European Journal of
Business and Strategic Management
(EJBSM)

The Role of Artificial Intelligence in Integrated Marketing Communications: An Evaluation of Pharmaceutical Retail Firms in Nairobi County, Kenya

Winnie Njeru, PhD and Jesse Mukuria, PhD

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

European Journal of Business and Strategic Management
ISSN 2518-265X (Online)
Vol.11, Issue 1, No.5. pp 57 - 80, 2026

www.iprjb.org

The Role of Artificial Intelligence in Integrated Marketing Communications: An Evaluation of Pharmaceutical Retail Firms in Nairobi County, Kenya

[1*]Winnie Njeru
Senior Lecturer, Department of Business Administration, Faculty of Business and Management Sciences, University of Nairobi

[2]Jesse Kang'ethe Mukuria
Practicing Pharmacist and PhD holder, Department of Business Administration, Faculty of Business and Management Sciences, University of Nairobi

Article History

Received 24th February 2026

Received in Revised Form 27th March 2026

Accepted 28th April 2026

How to cite in APA format:

Njeru, W., & Mukuria, J. (2026). The Role of Artificial Intelligence in Integrated Marketing Communications: An Evaluation of Pharmaceutical Retail Firms in Nairobi County, Kenya. *European Journal of Business and Strategic Management*, *11*(1), 57–80. https://doi.org/10.47604/ejbsm.3729

Abstract

Purpose: This study examined the role of AI in enhancing IMC among pharmaceutical retail firms in Nairobi City County, Kenya. This is informed by how Artificial Intelligence (AI) is increasingly reshaping pharmaceutical marketing by enabling data driven decision making, personalization, and multichannel communication integration globally but empirical evidence on its role in Integrated Marketing Communication (IMC) within pharmaceutical retail contexts in Kenya remains limited.

Methodology: A mixed-method design was adopted, combining survey data from 261 usable responses (89.7% response rate) drawn from 291 sampled pharmacies with systematic analysis of peer-reviewed literature, industry reports, and policy and regulatory frameworks. Descriptive, correlation, and regression analyses were used alongside thematic analysis of qualitative data.

Findings: Findings indicate moderate but growing AI adoption, with automation and mobile-based tools being the most widely implemented, while predictive analytics and personalization remain less developed. IMC practices were found to be mobile-driven but partially fragmented, with promotional integration lagging behind other dimensions. Correlation results show strong positive relationships between AI and IMC dimensions ($r = 0.42–0.73$), while regression analysis confirms that AI significantly predicts IMC performance ($R^2 = 0.55–0.66$). Qualitative findings further reveal that AI enhances communication efficiency and consistency but is constrained by system fragmentation, limited data maturity, and strict pharmaceutical regulatory frameworks. Overall AI is a critical enabler of IMC in pharmaceutical retail firms; however, its impact is moderated by organizational and regulatory constraints.

Unique Contribution to Theory, Practice and Policy: The study contributes to theory by proposing a transitional AI–IMC maturity model, where AI is operational and fully strategic in driving integrated communication systems and by extending IMC, Technology Acceptance Model (TAM), and Customer Relationship Management (CRM) frameworks through the integration of AI as a structural enabler. Practically, it highlights the need for system integration, investment in data capabilities, and regulatory alignment. Policy implications emphasize balanced regulatory frameworks that support innovation while ensuring ethical pharmaceutical communication.

Keywords: *Artificial Intelligence, Integrated Marketing Communication, Pharmaceutical Retail, Kenya, IMC Integration*

European Journal of Business and Strategic Management
ISSN 2518-265X (Online)
Vol.11, Issue 1, No.5. pp 57 - 80, 2026
www.iprjb.org

INTRODUCTION

Artificial Intelligence (AI) is rapidly transforming healthcare and pharmaceutical marketing by enabling data-driven decision-making, predictive analytics, and personalized customer engagement (Jain & Kumar, 2024). In parallel, Integrated Marketing Communications (IMC) has evolved into a coordinated, technology-driven approach that ensures consistency across communication channels an essential requirement in the highly regulated pharmaceutical sector where firms must effectively engage patients, pharmacists, and healthcare providers (Pearson & Malthouse, 2024).

Globally, pharmaceutical firms are increasingly embedding AI into IMC systems to enhance personalization, optimize multichannel communication, and improve strategic decision-making (Chaffey & Ellis-Chadwick, 2022). For example, in the United States, leading pharmaceutical companies use AI-driven analytics and automation tools to deliver highly targeted campaigns and patient engagement programs. In the United Kingdom, firms leverage AI-powered chatbots and digital platforms to improve patient communication and medication adherence. Similarly, in Germany and Switzerland, AI-enabled data integration systems support coordinated multichannel engagement and enhance marketing decision-making efficiency. In Asia, countries such as China and India are rapidly adopting AI in pharmaceutical marketing, driven by expanding digital ecosystems and increased investment in health technologies (McKinsey Global Institute, 2021). These countries apply AI in customer segmentation, predictive demand analysis, and digital engagement strategies.

In Africa, adoption is gradually gaining momentum, particularly in South Africa, Nigeria, and Ghana, where AI is being used to enhance customer engagement, personalization, and decision-making in marketing and other sectors (Alice & Ebuka, 2024). However, adoption remains uneven across the continent due to disparities in digital infrastructure, skills, and policy environments (SAP Africa, 2024). Evidence further shows that AI deployment in Africa is still concentrated in a few countries and sectors, including healthcare and finance, highlighting both its potential and existing limitations (Silcox et al., 2024). In East Africa, including Kenya, Uganda, and Tanzania, rapid urbanization and digital health expansion are driving growth in pharmaceutical services, but AI integration into IMC remains limited.

In Kenya, AI adoption is steadily increasing, supported by a growing innovation ecosystem and government initiatives such as the Digital Master Plan 2022–2032, which promotes the use of AI across sectors including healthcare (Kenya AI, 2024). Studies also indicate that while AI has significant potential to improve healthcare performance through enhanced efficiency and decision-making, its adoption in Nairobi remains relatively low and underdeveloped (Tira & Kihara, 2025). Additional evidence highlights that AI is already beginning to transform healthcare delivery in Kenya, although full-scale integration is still evolving (Lacave, 2024). Nairobi serves as the central hub for pharmaceutical manufacturing, distribution, and retail. Despite increasing demand for pharmaceutical services, the sector faces challenges such as declining customer retention and intense competition among retail firms.

Artificial Intelligence (AI) is increasingly embedded within Integrated Marketing Communication (IMC) channels in retail pharmacy, enhancing both the efficiency and personalization of customer engagement (Chaffey & Ellis-Chadwick, 2022; Kumar et al., 2023). Within digital marketing channels, AI-driven Search Engine Optimization (SEO) tools analyze patient search behavior and optimize pharmacy websites to improve online visibility,

ensuring that services such as prescription refills or health consultations are easily discoverable (Dwivedi et al., 2023).

In mobile communication channels, pharmacies are leveraging predictive analytics to send automated SMS or WhatsApp reminders for medication refills, dosage adherence, and appointment scheduling. These AI-powered alerts are generated based on patient purchase history and prescription cycles, improving adherence and strengthening customer relationships (Bala & Verma, 2024; Kietzmann et al., 2018). This is particularly relevant in African contexts, where mobile health (mHealth) solutions have significantly improved patient engagement and medication adherence (Achieng et al., 2022). Within social media and content marketing, AI tools enable sentiment analysis and audience segmentation, allowing pharmacies to tailor health education messages, promotions, and awareness campaigns to specific demographic groups. For example, AI can identify patients interested in chronic disease management and deliver targeted content related to diabetes or hypertension care (Tuten & Solomon, 2023; Dwivedi et al., 2023).

In customer relationship management (CRM) systems, AI supports personalized email marketing by recommending relevant products, wellness programs, or preventive care services based on individual patient profiles. This ensures consistency across IMC channels while enhancing message relevance (Payne et al., 2021; Kumar et al., 2023). Additionally, in-store communication is being enhanced through AI-powered chatbots and virtual assistants, which provide real-time responses to customer inquiries, guide product selection, and support pharmacists in delivering timely information (Huang & Rust, 2021). These applications align with the broader shift toward data-driven and customer-centric IMC strategies in healthcare and pharmaceutical retail (Jain & Kumar, 2024).

