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IMPROVING DECISION-MAKING MECHANISMS IN DIGITAL MARKETING IN TRADE THROUGH ARTIFICIAL INTELLIGENCE

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Abstract: This article examines how artificial intelligence can improve decision-making mechanisms in digital marketing in trade. In modern trade, digital marketing decisions are increasingly shaped by large-scale customer data, omnichannel interactions, predictive analytics, recommendation systems, conversational interfaces, and real-time performance metrics. Recent studies show that AI strengthens marketing decision-making by supporting personalization, customer segmentation, demand prediction, campaign optimization, budget allocation, and interactive customer communication. At the same time, the literature also points to significant limitations, including algorithmic bias, opacity, consumer privacy concerns, reduced perceived control, and the risk of over-automation. The article argues that effective AI-based decision-making in digital marketing depends not only on analytical power, but also on data governance, explainability, human oversight, and strategic integration across trade channels. [1], [2], [3], [4], [5], [6], [7], [8].

Keywords: artificial intelligence, digital marketing, trade, retail, decision-making, omnichannel marketing, personalization, recommendation systems, explainable AI, consumer behavior.

Introduction

Digital transformation has significantly changed the logic of marketing decision-making in trade. Retailers and trade enterprises now operate in an environment where customer journeys are fragmented across websites, mobile apps, social media, marketplaces, physical stores, and conversational interfaces. In such a setting, managerial decisions about targeting, pricing, content, promotion, and channel coordination can no longer rely only on intuition or periodic reporting. They increasingly depend on algorithmic systems capable of processing large volumes of behavioral and transactional data. Recent research in marketing and retail shows that AI is becoming central to personalization, omnichannel coordination, predictive analytics, and customer engagement. [1], [2], [3], [4].

In trade, this shift is particularly important because competition is not only about price or assortment, but also about the quality and timing of marketing decisions. AI enables firms to identify patterns in consumer behavior, optimize campaign design, allocate promotional resources more effectively, and respond to demand in a more adaptive way. At the same time, scholars warn that AI-based marketing decisions may weaken transparency, amplify bias, and affect consumer autonomy if they are deployed without appropriate governance. [2], [5], [6].

The purpose of this article is to analyze the main mechanisms through which artificial intelligence improves digital marketing decision-making in trade and to identify the organizational and methodological conditions necessary for its effective use. [1], [3], [4], [7], [8].

Literature Review

The recent literature increasingly treats AI in digital marketing as a strategic decision infrastructure rather than a simple automation tool. Grewal and co-authors argue that generative AI is reshaping marketing through capabilities such as personalization, content generation, customer

interaction, and decision support, while also introducing new governance and ethical concerns. Lopez-Lopez and Bara Iniesta, in their 2025 systematic review, identify five major research clusters in conversational AI and digital marketing: consumer behavior and engagement, sentiment analysis and NLP in e-commerce, artificial intelligence in marketing, trust and technology adoption, and big data and predictive analytics. [1], [2].

A second important stream of research concerns **data-driven decision-making in marketing**. Tiago's 2025 systematic review of 94 peer-reviewed articles identifies four major themes: improvement in customer experience through personalization, innovation through machine learning and analytics, performance enhancement through better resource allocation, and the importance of data governance and ethical data use. This is especially relevant for trade because digital marketing decisions increasingly involve optimization of budget, timing, targeting, and customer experience across multiple touchpoints. [3].

A third stream focuses on **retail-specific AI applications**. Furtick's 2025 analysis of AI-powered omnichannel retail explains that AI is reshaping trade by integrating physical, digital, mobile, and social platforms into more seamless customer experiences, with key applications in personalization, predictive supply chain management, mobile commerce, and social shopping. Qin, Pauwels, and Zhou's 2024 study on retail media adds a more specific decision perspective by showing how data-driven budget allocation varies by ad product, funnel metric, and brand size. Together, these studies suggest that AI in trade improves not only customer engagement but also managerial allocation decisions. [4], [7].

At the same time, critical research highlights limitations. Rohden and Espartel's 2024 study on recommendation agents in retail finds that AI-assisted decisions may increase consumer choice uncertainty and reduce perceived control. Reed, Wynn, and Bown's 2025 analytical framework on AI in digital marketing argues that bias, fairness, and governance are not peripheral issues but central problems that must be addressed if AI-driven marketing decisions are to remain legitimate and effective. [5], [6].

Analysis and Discussion

1. Personalization as a decision-making mechanism

The first major mechanism through which AI improves digital marketing decisions in trade is personalization. AI systems process browsing history, transaction data, click behavior, location signals, and channel interactions in order to tailor messages, product suggestions, offers, and experiences to specific customer segments or individuals. Tiago's systematic review identifies customer-experience improvement through personalization as one of the dominant themes in data-driven marketing decision-making. Grewal and co-authors similarly show that AI is changing how firms personalize interactions and communications in marketing. [1], [3].

For trade enterprises, this means that marketing decisions become more precise. Instead of broadcasting generic campaigns, managers can use AI to decide which message should be delivered, to whom, on which platform, and at what moment. In practical terms, this improves conversion efficiency and makes digital marketing more responsive to customer heterogeneity. Furtick's analysis of omnichannel retail supports this view by showing that AI helps trade firms move from reactive to predictive and experiential retail strategies. [4].

2. Predictive analytics and market-response forecasting

The second mechanism is predictive analytics. AI supports marketing decision-making by forecasting customer demand, purchase propensity, churn likelihood, response rates, and channel effectiveness. Lopez-Lopez and Bara Iniesta identify big data and predictive analytics as one of the key thematic clusters in the literature on conversational AI and digital marketing. In retail contexts,

this predictive logic is especially valuable because trade firms must make fast decisions about promotions, timing, stock-linked advertising, and retention actions. [2], [4].

