



## ARTIFICIAL INTELLIGENCE AND STRATEGIC DECISION-MAKING: EXAMINING THE IMPACT OF AI-DRIVEN ANALYTICS ON ORGANIZATIONAL PERFORMANCE

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**ABSTRACT:** *This study examined the impact of artificial intelligence (AI)-driven analytics on organizational performance. Specifically, the study investigated the influence of predictive analytics, decision automation, and data-driven strategic planning on organizational performance. The study adopted a survey research design. Data were collected from 320 managers and senior staff of selected manufacturing, banking, telecommunications, and service organizations in Nigeria. A sample size of 178 respondents was determined using Taro Yamane's formula, while data were analyzed using descriptive statistics and multiple regression analysis. Findings revealed that predictive analytics significantly improves organizational profitability ( $\beta = 0.381, p < 0.05$ ), decision automation positively influences organizational productivity ( $\beta = 0.294, p < 0.05$ ), and data-driven strategic planning has a significant positive impact on organizational efficiency ( $\beta = 0.427, p < 0.05$ ). The study concludes that AI-driven analytics significantly enhances organizational performance through improved predictive analytics, decision automation, and data-driven strategic planning. The study recommends increased investment in AI infrastructure, employee training, and data governance systems to maximize organizational benefits from AI technologies.*

**KEYWORDS:** Artificial intelligence, Strategic Decision-Making, AI Analytics, Organizational Performance, Predictive Analytics.



## INTRODUCTION

### Background to the Study

The contemporary business environment is characterized by rapid technological advancements, increasing market competition, globalization, and continuously evolving customer expectations. Organizations are increasingly confronted with complex strategic decisions that require accurate, timely, and reliable information for effective planning and execution. In today's digital economy, the ability of organizations to make informed strategic decisions has become a critical determinant of organizational survival, competitiveness, and long-term success (Dwivedi et al., 2023). Consequently, business leaders are seeking innovative tools and technologies that can enhance decision-making processes and improve organizational performance.

One of the most significant technological innovations influencing modern organizational decision-making is Artificial Intelligence (AI). Artificial Intelligence refers to the simulation of human intelligence by machines and computer systems capable of learning, reasoning, problem-solving, and making decisions (Russell & Norvig, 2021). AI technologies include machine learning, deep learning, natural language processing, expert systems, robotics, and predictive analytics. These technologies have transformed how organizations collect, process, analyze, and utilize data for strategic purposes (Chatterjee et al., 2023).

The increasing availability of big data has further accelerated the adoption of AI-driven analytics in organizations. Every day, organizations generate and collect massive volumes of data from customers, suppliers, competitors, social media platforms, financial transactions, and internal operations. While such data can provide valuable insights, the sheer volume and complexity often exceed the analytical capabilities of traditional decision-making approaches (Wamba et al., 2022). Consequently, organizations are increasingly relying on AI-driven analytics to convert raw data into meaningful information that supports strategic decision-making.

AI-driven analytics refers to the application of artificial intelligence technologies to analyze large and complex datasets, identify hidden patterns, generate predictions, and provide recommendations for managerial actions (Zhao et al., 2023). Through machine learning algorithms and advanced analytical techniques, AI-driven systems can process data at unprecedented speed and accuracy, enabling organizations to make evidence-based decisions. Unlike conventional analytical tools that rely primarily on historical data analysis, AI-driven analytics can learn from new data continuously, adapt to changing business environments, and improve the quality of decisions over time (Keding, 2022).

Strategic decision-making involves the formulation and implementation of decisions that determine an organization's long-term direction, competitive positioning, and resource allocation. Such decisions often involve significant uncertainty, risk, and complexity. Traditionally, strategic decisions were based largely on managerial intuition, experience, and limited information. However, the increasing complexity of business environments has made these traditional approaches insufficient for addressing contemporary organizational challenges (Brynjolfsson & McAfee, 2017). AI-driven analytics provides organizations with the capability to analyze multiple scenarios, forecast future outcomes, assess risks, and identify



optimal strategic alternatives, thereby improving decision quality and organizational effectiveness (Dwivedi et al., 2023).

Organizations across various industries are increasingly integrating AI-driven analytics into their strategic processes. In the banking sector, AI is used for fraud detection, risk assessment, customer segmentation, and credit scoring. Manufacturing firms employ AI technologies to optimize production processes, predict equipment failures, and improve supply chain management. Telecommunications companies use AI-driven analytics to enhance customer experiences, predict market trends, and improve operational efficiency (Ransbotham et al., 2023). Similarly, organizations in healthcare, retail, education, and public administration are leveraging AI technologies to improve strategic planning and performance outcomes.

The adoption of AI-driven analytics offers numerous benefits to organizations. These include enhanced decision accuracy, improved operational efficiency, increased innovation, better customer relationship management, reduced costs, and stronger competitive advantage (Zhang et al., 2024). AI systems enable managers to identify emerging opportunities and threats more effectively, thereby facilitating proactive strategic responses. Furthermore, AI-driven analytics supports real-time decision-making by providing instant insights from continuously generated data streams (Chatterjee et al., 2023).

Despite these potential benefits, the implementation of AI-driven analytics is not without challenges. Many organizations face difficulties related to technological infrastructure, data quality, cybersecurity risks, ethical concerns, organizational culture, and employee resistance to technological change (Jöhnk et al., 2022). The successful integration of AI technologies often requires substantial investments in technology, employee training, and organizational restructuring. Moreover, concerns regarding algorithmic bias, privacy violations, and transparency have raised important questions about the responsible use of AI in organizational settings (Dwivedi et al., 2023).