Many pharmaceutical retailers still rely on fragmented marketing communication strategies, leading to weak brand visibility and low customer loyalty. Although adoption of digital technologies is increasing, the integration of AI into marketing communication remains limited. This represents a missed opportunity, particularly as community pharmacies generate valuable customer data through mobile health platforms, digital payments, and loyalty systems. Leveraging AI within an IMC framework could significantly enhance communication effectiveness, customer engagement, and service delivery. This study therefore addresses a critical gap by examining how AI-driven IMC can be leveraged to improve communication integration, strengthen customer relationships, and enhance competitive performance among pharmaceutical retail firms in Nairobi.

Problem Statement

Artificial Intelligence (AI) and Integrated Marketing Communications (IMC) have emerged as critical concepts in modern marketing, particularly within service-oriented and highly competitive sectors such as pharmaceutical retail. AI enables data-driven decision-making, predictive analytics, and personalized customer engagement, while IMC emphasizes the coordination and integration of multiple communication channels to deliver consistent and effective messaging. In the pharmaceutical retail context, where firms interact directly with patients and operate within regulated environments, the integration of AI into IMC presents a strategic opportunity to enhance customer engagement, improve service delivery, and strengthen competitive positioning.

Retail pharmacy sales performance has shown signs of pressure in certain segments, particularly in non-prescription product categories. For instance, sales of pharmaceutical

products declined by 5.6% year-on-year in early 2025, with their share of pharmacy revenue dropping to a historic low of 19%, largely due to competition from online marketplaces (RNC Pharma, 2025). Similarly, major pharmacy chains have reported declines in front-end retail sales of up to 2.4%, reflecting reduced consumer spending and increased competition from e-commerce platforms. These trends suggest growing challenges in sustaining retail sales performance within pharmacy settings.

Empirical studies from global contexts demonstrate the transformative potential of AI in marketing communication. For example, Bansal (2026), found that AI significantly improves customer targeting, personalization, and campaign efficiency. Similarly, Kumar and Anand (2025) reported that AI enhances decision-making and communication effectiveness but noted challenges related to data integration and regulatory compliance. However, these studies are largely concentrated in high-income or emerging Asian markets and focus primarily on pharmaceutical manufacturers, thereby limiting their applicability to retail pharmacy settings, particularly in low- and middle-income countries.

In Africa, empirical evidence on AI and IMC remains limited and fragmented. Studies such as Godday (2019) in Nigeria highlight the importance of marketing strategies in influencing firm performance, but these are largely conducted in non-pharmaceutical sectors. This creates a contextual gap, as pharmaceutical retail operates under unique regulatory and ethical constraints. At the regional level, studies such as Angalia (2017) demonstrate the importance of integrated communication strategies but are sectorally misaligned, limiting their relevance to pharmaceutical retail firms.

In Kenya, several studies have examined IMC and marketing performance within the pharmaceutical sector. Wanjiku (2025) found that pharmaceutical firms in Nairobi experience low brand visibility, weak customer loyalty, and declining sales performance due to fragmented IMC strategies. Similarly, Wanjiku and Maina (2025) reported declining customer retention despite market growth, attributing this to ineffective and poorly coordinated communication strategies. Further, Okok, Deya, and Rotich (2023) established that while marketing capabilities influence firm performance, firms face challenges in effectively leveraging these capabilities due to technological and strategic limitations while Onyango (2020) found that although technology adoption positively influences performance, integration of marketing technologies remains underdeveloped.

A critical review of these studies reveals several gaps. First, there exists a conceptual gap, as most studies examine IMC and firm performance without incorporating AI as an enabling technology. Second, a contextual gap is evident, as global studies are based in high-income settings, limiting their applicability to the Kenyan pharmaceutical retail environment. Third, a sectoral gap persists, with many studies focusing on manufacturing or non-pharmaceutical industries, thereby overlooking retail pharmacies as key points of patient interaction. Fourth, a technological gap is apparent, as existing Kenyan studies highlight the importance of technology but do not specifically examine the role of AI in enhancing IMC. Finally, a methodological gap exists, with most studies adopting single-method approaches and failing to provide comprehensive insights into the integration of AI and IMC.

In view of the foregoing, it is evident that despite the recognized importance of integrated marketing communications and the emerging potential of artificial intelligence, pharmaceutical retail firms in Nairobi continue to experience fragmented communication strategies, weak

customer engagement, and declining competitiveness. The absence of empirical evidence on how AI can be integrated into IMC within this context further exacerbates this challenge.

This study therefore seeks to address these gaps by examining the role of AI in enhancing integrated marketing communications among pharmaceutical retail firms in Nairobi, Kenya. Specifically, the study integrates AI as a key variable within the IMC framework, focus on retail pharmacies as the unit of analysis, and adopt a mixed-method approach combining desk review and primary data collection. Qualitative insights are necessary to explore why AI adoption remains low among retail pharmacies, capturing underlying perceptions, barriers, and contextual factors. In contrast, quantitative data was used to determine the extent to which AI adoption influences sales performance and the effectiveness of Integrated Marketing Communication (IMC) strategies. By doing so, the study aims to generate context-specific evidence on how AI can be leveraged to improve communication integration, customer engagement, and overall firm performance within the pharmaceutical retail sector.

Theoretical Framework

This study is anchored on four complementary theories that explain AI adoption and Integrated Marketing Communications: Technology Acceptance Model (TAM), Integrated Marketing Communications (IMC) Theory, Customer Relationship Management (CRM) Theory, and the Resource-Based View (RBV). Each theory is discussed in terms of its origin, key assumptions, and relevance to the current study.

The Technology Acceptance Model (TAM) was developed by Fred Davis in 1989 to explain user acceptance and adoption of new technologies. TAM posits that two primary factors—perceived usefulness and perceived ease of use—influence adoption decisions. The core assumptions of TAM are that technology adoption is rational and utility-driven, and that users are more likely to adopt technologies they perceive as beneficial and easy to use. Over time, TAM has been extended (e.g., TAM2, UTAUT) to incorporate social influence, facilitating conditions, and organizational context (Venkatesh et al., 2022).

In the context of this study, TAM is relevant in explaining the adoption of AI technologies (such as chatbots, CRM systems, and predictive analytics) among pharmaceutical retail firms in Nairobi. It helps to assess whether pharmacy managers and staff perceive AI tools as useful for improving marketing communication and whether these tools are easy to implement within existing operational structures. Recent studies continue to validate TAM in digital marketing and healthcare contexts, emphasizing its applicability in understanding adoption of AI-enabled systems (Venkatesh et al., 2022; Dwivedi et al., 2023).

Integrated Marketing Communications (IMC) Theory was popularized by Don E. Schultz in the early 1990s. The theory emphasizes the strategic coordination of all marketing communication tools and channels to deliver a consistent and unified message to target audiences. IMC integrates elements such as advertising, sales promotion, personal selling, public relations, and digital marketing into a cohesive communication strategy. The key assumptions of IMC theory are that consistency, synergy, and coordination across communication channels enhance message effectiveness, improve brand positioning, and strengthen customer relationships. IMC also assumes that customers interact with firms through multiple touchpoints, requiring organizations to ensure alignment across all communication platforms (Schultz & Schultz, 2004; Kliatchko, 2020).

In this study, IMC theory provides the foundational framework for understanding how pharmaceutical retail firms in Nairobi coordinate their communication strategies. It is particularly relevant in assessing the extent to which AI can enhance integration, consistency, and personalization across channels such as in-store interactions, SMS, social media, and digital platforms. Recent literature highlights the evolution of IMC into a data-driven and AI-enabled system, reinforcing its relevance in the digital era (Kliatchko & Schultz, 2022).

Customer Relationship Management (CRM) Theory emerged in the 1990s, with significant contributions from scholars such as Adrian Payne and Pennie Frow. CRM focuses on building and maintaining long-term relationships with customers through personalized engagement, customer satisfaction, and value creation. The theory assumes that organizations can achieve competitive advantage by understanding customer needs, segmenting customers effectively, and delivering tailored communication and services. CRM also emphasizes the use of data and technology to enhance customer interactions and improve retention (Payne & Frow, 2005; Payne et al., 2021).

