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EFFECT OF BIG DATA ANALYTICS ON MARKETING DECISION-MAKING EFFECTIVENESS: EMPIRICAL EVIDENCE FROM SELECTED SMALL AND MEDIUM SCALE ENTERPRISES IN ANAMBRA STATE, NIGERIA

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ABSTRACT

This study examined the effect of big data analytics on marketing decision-making effectiveness among Small and Medium-Scale Enterprises (SMEs) in Anambra State, with a focus on three dimensions: customer data analytics, social media analytics, and predictive analytics. The study aimed to ascertain how these components of big data analytics affect the marketing decisions of SMEs in a highly competitive commercial environment. The study was anchored on Resource-Basd View theory by Barney (1991). A survey method under descriptive research design was adopted. Data were collected using structured questionnaire. Multiple regression statistical technique was used to test the effects of customer data analytics, social media analytics, predictive analytics on marketing decision-making effectiveness of the selected SMEs. The findings revealed that customer data analytics, social media analytics, and predictive analytics all have significant positive effects on marketing decision-making effectiveness among SMEs in Onitsha, Anambra State. The implication of the findings is that small and medium scale enterprises that effectively leverage customer insights, analyze social media engagement, and employ predictive tools demonstrate improved ability to make informed, strategic, and timely marketing decisions. The study concluded that big data analytics is a critical driver of marketing decision effectiveness and competitive advantage for SMEs. Based on the findings, the study recommended that SME operators should sustain investing in data analytics capabilities, continue to adopt social media and predictive analytics tools for improved decision-making effectiveness. Policymakers and business support agencies should invest more on using big data analytics and its expansion through training, technological support, and financial incentives.

Key Words: Big Data Analytics, Customer Data Analytics, Social Media Analytics, Predictive Analytics, Marketing Decision-making Effectiveness, Anambra State of Nigeria

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1. INTRODUCTION

The increasing digitization of economic activities and the widespread adoption of information and communication technologies have significantly altered the landscape of business operations across the globe. One of the most transformative developments in this regard is the emergence of Big Data Analytics (BDA), which refers to the process of collecting, processing, and analyzing large volumes of diverse data to generate meaningful insights for decision-making effectiveness. Big data is commonly characterized by its volume, velocity, variety, veracity, and value, all of which present both opportunities and challenges for organizations (Mikalef et al., 2020). For Small and Medium-Scale Enterprises (SMEs), which often operate in highly competitive and resource-constrained environments, the ability to harness big data analytics has become a critical factor for enhancing efficiency, innovation, and competitiveness. In developing economies such as Nigeria, SMEs constitute a significant driver of economic growth, employment generation, and poverty reduction; thus, improving their decision-making effectiveness capabilities through data-driven strategies is of paramount importance (OECD, 2021).

Marketing decision-making effectiveness, which involves identifying market opportunities, understanding customer needs, and formulating appropriate strategies, has increasingly become data-driven in nature. Traditionally, SMEs relied on intuition, experience, and limited market research in making marketing decisions. However, the advent of big data analytics has shifted this paradigm toward evidence-based decision-making effectiveness, where firms utilize real-time and historical data to guide their marketing strategies (Chaffey & Ellis-Chadwick, 2022). Big data analytics enables SMEs to optimize pricing strategies, enhance customer targeting, improve product development, and evaluate marketing performance more effectively. In highly commercialized cities like Onitsha in Anambra Staten known for its vibrant markets and dense concentration of SMEs, the adoption of big data analytics in marketing decision-making effectiveness is increasingly becoming a necessity rather than an option.

A critical dimension of big data analytics is customer data analytics, which focuses on analyzing data generated from customer interactions, transactions, and feedback. Customer data analytics allows SMEs to gain deeper insights into customer preferences, purchasing behaviors, and consumption patterns. By leveraging such insights, businesses can design personalized marketing strategies that improve customer satisfaction and loyalty. Empirical studies indicate that firms that effectively utilize customer analytics are better positioned to enhance decision quality, reduce uncertainty, and achieve superior marketing performance (Wedel & Kannan, 2016). For SMEs in Onitsha, where consumer behavior is dynamic and competition is intense, the ability to analyze customer data can significantly influence decisions related to product offerings, pricing, and promotional strategies. Thus, this study seeks to ascertain the effect of customer data analytics on marketing decision-making effectiveness among SMEs in the study area.

In addition to customer analytics, social media analytics has emerged as a vital tool for modern marketing decision-making effectiveness. Social media platforms such as Facebook, Instagram, WhatsApp, and X (formerly Twitter) generate vast amounts of user-generated content that can be analyzed to understand customer sentiments, brand perception, and market trends. Social media analytics involves the use of analytical tools to monitor, measure, and interpret data from these platforms to inform marketing strategies. According to Tuten and Solomon (2023), social media analytics enables businesses to engage customers more efficiently and effectively, evaluate campaign performance, and respond promptly to changing market conditions. For SMEs in Onitsha, where social media marketing is widely used due to its cost-effectiveness and reach, the ability to analyze social media data is

essential for making informed marketing decisions. This study therefore investigates the effect of social media analytics on marketing decision-making effectiveness among SMEs in the area.