In recent years, scholars and practitioners have increasingly emphasized the strategic importance of AI-driven analytics in enhancing organizational performance. Organizational performance refers to the extent to which an organization achieves its objectives effectively and efficiently (Richard et al., 2009). It encompasses financial outcomes, operational efficiency, customer satisfaction, innovation capability, market share growth, and overall competitiveness. Evidence from existing studies suggests that organizations that successfully implement AI-driven analytics tend to outperform their competitors in several performance dimensions (Wamba et al., 2022; Zhang et al., 2024). However, the magnitude and nature of these impacts may vary across industries, organizational contexts, and levels of AI maturity.

In developing economies such as Nigeria, the adoption of AI technologies is gradually increasing as organizations seek to improve their competitiveness in both domestic and international markets. Nevertheless, empirical studies examining the relationship between AI-driven analytics and organizational performance within the Nigerian context remain relatively limited (Adeleke & Eze, 2024). Most existing studies have focused on developed economies where technological infrastructure, digital literacy, and organizational readiness are more advanced. Consequently, there is a need for context-specific empirical investigations to understand how AI-driven analytics influences organizational performance in Nigerian organizations.



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## Statement of the Problem

The increasing availability of data and rapid advancements in artificial intelligence technologies have created unprecedented opportunities for organizations to enhance their strategic decision-making processes (Dwivedi et al., 2023). Consequently, many organizations have invested heavily in AI-driven analytics systems with the expectation of improving efficiency, competitiveness, innovation, and overall organizational performance. Despite these substantial investments, evidence suggests that not all organizations have achieved the expected benefits associated with AI adoption (Ransbotham et al., 2023).

Many organizations continue to experience challenges in translating AI capabilities into measurable performance improvements. In some cases, organizations struggle with integrating AI technologies into existing strategic management processes, leading to underutilization of analytical capabilities. Others face difficulties related to poor data quality, inadequate technological infrastructure, lack of skilled personnel, cybersecurity concerns, and organizational resistance to technological change (Jöhnk et al., 2022). These challenges often limit the effectiveness of AI-driven initiatives and reduce the return on investment associated with AI implementation.

Furthermore, while AI technologies have demonstrated significant potential in enhancing strategic decision-making, there remains considerable uncertainty regarding the extent to which AI-driven analytics contributes to organizational performance. Existing studies have reported mixed findings concerning the effectiveness of AI adoption, with some studies indicating substantial performance improvements and others suggesting limited or insignificant impacts (Chatterjee et al., 2023; Zhang et al., 2024).

## Objectives of the Study

The broad objective of this study is to examine the impact of AI-driven analytics on organizational performance.

The specific objectives are to:

1. Examine the effect of predictive analytics on organizational profitability
2. Determine the influence of decision automation on organizational productivity
3. Assess the impact of data-driven strategic planning on operational efficiency

## Research Questions

The following research questions guide the study:

1. What effect does predictive analytics have on organizational profitability?
2. How does decision automation influence organizational productivity?
3. What impact does data-driven strategic planning have on operational efficiency?



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## Research Hypotheses

The following null hypotheses were formulated and tested in the study:

1. H01: Predictive analytics has no significant effect on organizational productivity.
2. H02: Decision automation has no significant influence on organizational profitability.
3. H03: Data-driven strategic planning has no significant impact on operational efficiency.

## Literature Review

### Conceptual Review

#### Artificial Intelligence (AI)

Artificial Intelligence (AI) refers to the capability of machines and computer systems to perform tasks that ordinarily require human intelligence, such as learning, reasoning, problem-solving, perception, language understanding, and decision-making (Dwivedi et al., 2023). AI integrates advanced computational techniques, algorithms, and data-processing capabilities to enable machines to mimic human cognitive functions and continuously improve their performance through learning and adaptation.

The concept of AI has evolved significantly over the years, transitioning from simple rule-based systems to sophisticated machine learning and deep learning models capable of analyzing complex datasets and generating actionable insights. According to Chatterjee et al. (2023), AI technologies have become fundamental tools for organizations seeking to enhance strategic decision-making, operational efficiency, and competitive advantage. Modern AI applications include machine learning, neural networks, natural language processing, computer vision, robotics, and expert systems, all of which contribute to improved organizational effectiveness.

The increasing digitalization of business activities has accelerated the adoption of AI technologies across industries. Organizations utilize AI to automate business processes, improve customer experiences, forecast market trends, optimize resource allocation, and support strategic planning (Zhang, Zhao & Xu, 2024). As a result, AI is increasingly recognized as a strategic resource capable of driving innovation, productivity, and sustainable organizational performance.

#### AI-Driven Analytics

AI-driven analytics refers to the application of artificial intelligence technologies, machine learning algorithms, predictive models, and data mining techniques to analyze large volumes of structured and unstructured data for decision-making purposes (Wamba et al., 2022). It enables organizations to transform raw data into valuable information that supports strategic and operational decisions.

Unlike traditional business analytics, AI-driven analytics can learn from historical and real-time data, identify hidden patterns, predict future outcomes, and continuously improve its



analytical accuracy over time (Dwivedi et al., 2023). This capability allows organizations to respond proactively to market changes, customer demands, and competitive pressures.

According to Zhao, Liu, and Chen (2023), AI-driven analytics enhances organizational agility by providing managers with timely, accurate, and predictive information needed to make informed decisions. The adoption of AI-driven analytics has become increasingly important as organizations seek to gain a competitive advantage in highly dynamic and data-intensive environments.

In this study, AI-driven analytics is operationalized using three dimensions: predictive analytics, decision automation, and data-driven strategic planning.

### **Predictive Analytics**

Predictive analytics is a branch of advanced analytics that utilizes statistical techniques, machine learning algorithms, and historical data to forecast future events and outcomes (Keding, 2022). It helps organizations identify trends, anticipate customer behavior, evaluate risks, and predict market developments.

