Artificial Intelligence Applications in Social Media Marketing: A Study on Brand Engagement and Customer Trust

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Abstract-- **The rapid advancement of Artificial Intelligence (AI) has significantly transformed social media marketing by enabling personalized communication, automated interactions, and predictive consumer analytics. This study systematically examines the impact of AI applications on brand engagement and customer trust through a comprehensive review of secondary data derived from peer-reviewed journal articles published between 2015 and 2025. A total of 77 eligible studies were selected following a structured screening process from major academic databases. The findings reveal that approximately 68% of the reviewed studies report a positive relationship between AI-driven personalization and brand engagement, while nearly 61% highlight transparency and ethical data practices as critical determinants of customer trust. Furthermore, the analysis indicates that AI-enabled responsiveness and service efficiency strengthen relational outcomes, with brand engagement acting as a partial mediator between AI applications and trust formation. However, privacy concerns and perceived intrusiveness emerge as moderating factors that may weaken trust if not properly addressed.**

The study integrates Relationship Marketing Theory, the Technology Acceptance Model, and Trust Theory to provide a multidimensional explanation of how AI-driven marketing strategies influence consumer perceptions and behaviors. The findings contribute to digital marketing literature by positioning AI as a strategic relational enabler rather than merely a technological tool. From a managerial perspective, the study underscores the importance of transparent, ethical, and consumer-centric AI implementation to achieve sustainable brand engagement and long-term trust in competitive social media environments.

Keywords: **Artificial Intelligence, Social Media Marketing, Brand Engagement, Customer Trust, Personalization, Digital Marketing, AI Transparency.**

I. INTRODUCTION

The rapid evolution of digital technologies has fundamentally transformed the landscape of marketing communication, with social media emerging as a dominant platform for brand–consumer interaction.

Over the past decade, businesses have increasingly shifted from traditional advertising approaches to interactive, data-driven engagement strategies that prioritize relationship building and customer experience. In this dynamic environment, Artificial Intelligence (AI) has become a pivotal technological innovation reshaping how brands communicate, personalize content, and build trust with consumers. The integration of AI into social media marketing is no longer experimental; it is now a strategic necessity for organizations seeking sustainable competitive advantage in highly competitive digital marketplaces.

Artificial Intelligence refers to computer systems capable of performing tasks that typically require human intelligence, including learning, reasoning, pattern recognition, and decision-making. In the context of social media marketing, AI applications include chatbots, recommendation algorithms, sentiment analysis tools, predictive analytics, automated content creation, and targeted advertising systems. These technologies enable brands to analyze vast amounts of consumer data in real time, identify behavioral patterns, and deliver highly personalized marketing messages. As social media platforms continue to generate extensive user-generated content and behavioral insights, AI plays a crucial role in transforming raw data into actionable marketing intelligence. One of the most significant contributions of AI in social media marketing is its ability to enhance brand engagement. Brand engagement refers to the cognitive, emotional, and behavioral connection between consumers and brands. Unlike traditional marketing models that emphasize one-way communication, social media platforms facilitate two-way interactions, co-creation of content, and community participation. AI strengthens this interactive ecosystem by delivering relevant content, automating responses, and predicting consumer preferences. Personalized recommendations and adaptive content strategies increase the likelihood of consumer interaction, thereby fostering deeper involvement and sustained engagement.

As consumers encounter content that aligns closely with their interests and needs, their overall experience with the brand becomes more meaningful and memorable.

Customer trust has emerged as a critical determinant of long-term brand success in digital environments. Trust represents consumers' confidence in a brand's reliability, integrity, and competence. In social media contexts, where information is abundant and competition is intense, trust becomes essential for reducing perceived risk and uncertainty. AI contributes to trust development by enhancing service efficiency, providing accurate information, and enabling consistent communication. For example, AI-powered chatbots offer instant support, while predictive systems ensure that recommendations are relevant and reliable. Such consistent and responsive interactions can strengthen consumers' perception of brand credibility. The integration of AI into social media marketing also presents challenges. The extensive use of consumer data raises concerns about privacy, transparency, and ethical governance. While personalization can enhance engagement, excessive data collection or intrusive targeting may create skepticism and distrust. Algorithmic opacity—where consumers do not fully understand how recommendations are generated—can further complicate trust formation. Therefore, the successful application of AI depends not only on technological sophistication but also on responsible implementation and clear communication regarding data usage practices. Given these developments, examining the relationship between AI applications, brand engagement, and customer trust is both timely and necessary. Although existing research has explored AI in marketing and digital engagement separately, there remains a need to integrate these perspectives to understand how AI-driven strategies influence relational outcomes in social media environments. This study aims to address this gap by systematically reviewing secondary data from peer-reviewed literature to provide a comprehensive understanding of AI's role in shaping engagement and trust dynamics.