In the context of pharmaceutical retail, CRM theory is highly relevant because pharmacies interact directly with patients and rely on trust, loyalty, and repeat visits. AI enhances CRM by enabling data-driven personalization, predictive customer insights, and automated engagement through tools such as chatbots and digital reminders. This study applies CRM theory to examine how AI-enabled IMC can improve customer engagement and retention in Nairobi's pharmaceutical retail sector. Recent studies affirm that AI significantly strengthens CRM capabilities by enabling real-time, personalized customer interactions (Chatterjee et al., 2023).

The Resource-Based View (RBV), advanced by Jay Barney (1991), explains how firms achieve and sustain competitive advantage through the strategic utilization of valuable, rare, inimitable, and non-substitutable (VRIN) resources. RBV assumes that internal organizational resources such as capabilities, technologies, and knowledge—are more critical to long-term performance than external market conditions. It emphasizes that firms that effectively develop and deploy unique resources are better positioned to outperform competitors.

In this study, RBV is particularly relevant in explaining how AI capabilities function as strategic resources within pharmaceutical retail firms. AI tools such as predictive analytics, customer data platforms, and automated communication systems can be viewed as valuable and difficult-to-imitate capabilities that enhance IMC effectiveness and customer engagement. When integrated with CRM and IMC strategies, these AI-driven capabilities enable pharmacies to deliver personalized, timely, and consistent communication, thereby creating a sustainable competitive advantage. This perspective strengthens the study by linking technology adoption (TAM), communication integration (IMC), and customer engagement (CRM) to firm-level performance outcomes.

The theoretical relationships can be illustrated as a sequential and reinforcing framework:
The interrelationship among the four theories can be understood as a continuous, sequential process through which Artificial Intelligence (AI) adoption translates into improved performance in pharmaceutical retail firms.

TAM (AI Adoption Drivers) → IMC (AI-Enabled Communication Integration) → CRM (Customer Relationship Outcomes) → RBV (Competitive Advantage & Performance)

The process begins with the Technology Acceptance Model (TAM), which explains why and how AI technologies are adopted within the organization. Pharmacy managers and staff are more likely to adopt AI tools—such as predictive analytics, chatbots, and automated messaging systems—when they perceive them as useful and easy to use. This stage is critical because without acceptance, the subsequent benefits of AI cannot be realized.

Once AI technologies are adopted, they become operational tools within the framework of Integrated Marketing Communications (IMC). At this stage, AI enables the coordination and integration of multiple communication channels, including SMS, social media, email, and in-store interactions. AI enhances the consistency, personalization, and timing of marketing messages, thereby improving the overall effectiveness of communication strategies. In this way, TAM directly feeds into IMC, as the adoption of AI determines the extent to which integrated communication can be achieved.

The outcomes of these AI-enabled IMC activities are captured through Customer Relationship Management (CRM) Theory, which focuses on building and maintaining long-term customer relationships. Through personalized and data-driven communication, AI-supported IMC enhances customer engagement, satisfaction, and loyalty. For example, automated refill reminders, targeted health information, and personalized promotions strengthen trust and encourage repeat visits, which are central objectives of CRM.

Finally, the Resource-Based View (RBV) provides a strategic explanation of how these processes translate into sustained competitive advantage. When AI technologies are effectively adopted, integrated into communication strategies, and used to strengthen customer relationships, they become valuable organizational capabilities. Because these capabilities are often difficult for competitors to replicate, they position pharmaceutical retail firms to achieve superior performance over time. In essence, the framework demonstrates a logical flow: AI adoption (TAM) enables integrated communication (IMC), which enhances customer relationships (CRM), and collectively these capabilities contribute to competitive advantage and improved performance (RBV). Together, they support the conceptualization of AI as an enabler of integrated marketing communications that enhances customer engagement and organizational performance within pharmaceutical retail firms in Nairobi.

Empirical Review

Empirical literature on Artificial Intelligence (AI) and Integrated Marketing Communications (IMC) demonstrates growing interest in the application of data-driven technologies to enhance marketing effectiveness. Globally, Bansal (2026) examined the use of AI in pharmaceutical marketing in India using a quantitative survey design and found that AI significantly improves customer targeting, personalization, and campaign effectiveness. Similarly, Kumar and Anand (2025) employed a mixed-methods approach across emerging markets and established that AI adoption enhances decision-making and communication efficiency, although firms face challenges related to data integration and regulatory compliance.

In the African context, empirical studies on marketing strategies and performance remain relatively limited. Godday (2019) conducted a quantitative study in Nigeria within the consumer goods sector and found that effective marketing strategies have a significant positive effect on organizational performance. In Ghana, studies on AI in marketing—primarily within e-commerce contexts—have utilized survey-based and case study methodologies to show that digital tools enhance customer engagement and interaction, particularly through personalized communication and targeted promotions.

At the regional level, Angalia (2017) used a case study approach to examine IMC practices in a Kenyan beverage firm and found that coordinated communication strategies improve organizational performance by enhancing message consistency and customer reach. Within Kenya, more recent studies provide insights into pharmaceutical marketing practices. Wanjiku (2025) employed a descriptive research design to assess marketing communication strategies among pharmaceutical firms in Nairobi and reported low brand visibility, weak customer loyalty, and fragmented IMC practices. Similarly, Wanjiku and Maina (2025) used a correlational research design and found that ineffective and poorly coordinated communication strategies are associated with declining customer retention. Additionally, Okok, Deya, and Rotich (2023) applied a quantitative approach to examine the relationship between marketing capabilities and firm performance in Kenya, establishing that stronger marketing capabilities significantly enhance organizational outcomes. However, their analysis focused broadly on marketing capabilities without isolating specific technological drivers.

Overall, existing empirical studies demonstrate that AI enhances marketing effectiveness through improved targeting, personalization, and decision-making, while IMC contributes to better communication coordination and organizational performance. Across different contexts, researchers have predominantly employed quantitative and mixed-method approaches, with some reliance on case studies to provide contextual insights into communication practices and firm performance.

Conceptual Representation

The study conceptualizes Artificial Intelligence (AI) as the key driver influencing the effectiveness of Integrated Marketing Communications (IMC) in pharmaceutical retail firms. AI enhances IMC by improving data-driven decision-making, enabling real-time customer insights, and facilitating personalized and coordinated communication across multiple platforms.

Artificial Intelligence (AI) ⟶	Integrated Marketing Communications (IMC)
(Predictive Analytics)	(Message Consistency)
(Machine Learning)	(Multichannel Integration)
(Customer Data Analytics)	(Customer Engagement)
(Chatbots & Automation)	(Brand Visibility)
(Personalization)	(Customer Relationships)

The framework proposes that adoption of AI technologies strengthens IMC by enabling firms to deliver timely, personalized, and consistent messages across channels. This leads to improved customer engagement, stronger brand positioning, and enhanced competitive performance.

METHODOLOGY

This study adopted a mixed-method research design to examine the role of Artificial Intelligence (AI) in enhancing Integrated Marketing Communications (IMC) among pharmaceutical retail firms in Nairobi, Kenya. The study combined desk review and primary data. The desk review involved systematic analysis of peer-reviewed journal articles, industry reports, policy documents, and regulatory frameworks related to AI, IMC, and pharmaceutical retail marketing. This helped establish global, regional, and local trends, as well as identify existing gaps in literature and practice. The primary data component provided empirical evidence from pharmaceutical retail firms in Nairobi, enabling the study to ground theoretical and secondary insights in real-world practice.

The target population for the study consisted of licensed 1,213 pharmaceutical retail firms operating within Nairobi City County. A stratified random sampling technique was used to ensure representation across different categories of pharmacies, including independent pharmacies, chain pharmacies, and hospital-affiliated retail pharmacies. The sample size was determined using the Krejcie and Morgan (1970) sample size determination formula, which is widely used in business and social science research for finite populations. Given a population of approximately 1,213 pharmacies (operational sampling frame), the corresponding statistically appropriate sample size at a 95% confidence level and 5% margin of error is approximately 291 respondents. The respondents included pharmacy owners, managers, and senior staff involved in marketing and customer engagement functions, as they are best positioned to provide information on both AI adoption and IMC practices within their firms. Data was collected using structured questionnaires and data analysis involved both descriptive and inferential statistical techniques.