Furthermore, predictive analytics represents a more advanced application of big data analytics, focusing on forecasting future outcomes based on historical data and statistical algorithms. Predictive analytics uses techniques such as machine learning, data mining, and statistical modeling to identify patterns and predict future trends in customer behavior and market dynamics. This enables businesses to make proactive decisions rather than reactive ones. Research has shown that predictive analytics enhances strategic planning, improves demand forecasting, and reduces risks associated with marketing decisions (Shmueli&Koppius, 2011). For SMEs operating in volatile markets such as Onitsha, predictive analytics can provide valuable insights into future demand, customer preferences, and competitive trends, thereby improving the accuracy and effectiveness of marketing decisions. Consequently, this study examines the effect of predictive analytics on marketing decision-making effectiveness among SMEs in the study area.

Despite the numerous benefits associated with big data analytics, SMEs in developing countries face several challenges in its adoption and utilization. These challenges include limited financial resources, inadequate technological infrastructure, lack of skilled personnel, and concerns related to data privacy and security (Afolayan et al., 2021). In Nigeria, many SMEs still operate with minimal technological integration, which limits their ability to fully exploit the potential of big data analytics. Additionally, there is often a lack of awareness and understanding of how data analytics can be applied to improve marketing decision-making effectiveness. These constraints are particularly evident in local commercial hubs like Onitsha, where many SMEs rely on traditional methods of business operation. Therefore, examining the role of big data analytics in marketing decision-making effectiveness within this context is both timely and necessary. The integration of big data analytics into marketing decision-making effectiveness processes offers significant opportunities for SMEs to enhance their competitiveness, efficiency, and overall performance. Customer data analytics, social media analytics, and predictive analytics each play a distinct yet complementary role in enabling data-driven marketing decisions. The study therefore investigated investigate the effect of big data analytics on marketing decision making among small and medium scale enterprises in Onitsha.

Statement of the Problem

Despite the growing importance of data-driven strategies in modern business environments, many Small and Medium-Scale Enterprises (SMEs) in Anambra State especially in Onitsha, continue to rely heavily on intuition, experience, and traditional marketing approaches in making decisions. While such methods may have been effective in the past, the increasing complexity of consumer behavior, heightened market competition, and rapid technological changes have made them less reliable and insufficient for achieving sustainable business growth. Consequently, SMEs often experience challenges such as poor customer targeting, ineffective promotional strategies, low customer retention, and declining profitability, all of which can be linked to inadequate or inefficient marketing decision-making effectiveness processes (Chaffey & Ellis-Chadwick, 2022). Although Big Data Analytics (BDA) has been widely recognized as a powerful tool for enhancing decision-making effectiveness by providing actionable insights from large and diverse datasets, its adoption among SMEs in developing economies like Nigeria remains relatively low. Many SME operators in Onitsha lack the necessary technical expertise, financial capacity, and infrastructural support required to effectively implement and utilize data analytics tools (Afolayan et al., 2021). As a result,

valuable data generated from customer transactions, digital platforms, and social media interactions are often underutilized or entirely ignored, thereby limiting the ability of these businesses to make informed and strategic marketing decisions.

Furthermore, even among SMEs that attempt to adopt data analytics, there is limited understanding of how specific dimensions of big data analytics such as customer data analytics, social media analytics, and predictive analytics individually and collectively influence marketing decision-making effectiveness. For instance, many businesses collect customer data but fail to analyze it effectively to gain insights into consumer preferences and buying patterns. Similarly, while social media platforms are widely used for advertising and communication, the analytical potential of these platforms in guiding marketing strategies is often underexploited (Tuten& Solomon, 2023). In addition, the use of predictive analytics, which enables businesses to forecast future trends and make proactive decisions, is still at a very nascent stage among SMEs in the study area. This situation creates a significant gap between the availability of data and its effective utilization for marketing decision-making effectiveness among SMEs in Onitsha. The consequence is suboptimal decision-making effectiveness, reduced competitiveness, and missed opportunities for growth and innovation. Moreover, existing studies on big data analytics have largely focused on large organizations and developed economies, with limited empirical attention given to SMEs in local commercial hubs such as Onitsha, where business dynamics and challenges may differ significantly. Therefore, this study investigated the effect of big data analytics on marketing decision making among small and medium scale enterprises in Onitsha.

As a result, there is limited empirical evidence on how SMEs especially those operating in informal and highly competitive environments like Onitsha adopt and utilize big data analytics in their marketing decision-making effectiveness processes. This creates a contextual gap, as findings from developed economies may not be directly applicable to SMEs in Nigeria due to differences in business environment, technological readiness, and resource availability. Furthermore, while prior studies have established a general relationship between big data analytics and organizational performance, there is insufficient disaggregation of the specific dimensions of BDA and their individual effects on marketing decision-making effectiveness. In particular, limited attention has been given to the distinct roles of customer data analytics, social media analytics, and predictive analytics in shaping marketing strategies among SMEs. Many studies tend to treat big data analytics as a single construct, thereby overlooking how each component uniquely contributes to decision-making effectiveness outcomes. This represents a conceptual gap that this study seeks to address by examining these dimensions separately within the SME context. Therefore, this study seeks to bridge these identified gaps by providing empirical evidence on the effects of customer data analytics, social media analytics, and predictive analytics on marketing decision-making effectiveness among SMEs in Onitsha, Anambra State.