Predictive analytics enables organizations to move beyond descriptive analysis by providing insights into what is likely to happen in the future. Through predictive models, organizations can forecast sales demand, customer preferences, financial risks, operational disruptions, and market opportunities (Ransbotham et al., 2023).

The adoption of predictive analytics improves strategic decision-making by reducing uncertainty and enabling managers to make proactive rather than reactive decisions. Wamba et al. (2022) argue that predictive analytics enhances organizational performance by improving forecasting accuracy, optimizing resource allocation, and reducing operational risks.

In manufacturing organizations, predictive analytics is commonly used for predictive maintenance and production planning, while financial institutions utilize predictive models for fraud detection and credit risk assessment (Zhang et al., 2024). Consequently, predictive analytics has emerged as a critical component of AI-driven analytics and a significant determinant of organizational success.

### **Decision Automation**

Decision automation refers to the use of AI-powered systems to automatically make decisions or execute actions based on predefined rules, algorithms, and machine learning capabilities with minimal human intervention (Jöhnk, Weißert, & Wyrski, 2022). It involves the automation of routine and repetitive decision-making processes to improve efficiency, consistency, and accuracy.

Organizations increasingly utilize decision automation in customer service, financial management, inventory control, procurement, and supply chain operations. Automated decision systems can process large amounts of information rapidly and consistently, thereby reducing human errors and improving operational effectiveness (Dwivedi et al., 2023).

According to Chatterjee et al. (2023), decision automation enhances organizational efficiency by reducing decision-making time and improving process standardization. Automated systems



also enable organizations to allocate human resources to more strategic and value-adding activities.

The growing adoption of AI-powered automation technologies demonstrates the increasing importance of decision automation as a strategic tool for improving organizational performance and competitiveness in the digital era.

### **Data-Driven Strategic Planning**

Data-driven strategic planning refers to the process of formulating and implementing organizational strategies based on empirical evidence and analytical insights generated from data rather than intuition or assumptions (Keding, 2022). It involves the use of AI-driven analytics to support long-term planning, strategic forecasting, and competitive positioning.

Traditional strategic planning often relied heavily on managerial experience and subjective judgment. However, advances in AI technologies have enabled organizations to integrate real-time data, predictive models, and analytical intelligence into strategic planning processes (Dwivedi et al., 2023).

Data-driven strategic planning enables organizations to evaluate market opportunities, identify emerging threats, allocate resources effectively, and develop competitive strategies based on objective information (Zhao et al., 2023). According to Ransbotham et al. (2023), organizations that utilize data-driven strategic planning are more likely to achieve superior business performance and maintain sustainable competitive advantages.

Furthermore, AI-supported strategic planning improves organizational adaptability and responsiveness to environmental changes, thereby enhancing long-term competitiveness and growth.

### **Organizational Performance**

Organizational performance refers to the degree to which an organization achieves its goals and objectives through the efficient and effective utilization of resources (Richard et al., 2009). It reflects an organization's ability to generate desired outcomes, maintain competitiveness, and achieve sustainable growth.

Modern perspectives on organizational performance recognize that performance extends beyond financial outcomes to include operational efficiency, customer satisfaction, innovation, productivity, and market competitiveness (Wamba et al., 2022). Consequently, organizational performance is viewed as a multidimensional construct that captures both financial and non-financial indicators of organizational success.

AI-driven analytics has increasingly been identified as a critical factor influencing organizational performance because it enhances decision quality, operational effectiveness, innovation capability, and strategic responsiveness (Chatterjee et al., 2023). Organizations that effectively leverage AI technologies are generally better positioned to achieve superior performance outcomes and sustainable competitive advantages.



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## **Dimensions of Organizational Performance**

### **Profitability**

Profitability refers to an organization's ability to generate earnings from its business activities after accounting for costs and expenses. It is one of the most widely used indicators of organizational success and financial performance (Richard et al., 2009). AI-driven analytics can improve profitability by optimizing operations, reducing costs, enhancing decision quality, and identifying revenue-generating opportunities (Ransbotham et al., 2023).

### **Productivity**

Productivity refers to the efficiency with which organizations convert inputs into outputs. It measures the relationship between resources utilized and results achieved. According to Wamba et al. (2022), AI technologies enhance productivity by automating routine tasks, improving workflow efficiency, and facilitating better resource allocation.

### **Customer Satisfaction**

Customer satisfaction represents the degree to which customers perceive that organizational products and services meet or exceed their expectations. AI-driven analytics enables organizations to understand customer preferences, personalize interactions, and improve service quality, thereby increasing customer satisfaction and loyalty (Zhao et al., 2023).

### **Market Share**

Market share refers to the proportion of total industry sales controlled by an organization within a specific market. Organizations that effectively utilize AI-driven analytics can better anticipate market trends, understand customer needs, and implement competitive strategies that increase their market presence (Zhang et al., 2024).

### **Innovation Capability**

Innovation capability refers to an organization's ability to develop and implement new products, services, technologies, or processes. AI technologies support innovation by identifying emerging trends, generating insights, and facilitating research and development activities (Chatterjee et al., 2023). Organizations with strong innovation capabilities are more likely to achieve sustainable competitive advantage.

### **Operational Efficiency**

Operational efficiency refers to an organization's ability to maximize outputs while minimizing resource utilization and operational costs. AI-driven systems improve operational efficiency by automating business processes, reducing errors, optimizing workflows, and enhancing decision-making speed (Dwivedi et al., 2023). Improved operational efficiency contributes significantly to overall organizational performance and competitiveness.



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## **Theoretical Framework**

### **Resource-Based View (RBV) Theory**

The Resource-Based View (RBV) theory was developed by Barney (1991) and is one of the most influential theories in strategic management. The theory posits that an organization's ability to achieve and sustain competitive advantage depends on the possession and effective utilization of valuable, rare, inimitable, and non-substitutable (VRIN) resources. According to the theory, organizations that possess unique resources and capabilities are more likely to achieve superior performance than their competitors.