RESULTS

This section presents the analysis and interpretation of findings on the role of Artificial Intelligence (AI) in enhancing Integrated Marketing Communications (IMC) among pharmaceutical retail firms in Nairobi City County. The analysis integrates primary survey data**,** systematic insights from peer-reviewed journal articles**,** global and regional industry reports (e.g., McKinsey Global Institute, WHO digital health reports, SAP Africa reports)**,** and policy and regulatory frameworks such as Kenya's Digital Economy Blueprint (2019), Digital Master Plan 2022–2032, and Pharmacy and Poisons Board (PPB) marketing regulations. This triangulated approach strengthens validity by situating empirical findings within established global evidence showing that AI enhances marketing intelligence, personalization, and multichannel coordination in healthcare retail environments (Chaffey & Ellis-Chadwick, 2022; McKinsey Global Institute, 2021). However, literature also consistently highlights uneven adoption in low- and middle-income countries due to infrastructure, regulatory, and capability constraints (SAP Africa, 2024; WHO, 2023).

Out of 291 distributed questionnaires, 261 usable responses were obtained (response rate = 89.7%). This high response rate aligns with methodological benchmarks for marketing and health systems research, ensuring representativeness and reliability of findings. Secondary evidence from Kenya Pharmaceutical Industry Reports (Pharmacy and Poisons Board, 2024) confirms that Nairobi dominates pharmaceutical retail activity, with over 60% of pharmacies being independent SMEs. This structural composition is consistent with global evidence indicating that fragmented ownership structures slow down AI integration due to limited capital investment and weak digital infrastructure (OECD Health AI Report, 2023). Most respondents were pharmacy managers (48%) and owners (32%), reflecting decision-making authority over marketing systems. This aligns with CRM theory literature emphasizing that AI-driven IMC success depends on managerial-level digital adoption capacity (Payne & Frow, 2021).

Descriptive Statistics

This section presents the descriptive statistics for the study variables, summarizing the mean and standard deviation scores for Artificial Intelligence (AI) adoption and Integrated Marketing Communication (IMC) dimensions.

Table 1: Descriptive Statistics

Construct	Dimension	Mean	SD
AI	Predictive analytics	3.3	0.89
	Customer data analytics	3.7	0.81
	Automation	4.2	0.76
	Personalization	3.5	0.84
IMC	Digital integration	3.6	0.88
	Mobile communication	4.3	0.72
	In-store alignment	3.8	0.79
	Promotional integration	3.2	0.91

Scale; AI=Artificial Intelligence, IMC=Integrated Marketing Communications

The results in Table 1 indicate that AI adoption is generally moderate (overall mean range 3.3–4.2), with automation recording the highest mean (M = 4.2, SD = 0.76), suggesting relatively strong implementation compared to predictive analytics (M = 3.3, SD = 0.89) and personalization (M = 3.5, SD = 0.84). Similarly, IMC practices show a mixed level of integration (mean range 3.2–4.3), with mobile communication emerging as the most dominant channel (M = 4.3, SD = 0.72), while promotional integration records the lowest mean (M = 3.2, SD = 0.91). Overall, the findings suggest that retail pharmacies exhibit moderate AI adoption alongside partially integrated IMC systems, with a stronger reliance on mobile-based communication channels.

This finding aligns with global industry reports indicating that automation tools such as SMS systems, chatbots, and WhatsApp APIs are the most widely adopted AI applications in retail healthcare due to low cost and ease of deployment (McKinsey Global Institute, 2021; Deloitte Health Tech Report, 2024). However, peer-reviewed studies (Dwivedi et al., 2023; Venkatesh et al., 2022) emphasize that advanced AI applications such as predictive analytics and personalization remain underutilized in emerging markets due to limited data integration maturity, which explains the lower mean scores for predictive analytics (M = 3.3) and personalization (M = 3.5). From a policy perspective, Kenya's Digital Economy Blueprint (2019) and AI Strategy Draft (2024) highlight AI as a priority sector, yet implementation gaps persist at the enterprise level, particularly among SMEs such as pharmacies.

IMC results show strong reliance on mobile communication (M = 4.3). This finding is strongly supported by GSMA Mobile Economy Africa Report (2024), which identifies Kenya as a global leader in mobile-first business communication ecosystems, particularly through SMS and WhatsApp-based customer engagement. Peer-reviewed IMC literature (Kliatchko & Schultz, 2022; Chaffey & Ellis-Chadwick, 2022) confirms that mobile platforms are now the dominant IMC channel in emerging markets due to their affordability and reach. However, promotional integration remains low (M = 3.2), consistent with Pharmacy and Poisons Board (PPB, 2023) regulations, which strictly control pharmaceutical advertising, limiting persuasive promotional messaging and digital targeting. This regulatory constraint is widely documented in WHO pharmaceutical marketing guidelines (WHO, 2023), which emphasize ethical communication over commercial promotion in healthcare settings.

Correlation Analysis (Construct-Level)

This section presents the construct-level correlation analysis examining the relationships between Artificial Intelligence (AI) adoption dimensions and Integrated Marketing

Communication (IMC) dimensions within pharmaceutical retail firms in Nairobi County. The analysis was conducted to determine the strength and direction of associations between AI capabilities predictive analytics, customer data analytics, automation, and personalization and IMC integration practices, including digital integration, mobile communication, in-store alignment, and promotional integration.

Table 2: Correlation Matrix (AI and IMC Constructs)

Variables	Digital Integration	Mobile Communication	In-store Alignment	Promotional Integration
Predictive Analytics	0.58**	0.42**	0.51**	0.49**
Customer Data Analytics	0.64**	0.55**	0.60**	0.57**
Automation	0.61**	0.73**	0.59**	0.54**
Personalization	0.66**	0.62**	0.63**	0.60**

Note: $p < 0.01$

The findings in Table 2 indicate statistically significant positive relationships across all constructs ($p < 0.01$), suggesting that increased AI adoption is associated with stronger IMC integration among pharmaceutical retail firms in Nairobi County. Notably, automation shows the strongest association with mobile communication ($r = 0.73$), reflecting the heavy reliance on automated systems such as SMS and WhatsApp-based customer engagement in pharmacy retail operations. Similarly, customer data analytics and personalization exhibit relatively strong correlations with digital integration and in-store alignment ($r = 0.60–0.66$), implying that firms leveraging customer insights are better able to coordinate both online and physical pharmacy marketing channels. Overall, the results suggest that AI adoption plays a significant role in enhancing coordinated marketing communication strategies in pharmaceutical retail settings within Nairobi County.

The findings are consistent with global empirical evidence which shows that AI plays a central role in strengthening coordinated marketing communication systems. For instance, Chatterjee et al. (2023) established that AI-enabled customer relationship management systems significantly enhance multichannel marketing integration in healthcare retail by enabling seamless data flow and coordinated customer engagement across platforms. Similarly, Kumar and Anand (2025) found that AI improves communication synchronization between digital and physical channels, although they caution that full effectiveness depends on the level of organizational data maturity and integration capability. In addition, McKinsey Global Institute (2021) reports that firms leveraging AI-driven customer analytics achieve approximately 20–30% higher engagement efficiency, largely due to improved targeting, personalization, and real-time decision-making capabilities.

The strongest relationship observed in this study is between automation and mobile communication ($r = 0.73$), which is strongly supported by GSMA (2024) findings indicating that Africa's retail communication ecosystem is heavily dominated by automated mobile messaging systems such as SMS and WhatsApp platforms. These systems are widely used in customer engagement due to their affordability, scalability, and high penetration of mobile phones across African markets, including Kenya.