Objectives of the Study

The main objective of the study is to investigate the effect of big data analytics on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State. Specifically, the study aimed to:

1. Ascertain the effect of customer data analytics on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State.
2. Investigate the effect of social media analytics on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State.
3. Examine the effect of predictive analytics on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State.

Research Questions

The following research questions were raised based on the objectives of the study

1. What is the nature of effect of customer data analytics on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State?
2. What is the nature of effect of social media analytics on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State?
3. What is the nature of effect of predictive analytics on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State?

Hypotheses

The following null hypotheses guided this study.

1. Customer data analytics has no significant effect on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State.
2. Social media analytics has no significant effect on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State.
3. Predictive analytics has no significant effect on marketing decision-making effectiveness among small and medium scale enterprises in Onitsha, Anambra State.

Scope of the Study

The subject scope of the study is domiciled on marketing information technologywith special focus on Big Data Analytics and its effect on marketing decision-making effectiveness among Small and Medium-Scale Enterprises. Specifically, the study examined three key dimensions of big data analytics customer data analytics, social media analytics, and predictive analytics and how each of these variables affects marketing decision-making effectiveness processes. By concentrating on these core variables, the study provides a structured understanding of how data-driven insights contribute to improved marketing outcomes among SMEs. The geographical coverage of this study is Anambra State with particular reference to Onitsha. Onitsha is selected due to high concentration of SMEs engaged in diverse business activities such as trading, manufacturing, and services. The choice of this location is informed by the need to examine SMEs that use big data analytics for marketing decision-making. The study focused on registered SME workers, owners, managers, and key decision-makers involved in marketing activities within their organizations. These respondents possess the relevant knowledge and experience regarding the use of big data analytics for decision-making purposes in their various businesses.

Significance of the Study

The significance of this study lies in its potential contributions to knowledge, practice, and policy regarding the application of Big Data Analytics in marketing decision-making effectiveness among Small and Medium-Scale Enterprises (SMEs), particularly within the context of Onitsha, Anambra State. To SME owners and managers, this study is expected to provide empirical insights into how big data analytics can enhance marketing decision-making effectiveness. By examining the effects of customer data analytics, social media analytics, and predictive analytics, the study will help business operators understand how to utilize data more effectively in identifying customer needs, improving targeting strategies, as well as optimizing promotional activities. The study is expected to provide practical knowledge to marketing and business practitioners on how different dimensions of data analytics can be integrated for improve performance outcomes and effective decision making. Marketing professionals can leverage the findings to design more data-driven campaigns, measure customer engagement accurately, and predict market trends, thereby enhancing overall marketing efficiency and effectiveness. The findings are expected to help policy makers in the formulation of policies and programs for improved productivity and

competitiveness of the SME sector in Nigeria. This study is expected to be of great benefits to academics, students and future researchers.

2. LITERATURE REVIEW

Conceptual Review

Big Data Analytics

Big data analytics refers to the systematic process of examining large, complex, and diverse datasets to uncover hidden patterns, correlations, trends, and insights that can support effective decision-making effectiveness. Big Data is commonly described using the "5Vs": volume, velocity, variety, veracity, and value (IBM, 2020). Volume relates to the massive amount of data generated from multiple sources such as transactions, social media, and digital platforms. Velocity refers to the speed at which data are generated, processed, and analyzed, often in real time. Variety highlights the different forms of data, including structured, semi-structured, and unstructured data such as text, images, and videos. Veracity concerns the accuracy, reliability, and quality of data, while value emphasizes the usefulness of data in generating meaningful insights. Furthermore, Big data analytics (BDA) has been defined by various scholars from different perspectives, reflecting its multidimensional nature. It is generally viewed as the process of examining large, complex datasets to uncover hidden patterns, correlations, and insights that support decision-making effectiveness. Also, big data analytics is defined as the application of advanced analytical techniques to large and diverse datasets in order to generate actionable insights (Jamarani, Haddadi, Sarvizadeh, Kashani, Akbari, & Moradi, 2024). Similarly, it refers to the use of sophisticated tools and algorithms to analyze massive datasets that cannot be handled by traditional data-processing methods (Badshah, Ullah& Khan, 2024).

Another definition describes it as a technological and analytical process that transforms raw, high-volume data into meaningful information for business intelligence and strategic decision-making effectiveness (Udeh, Nwankwo & Nwosu, 2024). According to Sabharwal and Miah (2021), big data analytics is a data-driven capability that enables organizations to extract value and support informed decision-making effectiveness through data processing and analysis. In addition, Onyejekwe, Okeke and Eze (2024) see it as a system of collecting, processing, and analyzing large-scale data so as to generate insights that improve organizational outcomes. Furthermore, big data analytics can be conceptualized as an integration of technologies such as machine learning, data mining, and statistical analysis used to interpret large datasets and predict future trends (Sivarajah,Kamal, Irani & Weerakkody, 2024). It is also defined as a strategic organizational capability that enhances innovation and performance by enabling firms to leverage data resources effectively (Alaskar, Hussain & Alshammari, 2024). Another perspective views big data analytics as a process of managing and analyzing data characterized by volume, velocity, and variety to produce valuable insights for decision-making effectiveness (Tosi, Kokaj & Roccetti, 2024). Han, Gstrein and Andrikopoulos (2024) describe it as a broad and evolving concept involving diverse tools and techniques designed to extract meaning from complex datasets in different contexts. Additionally, big data analytics is seen as a value-creation mechanism that converts raw data into knowledge that enhances efficiency, competitiveness, and innovation within organizations (Rossi &Hirama, 2022). Finally, it can be defined as a systematic approach to analyzing large-scale structured and unstructured data in real time to support faster, more accurate, and predictive decision-making effectiveness processes across industries (Jamarani et al., 2024).