RBV emphasizes that resources can be tangible or intangible. Tangible resources include physical assets such as machinery, technology, and financial capital, while intangible resources include knowledge, skills, organizational culture, innovation capabilities, and information systems. The theory argues that organizations should focus on developing and leveraging strategic resources that competitors cannot easily replicate.

In the contemporary business environment, artificial intelligence (AI) and AI-driven analytics have emerged as critical strategic resources. AI technologies enable organizations to process large volumes of data, generate insights, improve forecasting accuracy, automate decision-making, and optimize business operations. These capabilities create value by enhancing efficiency, innovation, responsiveness, and competitiveness. Organizations that successfully integrate AI-driven analytics into their strategic processes can achieve sustainable competitive advantages through superior decision-making and improved organizational performance.

The relevance of the RBV theory to this study lies in its explanation of how AI-driven analytics can serve as a strategic capability that improves organizational outcomes. Predictive analytics, decision automation, and data-driven strategic planning represent valuable organizational resources that can enhance operational efficiency, competitiveness, innovation, and overall performance. Therefore, the theory provides a strong foundation for understanding the relationship between AI-driven analytics and organizational performance.

### **Strengths of the RBV Theory**

1. It explains how internal organizational resources contribute to competitive advantage.
2. It emphasizes the strategic importance of technological capabilities and innovation.
3. It provides a framework for understanding how AI-driven analytics can improve organizational performance.
4. It is widely used in studies relating to technology adoption, innovation, and organizational performance.

### **Criticisms of the RBV Theory**

1. The theory pays limited attention to external environmental factors.
2. It does not adequately explain how organizations acquire strategic resources.
3. The identification and measurement of valuable resources may be subjective.



This study adopts the Resource-Based View (RBV) theory as its underpinning theoretical framework. The choice of RBV is based on its direct relevance to the study's objective of examining the impact of AI-driven analytics on organizational performance. The theory provides a clear explanation of how organizational resources and capabilities contribute to superior performance and sustainable competitive advantage.

AI-driven analytics, represented by predictive analytics, decision automation, and data-driven strategic planning, constitutes a valuable organizational capability that enables firms to improve strategic decision-making, optimize operations, enhance innovation, and strengthen competitiveness. Since the primary focus of this study is not merely the adoption of AI technologies but their contribution to organizational performance, the RBV theory is more appropriate than the TOE framework.

Furthermore, RBV aligns with the study's dependent variable—organizational performance—by explaining how organizations can utilize AI-driven analytical capabilities as strategic resources to achieve improved productivity, operational efficiency, innovation, competitiveness, and overall effectiveness. Consequently, the resource-based view (RBV) theory provides the most suitable theoretical lens for examining the relationship between AI-driven analytics and organizational performance.

### **Empirical Review**

Zhang, Zhao, and Xu (2024) investigated the relationship between artificial intelligence capability and firm performance in emerging economies. Using survey data collected from firms across multiple sectors, the study employed structural equation modeling to examine the direct and indirect effects of AI capabilities on organizational outcomes. The findings revealed that AI capability significantly enhances organizational competitiveness, innovation performance, and market responsiveness. The study further demonstrated that organizations with advanced AI capabilities were better able to identify market opportunities, respond to environmental changes, and develop innovative products and services. The researchers concluded that AI capability serves as a strategic asset that strengthens competitive advantage and contributes positively to overall firm performance.

Similarly, Dwivedi et al. (2023) examined the role of artificial intelligence in organizational decision-making and business performance. Their study explored how AI technologies influence managerial decision processes through predictive analytics, machine learning, and intelligent automation. The findings indicated that AI adoption improves strategic decision quality by providing timely, accurate, and data-driven insights. The study also found that AI technologies significantly enhance forecasting accuracy, reduce uncertainty, and support evidence-based decision-making. Consequently, organizations utilizing AI-driven analytical tools were found to achieve superior strategic outcomes compared to organizations relying solely on conventional decision-making approaches.

Chatterjee et al. (2023) explored the influence of artificial intelligence on organizational performance from a strategic management perspective. The study found that AI adoption significantly enhances organizational agility, innovation capability, and competitive advantage. The researchers reported that organizations implementing AI-driven systems experienced improved business process efficiency, faster decision-making, and greater adaptability to changing market conditions. The study concluded that AI serves as an important



strategic tool that enables organizations to create value and sustain long-term performance improvements.

Jöhnk, Weißert, and Wyrski (2022) investigated organizational readiness for AI implementation and its implications for performance. Their findings revealed that organizations possessing adequate technological infrastructure, skilled personnel, and supportive leadership were more likely to realize the benefits of AI adoption. The study highlighted that organizational readiness significantly influences the effectiveness of AI implementation and subsequent performance outcomes. Firms lacking the necessary capabilities often struggled to translate AI investments into measurable business value.

Ransbotham et al. (2023) examined how organizations create business value through artificial intelligence. Their study reported that organizations with mature AI strategies experienced higher revenue growth, stronger operational performance, and improved competitive positioning. The researchers found that successful AI implementation requires alignment between organizational strategy, technological capabilities, and workforce competencies. Organizations that integrated AI into core business processes achieved greater returns on investment and sustained performance advantages over competitors.

Zhao, Liu, and Chen (2023) investigated the impact of AI-enabled business analytics on organizational competitiveness. Using evidence from technology-driven firms, the study found that AI-powered analytical capabilities significantly improve market intelligence, customer insights, and strategic responsiveness. The findings indicated that organizations utilizing AI-driven analytics were better positioned to anticipate market changes, identify emerging opportunities, and respond effectively to competitive threats. Consequently, AI-enabled analytics was found to be a significant predictor of organizational competitiveness and business success.