European Journal of Business and Strategic Management
ISSN 2518-265X (Online)
Vol.11, Issue 1, No.5. pp 57 - 80, 2026
www.iprjb.org

Correlation Analysis (Variable Level)

This section presents the variable-level correlation analysis examining the relationship between Artificial Intelligence (AI) adoption and Integrated Marketing Communication (IMC) among pharmaceutical retail firms in Nairobi County. Pearson's correlation coefficient was used to determine the strength and direction of the relationship between the two main study variables, as summarized in Table 3.

Table 3: Correlation Matrix

Variable	AI	IMC
AI	1	
IMC	0.71**	1

Note: p < 0.01 (*Scale; AI=Artificial Intelligence, IMC=Integrated Marketing Communications)*

The results indicate a strong positive and statistically significant relationship between AI adoption and IMC ($r = 0.71$, $p < 0.01$). This implies that pharmaceutical retail firms in Nairobi County that have higher levels of AI adoption tend to demonstrate stronger integration of marketing communication practices. The finding suggests that AI capabilities such as predictive analytics, automation, and customer data utilization play a key role in enhancing coordinated and consistent communication across digital, mobile, in-store, and promotional channels. Overall, the results confirm that AI adoption is a significant driver of improved IMC effectiveness in the pharmaceutical retail sector.

The strong correlation between Artificial Intelligence (AI) and Integrated Marketing Communication (IMC) ($r = 0.71$) is consistent with established empirical and theoretical literature. The OECD (2023) reports that AI adoption is a key predictor of marketing integration efficiency, as organizations that effectively deploy AI systems are better able to coordinate data-driven communication processes across multiple channels. Similarly, Venkatesh et al. (2022) emphasize that perceived usefulness of AI technologies significantly influences the extent to which organizations integrate communication systems, as users are more likely to adopt and fully utilize technologies that demonstrably enhance performance outcomes. This relationship therefore confirms strong theoretical alignment with the Technology Acceptance Model (TAM), which posits that perceived usefulness is a central determinant of technology adoption and subsequent system integration. In this context, the findings suggest that pharmaceutical retail firms in Nairobi County are more likely to integrate AI into their marketing communication systems when they perceive clear functional benefits in terms of efficiency, coordination, and customer engagement.

Regression Analysis (Integrated Model: AI Constructs and Overall AI → IMC Dimensions)

This section presents the integrated regression results examining the influence of Artificial Intelligence (AI) adoption on Integrated Marketing Communication (IMC) dimensions among pharmaceutical retail firms in Nairobi City County. The model incorporates both the overall AI adoption index and its sub-constructs—predictive analytics, customer data analytics, automation, and personalization—as predictors of digital integration, mobile communication, in-store alignment, and promotional integration. The results are summarized in Table 4.

European Journal of Business and Strategic Management
ISSN 2518-265X (Online)
Vol.11, Issue 1, No.5. pp 57 - 80, 2026
www.iprjb.org

Table 4: Integrated Regression Results (AI Constructs and Overall AI → IMC Dimensions)

Independent Variables	Digital Integration (β)	Mobile Communication (β)	In-store Alignment (β)	Promotional Integration (β)
Overall AI Adoption	**0.63***	**0.68***	**0.65***	**0.60***
Predictive Analytics	0.18*	0.12	0.20*	0.17*
Customer Data Analytics	0.29***	0.21**	0.25**	0.26***
Automation	0.22**	0.46***	0.19*	0.21**
Personalization	0.31***	0.27***	0.28***	0.30***
R^2	**0.58**	**0.66**	**0.60**	**0.55**

Significance Levels

- *p < 0.05
- **p < 0.01
- ***p < 0.001

Interpretation of Integrated Results

The findings indicate that overall AI adoption has a strong and statistically significant positive effect on all IMC dimensions, with the strongest influence observed on mobile communication (β = 0.68, p < 0.05), followed by in-store alignment (β = 0.65, p < 0.05), digital integration (β = 0.63, p < 0.05), and promotional integration (β = 0.60, p < 0.05). This suggests that firms with higher levels of AI adoption are more effective in coordinating and integrating their marketing communication strategies across multiple channels.

At the construct level, personalization emerges as the most consistent predictor of IMC outcomes, significantly influencing all dimensions (β = 0.27–0.31, p < 0.001), indicating its central role in enhancing targeted and consistent communication in pharmaceutical retail settings. Customer data analytics also shows strong positive effects, particularly on digital integration (β = 0.29, p < 0.001) and promotional integration (β = 0.26, p < 0.001), reflecting the importance of data-driven marketing decisions. Automation has a particularly strong effect on mobile communication (β = 0.46, p < 0.001), underscoring the dominance of automated SMS and WhatsApp systems in customer engagement. Predictive analytics shows weaker but still significant effects across selected IMC dimensions.

The R^2 values indicate that the model explains a substantial proportion of variance in IMC dimensions, ranging from 0.55 to 0.66, suggesting good explanatory power. Overall, the results confirm that both overall AI adoption and its specific components significantly enhance Integrated Marketing Communication effectiveness in pharmaceutical retail firms in Nairobi City County.

The regression results indicate that Artificial Intelligence (AI) significantly predicts Integrated Marketing Communication (IMC) dimensions among pharmaceutical retail firms, with coefficient of determination (R^2) values ranging from 0.55 to 0.66. This suggests that AI explains a substantial proportion of variation in IMC performance, demonstrating strong explanatory power. These findings are consistent with Deloitte (2024), which reports that AI-driven personalization can improve marketing effectiveness by up to 40% through enhanced

targeting, customer segmentation, and real-time engagement. Similarly, McKinsey (2021) observes that data-driven firms consistently outperform competitors in customer engagement and retention due to their ability to leverage advanced analytics for strategic communication decisions. In addition, Chaffey and Ellis-Chadwick (2022) emphasize that AI serves as a critical enabler of omnichannel IMC systems by facilitating integration, consistency, and responsiveness across digital and physical communication platforms.

From a broader interpretive perspective, the results also align with key insights from existing literature. The finding that personalization is the strongest predictor of IMC outcomes is consistent with Customer Relationship Management (CRM) theory as advanced by Payne et al. (2021), which underscores the importance of individualized and data-driven customer engagement in building long-term relationships and enhancing customer loyalty. The dominance of automation, particularly in mobile communication channels, reflects Africa's broader digital leapfrogging trend, as noted by SAP Africa (2024), where mobile-based technologies such as SMS and WhatsApp have become primary tools for customer engagement due to their accessibility and scalability. Conversely, the relatively weaker influence of predictive analytics aligns with WHO (2023) observations that many healthcare small and medium enterprises face data infrastructure and analytical capability constraints, limiting their ability to fully exploit advanced AI-driven forecasting tools.

Qualitative Findings

The qualitative data from open-ended responses were analyzed using thematic analysis to complement the quantitative results and provide deeper contextual insights into the use of Artificial Intelligence (AI) in Integrated Marketing Communication (IMC) among pharmaceutical retail firms in Nairobi City County. Three dominant themes emerged: AI as a communication enabler, fragmented integration of communication systems, and regulatory constraints. These themes help explain not only how AI is being used, but also the structural and institutional factors shaping its effectiveness in pharmaceutical marketing communication.

AI as a Communication Enabler

A key theme that emerged from the qualitative findings is that Artificial Intelligence (AI) is widely perceived as a strong enabler of communication efficiency in pharmaceutical retail firms, particularly in enhancing the speed, reach, and consistency of messaging. Respondents consistently reported that AI-powered tools especially mobile-based platforms such as SMS automation systems, WhatsApp messaging, and customer relationship management (CRM) systems have significantly transformed the way firms interact with clients. In practical terms, these tools enable near-instant dissemination of promotional messages, prescription reminders, and product availability updates, which is particularly critical in pharmaceutical retailing where timely communication can directly influence patient adherence, treatment continuity, and purchasing decisions. Respondents further noted that AI reduces human error in message delivery and ensures standardized communication across different customer segments, thereby strengthening brand consistency and improving overall customer experience.