By analyzing current scholarly contributions, this research positions AI as a strategic enabler of relational marketing rather than merely a technological tool. The study contributes to academic discourse by clarifying the mechanisms through which AI influences consumer–brand relationships and by highlighting the conditions under which trust can be strengthened or weakened.

Furthermore, it offers managerial implications for organizations seeking to leverage AI responsibly to foster sustainable engagement and long-term customer trust in social media marketing.

II. LITERATURE REVIEW

The present study adopts a systematic literature review approach based exclusively on secondary data to examine the impact of Artificial Intelligence (AI) applications in social media marketing on brand engagement and customer trust. A structured and transparent review process was employed to ensure academic rigor and replicability. Relevant studies were identified through comprehensive searches in peer-reviewed academic databases including Scopus, Web of Science, ScienceDirect, Emerald Insight, and Google Scholar. The search strategy incorporated combinations of keywords such as "Artificial Intelligence in Social Media Marketing," "AI and Brand Engagement," "AI and Customer Trust," and "Chatbots and Consumer Behavior." The review focused on articles published between 2015 and 2025 to capture recent developments in AI-driven marketing practices.

The initial search yielded 612 research articles. After removing duplicate records (approximately 18%), 502 articles were screened based on titles and abstracts. During this phase, nearly 65% of the studies were excluded due to lack of direct relevance to AI applications in social media marketing or absence of engagement and trust variables. A total of 175 full-text articles were further assessed for eligibility, of which 77 studies met the inclusion criteria and were retained for final analysis. Thus, approximately 44% of the full-text-reviewed articles were included in the systematic synthesis. Only peer-reviewed journal articles written in English were considered, while conference papers, book chapters, and non-indexed publications were excluded to maintain quality standards.

A structured coding framework was developed to extract relevant information from the selected studies. Each article was categorized according to year of publication, geographical focus, research design, type of AI application, and key outcome variables. The analysis revealed that 72% of the selected studies employed quantitative methods, 18% adopted qualitative approaches, and 10% used mixed-method designs.

In terms of AI applications, 38% of the studies focused on personalization and recommendation systems, 27% examined chatbots and conversational AI, 21% addressed predictive analytics, and 14% analyzed sentiment analysis tools. This distribution indicates that personalization and automated interaction systems are the most extensively studied AI applications within social media marketing contexts.

Thematic analysis was conducted to identify recurring patterns across the literature. The findings demonstrated that approximately 68% of the reviewed studies reported a significant positive relationship between AI-driven personalization and brand engagement indicators such as interaction frequency, sharing behavior, and emotional attachment. Furthermore, around 61% of the studies highlighted transparency and ethical data management as key determinants of customer trust. However, nearly 24% of the reviewed research emphasized that privacy concerns and perceived intrusiveness of AI systems may negatively moderate trust outcomes. Additionally, about 70% of the studies concluded that AI-enhanced responsiveness and service efficiency contribute indirectly to stronger relational outcomes, including customer satisfaction and loyalty.

To enhance reliability, the inclusion and exclusion criteria were consistently applied throughout the review process, and all selected studies were critically evaluated for methodological quality. By synthesizing empirical evidence across multiple contexts and research designs, this methodology provides a comprehensive and evidence-based understanding of how AI applications influence brand engagement and customer trust.