Wamba et al. (2022) conducted an empirical investigation into the effects of big data analytics and artificial intelligence capabilities on organizational performance. Using data from firms operating in technology-intensive industries, the study examined the extent to which AI-enabled analytics contributes to operational efficiency and customer satisfaction. The findings revealed that organizations leveraging AI-powered analytics achieved higher levels of productivity, operational excellence, and customer responsiveness. The study further established that AI capability mediates the relationship between big data analytics and organizational performance, suggesting that organizations derive greater value from data when supported by advanced AI technologies.

### **Summary of Literature Review**

The literature reviewed demonstrates that artificial intelligence (AI) has become a critical technological innovation that enhances organizational decision-making and performance. The conceptual review established that AI-driven analytics enables organizations to process large volumes of data, generate valuable insights, automate decision-making processes, and improve strategic planning. The study conceptualized AI-driven analytics using three dimensions: predictive analytics, decision automation, and data-driven strategic planning. Organizational performance, on the other hand, was viewed as a multidimensional construct measured through profitability, productivity, customer satisfaction, market share, innovation capability, and operational efficiency.



The theoretical review examined the resource-based view (RBV). The RBV theory was adopted for the study because it explains how organizational resources and capabilities, such as AI-driven analytics, can create sustainable competitive advantage and improve organizational performance.

The empirical review revealed that AI adoption has a positive influence on organizational outcomes. Studies by Wamba et al. (2022), Dwivedi et al. (2023), Chatterjee et al. (2023), Zhao et al. (2023), Ransbotham et al. (2023), and Zhang et al. (2024) consistently found that AI technologies enhance decision quality, operational efficiency, innovation capability, customer satisfaction, competitiveness, and overall organizational performance.

### Gap in Literature

Despite the extensive literature on artificial intelligence and organizational performance, several gaps remain. First, most existing studies were conducted in developed countries such as the United States, China, and European nations, where technological infrastructure, digital literacy, and AI adoption levels are relatively advanced. Consequently, the findings may not adequately reflect the realities of developing economies such as Nigeria, where technological readiness and organizational capabilities differ significantly.

Second, many previous studies focused broadly on AI adoption, AI capability, or big data analytics without specifically examining the individual contributions of predictive analytics, decision automation, and data-driven strategic planning to organizational performance. This creates a conceptual gap regarding the specific dimensions of AI-driven analytics that drive organizational performance.

Third, the majority of empirical studies concentrated on single industries or technology-intensive sectors, leaving limited evidence on the impact of AI-driven analytics across diverse sectors such as manufacturing, banking, telecommunications, and service industries within the Nigerian economy. This creates a contextual gap in the literature.

Finally, while previous studies have established a positive relationship between AI and organizational performance, limited empirical research has examined how AI-driven analytics influences organizational performance through strategic decision-making processes in Nigeria. Therefore, this study seeks to fill the geographical, contextual, and empirical gaps by examining the effects of predictive analytics, decision automation, and data-driven strategic planning on organizational performance among selected organizations in Nigeria.

### METHODOLOGY

This study adopted a survey research design to examine the impact of AI-driven analytics on organizational performance. The design was considered appropriate because it enabled the collection of quantitative data from managers and senior staff regarding their perceptions and experiences with artificial intelligence applications and strategic decision-making processes within their organizations.

The population of the study comprised 320 managers and senior staff drawn from selected organizations in the banking (80), manufacturing (90), telecommunications (70), and service



(80) sectors of the Nigerian economy. These sectors were selected because of their increasing adoption of AI-driven technologies and digital transformation initiatives.

The sample size of 178 respondents was determined using the Taro Yamane (1967) formula for finite populations at a 5% level of significance. A stratified random sampling technique was employed to ensure adequate representation of each sector. Using Bowley's proportional allocation formula, the sample was distributed as follows: Banking (45), Manufacturing (50), Telecommunications (39), and Service Industry (44).

Data for the study were collected using a structured questionnaire developed from the study objectives and relevant literature. The questionnaire consisted of two sections. Section A contained respondents' demographic information, while Section B measured the study variables: Predictive Analytics, Decision Automation, Data-Driven Strategic Planning, and Organizational Performance. Responses were measured using a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1).

To ensure the validity of the instrument, the questionnaire was reviewed by experts in strategic management, Artificial Intelligence, Marketing, and Research Methodology. Their observations and recommendations were incorporated into the final version of the instrument. Reliability was assessed using Cronbach's alpha coefficient. The results showed reliability coefficients of 0.842 for predictive analytics, 0.816 for decision automation, 0.874 for data-driven strategic planning, and 0.887 for organizational performance, with an overall reliability coefficient of 0.855, indicating that the instrument was reliable for the study.

The questionnaires were administered directly to respondents and through electronic means where necessary. Respondents were assured of confidentiality and anonymity to encourage accurate responses. Data collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 27. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data, while multiple regression analysis was employed to test the hypotheses at a 5% level of significance.

## DATA PRESENTATION AND ANALYSIS

### Questionnaire Administration and Response Rate

A total of 178 copies of the questionnaire were administered to respondents across the selected organizations. Out of the total questionnaires distributed, 168 copies were retrieved, representing a retrieval rate of 94.4%. However, after screening for completeness and consistency, 162 questionnaires were found suitable for analysis, while 6 copies were discarded due to incomplete responses.

**Table 4.1: Questionnaire Distribution and Response Rate**

| Questionnaire Status | Frequency | Percentage (%) |
|----------------------|-----------|----------------|
| Distributed          | 178       | 100            |
| Returned             | 168       | 94.4           |
| Valid for Analysis   | 162       | 91.0           |
| Unusable             | 6         | 3.4            |



The response rate of 91% is considered highly satisfactory and adequate for statistical analysis. According to research methodology standards, a response rate above 70% is generally regarded as excellent and sufficient for drawing reliable conclusions. Therefore, the response rate achieved in this study provides confidence in the validity and generalizability of the findings.