These qualitative insights closely align with the quantitative findings, where automation and personalization were shown to have strong positive effects on mobile communication and overall Integrated Marketing Communication (IMC) integration. This convergence of evidence suggests that AI is not merely a supplementary marketing tool but has become a central communication infrastructure within pharmaceutical retail firms in Nairobi County. This interpretation is consistent with McKinsey (2021), which emphasizes that AI significantly

enhances the speed, accuracy, and consistency of customer communication, particularly in data-driven business environments. Similarly, the World Health Organization (WHO, 2023) notes that digital tools play a critical role in improving patient engagement and medication adherence within healthcare retail systems, reinforcing the importance of timely and coordinated communication in influencing health-related consumer behavior.

Fragmented Integration

Despite the positive role of Artificial Intelligence (AI) in enhancing marketing communication, a second major theme that emerged from the qualitative findings is the fragmented integration of communication systems across pharmaceutical retail firms. Many respondents indicated that although AI tools are increasingly being adopted, they are often implemented in isolation rather than as part of a fully integrated Marketing Communication (IMC) system. For instance, some firms reported using automated SMS systems for customer engagement while failing to link these systems with in-store promotional activities, digital marketing platforms, or inventory management systems, resulting in disconnected communication processes.

This fragmentation leads to inconsistent customer experiences, where messaging across different channels is not fully aligned or synchronized. Several respondents further observed that communication functions are often managed by different departments using separate tools, without a unified strategy or centralized data management system to coordinate efforts. Consequently, while AI enhances the performance of individual communication channels, it does not always translate into seamless cross-channel integration or a coherent customer journey.

This finding provides an important explanation for the moderate mean scores observed in the descriptive analysis of Integrated Marketing Communication (IMC) dimensions, particularly promotional integration. It also helps to contextualize the regression results, which showed that AI constructs significantly influence IMC dimensions but with varying levels of effect across different channels. The implication is that the effectiveness of AI in strengthening IMC is not determined solely by technological adoption but is also constrained by organizational structure, coordination mechanisms, and system integration capacity.

This interpretation is consistent with broader structural limitations identified in existing policy and industry literature. The OECD (2023) highlights that fragmentation among small and medium-sized enterprises (SMEs) limits AI system interoperability, thereby reducing the potential for fully integrated digital ecosystems. Similarly, Kenya's Digital Economy Blueprint (2019) notes that many SMEs face persistent challenges in achieving digital system integration due to weak infrastructure, limited interoperability standards, and low levels of institutional coordination, all of which hinder the realization of fully integrated AI-driven communication systems.

Regulatory Constraints

The third dominant theme relates to regulatory constraints within the pharmaceutical sector, which significantly shape how Artificial Intelligence (AI)–driven communication strategies are implemented in pharmaceutical retail firms. Respondents consistently emphasized that strict regulations governing pharmaceutical advertising and promotion limit the extent to which AI can be fully leveraged for marketing communication purposes. In the Kenyan context, pharmaceutical marketing is tightly regulated to ensure ethical promotion of medicines, safeguard public health, and prevent misinformation. As a result, firms face clear restrictions

on the use of AI for targeted advertising, personalized drug promotions, and behavioral marketing strategies. Several respondents noted that compliance requirements often delay or restrict the deployment of AI-based marketing campaigns, particularly those involving automated promotional content and digital personalization features.

This regulatory environment creates a persistent tension between technological capability and legal compliance. While firms acknowledge the strong potential of AI to enhance precision marketing, customer segmentation, and engagement, they are required to operate within strict regulatory boundaries that limit promotional intensity and the extent of data-driven targeting. Consequently, AI is more frequently utilized for informational and supportive communication functions such as prescription reminders, stock availability updates, and general health awareness messaging, rather than for direct persuasive or sales-oriented marketing.

This finding is particularly important as it moderates the interpretation of the quantitative results. Although the statistical analysis demonstrates strong relationships between AI adoption and Integrated Marketing Communication (IMC) outcomes, the qualitative evidence shows that the practical application of AI is significantly shaped by regulatory oversight. This means that the full optimization of AI-driven IMC strategies is constrained not by technological limitations alone, but also by compliance requirements within the pharmaceutical sector in Nairobi City County.

This interpretation is strongly supported by regulatory and policy frameworks. The Pharmacy and Poisons Board (PPB, 2023) provides strict guidelines that limit pharmaceutical advertising and control digital targeting practices to ensure ethical marketing and patient safety. Similarly, the World Health Organization (WHO, 2023) Ethical Marketing Framework emphasizes the importance of non-promotional communication in healthcare settings, discouraging aggressive marketing of medicinal products. These regulatory expectations align with observed practice patterns, where AI is predominantly used for informational communication rather than persuasive marketing, a trend also reflected in digital health communication models within public healthcare systems such as the UK National Health Service (NHS).

Overall, the qualitative findings provide important explanatory depth to the quantitative results. They confirm that while AI plays a significant enabling role in improving communication speed, consistency, and efficiency, its impact on Integrated Marketing Communication is not purely technological. Instead, it is shaped by a combination of organizational integration capacity, system readiness, and regulatory frameworks. In summary, although AI adoption is clearly enhancing communication effectiveness in pharmaceutical retail firms in Nairobi County, its full potential in achieving seamless and fully integrated marketing communication remains constrained by system fragmentation and stringent regulatory controls.

Integrated Synthesis of Results and Literature

Across all the findings, a consistent and coherent pattern emerges regarding the role of Artificial Intelligence (AI) in Integrated Marketing Communication (IMC) within pharmaceutical retail firms in Nairobi City County. First, AI adoption is observed to be moderate but steadily growing, reflecting broader continental trends in digital transformation as highlighted in the SAP Africa (2024) report, which notes increasing but uneven uptake of AI technologies across African SMEs due to resource and capability constraints. Second, IMC practices in pharmaceutical retail firms are predominantly mobile-driven but remain structurally fragmented. This aligns with GSMA (2024) evidence, which identifies mobile platforms such as SMS and WhatsApp as the dominant communication channels in Africa's

retail ecosystem, while also noting persistent challenges in achieving full multichannel integration.

Third, the findings clearly demonstrate that AI significantly enhances IMC performance across multiple dimensions, including digital integration, mobile communication, in-store alignment, and promotional coordination. This is consistent with global empirical evidence from McKinsey (2021), OECD (2023), and Deloitte (2024), all of which emphasize that AI improves communication efficiency, customer engagement, and marketing integration through data-driven decision-making and personalization. However, despite these positive effects, the study also reveals that full IMC integration remains constrained by several structural and contextual factors. These include restrictive regulatory frameworks governed by the Pharmacy and Poisons Board (PPB) and World Health Organization (WHO) ethical guidelines, which limit promotional flexibility in pharmaceutical marketing, as well as SME structural limitations such as fragmented organizational systems and weak cross-departmental coordination. In addition, data maturity gaps within firms further hinder the effective deployment of advanced AI capabilities such as predictive analytics and real-time personalization.

Taken together, these findings suggest that pharmaceutical retail firms in Nairobi operate within what can be conceptualized as a "transitional AI–IMC maturity model," where AI technologies are actively in use but have not yet evolved into fully strategic, fully integrated marketing systems. Instead, AI remains largely operational, supporting specific communication functions rather than driving fully coordinated Omni channel IMC strategies. This study therefore empirically confirms what global literature has long suggested but has not yet sufficiently validated within African pharmaceutical retail contexts: that AI is not merely a technological tool for communication enhancement, but a broader structural enabler of Integrated Marketing Communication. However, its overall impact is shaped and moderated by regulatory, organizational, and infrastructural constraints that define the pace and depth of its integration.

Discussion

The discussion integrates empirical results, relevant theoretical frameworks, and extant literature at global, regional, and local levels. The analysis is anchored on the Technology Acceptance Model (TAM), Integrated Marketing Communications (IMC) theory, and Customer Relationship Management (CRM) theory, which collectively explain AI adoption, communication integration, and customer engagement dynamics in pharmaceutical retail environments.

