Sing. J. Bus. Eco. & Mng, 11(3)2025,53-56
ISSN: 3009-0024 (Online)
Open Access

Singaporean Journal of Business Economics and Management

Research Paper

Mainstreaming data-driven marketing: Widespread adoption and integration in the digital economy

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ARTICLE INFO

KEYWORDS:
Data-Driven, Digital Marketing, Economic Implication, Shift

JEL Classification: M10, M21, M31

Received: 15 Mar 2025
Accepted: 25 May 2025
Available Online: 25 Jul 2025

ABSTRACT

This paper explores the mainstreaming of data-driven marketing its widespread adoption and integration within the digital economy in Adamawa State. The objective of the study is to examine the adoption, integration, and mainstreaming of data-driven marketing in the digital economy. The study employed both qualitative and quantitative methods through the use of surveys. It focused on small and medium enterprise (SME) owners in Adamawa State. A total of 400 SME owners were selected as respondents using multi-stage sampling techniques from four local government areas: Yola North, Yola South, Mubi North, and Mubi South, using a structured questionnaire. The study finds that internal organizational factors, rather than financial resources, are key to integrating data-driven marketing in the digital economy. While data-driven strategies positively impact business alignment, owner-managed firms face adoption barriers. Successful integration depends on leadership, organizational culture, and digital skills. Based on the findings, the following recommendations were made: to mainstream data-driven marketing, businesses should improve digital literacy, foster a data-driven culture, promote innovation, and use analytics strategically. Collaboration with tech providers, supportive policies, and awareness campaigns are also essential for successful adoption in the digital economy.

1 | INTRODUCTION

The global marketing landscape has undergone a profound transformation in recent decades, driven by rapid advancements in digital technologies and the exponential growth of data. Traditionally, marketing relied heavily on intuition, broad demographic targeting, and mass communication through traditional media such as radio, print, and television. However, the rise of digital platforms has revolutionized how businesses interact with consumers, giving birth to data-driven marketing a practice where consumer data informs strategy, enhances personalization, and increases the effectiveness of marketing campaigns (Chaffey & Smith, 2017). This global shift is part of a broader digital transformation trend, where organizations are rethinking their operational and strategic models to harness the power of digital tools. Technologies such as big data, artificial intelligence (AI), machine learning, and predictive analytics now empower marketers to extract deep insights into consumer behavior, preferences, and purchasing patterns in real time. These innovations allow businesses to forecast trends and deliver personalized messages across multiple channels, significantly boosting customer engagement and loyalty (Wedel & Kannan, 2016; Erevelles, Fukawa, & Swayne, 2016). Regionally, the transition toward data-driven marketing has accelerated across both developed and emerging economies, where customer-centric strategies have fueled the mainstream adoption of marketing analytics. In Asia and parts of Europe, data-based decision-making is fast replacing assumption-driven strategies, leading to higher efficiency and improved ROI (Chong, Ch'ng, Liu, & Li, 2017). Despite these advancements, many organizations continue to face considerable challenges in fully integrating data-driven practices. These include data privacy concerns, compliance with regulatory frameworks such as the General Data Protection Regulation (GDPR), infrastructural deficiencies, and a lack of data-literate personnel.

In the Nigerian context, the digital economy is expanding rapidly driven by increased internet penetration, widespread mobile device usage, and a vibrant tech ecosystem offering immense potential for data-driven marketing. According to the Nigerian Communications Commission (NCC), internet penetration surpassed 80 million users by 2023, laying a strong foundation for digital engagement and connectivity. The growth of fintech startups, e-commerce platforms, and digital service providers further reflects Nigeria's readiness to harness data for marketing and business intelligence. However, the adoption of data-driven marketing remains uneven and underdeveloped due to several structural and operational challenges. These include limited digital infrastructure, high costs of analytics tools, low data literacy among marketing professionals, and a shortage of skilled personnel in areas such as data science, artificial intelligence, and marketing analytics (Wamba et al., 2017).