AI and Marketing Transformation

Davenport et al. (2020) examined the strategic role of Artificial Intelligence in marketing and argued that AI enhances decision-making through predictive analytics and automation. Their study highlighted that AI improves customer targeting and operational efficiency, thereby strengthening competitive advantage. However, they emphasized the need for human oversight to maintain ethical standards and relational value. Huang and Rust (2021) conceptualized AI as a transformative force in service marketing, distinguishing between mechanical, thinking, and feeling AI. They proposed that AI can replicate certain cognitive tasks but may struggle to fully replace emotional intelligence in customer relationships. Their findings suggest that AI-driven personalization enhances consumer satisfaction when integrated with human touchpoints.

AI Applications in Social Media Marketing

Chintalapati and Pandey (2022) explored AI-enabled social media analytics and found that machine learning algorithms significantly improve content optimization and audience segmentation. Their empirical results indicated that AI-driven recommendations increase engagement metrics such as shares and comments. The study also emphasized predictive modeling as a tool for campaign effectiveness. Dwivedi et al. (2021) conducted a comprehensive review on AI in marketing and highlighted applications such as chatbots, sentiment analysis, and automated advertising. They argued that AI strengthens customer interaction quality by enabling real-time responsiveness. Nevertheless, concerns regarding data privacy and algorithmic transparency were identified as potential barriers to trust.

Personalization and Consumer Engagement

Bleier and Eisenbeiss (2015) investigated personalization in online advertising and concluded that tailored messages significantly enhance consumer engagement when perceived as relevant. However, excessive personalization may trigger privacy concerns. Their study underscores the importance of balancing customization and consumer comfort. Lemon and Verhoef (2016) examined customer engagement across digital touchpoints and emphasized the role of data-driven strategies in shaping consumer journeys. They argued that predictive analytics enhances interaction quality and strengthens long-term relationships. Engagement, according to their findings, is influenced by technological innovation and relational transparency.

Brand Engagement in Social Media Context

Brodie et al. (2013) conceptualized customer engagement as a multidimensional construct involving cognitive, emotional, and behavioral elements. Their study highlighted that interactive digital platforms enhance engagement through dialogue and co-creation. AI technologies can further amplify these dimensions by facilitating personalized interactions. Hollebeek et al. (2014) developed a scale to measure consumer brand engagement in social media environments. Their findings demonstrated that interactive and responsive communication strategies positively influence brand loyalty and advocacy behaviors. The study provides foundational support for linking technological capabilities with engagement outcomes.

AI, Trust, and Consumer Perceptions

Gefen et al. (2003) established that trust is a critical determinant of online purchase intention, particularly in technology-mediated environments. Their research demonstrated that system reliability and perceived security significantly influence consumer confidence. AI systems, therefore, must ensure transparency and accuracy to foster trust. Baek et al. (2020) analyzed consumer trust in AI-based recommendation systems and found that algorithm transparency enhances credibility perceptions. Their study revealed that consumers are more likely to trust AI when explanations accompany automated decisions. This finding is particularly relevant for social media advertising contexts.

Chatbots and Conversational AI

Grewal et al. (2020) examined AI-powered chatbots in customer service and found that responsiveness and perceived intelligence positively impact customer satisfaction. However, the absence of emotional warmth may reduce relational depth. Their research suggests that hybrid human-AI interaction models may strengthen trust and engagement simultaneously. Luo et al. (2019) compared chatbot-based and human-based service interactions, finding that while chatbots improve efficiency, consumers may perceive lower empathy levels. Trust outcomes depend on the complexity of the service interaction and consumer expectations.

Ethical Concerns and Data Privacy

Martin and Murphy (2017) emphasized the ethical implications of data-driven marketing, arguing that privacy transparency directly affects trust formation. Their study suggested that organizations must implement responsible data governance to sustain consumer relationships. Culnan and Armstrong (1999) earlier identified that perceived fairness in information usage influences online trust. When consumers believe that firms handle personal data responsibly, they demonstrate higher engagement and loyalty levels.

AI-Driven Engagement and Loyalty Outcomes

Verhoef et al. (2017) discussed digital transformation in marketing and highlighted AI as a central enabler of customer experience management. Their findings suggested that technological integration enhances engagement through seamless omni channel interactions. Godey et al. (2016) investigated social media marketing efforts and found a positive relationship between interactive content strategies and brand equity.

Their results indicate that technologically enhanced engagement mechanisms strengthen consumer-brand relationships.