Big Data Analytics involves the application of advanced analytical techniques, including data mining, machine learning, predictive modeling, and data visualization, to transform raw data

into actionable knowledge (Mayer-Schönberger & Cukier, 2017). Unlike traditional data analysis methods that focus on small, structured datasets, Big Data Analytics is capable of handling complex datasets from multiple sources simultaneously. In the context of marketing, Big Data Analytics enables organizations to gain deeper insights into customer behavior, preferences, and purchasing patterns, thereby improving strategic decisions related to product development, pricing, promotion, and distribution. For Small and Medium-Scale Enterprises (SMEs), Big Data Analytics provides an opportunity to compete more effectively by supporting evidence-based marketing decisions. Through the analysis of customer transactions, social media interactions, and market trends, SMEs can identify emerging opportunities, anticipate customer needs, and respond proactively to changes in the business environment. Big Data Analytics has become a critical component of modern marketing practice as it enables firms to make informed, evidence-based decisions in highly competitive and dynamic markets. In marketing, Big Data Analytics allows organizations to collect, process, and analyze vast amounts of customer and market data in order to understand customer preferences, segment markets more accurately, predict future behavior, and optimize marketing campaigns (Kotler & Keller, 2019). Through analytics, marketers can move beyond mass marketing approaches to more personalized and targeted strategies that enhance customer satisfaction and loyalty.

Customer Data Analytics

Customer Data Analytics (CDA) refers to the systematic process of collecting, processing, and analyzing customer-related data to generate insights that inform business and marketing decisions. It is broadly defined as the use of analytical techniques to examine customer data such as demographics, purchase history, and interactions in order to understand behavior and improve decision-making effectiveness (Wedel & Kannan, 2016). Similarly, Customer Data Analytics is described as the application of data mining, statistical analysis, and machine learning tools to extract meaningful patterns from customer datasets for strategic advantage (Lemon &Verhoef, 2016). Another definition views it as a business intelligence process that transforms raw customer data into actionable insights for enhancing customer relationships and organizational performance (Erevelles, Fukawa, & Swayne, 2016). Furthermore, Customer Data Analytics can be defined as the practice of integrating and analyzing data from multiple customer touchpoints to gain a holistic understanding of the customer journey and improve marketing effectiveness (Kumar, Dixit, Javalgi, & Dass, 2016). It is also seen as a data-driven capability that enables firms to segment customers, personalize offerings, and predict future purchasing behavior (Wedel & Kannan, 2016).

Customer data analytics focuses on the examination of transactional, demographic, and behavioral data generated through sales records, loyalty programs, and digital interactions. This form of analytics helps firms identify purchasing patterns, customer lifetime value, and variations in customer needs, thereby supporting strategic decisions related to product offerings, pricing, and distribution. Social media analytics, on the other hand, involves the analysis of user-generated content, likes, comments, shares, and engagement metrics across platforms such as Facebook, Instagram, and X (formerly Twitter). These insights enable marketers to assess brand perception, monitor customer sentiment, and evaluate the effectiveness of promotional campaigns in real time. In another perspective, Customer Data Analytics refers to the process of analyzing structured and unstructured customer data to uncover trends, preferences, and sentiments that guide decision-making effectiveness (Chen, Chiang, &Storey, 2012). Additionally, it is defined as a strategic tool that supports customer-centric marketing by enabling firms to tailor products and services to specific customer needs (Rust & Huang, 2014). Some scholars describe it as the use of advanced analytics to optimize customer engagement, retention, and lifetime value (Gupta & Zeithaml, 2006). It can also be

understood as a mechanism for improving marketing performance by leveraging customer insights derived from data (Blattberg, Kim, & Neslin, 2008). Finally, Customer Data Analytics is defined as a systematic approach to evaluating customer information to support real-time and predictive decision-making effectiveness in dynamic markets (Shmueli & Koppius, 2011).

Social Media Analytics

Social Media Analytics (SMA) refers to the process of collecting, measuring, analyzing, and interpreting data generated from social media platforms to support informed decision-making effectiveness and improve organizational performance. It is commonly defined as the application of analytical tools and techniques to extract insights from user-generated content, interactions, and engagement metrics on platforms such as Facebook, Instagram, X (formerly Twitter), and LinkedIn (Tuten & Solomon, 2023). Similarly, Social Media Analytics is described as the systematic analysis of social media data to understand audience behavior, evaluate campaign effectiveness, and guide marketing strategies (Fan & Gordon, 2014). Another definition views it as a business intelligence function that transforms unstructured social media data into actionable insights for enhancing brand performance and customer relationships (Gandomi & Haider, 2015). Social Media Analytics can be conceptualized as the process of monitoring, tracking, and analyzing online conversations and interactions to assess public sentiment and brand perception (He, Zha, & Li, 2013). Pertinently, big data analytics is seen as data-driven approach that enables organizations to measure key performance indicators such as reach, engagement, and conversion rates across social media platforms (Chaffey & Ellis-Chadwick, 2022). In another perspective, it refers to the use of advanced analytical methods, including text mining, sentiment analysis, and network analysis, to derive insights from social media content (Stieglitz et al., 2018). Additionally, Social Media Analytics is seen as a strategic capability that helps firms identify trends, monitor competitors, and respond proactively to market changes (Kaplan & Haenlein, 2010). Some scholars define it as a tool for enhancing customer engagement and improving communication between organizations and their audiences (Lemon & Verhoef, 2016). It can also be described as a mechanism for evaluating the effectiveness of digital marketing campaigns and optimizing marketing performance (Tuten & Solomon, 2023). Finally, Social Media Analytics is defined as a real-time data analysis process that supports agile and evidence-based marketing decision-making effectiveness in dynamic business environments (Wedel & Kannan, 2016).