Despite the growing recognition of data-driven marketing as a vital enabler in the digital economy, its widespread adoption and integration remain limited, especially in emerging markets like Nigeria. While digital transformation has gained momentum globally with organizations leveraging big data, artificial intelligence, and analytics to enhance customer engagement and drive strategic decisions the mainstreaming of data-driven marketing is impeded by several persistent challenges. In the Nigerian context, although internet penetration has exceeded 80 million users and a vibrant tech ecosystem is emerging (Nigerian Communications Commission, 2023), adoption remains uneven and underdeveloped. Many organizations grapple with inadequate technical infrastructure, low data literacy, and a shortage of skilled personnel necessary to implement data-driven strategies effectively. Furthermore, resistance to organizational change and the difficulty of integrating new technologies with legacy systems pose substantial barriers. Compliance with data protection laws such as the General Data Protection Regulation (GDPR) and the Nigeria Data Protection Regulation (NDPR) is weak due to limited awareness and enforcement, further complicating data use and governance. These issues collectively slow down the institutionalization of data-driven marketing, curbing its potential to drive innovation, improve customer experiences, and enhance business competitiveness in the evolving digital economy (Homburg, Jozić, & Kuehnl, 2017; Chaffey, 2015). The objective of this study is to examine the adoption, integration, and mainstreaming of data-driven marketing in the digital economy. The paper is structured into five sections: Introduction, Literature Review, Methodology, Results and Discussion, and Conclusion and Recommendations.

2 | LITERATURE REVIEW

2.1 | Data-Driven Marketing

Data-driven marketing refers to the strategic use of customer data such as behavioral patterns, demographic profiles, and transactional records to guide and improve marketing decisions. This approach involves collecting data from various sources, including websites, social media platforms, email campaigns, and purchase histories, to gain a deeper understanding of customer preferences and behaviors. With these insights, businesses can create highly targeted and personalized marketing campaigns that resonate with specific customer segments. This not only enhances customer engagement but also increases the efficiency and effectiveness of marketing efforts by reducing guesswork and enabling data-backed decisions. Unlike traditional marketing, which often relies on broad generalizations, data-driven marketing allows for precise audience segmentation, real-time content delivery, and continuous performance optimization based on measurable outcomes. As a result, companies can improve customer satisfaction, boost

conversion rates, and achieve a higher return on investment. This strategic shift toward data-informed practices is essential in today's competitive and fast-paced digital environment (Wedel & Kannan, 2016).

2.2 |Mainstreaming

Mainstreaming, in this context, involves the process of embedding data-driven marketing practices into the everyday operations and strategic frameworks of businesses, thereby transforming them from innovative or optional approaches into standard and widely accepted methods across industries. It means that the use of data analytics, customer insights, and technology-driven decision-making is no longer limited to a few advanced companies but is being adopted as a norm across both small and large enterprises. This integration requires organizational alignment, where departments such as marketing, sales, IT, and customer service collaborate using shared data platforms and insights. It also involves developing the digital skills of employees, investing in analytical tools, and fostering a data-driven culture that values evidence-based decision-making. As data becomes a central asset for driving performance, customer satisfaction, and innovation, businesses that successfully mainstream these practices gain a competitive edge in responsiveness, personalization, and strategic planning. Thus, mainstreaming is not just about adoption, but about institutionalizing data-driven thinking as an integral part of how modern businesses operate and compete in the digital economy (Van der Heijden, 2005).

2.3 |Digital Economy

The rise of the digital economy, driven by technologies like e-commerce, data analytics, and cloud computing, is reshaping how businesses operate and compete. Within this framework, data-driven marketing has emerged as a key strategy, enabling companies to use customer data to personalize campaigns and make informed decisions. As these practices become more effective and widely adopted, they are being mainstreamed integrated into core business operations across industries. This digital transformation marks a shift from traditional marketing to more precise, efficient, and customer-centric approaches, highlighting how data is revolutionizing modern business strategies (Safronchuk & Sergeeva (2019).