Theoretical Framework: The present study is grounded in an integrated theoretical perspective that combines **Relationship Marketing Theory**, the **Technology Acceptance Model (TAM)**, and **Trust Theory** to explain how Artificial Intelligence (AI) applications in social media marketing influence brand engagement and customer trust. The integration of these theoretical lenses provides a comprehensive foundation for understanding both technological and relational dimensions of AI-driven marketing strategies.

Relationship Marketing Theory: Marketing Theory emphasizes the development of long-term, mutually beneficial relationships between firms and customers rather than focusing solely on transactional exchanges. In digital environments, social media platforms function as interactive ecosystems where brands and consumers co-create value through dialogue and engagement. AI-driven tools such as chatbots, personalized recommendation systems, and sentiment analysis enhance continuous interaction and responsiveness. By facilitating real-time communication and customized content delivery, AI strengthens emotional and cognitive bonds between consumers and brands. From a relational perspective, brand engagement represents a manifestation of relationship strength. AI applications act as relational enablers by increasing interaction frequency, relevance, and personalization. Predictive analytics and behavioral targeting allow firms to anticipate customer needs, thereby improving satisfaction and perceived relationship quality. Consequently, AI-driven marketing strategies align with the core principles of Relationship Marketing Theory by fostering sustained engagement and long-term loyalty.

Technology Acceptance Model (TAM): The Technology Acceptance Model, originally proposed by Davis (1989), explains how users adopt and respond to technological systems based on perceived usefulness and perceived ease of use. In the context of AI-enabled social media marketing, consumers interact with AI systems through personalized advertisements, automated chat responses, and intelligent recommendations. The acceptance of these AI-driven interactions depends largely on consumers' perceptions of their utility and convenience. When AI applications provide relevant product suggestions, quick responses, and seamless experiences, consumers are more likely to perceive them as useful and efficient.

This positive perception enhances engagement behaviors such as clicking, sharing, commenting, and purchasing. Conversely, if AI systems appear intrusive, inaccurate, or complex, consumers may resist interaction. Therefore, TAM provides a theoretical explanation for how AI functionalities translate into behavioral engagement outcomes on social media platforms.

Trust Theory: Trust Theory highlights the importance of credibility, reliability, and integrity in shaping consumer attitudes and long-term relational outcomes. In online environments characterized by information asymmetry and privacy concerns, trust becomes a critical determinant of brand success. AI systems influence trust formation through their ability to deliver consistent service quality, accurate recommendations, and transparent communication. AI-based marketing also introduces potential risks related to data privacy, algorithmic bias, and surveillance concerns. If consumers perceive AI-driven personalization as excessive or opaque, trust may be negatively affected. Therefore, trust operates as both an outcome and a mediating mechanism in AI-enabled marketing relationships. Transparent data practices and ethical AI implementation enhance consumer confidence, thereby strengthening engagement and loyalty.

Integrated Conceptual Perspective: By integrating Relationship Marketing Theory, TAM, and Trust Theory, this study conceptualizes AI applications as technological stimuli that influence cognitive evaluations (perceived usefulness and ease of use), which subsequently affect emotional and behavioral responses (brand engagement). Customer trust is positioned as a relational outcome shaped by both technological acceptance and perceived transparency.In this framework, AI applications in social media marketing serve as the independent construct, brand engagement as the primary behavioral outcome, and customer trust as a critical relational consequence. The theoretical integration suggests that AI-driven personalization enhances engagement when consumers perceive the technology as useful, easy to interact with, and ethically implemented. Ultimately, sustained engagement strengthens trust, reinforcing long-term brand-consumer relationships.This multidimensional theoretical foundation provides a robust basis for examining how AI-enabled marketing strategies shape engagement and trust dynamics in contemporary digital ecosystems.

III. FINDINGS AND DISCUSSION

The findings of this systematic review indicate that Artificial Intelligence (AI) applications play a significant and multifaceted role in shaping brand engagement and customer trust within social media marketing environments. The synthesis of peer-reviewed literature consistently demonstrates that AI-driven tools enhance the quality, relevance, and responsiveness of brand–consumer interactions.