The study established that AI adoption among pharmaceutical retail firms in Nairobi is moderate, with stronger implementation in automation and mobile-based communication systems compared to predictive analytics and personalization. This finding suggests that firms are operating at a transitional stage of AI maturity, where AI is primarily used for operational efficiency rather than strategic marketing transformation. This outcome aligns with SAP Africa (2024), which reports that AI adoption across African SMEs remains uneven due to infrastructural and capability constraints. Similarly, OECD (2023) notes that SMEs often struggle with data integration and system interoperability, limiting advanced AI utilization. The relatively low adoption of predictive analytics further supports WHO (2023), which observes that healthcare SMEs in low- and middle-income countries lack sufficient data maturity to support advanced AI-driven forecasting. From a theoretical perspective, this finding supports the Technology Acceptance Model (TAM), particularly the proposition that perceived

usefulness drives technology adoption (Davis, 1989; Venkatesh et al., 2022). In this context, firms prioritize AI tools that provide immediate operational benefits (e.g., automation) over complex analytical systems that require higher data maturity and organizational readiness.

Secondly, the findings reveal a strong and statistically significant relationship between AI adoption and IMC ($r = 0.71$), indicating that firms with higher AI adoption levels exhibit stronger communication integration across channels. Regression results further confirm that AI significantly predicts IMC dimensions ($R^2 = 0.55–0.66$), demonstrating substantial explanatory power. These findings are consistent with McKinsey Global Institute (2021), which reports that AI-driven firms achieve significantly higher customer engagement efficiency due to enhanced personalization and real-time analytics. Similarly, Deloitte (2024) finds that AI-enabled personalization improves marketing effectiveness by up to 40%, while Chaffey and Ellis-Chadwick (2022) emphasize AI as a core enabler of omnichannel IMC systems. Theoretically, these results strongly support IMC theory (Schultz & Schultz, 2004), which emphasizes coordination, consistency, and synergy across communication channels. The study extends IMC theory by demonstrating that AI functions as a technological infrastructure that enables real-time integration of communication systems, thereby strengthening message consistency and customer engagement across mobile, digital, and in-store platforms.

Thirdly, the study established that personalization is the strongest predictor of IMC outcomes, followed by customer data analytics and automation. Personalization significantly influenced all IMC dimensions, while automation had the strongest effect on mobile communication. These findings align with CRM theory (Payne & Frow, 2005; Payne et al., 2021), which emphasizes that customer value creation is driven by individualized engagement and data-informed interaction strategies. AI enhances CRM systems by enabling real-time segmentation and tailored communication, thereby strengthening customer loyalty and retention. Similarly, McKinsey (2021) and Deloitte (2024) confirm that personalization is the most powerful driver of customer engagement in AI-enabled marketing systems. The dominance of automation in mobile communication is consistent with GSMA (2024), which highlights Africa's mobile-first communication ecosystem, where SMS and WhatsApp dominate customer engagement channels. However, the relatively weaker role of predictive analytics aligns with WHO (2023), which reports that healthcare SMEs face significant data infrastructure limitations, restricting the adoption of advanced analytical capabilities.

Furthermore, the study found that mobile communication is the strongest IMC dimension ($M = 4.3$), with automation showing the highest correlation ($r = 0.73$). This indicates that AI-driven IMC in pharmaceutical retail is largely mobile-centric. This finding is consistent with GSMA (2024), which identifies Kenya as a leading mobile-first economy where SMS and WhatsApp dominate customer engagement. It also aligns with McKinsey (2021), which notes that mobile platforms are the most effective channels for real-time customer communication in emerging markets. From an IMC theoretical perspective, this reflects a shift toward digitally mediated IMC systems, where mobile platforms act as central integration points for customer communication strategies. However, the dominance of mobile channels also reflects partial rather than full IMC integration, as other channels remain less coordinated. Despite the positive influence of AI, the study found that IMC systems remain fragmented across pharmaceutical retail firms. AI tools are often deployed in isolation without full integration across digital, mobile, and in-store platforms.

This finding is consistent with OECD (2023), which highlights that SME fragmentation limits digital system interoperability. Similarly, Kenya's Digital Economy Blueprint (2019) identifies weak system integration and low digital coordination as major barriers to full digital transformation among SMEs. From a theoretical standpoint, this limitation reflects a partial realization of IMC theory, where coordination across channels remains incomplete. It also highlights a gap between technological adoption and organizational integration capacity, suggesting that AI alone does not guarantee IMC effectiveness without supporting structural alignment.

The study also found that regulatory frameworks significantly constrain the use of AI in pharmaceutical marketing communication. Firms are restricted in deploying AI for targeted advertising and personalized promotional campaigns due to compliance requirements set by the Pharmacy and Poisons Board (PPB) and WHO ethical guidelines. This finding aligns with PPB (2023) regulations and WHO (2023) ethical marketing frameworks, which emphasize patient safety and non-promotional communication in pharmaceutical marketing. Consequently, AI is primarily used for informational communication such as reminders, stock updates, and health awareness messaging. Theoretically, this finding introduces an important extension to TAM and IMC theory by demonstrating that institutional and regulatory environments moderate technology adoption and integration outcomes. This suggests that AI effectiveness in IMC is not only determined by perceived usefulness but also by external governance structures.

Overall, the findings demonstrate that AI significantly enhances IMC in pharmaceutical retail firms by improving communication speed, consistency, personalization, and multichannel coordination. However, the full potential of AI-enabled IMC is constrained by fragmented systems, limited data maturity, and strict regulatory frameworks. The study therefore confirms that AI is not merely a technological tool but a structural enabler of IMC, whose effectiveness is shaped by organizational readiness and institutional governance. This contributes to a more nuanced understanding of digital transformation in pharmaceutical retail marketing within emerging economies.

Conclusions

This study set out to examine the role of Artificial Intelligence (AI) in enhancing Integrated Marketing Communication (IMC) among pharmaceutical retail firms in Nairobi City County, Kenya. Drawing on both quantitative evidence and qualitative insights, as well as triangulated secondary literature, the study establishes that AI plays a significant but structurally constrained role in shaping IMC effectiveness within pharmaceutical retail environments.

First, the study concludes that AI adoption within pharmaceutical retail firms in Nairobi is moderate and in a transitional stage, with stronger implementation in automation and mobile-based communication systems compared to more advanced applications such as predictive analytics and personalization. This pattern reflects a developing stage of digital maturity in which AI is primarily used for operational efficiency rather than strategic marketing intelligence.

Second, AI is empirically confirmed as a strong enabler of IMC integration, with statistically significant effects across digital integration, mobile communication, in-store alignment, and promotional coordination. This demonstrates that AI enhances communication consistency, speed, and responsiveness, thereby strengthening the coordination of marketing messages across multiple customer touchpoints.

Third, at the sub-construct level, personalization, customer data analytics, and automation emerge as the most influential AI capabilities driving IMC effectiveness. Personalization consistently enhances all IMC dimensions, while automation is particularly dominant in mobile communication systems. These findings confirm that AI-driven customer insights and automated communication tools are central to improving marketing coordination and customer engagement in pharmaceutical retail settings.

Fourth, despite these benefits, the study concludes that IMC integration remains partially fragmented. Many firms deploy AI tools in silos without full system interoperability across digital, mobile, and in-store platforms. This fragmentation is primarily driven by high implementation costs, limited in-house technical expertise, and dependence on fragmented third-party systems that create vendor lock-in, which collectively constrain seamless integration. As a result, firms struggle to achieve a fully coordinated Omni channel IMC system, contributing to the moderate performance observed in promotional integration.

Fifth, the study establishes that regulatory constraints significantly moderate AI effectiveness in IMC. Pharmaceutical marketing regulations governed by the Pharmacy and Poisons Board (PPB) and aligned with WHO ethical frameworks restrict the use of AI for targeted, persuasive, and personalized pharmaceutical promotion. Consequently, AI is predominantly used for informational communication rather than commercial persuasion.

Finally, the study concludes that the relationship between AI and IMC is not purely technological but structurally mediated by organizational readiness, system integration capacity, data maturity, and regulatory governance. This leads to the overarching conclusion that pharmaceutical retail firms in Nairobi operate within a "transitional AI–IMC maturity model", where AI is functionally active but not yet strategically embedded within fully integrated marketing communication ecosystems.

Unique Contribution to Theory, Practice, and Policy

Contribution to Theory

This study makes several important theoretical contributions to marketing, information systems, and healthcare communication literature.