### Demographic Characteristics of Respondents

**Table 4.2: Demographic Characteristics of Respondents**

| Variable                         | Category                   | Frequency  | Percentage (%) |
|----------------------------------|----------------------------|------------|----------------|
| <b>Gender</b>                    | Male                       | 96         | 59.3           |
|                                  | Female                     | 66         | 40.7           |
|                                  | <b>Total</b>               | <b>162</b> | <b>100.0</b>   |
| <b>Age (Years)</b>               | 20–30                      | 28         | 17.3           |
|                                  | 31–40                      | 54         | 33.3           |
|                                  | 41–50                      | 49         | 30.2           |
|                                  | Above 50                   | 31         | 19.2           |
|                                  | <b>Total</b>               | <b>162</b> | <b>100.0</b>   |
| <b>Educational Qualification</b> | HND/B.Sc                   | 73         | 45.1           |
|                                  | Master's Degree            | 58         | 35.8           |
|                                  | PhD                        | 18         | 11.1           |
|                                  | Professional Certification | 13         | 8.0            |
|                                  | <b>Total</b>               | <b>162</b> | <b>100.0</b>   |
| <b>Years of Experience</b>       | Below 5 years              | 25         | 15.4           |
|                                  | 5–10 years                 | 57         | 35.2           |
|                                  | 11–15 years                | 48         | 29.6           |
|                                  | Above 15 years             | 32         | 19.8           |
|                                  | <b>Total</b>               | <b>162</b> | <b>100.0</b>   |

**Source:** Field Survey, 2026.

Table 4.2 presents the demographic characteristics of the respondents. The result shows that 96 respondents, representing 59.3%, were male, while 66 respondents, representing 40.7%, were female, indicating that male respondents constituted the majority of the participants in the study.

Regarding age distribution, respondents aged 31–40 years accounted for the highest proportion with 54 respondents (33.3%), followed by those aged 41–50 years with 49 respondents (30.2%). Respondents above 50 years constituted 19.2%, while those between 20 and 30 years represented 17.3%. This suggests that the majority of the respondents were within the active managerial and professional age category and were therefore capable of providing informed responses regarding AI-driven analytics and organizational performance.

In terms of educational qualifications, 73 respondents (45.1%) possessed HND/B.Sc. qualifications; 58 respondents (35.8%) held master's degrees; 18 respondents (11.1%) possessed Ph.D. qualifications, while 13 respondents (8.0%) had professional certifications. This indicates that the respondents were adequately educated and possessed the academic background necessary to understand and respond effectively to issues relating to artificial intelligence and strategic decision-making.



Concerning years of work experience, 57 respondents (35.2%) had between 5 and 10 years of experience; 48 respondents (29.6%) had between 11 and 15 years of experience; 32 respondents (19.8%) had more than 15 years of experience, while 25 respondents (15.4%) had less than 5 years of experience. The findings imply that the majority of respondents possessed considerable professional experience and were therefore knowledgeable about organizational operations, strategic decision-making processes, and the application of AI-driven analytics in their respective organizations.

### Analysis of Questionnaire Items

The responses were analyzed using mean and standard deviation. A criterion mean of 3.00 was adopted for decision-making. Any item with a mean score of 3.00 and above was accepted, while items with mean scores below 3.00 were rejected.

**Table 4.3: Analysis of Questionnaire Items (N = 162)**

| Variable                              | Item                                                      | Mean        | Std. Dev.   | Decision     |
|---------------------------------------|-----------------------------------------------------------|-------------|-------------|--------------|
| <b>Predictive Analytics</b>           | AI tools are used to forecast future business trends.     | 4.18        | 0.74        | Agree        |
|                                       | Predictive analytics improves forecasting accuracy.       | 4.29        | 0.68        | Agree        |
|                                       | AI predictions support strategic decision-making.         | 4.11        | 0.81        | Agree        |
|                                       | Predictive analytics helps identify future risks.         | 4.06        | 0.85        | Agree        |
|                                       | Predictive analytics improves organizational performance. | 4.23        | 0.72        | Agree        |
|                                       | <b>Grand Mean</b>                                         | <b>4.17</b> | <b>0.76</b> | <b>Agree</b> |
| <b>Decision Automation</b>            | AI systems automate routine decisions.                    | 3.98        | 0.86        | Agree        |
|                                       | Decision automation reduces delays.                       | 4.16        | 0.75        | Agree        |
|                                       | Automation improves efficiency.                           | 4.08        | 0.79        | Agree        |
|                                       | Automated systems reduce human errors.                    | 4.13        | 0.73        | Agree        |
|                                       | Decision automation enhances productivity.                | 4.01        | 0.82        | Agree        |
|                                       | <b>Grand Mean</b>                                         | <b>4.07</b> | <b>0.79</b> | <b>Agree</b> |
| <b>Data-Driven Strategic Planning</b> | Strategic decisions are based on data analysis.           | 4.30        | 0.67        | Agree        |
|                                       | AI insights improve strategic planning.                   | 4.37        | 0.61        | Agree        |
|                                       | Data-driven planning enhances competitiveness.            | 4.25        | 0.72        | Agree        |
|                                       | AI analytics identifies business opportunities.           | 4.21        | 0.76        | Agree        |
|                                       | Data-driven planning supports long-term success.          | 4.40        | 0.58        | Agree        |
|                                       | <b>Grand Mean</b>                                         | <b>4.31</b> | <b>0.67</b> | <b>Agree</b> |
| <b>Organizational Performance</b>     | AI has improved organizational productivity.              | 4.20        | 0.75        | Agree        |
|                                       | AI has improved operational efficiency.                   | 4.26        | 0.69        | Agree        |
|                                       | AI has enhanced customer satisfaction.                    | 4.11        | 0.80        | Agree        |
|                                       | AI has strengthened competitiveness.                      | 4.18        | 0.77        | Agree        |
|                                       | AI has improved organizational profitability.             | 4.30        | 0.65        | Agree        |
|                                       | <b>Grand Mean</b>                                         | <b>4.21</b> | <b>0.73</b> | <b>Agree</b> |

Source: Field Survey, 2026.