2.4 |Data-driven decision-making

Data-driven decision-making involves making informed choices based on data and analytics rather than relying on intuition or guesswork. Troisi et al. (2020) explains that data-driven managers utilize data-analytic thinking to guide business decisions, using data to determine courses of action, implement changes, and anticipate potential issues that may affect outcomes. Data-driven marketing practices enable more informed decision-making by collecting and analyzing data on customer behavior, market trends, and other relevant variables (Kontis & Lagos, 2016). This reliance on data increases the probability of achieving positive outcomes and enhances strategic precision. A key benefit of this approach is the ability to recognize patterns and trends not immediately visible through intuition or observation, allowing organizations to identify emerging opportunities or threats and adapt their strategies accordingly (Xu et al., 2023). Moreover, firms can leverage data technologies to measure the effectiveness of different marketing strategies and techniques. Big data and analytics provide tools for tracking and evaluating key performance indicators (KPIs), which help marketers assess which strategies and channels are delivering results and where improvements are needed (Zahay et al., 2019).

2.5 |Innovation Diffusion Theory (IDT)

In the age of digital disruptions, industries are increasingly becoming data-centric, with data-driven marketing decisions and technology becoming pervasive across sectors. The internet, as a driving force, plays a significant role as a strategic business tool, and recent studies highlight its importance. While the use of data in decision-making has grown, it is crucial to understand whether business professionals (middle to senior-level) have fully embraced this shift. To explore the intention behind users' adoption and the factors influencing their decisions, we draw on the widely accepted Innovation Diffusion Theory, developed by Rogers in (1962, 1995), and the Technology Acceptance Model (TAM), developed in the 1980s. TAM postulates that an individual's intention to use a system depends on two primary belief factors: perceived usefulness and perceived ease of use (Chismar & Wiley-Patton, 2003a, b). However, subsequent studies have refined this model by emphasizing the importance of attitude and social factors in shaping behavioral intentions (Venkatesh & Davis, 2000). Additionally, Rogers' Innovation Diffusion Theory identifies various factors affecting adoption decisions, such as awareness, interest, evaluation, trial, and eventual adoption. According to Rogers, adopters are classified into five categories: innovators, early adopters, early majority, late majority, and laggards, each representing different stages of willingness and ability to embrace technological change (Rogers, 2004).

2.6 |Empirical Literature

The integration of digital marketing and digital transformation has been extensively examined across various studies, all emphasizing the positive impact on small and medium-sized enterprises (SMEs). Sharabati et al. (2024) found a strong positive correlation between digital transformation and SME performance in Jordan, with businesses adopting digital strategies achieving superior outcomes in sales growth, customer acquisition, and brand loyalty. Similarly, Toni et al. (2024) observed that digital marketing positively influenced the financial performance of SMEs in Indonesia, with digital transformation further enhancing performance by reconfiguring business operations. Munna and Shaikh (2023) also highlighted the importance of digital marketing tools in improving SME visibility and customer engagement, noting the challenges posed by skill gaps and limited resources in implementing digital strategies. These findings align with Saura et al. (2023), who found that data-driven strategies, such as personalized emails and CRM systems, significantly improve marketing effectiveness and ROI by enhancing customer targeting and engagement.

In addition to the positive effects of digital transformation on SMEs, regulatory and technological factors play a crucial role in shaping the success of digital marketing strategies. Fast et al. (2023) explored how businesses leverage big data and emerging technologies like AI to gain competitive advantages in the digital economy, stressing the importance of aligning IT systems with evolving data-sharing mandates for effective regulation. This supports the findings of Grandhi et al. (2021), whose survey-based study identified that organizations with substantial investments in data-driven marketing (DDM) were more likely to experience growth and profitability. The study categorized organizations based on their level of investment in DDM, with those in customer-focused industries, such as retail and banking, being more likely to adopt DDM effectively. Furthermore, Camilleri (2020) emphasized the role of big data analytics, programmatic advertising, and blockchain technologies in modernizing digital marketing strategies, enabling firms to enhance customer engagement, operational efficiency, and decision-making.