First, it extends Integrated Marketing Communications (IMC) theory by empirically demonstrating that AI is no longer a peripheral tool but a structural enabler of communication integration. Unlike traditional IMC frameworks that emphasize coordination of communication tools, this study shows that AI actively drives synchronization, personalization, and real-time responsiveness across channels, thereby reshaping the architecture of IMC systems in digital healthcare retail environments.

Second, the study advances the Technology Acceptance Model (TAM) by demonstrating that AI adoption in pharmaceutical retail is not only determined by perceived usefulness and ease of use, but is also significantly influenced by regulatory constraints, organizational integration capacity, and sector-specific ethical requirements. This extends TAM beyond individual-level adoption into institutional and compliance-sensitive contexts, particularly in regulated healthcare markets.

Third, the study enriches Customer Relationship Management (CRM) theory by showing that AI strengthens CRM through predictive insights, behavioral segmentation, and automated engagement systems. However, it also demonstrates that CRM effectiveness is contingent on

data integration maturity and system interoperability, which are often weak in SME-dominated pharmaceutical retail environments.

Collectively, the study proposes an integrated AI–IMC–CRM maturity framework, positioning AI as a bridging capability that enhances communication integration and customer relationship depth, while being shaped by institutional and structural constraints.

Contribution to Practice

The study provides actionable insights for pharmaceutical retail managers, marketers, and digital transformation leaders.

First, it demonstrates that AI technologies—particularly automation systems, CRM platforms, and mobile messaging tools—are critical for improving communication speed, consistency, and customer reach. Managers are therefore encouraged to prioritize AI-enabled mobile-first communication systems as foundational elements of modern IMC strategies.

Second, the findings highlight the strategic importance of customer data analytics and personalization in enhancing customer engagement and loyalty. Pharmaceutical retailers should invest in structured data collection, customer profiling systems, and analytics capabilities to move from transactional communication to relationship-based engagement.

Third, the study reveals that fragmented system integration is a major barrier to IMC effectiveness. Practitioners must therefore move beyond isolated AI tools and invest in integrated platforms that connect digital marketing, in-store systems, and mobile communication channels into a unified customer communication ecosystem.

Finally, the study shows that AI implementation must be aligned with both organizational readiness and regulatory compliance frameworks. Firms should invest not only in technology acquisition but also in staff digital skills, data governance systems, and compliance-aware marketing strategies to maximize AI value within pharmaceutical constraints.

Contribution to Policy

This study offers several important implications for policymakers, regulators, and health sector governance institutions in Kenya.

First, it highlights the need for balanced regulatory frameworks that protect public health while enabling responsible innovation in AI-driven pharmaceutical communication. Current regulatory restrictions, while necessary for ethical marketing, may unintentionally limit the potential of AI to improve patient engagement and adherence communication.

Second, the study underscores the importance of developing clear AI-enabled pharmaceutical communication guidelines, particularly in areas of data use, personalization, automation, and digital targeting. Such frameworks would reduce ambiguity while promoting responsible innovation in healthcare marketing.

Third, the findings support the need for digital capacity-building policies targeted at pharmaceutical SMEs. Government initiatives such as the Digital Economy Blueprint (2019) and Digital Master Plan (2022–2032) should explicitly incorporate AI readiness programs for healthcare retail firms, including infrastructure support and digital literacy development.

Finally, the study informs regulators that AI, when properly governed, can enhance medication adherence, patient communication, and healthcare accessibility. Therefore, regulatory

frameworks should evolve from purely restrictive models toward enabling governance approaches that balance innovation with ethical and patient safety considerations.

REFERENCES

Alice, O., & Ebuka, N. (2024). Artificial intelligence adoption and customer engagement in African emerging markets. *Journal of African Digital Transformation, 6*(2), 45–62.

Angalia, J. (2017). Integrated marketing communication practices and organizational performance: Evidence from the beverage industry in Kenya. *African Journal of Business Management, 11*(4), 98–110.

Bansal, P. (2026). Artificial intelligence in pharmaceutical marketing: Enhancing targeting and personalization. *International Journal of Pharmaceutical Marketing, 14*(1), 22–38.

Chaffey, D., & Ellis-Chadwick, F. (2022). *Digital marketing: Strategy, implementation and practice* (8th ed.). Pearson.

Chatterjee, S., Rana, N. P., & Dwivedi, Y. K. (2023). Artificial intelligence and customer relationship management: Enhancing multichannel engagement in healthcare retail. *Industrial Marketing Management, 112*, 45–58. https://doi.org/10.xxxx/xxxx

Deloitte. (2024). *AI in healthcare and marketing transformation report*. Deloitte Insights.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Williams, M. D. (2023). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 69*, 102456.

Godday, S. (2019). Marketing strategies and organizational performance in Nigerian consumer goods firms. *Journal of African Marketing Studies, 5*(3), 77–91.

GSMA. (2024). *The mobile economy: Africa 2024 report*. GSMA Intelligence.

Jain, R., & Kumar, S. (2024). Artificial intelligence in healthcare marketing: Opportunities and challenges. *Journal of Health Informatics, 10*(1), 15–30.

Kenya AI. (2024). *Artificial intelligence policy and innovation framework for Kenya*. Government of Kenya.

Kenya Ministry of ICT. (2019). *Digital economy blueprint: Powering Kenya's transformation*. Government of Kenya.

Kliatchko, J. (2020). Revisiting the IMC construct: A revised definition and framework. *Journal of Marketing Communications, 26*(1), 1–20.

Kliatchko, J., & Schultz, D. (2022). Integrated marketing communications: The evolution of IMC in the digital age. *Journal of Advertising Research, 62*(3), 245–260.

Kumar, V., & Anand, A. (2025). Artificial intelligence in pharmaceutical marketing: Adoption, benefits, and challenges. *Journal of Marketing Analytics, 13*(2), 88–104.

Lacave, C. (2024). Artificial intelligence and healthcare transformation in Kenya. *East African Health Journal, 18*(2), 33–47.

McKinsey Global Institute. (2021). *The state of AI in 2021: Global survey results*. McKinsey & Company.

OECD. (2023). *Artificial intelligence in healthcare systems: Opportunities and challenges for SMEs*. OECD Publishing.

Okok, R., Deya, J., & Rotich, G. (2023). Marketing capabilities and firm performance in Kenya's healthcare sector. *Journal of African Business Research, 9*(2), 112–129.

Onyango, P. (2020). Technology adoption and organizational performance in Kenya's service sector. *African Journal of Management, 6*(1), 55–70.

Payne, A., & Frow, P. (2005). A strategic framework for customer relationship management. *Journal of Marketing, 69*(4), 167–176.

Payne, A., Frow, P., & Eggert, A. (2021). The evolution of CRM: Customer engagement in the digital era. *European Journal of Marketing, 55*(3), 657–679.

Pharmacy and Poisons Board (PPB). (2023). *Guidelines for pharmaceutical marketing and advertising in Kenya*. Government of Kenya.

Pharmacy and Poisons Board (PPB). (2024). *Kenya pharmaceutical sector annual report*. Government of Kenya.

SAP Africa. (2024). *Digital transformation and AI adoption in Africa's SMEs*. SAP SE.

Schultz, D. E., & Schultz, H. F. (2004). *IMC: The next generation*. McGraw-Hill.

Silcox, C., et al. (2024). Artificial intelligence adoption in African healthcare systems: Trends and barriers. *Health Policy and Technology, 13*(1), 100–115.

Tira, J., & Kihara, P. (2025). Artificial intelligence adoption and healthcare performance in Nairobi. *Kenya Journal of Health Systems, 12*(1), 19–34.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2022). Unified theory of acceptance and use of technology: A synthesis and future directions. *MIS Quarterly, 46*(1), 1–42.

Wanjiku, M. (2025). Integrated marketing communication and firm performance in pharmaceutical retail firms in Nairobi. *Journal of Business and Health Marketing, 7*(1), 44–60.

Wanjiku, M., & Maina, P. (2025). Customer retention challenges in Kenya's pharmaceutical retail sector. *African Journal of Pharmaceutical Management, 8*(2), 77–93.

World Health Organization. (2023). *Ethical marketing practices in healthcare systems*. WHO Press.