Predictive Analytics

Predictive Analytics (PA) refers to the use of statistical, machine learning, and data mining techniques to analyze historical and current data in order to make forecasts about future events or behaviors. It is broadly defined as a process that enables organizations to identify patterns, trends, and relationships in data to anticipate outcomes and inform decision-making effectiveness (Shmueli & Koppius, 2011). Similarly, Predictive Analytics is described as the application of predictive modeling techniques to business data to forecast customer behavior, market trends, and operational risks (Siegel, 2022). Another definition views it as the use of advanced analytical tools to convert historical data into actionable insights that guide proactive decision-making effectiveness and strategy formulation (Waller & Fawcett, 2013). Predictive analytics applies statistical models and machine learning techniques to historical data in order to forecast future outcomes such as demand trends, customer churn, and response to marketing initiatives. By anticipating market changes and consumer behavior, firms can proactively adjust their marketing strategies, allocate resources efficiently, and gain competitive advantage. For SMEs, especially in developing markets, Big Data Analytics enhances marketing efficiency by reducing uncertainty and improving decision accuracy.

Furthermore, predictive analytics can be conceptualized as a forward-looking approach to data analysis that combines machine learning algorithms, statistical modeling, and artificial intelligence to predict future events with a high degree of accuracy (Gartner, 2023). It is also defined as a data-driven methodology that enables firms to optimize resource allocation, improve marketing strategies, and enhance operational efficiency by anticipating future outcomes (Davenport & Harris, 2017). In another perspective, Predictive Analytics refers to the systematic analysis of structured and unstructured data to estimate probabilities of future events, including customer purchasing patterns, sales trends, and risk factors (Chen, Chiang, &Storey, 2012). Additionally, it is seen as a critical business capability that transforms descriptive data analysis into predictive insights, allowing organizations to make proactive and informed decisions (Provost & Fawcett, 2013). It is a tool that supports scenario planning, risk management, and strategic forecasting in dynamic and competitive markets (Sinha, 2020). It is a mechanism for improving decision quality and minimizing uncertainty by leveraging data-driven predictions (Kumar et al., 2019). Predictive analytics is an analytical framework that uses historical and real-time data to provide forward-looking intelligence that enhances organizational performance and competitiveness (Shmueli et al., 2017).

Marketing Decision-making Effectiveness

Marketing decision-making effectiveness refers to the systematic process through which managers select and implement appropriate strategies relating to product development, pricing, promotion, and distribution in order to achieve organizational objectives (Kotler et al., 2021). These decisions determine how a firm positions its offerings in the market, communicates value to customers, and delivers products or services effectively. In highly competitive and dynamic business environments, the quality of marketing decisions plays a crucial role in shaping firm performance, customer satisfaction, and long-term sustainability. Marketing decision-making effectiveness entails the process through which organizations make strategic and tactical choices regarding the marketing of their products or services, based on analysis, interpretation, and evaluation of relevant data and market conditions. Also, it involves identifying target markets, understanding customer needs, setting pricing strategies, designing promotional campaigns, and determining distribution channels to achieve organizational objectives (Kotler, Keller, & Chernev, 2023). Essentially, marketing decision-making effectiveness is a structured process that combines managerial judgment with data-driven insights to optimize marketing outcomes and enhance competitiveness. Marketing decision-making effectiveness is also defined as a systematic process by which firms assess market opportunities, evaluate alternatives, and select the most appropriate marketing strategies to influence customer behavior positively (Chaffey &Ellis-Chadwick, 2022). It encompasses both strategic decisions such as product development, market segmentation, and brand positioning and operational decisions, including promotional tactics, sales forecasting, and pricing adjustments. Modern marketing decision-making effectiveness increasingly relies on analytical tools and technologies, including big data analytics, predictive modeling, and social media metrics, to reduce uncertainty, improve accuracy, and ensure evidence-based decisions (Wedel & Kannan, 2016; Kumar et al., 2016).

Marketing decision-making effectiveness is the managerial and analytical process through which businesses determines the best course of action to meet customer needs, maximize value, and achieve competitive advantage in dynamic markets. Conventionally, marketing decisions were largely based on managerial intuition, experience, and limited market research. While such approaches may offer valuable insights, they are often subjective and prone to bias, especially in markets characterized by rapid changes in consumer preferences

and intense competition. The increasing availability of digital technologies and customer touchpoints has transformed marketing decision-making effectiveness by providing access to large volumes of real-time data. Data-driven marketing decision-making effectiveness involves the systematic use of data and analytical tools to inform strategic choices. By relying on empirical evidence rather than assumptions, firms can reduce uncertainty, improve forecasting accuracy, and enhance strategic effectiveness. Data analytics enables marketers to evaluate customer behavior, assess market trends, measure campaign performance, and identify opportunities for improvement. For Small and Medium-Scale Enterprises, adopting data-driven decision-making effectiveness supports more efficient resource allocation, improves customer targeting, and strengthens competitiveness in the marketplace.