Finally, Krämer and Wohlfarth (2018) contributed to the discourse on digital markets by highlighting the complexities in assessing market power and the need for a coherent regulatory framework. Their study focused on the use of the Hypothetical Monopolist Test (HMT) and the Small but Significant and Non-transitory Increase in Price (SSNIP), test to define relevant markets, which is essential for understanding competitive dynamics in digital markets. The research also pointed out the challenges of harmonizing regulatory obligations for digital services and traditional telecommunications, particularly concerning data protection in data-driven business models. These regulatory challenges are critical for SMEs that seek to optimize their digital marketing strategies while ensuring compliance with evolving data protection regulations (Akram et al., 2025). Together, these studies underscore the transformative potential of digital marketing and digital transformation in enhancing SME performance, while also acknowledging the challenges SMEs face in terms of resources, skills, and regulatory complexities.

3 | METHODOLOGY

This research employed both quantitative and qualitative methods through the use of surveys. The study focused on SME owners in Adamawa State. A total of 400 SME owners were selected as respondents using multi-stage sampling approach was employed to ensure representative inclusion of the target populations across the four (4) LGAs in Adamawa State. Data for the study was collected through the distribution of online questionnaires via KoboCollect. The study population consists of small and medium enterprises (SMEs) across four local government areas in Adamawa State, targeting sectors such as retail, manufacturing, services (including ICT, marketing, and consulting), agriculture, and others, with a particular focus on data-driven marketing and integration into the digital economy. The local government areas are Yola South (estimated population of 302,500), Yola North (307,900), Mubi North (233,600), and Mubi South (200,400), bringing the total estimated population to 1,044,400 individuals, based on projections from the National Population Commission of Nigeria and the National Bureau of Statistics (2024). This thorough understanding of the population forms the foundation for determining the sample size for the study. The small and medium enterprises (SMEs) survey sample size was calculated using Taro Yamane's formula (1967), with a 95% confidence level and a 5% margin of error. Based on LGA population data from the 2006 census (projected to 2024), the minimum required sample was 399. This was rounded up to 400 SMEs. The sample size was calculated from the projected total population of the sampled local governments, considering a projected population of 1,044,400, as reported by the National Population Commission in 2024.

$$n = \frac{N}{1 + Ne^2}$$

Where n = sample size, N = Total population, e = error margin (the common error margin of 0.05 i.e. 5% is chosen with, 95% confidence interval).

$$n = \frac{1{,}044{,}400}{1+1{,}044{,}401(0.05)^2} = 399.99 \approx 400$$

Below is a table summarizing the estimated population for each local government, along with their corresponding sample sizes, resulting in a total sample size of 400 small and medium enterprises (SME)

Table 1: Sample Size Distribution

A	B	C	D	E	(C x E)
LGAs	Total No. of Wards	No. of Wards Selected	Total Projected Population in the LGA (NPC, 2022)	Sample size to be drawn from each ward	Proposed Sample Size from each LGA
Yola North	11	5	307,900	30	150
Yola South	09	3	302,500	20	60
Mubi North	11	5	233,600	24	130
Mubi South	10	4	200,400	17	60
Total	41	17	1,044,400	91	400

Source: *Author's Computation (2025)*

Adoption and Integration of Data –Driven Marketing in the Digital Economy

$$ARM = \frac{Number\ of\ firms\ using\ data-driven\ marketing\ tools}{Total\ number\ of\ firms\ surveyed}\ X\ 100$$

$$IDM = \sum_{i=1}^{n}(Data-driven\ marketing\ usage\ at\ each\ decision\ level)$$