This mechanism is significant because digital marketing in trade is highly time-sensitive. If demand patterns shift rapidly, slow managerial response can create lost sales, inventory imbalances, or inefficient ad spending. AI-based predictive models allow managers to move from backward-looking reporting toward forward-looking decision-making, where campaigns are shaped by expected consumer reactions rather than only past averages. [2], [3], [4].

3. Recommendation systems and interactive customer influence

A third mechanism is AI-driven recommendation and conversational interaction. Recommendation systems influence what consumers see, compare, and consider, while conversational AI adds real-time interactivity to customer journeys. Rohden and Espartel's study on recommendation agents shows that AI-assisted retail decisions can change how consumers perceive options and control. Lopez-Lopez and Bara Iniesta's review further shows that conversational AI affects consumer decision-making through engagement, trust, sentiment analysis, and e-commerce interaction. [2], [6].

From a managerial perspective, this means that AI is not only a back-end analytical engine; it is also a front-end influence mechanism. Trade enterprises can use AI-driven recommendations and conversational agents to guide product discovery, answer objections, reduce search costs, and support purchase completion. However, these same mechanisms can become problematic if they increase uncertainty, reduce perceived autonomy, or manipulate decision environments too aggressively. [2], [6].

4. Budget allocation and channel optimization

The fourth mechanism is budget allocation and marketing-resource optimization. One of the most important managerial decisions in digital marketing is how to distribute spending across channels, ad formats, and funnel stages. Qin, Pauwels, and Zhou demonstrate that data-driven budget allocation in retail media varies systematically by ad product, funnel metric, and brand size, which indicates that managerial spending decisions can be significantly improved through analytical modeling rather than uniform budgeting. [7].

This is especially important in trade because firms often operate simultaneously across marketplaces, search, social media, email, mobile, and owned platforms. AI can support managers by detecting which channels generate awareness, which convert most efficiently, and where marginal spending produces the highest return. In this sense, AI-driven digital marketing is not only about customer targeting; it is also about capital allocation inside the marketing system. [3], [4], [7].

5. Explainability and governance as conditions of effectiveness

A fifth mechanism is explainability. AI can improve decisions only if managers trust and understand the basis of recommendations. Marín Díaz and co-authors propose a methodological framework that combines explainable AI with the Analytic Hierarchical Process in order to improve transparent business decision-making. Their work is useful because it shows that explainability is not a secondary feature; it is part of how AI becomes actionable in management. [8].

The literature on digital marketing governance reaches a similar conclusion. Reed and co-authors emphasize that AI in digital marketing must be evaluated through the lenses of bias, fairness, and governance. Tiago's systematic review also identifies data governance and ethical use as one of the central themes in data-driven marketing. This means that AI-driven digital marketing decisions in trade should be built on transparent data management, bias monitoring, and human

review, especially where pricing, targeting, or promotional prioritization can affect consumer fairness. [3], [5].

Table 1.

Main mechanisms of AI-based decision-making in digital marketing in trade

Mechanism	Main function	Expected managerial effect
Personalization	Tailored offers, content, and targeting	Higher relevance and conversion rates
Predictive analytics	Forecasting demand and customer response	Faster and better-timed decisions
Recommendation and conversational systems	Guiding customer choice and engagement	Improved interaction and purchase support
Budget allocation optimization	Distributing resources across channels and formats	Higher marketing efficiency
Explainability and governance	Making decisions transparent and accountable	Greater managerial trust and legitimacy

Source: developed by the author on the basis of [1]–[8].

Methodological Directions for Improvement

To improve AI-based decision-making mechanisms in digital marketing in trade, several methodological directions should be emphasized.

First, trade enterprises should build integrated omnichannel data systems so that AI can work with unified customer, channel, and transaction data rather than fragmented information. Furtick's work on omnichannel retail suggests that integration across physical, digital, mobile, and social channels is central to AI's effectiveness in retail strategy. [4].

Second, firms should strengthen data governance and ethical oversight. Tiago's review and Reed's analytical framework both show that data quality, bias control, and ethical data use are central to sustainable AI-based marketing decisions. [3], [5].

Third, AI systems should be combined with human supervision and explainable methods. Marín Díaz and co-authors show that explainable AI can improve business decisions when integrated with structured decision frameworks. This is important because trade decisions often involve brand strategy, customer trust, and contextual judgment that should not be left entirely to opaque models. [8].

Fourth, assessment of AI effectiveness should include not only short-term conversion or revenue, but also consumer trust, perceived control, and long-term relationship quality. Rohden and Espartel's findings on uncertainty and reduced perceived control make clear that optimization without consumer legitimacy can be counterproductive. [6].

Conclusion

The analysis shows that artificial intelligence significantly improves digital marketing decision-making in trade through several interconnected mechanisms: personalization, predictive analytics, recommendation systems, budget optimization, and explainability-supported governance.

These mechanisms help trade enterprises move from reactive and fragmented marketing management toward more adaptive, data-driven, and strategically integrated decision systems. [1], [2], [3], [4], [7], [8].

At the same time, the literature also shows that the effectiveness of AI in digital marketing is conditional. Without data governance, ethical safeguards, explainability, and attention to consumer autonomy, AI-based decisions may become biased, opaque, or strategically shortsighted. Therefore, improving decision-making mechanisms in digital marketing in trade requires not only stronger algorithms, but also stronger organizational and managerial frameworks for using them responsibly. [3], [5], [6].

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