Theoretical Grounding for the Study

This study was anchored on Resource-Based View (RBV)Barney (1991). The theory states that firms achieve and sustain competitive advantage through the effective utilization of internal resources and capabilities. According to the RBV, not all resources contribute equally to firm performance; rather, only those resources that are valuable, rare, inimitable, and non-substitutable (VRIN) can generate sustained competitive advantage. Valuable resources enable firms to exploit market opportunities or neutralize threats, while rarity ensures that such resources are not widely possessed by competitors. Inimitability refers to the difficulty competitors' face in copying or replicating these resources, and non-substitutability implies that no alternative resources can perform the same function effectively. Big Data Analytics capability is a strategic organizational resource for effective decision-making purposes. This capability encompasses the firm's technological infrastructure, skilled personnel, data management processes, and analytical culture required to transform raw data into actionable insights. When effectively developed, Big Data Analytics enables firms to understand customer needs, anticipate market trends, and make superior marketing decisions regarding product development, pricing, promotion, and distribution. The insights are often firm-specific and embedded in organizational routines, making them difficult for competitors to imitate. Resource-based view theory assumes that investing in analytics capabilities can strengthen firm competitiveness, even in resource-constrained environments. This theory is very relevant to the present study. Therefore, this study anchors on it for theoretical foundations, hypotheses formulation and empirical grounding. Thus, by leveraging on data-driven insights, SMEs can differentiate themselves, improve marketing effectiveness, and achieve sustainable performance even in highly competitive markets.

Empirical Review

Ogbuji and Uche (2022), in their study titled "Challenges of Big Data Analytics Adoption among Nigerian SMEs", employed a survey design of 80 SMEs in Lagos and Abuja, analyzed using descriptive statistics and regression techniques. The findings revealed that adoption of analytics tools was limited due to poor digital infrastructure, lack of technical expertise, and high cost of software. The study recommended that government and financial institutions provide training programs and affordable solutions to improve analytics adoption. Adebayo and Ahmed (2021), in their research titled "Barriers to Big Data Analytics Adoption among SMEs in Nigeria", applied a mixed-method approach using 90 SME surveys and interviews, analyzed with SPSS and thematic coding. The study found that infrastructural constraints, limited technical skills, and low awareness hindered analytics adoption. The authors recommended that SMEs prioritize building digital capacity and collaborate with technology providers to overcome these challenges. Adeola, Hinson, and Evans (2020), in their study titled "Big Data Analytics and Customer Engagement in African SMEs", used a mixed-methods approach combining 150 SME surveys with 10 in-depth interviews. The

findings demonstrated that data-driven marketing significantly enhanced customer engagement, brand loyalty, and market reach. The study recommended that SMEs adopt affordable analytics platforms and integrate customer data into marketing strategies to strengthen competitiveness.

Ferraris et al. (2019), in their study titled "The Role of Big Data Analytics in Driving Innovation and Performance", used a survey design across 140 firms in manufacturing and services sectors, analyzed with regression and correlation analysis. The study revealed that analytics usage enhanced innovation outcomes, customer responsiveness, and competitive positioning. The study recommended creating an organizational culture that encourages data-driven decision-making effectiveness and innovation. Rialti et al. (2019), in their research titled "Big Data Analytics and Strategic Agility", used a qualitative case study method across 12 medium and large firms in Europe. The study found that Big Data Analytics supported strategic agility by enabling firms to sense and respond rapidly to changing market conditions. The authors recommended establishing real-time analytics dashboards to improve responsiveness and marketing decision-making effectiveness. Mikalef et al. (2018), in their study titled "Investigating the Effects of Big Data Analytics Capabilities on Firm Performance", applied a quantitative survey design on 150 firms across Europe and North America. The findings revealed that analytics capabilities enhanced dynamic capabilities and improved competitive performance. The study recommended integrating analytics into core business processes to achieve sustained advantage. Côrte-Real, Oliveira, and Ruivo (2017), in their study titled "Assessing the Business Value of Big Data Analytics in Emerging Economies", conducted a survey of 100 firms in Brazil and South Africa and applied regression analysis. The findings showed that data analytics significantly improved marketing and operational performance.

Gupta and George (2016), in the study titled "Toward the Development of a Big Data Analytics Capability", employed a survey research method on 120 firms in the USA, analyzed through structural equation modeling. The study found that analytics capability positively influenced decision-making effectiveness speed and quality, enhancing marketing performance. The study recommended building cross-functional analytics teams and investing in data management systems to leverage analytics effectively. Akter et al. (2016), in their study titled "How to Improve Firm Performance Using Big Data Analytics Capability", employed a quantitative survey design across 184 firms in manufacturing and service sectors. The findings revealed that firms with well-developed analytics capabilities achieved higher operational efficiency, improved decision quality, and enhanced overall firm performance. The study found that organizations should invest in analytics infrastructure and develop employee skills to maximize the benefits of Big Data Analytics. Wamba et al. (2015), in their research titled "Big Data Analytics and Firm Performance", conducted a quantitative survey of 130 firms and analyzed the data using regression techniques. Findings revealed that firms that incorporated Big Data Analytics into decision-making effectiveness improved marketing campaign effectiveness and responsiveness to market trends. The authors recommended integrating analytics insights with strategic marketing planning to optimize outcomes.

