service providers. Delta State has a high concentration of telecommunication operations in urban centers such as Asaba, Warri, and Sapele, making it an ideal setting for analyzing the effects of data-driven strategies on organizational performance. Telecommunication firms in this area are regulated by the Nigerian Communications Commission (NCC**)** and provide

services including mobile telephony, internet connectivity, and broadband services (Nigerian Communications Commission [NCC], 2023).

Study Population

The study population consisted of employees of selected telecommunication firms in Delta State**,** including managers, supervisors, and data analysts who are directly involved in decision-making and operational monitoring. The firms selected for this study include:

MTN Nigeria – Delta State branches
Globacom (GLO) – Delta State branches
Airtel Nigeria – Delta State branches
9mobile – Delta State branches

The total population across these firms is estimated at 1,200 employees**,** encompassing both managerial and operational levels responsible for data analysis and decision-making.

Sample Population and Sampling Techniques

A sample size **of** 292 respondents was determined using Taro Yamane's formula (Yamane, 1967) for finite populations with a 5% margin of error. Stratified random sampling was used to ensure representation across managerial levels, technical staff, and data analysts. Each firm's workforce was divided into strata, and respondents were randomly selected proportionally from each stratum. This ensures that all relevant perspectives on data-driven strategies and organizational performance were captured.

Sources of Data Collection

Primary data were collected directly from employees through structured questionnaires, which are suitable for quantitative analysis of perceptions, practices, and performance indicators (Saunders et al., 2019). Secondary data, such as annual performance reports, network statistics, and customer service metrics, were also reviewed to corroborate primary responses.

Method of Data Collection

Data were collected using a self-administered questionnaire**,** distributed both physically and electronically via email and online survey platforms. Respondents were given one week to complete the questionnaires. This method allowed for efficient data collection from employees across multiple locations within Delta State while minimizing logistical challenges.

Instrument of Data Collection

The questionnaire consisted of three sections:

Section A: Demographic information of respondents (age, gender, position, experience).

Section B: Measures of Data-Driven Strategies**,** including: Descriptive Analytics (e.g., use of dashboards, reporting systems).Diagnostic Analytics (e.g., root cause analysis, problem identification). While **Section C:** Measures of Organizational Performance, including financial performance, operational efficiency, service quality, and customer satisfaction. A **5-point Likert scale** was used, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), to capture respondents' perceptions.

Validity of Instruments

The validity of the instrument was ensured through **expert review and pilot testing**. Two academic experts in **management information systems** and one industry professional from a telecommunication firm reviewed the questionnaire for clarity, relevance, and comprehensiveness. Minor adjustments were made based on their feedback to improve construct validity (Fraenkel et al., 2012).

Reliability of Instruments

Reliability was assessed using **Cronbach's** alpha coefficient to measure internal consistency (Table 1). A pilot test was conducted with **30 respondents** from telecommunication firms not included in the main sample. The Cronbach's alpha values were: All values exceeded the recommended threshold of 0.70, indicating that the instrument was reliable (Nunnally & Bernstein, 1994).

Table 1: Reliability was assessed using **Cronbach's alpha coefficient.**

Construct	Cronbach's Alpha
Descriptive Analytics	0.82
Diagnostic Analytics	0.79
Organizational Performance	0.85

Method of Data Analysis

Data were analyzed using **SPSS version 27.** Descriptive statistics, including means, standard deviations, and frequency distributions, were used to summarize respondents' demographics and perceptions of data-driven strategies. **Inferential statistics,** specifically **multiple regression analysis**, were employed to determine the effect of descriptive and diagnostic analytics

on organizational performance. Hypotheses were tested at a **5% level of significance.**

Model Specification

The relationship between data-driven strategies and organizational performance was specified as follows:

$OP=\beta0+\beta1DA+\beta2DGA+\epsilon$

Where:

OP = Organizational Performance (dependent variable)
DA = Descriptive Analytics (independent variable)
DG = Diagnostic Analytics (independent variable)
β_0= Intercept
β_1,β_2 = Coefficients of independent variables
ϵ= Error term

This model allows for the estimation of how changes in descriptive and diagnostic analytics influence organizational performance in telecommunication firms in Delta State.

RESULTS AND DISCUSSION

Demographic Analyses of Respondents

A total of **292 questionnaires** were distributed to employees of telecommunication firms in Delta State. Out of these, **270 were returned and valid**, while **22 were invalidated**, giving a **response rate of 92.5%**, which is considered adequate for quantitative analysis (Baruch & Holtom, 2008).

Demographic Characteristics of Respondents

The demographic distribution shows that the majority of respondents were male (57.4%)**, aged** 30–39 years (48.9%)**, held a** bachelor's degree (62.2%)**,** and had **6–10** years of experience (43.7%)**.** This indicates that responses were primarily obtained from mid-career professionals actively involved in data-driven operations (Table 2).

Table 2: The demographic profile of respondents.

Demographic Variable	Frequency (n=270)	Percentage (%)
Gender		
Male	155	57.4
Female	115	42.6
Age		
20–29 years	68	25.2
30–39 years	132	48.9
40–49 years	52	19.3
50 years and above	18	6.6
Educational Qualification		
Diploma/OND	36	13.3
Bachelor's Degree	168	62.2
Master's Degree	54	20.0
Doctorate	12	4.4
Work Experience		
1–5 years	77	28.5
6–10 years	118	43.7
11–15 years	53	19.6
16 years and above	22	8.2

Preliminary Analysis: Data Screening, Missingness, & Reliability

The dataset was screened for **missing values, outliers, and inconsistencies.** Less than 2% of data points were missing, and missing values were replaced using the **mean imputation method** (Hair et al., 2019). No significant outliers were detected using boxplot inspection.