Table 4.3 presents respondents' perceptions regarding the dimensions of AI-driven analytics and organizational performance. The findings show that all the items recorded mean scores above the criterion mean of 3.00, indicating agreement among respondents.

For predictive analytics, the grand mean score of 4.17 indicates that respondents agreed that predictive analytics improves forecasting accuracy, supports strategic decision-making, increases organizational profitability, identifies potential risks, and contributes significantly to organizational performance.

For decision automation, the grand mean score of 4.07 suggests that respondents agreed that AI-powered automation improves efficiency, reduces delays and human errors, and enhances organizational productivity.

For data-driven strategic planning, the grand mean score of 4.31, which is the highest among the study variables, indicates strong agreement that data-driven strategic planning enhances competitiveness, supports long-term success, and improves strategic decision-making. This suggests that respondents perceive data-driven strategic planning as the most influential dimension of AI-driven analytics.

For organizational performance, the grand mean score of 4.21 indicates that respondents agreed that AI-driven analytics has improved productivity, operational efficiency, profitability, customer satisfaction, competitiveness, and overall organizational performance.

Overall, the results suggest that respondents strongly perceive AI-driven analytics as a significant contributor to organizational performance and strategic success. The highest grand mean recorded for data-driven strategic planning (4.31) further indicates that the strategic use of AI-generated insights is considered the most critical factor in enhancing organizational performance.

### Multiple Regression Analysis

To examine the combined effect of AI-driven analytics on organizational performance, multiple regression analysis was conducted. The independent variables were Predictive Analytics (PA), Decision Automation (DA), and Data-Driven Strategic Planning (DSP), while Organizational Performance (OP) served as the dependent variable.

The regression model is expressed as:

$$OP = \beta_0 + \beta_1 PA + \beta_2 DA + \beta_3 DSP + \mu$$

Where:

OP = Organizational Performance

PA = Predictive Analytics

DA = Decision Automation

DSP = Data-Driven Strategic Planning

$\beta_0$  = Constant



$\beta_1$ – $\beta_3$  = Regression Coefficients

$\mu$  = Error Term

**Table 4.4: Model Summary**

| Model | R     | R Square | Adjusted R-squared | Std. Error |
|-------|-------|----------|--------------------|------------|
| 1     | 0.842 | 0.709    | 0.704              | 0.437      |

The Model Summary indicates a correlation coefficient (R) of 0.842, which shows a strong positive relationship between AI-driven analytics and organizational performance.

The coefficient of determination ( $R^2$ ) is 0.709, implying that 70.9% of the variation in organizational performance is explained by predictive analytics, decision automation, and data-driven strategic planning.

The remaining 29.1% may be attributed to other variables not included in the model.

The Adjusted  $R^2$  of 0.704 confirms that the model possesses strong explanatory power.

**Table 4.5: ANOVA Result**

| Model      | Sum of Squares | df  | Mean Square | F       | Sig.  |
|------------|----------------|-----|-------------|---------|-------|
| Regression | 74.824         | 3   | 24.941      | 130.572 | 0.000 |
| Residual   | 30.175         | 158 | 0.191       |         |       |
| Total      | 104.999        | 161 |             |         |       |

The ANOVA table shows an F-statistic of 130.572 with a significance value of 0.000.

Since the regression model is statistically significant.

This indicates that the independent variables jointly exert a significant effect on organizational performance. The model is therefore fit for prediction and hypothesis testing.

**Table 4.6: Coefficients Table**

#### Regression Coefficients

| Variable                       | Unstandardized Beta (B) | Std. Error | Standardized Beta ( $\beta$ ) | t-value | Sig.  |
|--------------------------------|-------------------------|------------|-------------------------------|---------|-------|
| Constant                       | 1.024                   | 0.284      | —                             | 3.606   | 0.000 |
| Predictive Analytics           | 0.381                   | 0.064      | 0.352                         | 5.942   | 0.000 |
| Decision Automation            | 0.294                   | 0.061      | 0.271                         | 4.816   | 0.000 |
| Data-Driven Strategic Planning | 0.427                   | 0.065      | 0.398                         | 6.537   | 0.000 |

The estimated regression equation is as follows:  $OP = 1.024 + 0.381PA + 0.294DA + 0.427DSP$

The constant value of 1.024 indicates the expected level of organizational performance when all explanatory variables are held constant.



The coefficient of predictive analytics (0.381) indicates that a one-unit increase in predictive analytics will increase organizational performance by 38.1%, holding other variables constant.

The coefficient of decision automation (0.294) indicates that a one-unit increase in decision automation will increase organizational performance by 29.4%.

The coefficient of Data-Driven Strategic Planning (0.427) indicates that a one-unit increase in data-driven strategic planning will increase organizational performance by 42.7%.

Among the three variables, data-driven strategic planning exerts the strongest influence on organizational performance because it has the highest standardized beta coefficient ( $\beta = 0.398$ ).

## DISCUSSION OF FINDINGS

The findings show that predictive analytics has a significant positive effect on organizational performance ( $\beta = 0.381$ ,  $t = 5.942$ ,  $p < 0.05$ ). Organizations that use predictive analytics effectively are more likely to improve performance through better forecasting, risk management, and strategic decision-making.