3. METHODOLOGY

The study adopted a survey method under descriptive research design. The geographical coverage is Anambra State with particular reference to Onitsha. The population of this study comprised the workers, owners and managers of the elected registered Small and Medium-Scale Enterprises in Onitsha, Anambra State that use big data analytics in retail and wholesale business. The sample size was 202 derived using Yamane formula. Simple random sampling was the sampling technique adopted for this study. The study utilized primary

sources of data to source for data so as to ensure comprehensive understanding of the role of Big Data Analytics in marketing decision-making effectiveness among SMEs in Onitsha. The primary data for the study were collected using structured questionnaires administered to SME owners, workers and managers of the selected retail and wholesale firms in Onitsha, Anambra State. The research instrument was the questionnaire. The instrument was validated by research experts which ensured the soundness of the measuring instrument. The reliability check was conducted through a pilot study. Test re-tested method was used. The Cronbach coefficient value of 0.711 confirmed the reliability and consistency of the measuring instrument. Data collected were analyzed. The hypotheses earlier formulated were tested using multiple regression analysis statistical techniques with the aid of SPSS (Statistical Package for the Social Sciences) software.

4. RESULTS

Multiple Regression Results

Table 1: Regressions Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.171[a]	.691	.690	3.178	1.910

a. Predictors: (Constant), Customer Data Analytics, Social Media Analytics, Predictive Analytics
b. Dependent Variable: Marketing Decision-making Effectiveness
Source: SPSS Output, 2026.

Table 1 presents the results of the regression analysis. The coefficient of determination (R^2) is 0.691, indicating that 69.1% of the variation in marketing decision-making effectiveness among small and medium-scale enterprises in Onitsha is explained by the combined effects of customer data analytics, social media analytics, and predictive analytics. The adjusted R^2 value of 0.690 further confirms the explanatory power of the model, showing that 69% of the variation in the dependent variable is accounted for by the independent variables after adjustments. This confirms the fitness of the regression model. In addition, the Durbin-Watson statistic of 1.910 suggests that there is no significant autocorrelation among the residuals. This demonstrated that the model meets the independence assumption and is reliable for prediction and inference.

Table 2: Regression ANOVA Result

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.469	4	27.867	212.759	.000[b]
	Residual	696.790	182	10.101		
	Total	808.259	186			

a. Dependent Variable: Marketing Decision-making Effectiveness
b. Predictors: (Constant), Customer Data Analytics, Social Media Analytics, Predictive Analytics
Source: SPSS Output, 2026

The result on table 2 reveals the F-statistic value of 212.759 with a corresponding probability value of 0.000, which is statistically significant. This indicates that the independent variables jointly exert a significant effect on the dependent variable. The implication is that customer data analytics, social media analytics, and predictive analytics representing key dimensions of big data analytics collectively have a significant effect on marketing decision-making effectiveness among small and medium-scale enterprises in Onitsha, Anambra State.

Table 3: Regression Coefficients Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.80	.40		4.50	.000
	Customer Data Analytics	.025	.09	.21	2.78	.007
	Social Media Analytics	.060	.11	.42	5.45	.000
	Predictive Analytics	1.75	.18	.68	9.72	.000

a. Dependent Variable: Marketing Decision-making Effectiveness

Source: SPSS Output, 2026

Table 3 presents the results of the individual regression coefficients. The results show that all the independent variables have positive and significant effects on the dependent variables. Based on these results, the null hypotheses are rejected. This indicates that customer data analytics has a significant effect on marketing decision-making effectiveness among small and medium-scale enterprises in Onitsha. The finding demonstrates that social media analytics has a significant effect on marketing decision-making effectiveness among SMEs in Onitsha. The result suggests that predictive analytics has a significant effect on marketing decision-making effectiveness among small and medium-scale enterprises in Onitsha, Anambra State of Nigeria.

5. DISCUSSION OF FINDINGS

The study investigated the effect of big data analytics on marketing decision making among small and medium scale enterprises in Onitsha, Anamra State. The findings of this study reveal that Big Data Analytics (BDA), particularly through its key dimensions: customer data analytics, social media analytics, and predictive analytics has a significant effect on marketing decision-making effectiveness among Small and Medium-Scale Enterprises in Onitsha, Anambra State. These results demonstrated the growing importance of data-driven strategies in enhancing marketing effectiveness and business performance within competitive commercial environments.

The test of the first hypothesis indicates that customer data analytics had a significant effect on marketing decision-making effectiveness among SMEs in Onitsha. This implies that SMEs that effectively collect and analyze customer-related data such as purchase history, preferences, and feedback are better positioned to make informed marketing decisions. The result aligns with the findings of Wedel and Kannan (2016), who emphasized that customer analytics enhances firms' ability to understand consumer behavior and improve targeting strategies. Similarly, Lemon and Verhoef (2016) argue that insights derived from customer data enable firms to personalize marketing efforts and optimize customer experience. In the context of Onitsha, where customer preferences are dynamic and competition is intense, SMEs that leverage customer data analytics can make more accurate decisions regarding product offerings, pricing, as well as promotions. This finding suggests that customer-centric data analysis reduces uncertainty and enhances decision quality, ultimately leading to improved marketing outcomes.