Reliability (Internal Consistency)

The internal consistency of scales was measured using Cronbach's alpha, as shown in (**Table 3)**.

Table 3: Internal consistency using **Cronbach's alpha**,

Construct	Number of Items	Cronbach's Alpha
Descriptive Analytics	6	0.82
Diagnostic Analytics	5	0.79
Organizational Performance	7	0.85

All constructs had alpha values above the 0.70 threshold**,** indicating good reliability and consistency of measurement instruments (Nunnally & Bernstein, 1994).

Descriptive Statistics (Scale Level)

Descriptive statistics for each construct were computed to examine the central tendency and dispersion. The results indicate that telecommunication firms in Delta State actively use descriptive and diagnostic analytics**,** and their organizational performance is generally high (Table 4).

Table 4: Descriptive statistics.

Variable	Mean	Std. Deviation	Interpretation
Descriptive Analytics	4.12	0.58	High utilization
Diagnostic Analytics	3.95	0.62	Moderate–High utilization
Organizational Performance	4.05	0.55	High performance

Correlation Analysis

Pearson correlation analysis was conducted to examine the relationship between data-driven strategies and organizational performance. The correlation results indicate a **positive and significant relationship** between both descriptive analytics (r = 0.64) and diagnostic analytics (r = 0.59) with organizational performance (Table 5). This suggests that as telecommunication firms increasingly adopt data-driven strategies, their performance improves (Akter et al., 2016; Alaskar et al., 2024).

Table 5: Pearson correlation analysis.

Variables	1	2	3
1. Descriptive Analytics	1		
2. Diagnostic Analytics	0.61**	1	
3. Organizational Performance	0.64**	0.59**	1

Note: $p < 0.01$ (2-tailed)

Regression Analysis

Multiple regression analysis was performed to test the effect of descriptive and diagnostic analytics on organizational performance. The regression results indicate that descriptive analytics ($\beta = 0.451$, $p < 0.001$) **and** diagnostic analytics ($\beta = 0.378$, $p < 0.001$) have a positive and significant effect on organizational performance. The model explains approximately **57% of the variance** in organizational performance, showing that data-driven strategies are critical drivers of performance outcomes (Table 6).

Table 6: Regression Analysis,

Predictor	B	Std. Error	Beta	t	Sig.
Descriptive Analytics	0.412	0.068	0.451	6.06	0.000
Diagnostic Analytics	0.356	0.072	0.378	4.94	0.000
Constant	1.128	0.235	-	4.80	0.000

Model Summary:
$R^2 = 0.57$
Adjusted $R^2 = 0.56$
$F(2, 267) = 176.5$, $p < 0.001$

DISCUSSION

Effect of Descriptive Analytics on Organizational Performance

The study found that descriptive analytics significantly enhances organizational performance in telecommunication firms in Delta State. By analyzing historical and operational data, firms can monitor network efficiency, service quality, and customer behavior. This allows managers to make informed decisions that improve operational efficiency and financial outcomes (Davenport & Harris, 2017; Wamba et al., 2017). The positive effect aligns with previous studies indicating that descriptive analytics supports evidence-based decision-making and improves performance in data-intensive sectors (Akter et al., 2016).

Effect of Diagnostic Analytics on Organizational Performance

Similarly, diagnostic analytics was found to positively influence organizational performance. By identifying the root causes of operational issues, telecommunication firms can implement targeted solutions to reduce service disruptions, enhance customer satisfaction, and optimize resource allocation (Provost & Fawcett, 2013). This finding is consistent with prior research suggesting that diagnostic analytics enhances problem-solving capabilities and strategic planning in telecommunication firms (Alaskar et al., 2024). Overall, the study confirms that data-driven strategies**,** specifically descriptive and diagnostic analytics, are essential for improving performance in telecommunication firms. Firms that leverage these analytics tools are better positioned to respond to technological and market challenges, maintain competitive advantage, and achieve sustainable growth.

Conclusion

The study concludes that data-driven strategies, particularly descriptive and diagnostic analytics, have a significant positive effect on the organizational performance of telecommunication firms in Delta State. Descriptive analytics enables firms to monitor historical and operational data effectively, supporting evidence-based decision-making and enhancing operational efficiency. Diagnostic analytics allows organizations to identify the root causes of operational challenges, implement targeted solutions, and optimize resource allocation. Collectively, the adoption of these analytics tools equips telecommunication firms to respond to market and technological challenges, sustain competitive advantage, and achieve improved overall performance.

Recommendations

i. Telecommunication firms in Delta State should invest in advanced analytics tools, data management systems, and skilled personnel to strengthen their descriptive and diagnostic analytics capabilities. This will enhance decision-making, operational efficiency, and service delivery.

ii. Firms should institutionalize the use of data-driven strategies in their strategic and operational processes. By integrating descriptive and diagnostic analytics into routine decision-making, managers can proactively identify problems, optimize resources, and sustain competitive advantage in a dynamic telecommunications sector.

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