* ARM=Adoption Rate of Data-Driven Marketing, IDM=Integration of Data –Driven Marketing

$$IDDM = f(BO, AC, MS) \quad (3.1)$$

$$IDDM = \beta_o + \beta_1 BO + \beta_2 AC + \beta_3 MS + \varepsilon_t \quad (3.2)$$

Where: *IDDM=Integrating Data-Driven Marketing, BO=Business Ownership, AC=Access to capital, MS=Market Size.*

4 | RESULTS AND DISCUSSION

Table 2: Regression

	Unstandardized Coefficients		Standardized Coefficients			Unstandardized Coefficients	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	.947	.074		12.738	.000		
Integrating data-driven marketing	.151	.039	.193	3.933	.000	.994	1.006
The owner of the business	-.043	.019	-.109	-2.224	.027	1.000	1.000
Access to Capital (₦)	.003	.010	.013	.256	.798	.994	1.006
Market Size	.009	.016	.030	.610	.543	.999	1.001

Source: *Field Survey (2025)*

Table 2 presents regression coefficients assessing the relationship between selected predictors and the dependent variable in the context of mainstreaming data-driven marketing within the digital economy. The variable 'Integrating data-driven marketing' shows a statistically significant positive effect (B = 0.151, t = 3.933, p < 0.001), suggesting that higher levels of integration of data-driven practices within businesses are associated with increased adoption and alignment with digital economy strategies. Conversely, 'Ownership of the business' has a negative and statistically significant coefficient (B = -0.043, t = -2.224, p = 0.027), indicating that being the business owner slightly reduces the likelihood of engaging in data-driven strategies possibly reflecting resistance to change or limited digital literacy among some owners. On the other hand, 'Access to capital' (B = 0.003, p = 0.798) and 'Market size' (B = 0.009, p = 0.543) are both statistically insignificant, implying that while financial access and operational scope are important business elements, they do not significantly predict engagement in data-driven marketing in this model. The Variance Inflation Factor (VIF) values are all close to 1, indicating no multicollinearity concerns among the predictors. These findings align with research by Shah and Murthi (2020), which emphasizes the importance of internal organizational factors, such as marketing analytics capability, in achieving competitive advantage through data-driven strategies. However, they contrast with the study by Iddris and Ibrahim (2015), which found that factors influencing e-marketing adoption did not significantly impact marketing performance among SMEs in Ghana, highlighting the need for further research into the complex dynamics of data-driven marketing adoption.

Table 2: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.125	4	.281	5.181	.000[b]
Residual	21.435	395	.054		
Total	22.560	399			

Source: *Field Survey (2025)*

Table 4 presents the ANOVA (Analysis of Variance) results for the regression model examining the predictors of data-driven marketing integration. The regression model is statistically significant, with an F-value of 5.181 and a p-value of 0.000 (p < 0.05). This implies that the combination of the independent variable; Integrating data-driven marketing, Business Ownership, Access to Capital, and Market Size jointly contribute significantly to explaining the variations in the dependent variable related to the adoption and integration of data-driven marketing practices in the digital economy. Specifically, the model accounts for a meaningful proportion of variance in data-driven marketing integration, validating the relevance of the selected predictors in shaping business engagement with data-oriented strategies. This result supports the central theme of the study, highlighting that fostering integration of data-driven tools within organizational processes is crucial for widespread adoption in the evolving digital marketplace.

Table 4: Model Summary[b]

					Change Statistics					
Model	R	R^2	Adj. R^2	Std. Error of the Estimate	R^2 Changes	F Changes	df1	df2	Sig. F Changes	Durbin-Watson
1	.223[a]	.050	.040	.233	.050	5.181	4	395	.000	1.644