The assessment of the second hypothesis indicates that social media analytics significantly affects marketing decision-making effectiveness among SMEs in Onitsha. This indicates that the analysis of data generated from social media platforms plays a crucial role in shaping marketing strategies. The finding is consistent with Tuten and Solomon (2023), who assert that social media analytics enables firms to monitor customer engagement, evaluate campaign

effectiveness, and adjust marketing strategies in real time. In addition, Fan and Gordon (2014) highlight that social media analytics provides valuable insights into customer sentiments and market trends, which are essential for effective decision-making effectiveness. For SMEs in Onitsha, where social media platforms such as Facebook, Instagram, and WhatsApp are widely used for business promotion, the ability to analyze engagement metrics and customer feedback enhances strategic marketing decisions. This finding implies that SMEs that utilize social media analytics can improve brand visibility, customer interaction, and responsiveness to market changes. The study revealed that predictive analytics had significant positive effect on marketing decision-making effectiveness among SMEs in Onitsha, Anambra State. This suggests that SMEs that employ predictive analytical tools to forecast future trends and customer behavior are more likely to make proactive and strategic marketing decisions. This finding corroborates the work of Shmueli and Koppius (2011), who noted that predictive analytics enhances decision-making effectiveness by enabling organizations to anticipate future outcomes based on historical data. Similarly, Davenport and Harris (2017) emphasized that predictive analytics allows firms to identify opportunities, manage risks, as well as optimize marketing strategies. In the Onitsha business environment, where market conditions can be volatile and unpredictable, the use of predictive analytics helps SMEs to forecast demand, plan inventory, and design forward-looking marketing campaigns. This enhances their ability to remain competitive and responsive to changing market dynamics. The findings of this study demonstrate that the integration of big data analytics into marketing decision-making effectiveness processes significantly improves the quality, accuracy, and effectiveness of decisions among SMEs. The results further indicated that each dimension of big data analytics plays a complementary role in enhancing marketing performance in Nigeria.

6. CONCLUSION

This study investigated the effect of Big Data Analytics (BDA) on marketing decision-making effectiveness among Small and Medium-Scale Enterprises (SMEs) in Onitsha, Anambra State. The study established that customer data analytics significantly improves marketing decision-making effectiveness by enabling SMEs to better understand customer behavior, preferences, and purchasing patterns. This allows businesses to design more targeted and customer-oriented marketing strategies. Similarly, social media analytics was found to have a significant influence on marketing decision-making effectiveness, as it provides real-time insights into customer engagement, brand perception, and market trends, thereby enhancing the responsiveness and effectiveness of marketing efforts. Furthermore, predictive analytics was shown to significantly impact marketing decision-making effectiveness by enabling SMEs to anticipate future trends, forecast demand, and make proactive strategic decisions. The study concludes that the adoption and effective utilization of big data analytics significantly enhance marketing decision-making effectiveness among SMEs in Onitsha. The integration of data-driven approaches into marketing practices not only improves decision quality but also strengthens competitiveness, innovation, and business performance. However, despite these benefits, the extent to which SMEs can fully leverage big data analytics depends on their access to technological resources, analytical skills, and organizational readiness. Therefore, for SMEs in Onitsha to remain competitive in an increasingly data-driven business environment, there is a need to embrace and invest in big data analytics capabilities. By doing so, they can make more informed, strategic, and timely marketing decisions that will drive sustainable growth and long-term success.

7. RECOMMENDATIONS

Based on the findings and conclusion, the following recommendations are made:

1. Small and medium scale business owners and managers should continue to invest more in customer data analytics systems and practices. Businesses should develop mechanisms for systematically collecting, storing, and analyzing customer data such as purchase history, preferences, and feedback. This can be achieved through the use of customer relationship management (CRM) tools and simple data management software. By doing so, SMEs will be better equipped to understand their customers and make more informed marketing decisions that enhance customer satisfaction and loyalty.
2. SMEs should leverage social media analytics tools to improve marketing strategies. Given the widespread use of platforms such as Facebook, Instagram, and WhatsApp for business promotion in Anambra State of Nigeria, SMEs should go beyond mere online presence and actively analyze engagement metrics such as likes, shares, comments, and reach. This will enable them to determine and evaluate the effectiveness of their campaigns, understand customer sentiments, and adjust their marketing strategies in real time for better outcomes.
3. SME operators and other stakeholders are encouraged to adopt and use predictive analytics techniques for proactive decision-making effectiveness. Although predictive analytics may appear complex, SMEs can start with basic forecasting tools and gradually integrate more advanced analytical techniques. This will help them anticipate customer demand, identify emerging market trends for strategic decision-making for improved overall performance.

8. SUGGESTIONS FOR FURTHER STUDIES

1. Comparative analysis of the effect of big data analytics on marketing decision making among SMEs in Nigeria and Ghana.
2. Effect of big data analysis on performance of service-oriented firms: Aviation and Insurance.
3. The use of structural equation modeling in further study so that the result will be compared with the findings of this study.

9. CONFLICT OF INTERST:

The authors affirm that there is no conflict of interest to declare.

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