The finding is consistent with the study of Dwivedi et al. (2023), who reported that AI-driven predictive technologies improve forecasting accuracy and strategic decision quality. Similarly, Wamba et al. (2022) found that organizations utilizing advanced analytics achieve superior operational and financial performance due to their ability to anticipate market developments and optimize resource allocation. Zhang et al. (2024) also observed that AI capabilities significantly enhance organizational competitiveness and innovation through improved predictive intelligence.

The study also found that decision automation significantly improves organizational efficiency ( $\beta = 0.294$ ,  $t = 4.816$ ,  $p < 0.05$ ). Automating routine decision-making processes enhances profitability, productivity, and operational effectiveness. This result aligns with Chatterjee et al. (2023), who found that AI-enabled automation improves business process efficiency and agility. It also supports Jöhnk et al. (2022), who observed that organizations with advanced AI and automation capabilities achieve better performance than those relying on manual processes.

The findings further revealed that data-driven strategic planning has a significant positive effect on operational efficiency ( $\beta = 0.427$ ,  $t = 6.537$ ,  $p < 0.05$ ). Among the three dimensions of AI-driven analytics examined in this study, data-driven strategic planning recorded the highest beta coefficient, indicating that it exerts the strongest influence on organizational performance.

The finding supports the argument of Keding (2022), who emphasized that AI technologies have transformed strategic management by enabling organizations to utilize real-time data and predictive intelligence in planning and decision-making. Similarly, Zhao et al. (2023) found that AI-enabled business analytics significantly improves organizational competitiveness by enhancing strategic responsiveness and market intelligence. Ransbotham et al. (2023) also reported that organizations with mature AI strategies achieve superior business value and stronger competitive positioning.



Overall, the study established that AI-driven analytics significantly influences organizational performance. The results showed that predictive analytics, decision automation, and data-driven strategic planning all have significant positive effects on organizational outcomes. The model summary revealed that the three dimensions of AI-driven analytics jointly explained 70.9% of the variation in organizational performance ( $R^2 = 0.709$ ), indicating a strong explanatory power of the model.

## SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

### Summary of Findings

The regression analysis revealed that AI-driven analytics significantly influences organizational performance.

Specifically:

Predictive analytics significantly affects organizational profitability ( $\beta = 0.352$ ,  $t = 5.942$ ,  $p < 0.05$ ).

Decision automation significantly influences organizational productivity ( $\beta = 0.271$ ,  $t = 4.816$ ,  $p < 0.05$ ).

Data-driven strategic planning significantly enhances operational efficiency ( $\beta = 0.398$ ,  $t = 6.537$ ,  $p < 0.05$ ).

The model explained 70.9% of the variance in organizational performance ( $R^2 = 0.709$ ), indicating that AI-driven analytics is a strong predictor of organizational performance. Among the predictors, Data-Driven Strategic Planning emerged as the most influential factor, followed by predictive analytics and decision automation. These findings suggest that organizations that effectively integrate AI-driven analytics into their strategic processes are more likely to achieve superior performance, efficiency, and competitiveness.

## CONCLUSION

Based on the findings of this study, it is concluded that AI-driven analytics plays a critical role in enhancing organizational performance. The study provides empirical evidence that predictive analytics, decision automation, and data-driven strategic planning significantly contribute to improved decision-making, operational efficiency, competitiveness, and overall organizational performance.

The findings demonstrate that organizations that effectively leverage AI technologies are better positioned to achieve superior performance outcomes and sustainable competitive advantage. AI-driven analytics enables organizations to transform data into valuable strategic resources, thereby improving forecasting capability, optimizing decision processes, and strengthening strategic planning. Consequently, AI-driven analytics should be regarded as a strategic organizational capability that supports long-term growth, innovation, and competitiveness.



The study, therefore, concludes that increased investment in AI-driven analytics is essential for organizations seeking to remain competitive and successful in today's rapidly changing business environment.

### **Recommendations**

Based on the findings and conclusions of the study, the following recommendations are made:

1. Organizations should invest in advanced predictive analytics systems to improve forecasting accuracy, risk management, and strategic decision-making.
2. Management should increase the adoption of AI-powered decision automation tools to enhance operational efficiency, reduce human errors, and improve service delivery.
3. Organizations should integrate data-driven approaches into their strategic planning processes to strengthen competitiveness and facilitate evidence-based decision-making.

### **Contribution to Knowledge**

This study makes significant contributions to existing knowledge in the areas of artificial intelligence, strategic decision-making, and organizational performance.

First, the study extends existing literature by empirically demonstrating that AI-driven analytics significantly influences organizational performance within the Nigerian context.

Second, the study contributes conceptually by decomposing AI-driven analytics into three measurable dimensions: predictive analytics, decision automation, and data-driven strategic planning. This approach provides a deeper understanding of the specific mechanisms through which AI technologies influence organizational performance.

Third, the study contributes theoretically by validating the applicability of the Resource-Based View (RBV) theory in explaining the relationship between AI-driven analytics and organizational performance. The findings confirm that AI-driven analytical capabilities function as valuable organizational resources that contribute to sustainable competitive advantage.

### **Suggestions for Further Studies**

Although this study provides valuable insights into the relationship between AI-driven analytics and organizational performance, certain areas require further investigation.

1. Future studies should examine the impact of AI-driven analytics on organizational performance using larger samples and broader geographical coverage across different regions and countries.
2. Researchers should investigate the moderating role of organizational culture, leadership style, and technological readiness in the relationship between AI-driven analytics and organizational performance.
3. Future studies should explore the impact of individual AI technologies such as machine learning, deep learning, natural language processing, and generative AI on organizational outcomes.



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