Source: *Field Survey (2025)*

The regression model summary in Table 4 reveals a statistically significant relationship between the predictors and the integration of data-driven marketing in the digital economy, with an R^2 value of 0.050 indicating that approximately 5% of the variance in data-driven marketing integration is explained by the independent variables. The F-change statistic of 5.181 (p = 0.000) confirms the model's significance, while the Durbin-Watson statistic of 1.644 suggests no serious autocorrelation. These findings align with the study by Shah and Murthi (2020), who emphasize the transformative role of data-driven marketing and the adoption of digital technologies in expanding marketing strategies beyond traditional advertising. Their research highlights how data-driven approaches have shifted marketing towards more analytics-driven, customer-centric strategies, underscoring the importance of integrating data analytics into marketing functions to achieve fiscal responsibility and technological advancement. Conversely, the results contrast with the findings of Masenya (2022), who explored the role of big data analytics in small and medium-sized enterprises (SMEs) and found that while big data adoption influences business model innovation, the actual integration of data-driven marketing still faces significant challenges in many SMEs. This suggests that the integration of data-driven marketing may depend on more than just adoption, pointing to the need for additional contextual factors to fully leverage its benefits in the digital economy. Additionally, Iddris and Ibrahim (2015) found that e-marketing adoption among SMEs did not significantly impact marketing performance unless it was effectively integrated, further highlighting the complexity of data-driven marketing adoption and integration.

Table 5: Pearson's correlation coefficient (two-tailed)

		Integrating data-driven marketing	Business Ownership
Integrating data-driven marketing	Pearson Correlation	1	.966
	Sig. (2-tailed)		1.78E-235
	N	400	400
Business Ownership	Pearson Correlation	.966	1
	Sig. (2-tailed)	1.78E-235	
	N	400	400

Source: *Field Survey (2025)*

As presented in Table 5, the Pearson correlation coefficient of 0.966 between Integrating Data-Driven Marketing and Business Ownership indicates a very strong positive relationship, suggesting that the level or type of business ownership significantly influences the extent to which data-driven marketing is integrated. With a p-value of 1.78E-235, the relationship is statistically significant at all conventional levels, meaning it is not due to chance. In the context of mainstreaming data-driven marketing in the digital economy, this finding implies that owner-managed or entrepreneur-led businesses are more likely to embrace and integrate data-driven marketing strategies, possibly due to greater decision-making autonomy, openness to innovation, or direct interest in business growth.

5 | CONCLUSION AND RECOMMENDATIONS

In conclusion, the findings emphasize the critical role of internal organizational factors in the integration of data-driven marketing strategies within the digital economy. The significant positive effect of Integrating Data-Driven Marketing (B = 0.151, p < 0.001) indicates its substantial influence on businesses aligning with digital economy strategies. However, the negative relationship between Business Ownership (B = -0.043, p = 0.027) suggests that owner-managed businesses may face unique barriers, such as resistance to change or limited digital literacy, which hinder their adoption of data-driven practices. The insignificance of Access to Capital and Market Size in predicting data-driven marketing integration further suggests that financial

resources and operational scope alone are not sufficient to drive widespread adoption. The regression model's statistical significance ($F = 5.181$, $p < 0.05$) and the R^2 value of 0.050 indicate that while the predictors influence the adoption process, they do not fully explain its variance. These results align with Shah and Murthi (2020), who emphasized the importance of digital marketing tools in gaining a competitive advantage, yet contrast with Masenya (2022), who found that big data adoption in SMEs still faces significant integration challenges. The study highlights that successful integration of data-driven marketing requires more than just adoption; it depends on factors like organizational culture, leadership, and digital capabilities, offering valuable insights for policymakers and business practitioners striving to mainstream data-driven marketing in the digital economy. Based on the conclusion the following recommendations; to mainstream data-driven marketing in the digital economy, businesses should improve digital literacy among owners, especially in owner-managed businesses, to overcome resistance and enhance adoption. Promoting a culture of data-driven decision-making, fostering collaboration between SMEs and technology providers, and encouraging leadership to prioritize innovation are crucial. Policymakers can support SMEs through incentives and digital infrastructure development. Awareness campaigns should emphasize the benefits of data-driven marketing, while businesses should leverage data analytics in strategic planning to adapt to digital disruptions and gain a competitive edge in the digital marketplace.

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