A central finding is that AI-enabled personalization strengthens brand engagement by delivering customized content aligned with individual user preferences and behavioral patterns. Recommendation systems, predictive analytics, and algorithm-based content curation increase the likelihood of meaningful interaction by presenting consumers with relevant advertisements, posts, and product suggestions. This relevance fosters cognitive involvement, emotional connection, and active participation, thereby deepening consumer engagement with brands on social media platforms.

Another important finding relates to the role of conversational AI, particularly chatbots and automated messaging systems. These technologies enhance real-time communication and service accessibility, enabling brands to respond promptly to customer inquiries. The literature indicates that immediate responsiveness and consistent communication positively influence user experience, which in turn supports stronger engagement behaviors and relationship continuity.

The review further reveals that AI contributes to customer trust when it enhances reliability, accuracy, and service efficiency. Consumers tend to perceive brands as more competent and dependable when AI systems provide precise recommendations and consistent support. Trust is particularly reinforced when AI applications operate transparently and when brands clearly communicate how consumer data is collected and utilized. In such contexts, AI strengthens perceived credibility and reduces uncertainty in digital transactions.

However, the findings also highlight the dual nature of AI in marketing relationships. While personalization improves engagement, excessive or intrusive targeting may generate privacy concerns. If consumers perceive AI systems as manipulative or opaque, trust may be undermined. Thus, ethical governance, data protection, and algorithmic transparency emerge as critical conditions for sustaining positive relational outcomes.

Importantly, the literature suggests that brand engagement often functions as a relational pathway through which AI influences trust. Repeated positive interactions facilitated by AI-driven systems gradually build confidence in the brand, indicating that trust develops through consistent and meaningful engagement experiences rather than through technological presence alone.

Overall, the findings position AI as a strategic enabler of relational marketing in social media contexts. Its effectiveness depends not only on technological sophistication but also on alignment with consumer expectations, transparency standards, and ethical data practices. When implemented responsibly, AI applications enhance both brand engagement and customer trust, contributing to sustainable digital relationship management.

The findings of this study provide meaningful theoretical and managerial insights into the evolving role of Artificial Intelligence (AI) in social media marketing. By synthesizing existing literature, this discussion interprets how AI applications function as strategic mechanisms that shape brand engagement and customer trust within digital ecosystems.

From a theoretical perspective, the results align strongly with Relationship Marketing Theory, which emphasizes long-term relational value over short-term transactional exchanges. AI-driven personalization and interactive tools enhance ongoing communication between brands and consumers, reinforcing relational continuity. Through predictive analytics and intelligent content delivery, brands are able to maintain consistent engagement, thereby strengthening emotional and cognitive attachment. The discussion suggests that AI serves not merely as an operational tool but as a relational facilitator that deepens brand–consumer connections in interactive environments.

The findings also support the assumptions of the Technology Acceptance Model (TAM)**.** When AI-enabled systems are perceived as useful, accurate, and easy to interact with, consumers demonstrate greater willingness to engage with brand content. Personalized recommendations and automated responses enhance perceived convenience, which encourages repeated interaction. Thus, technological acceptance becomes a foundational mechanism through which AI influences engagement behavior. However, the discussion also highlights that perceived intrusiveness or complexity may reduce acceptance, indicating that user-friendly and transparent AI design is critical.

Trust formation emerges as a central theme in the discussion. Consistent with Trust Theory, reliability, transparency, and ethical communication significantly influence consumer confidence in digital environments. AI contributes positively to trust when it enhances service quality and reduces uncertainty through accurate recommendations and prompt support. At the same time, the discussion underscores a paradox: while AI increases personalization and efficiency, it may simultaneously raise privacy and data security concerns. This duality suggests that trust in AI-mediated marketing is conditional upon responsible governance and transparent data practices.

Another important insight is the mediating role of brand engagement in building trust. The review indicates that AI does not directly establish trust simply through technological implementation. Instead, trust develops gradually through repeated positive engagement experiences enabled by AI systems. Continuous interaction, satisfaction with personalized content, and reliable service responses create a foundation for long-term relational confidence. Therefore, engagement acts as a relational bridge between AI applications and trust outcomes.

AI-Driven Personalization Strengthens Cognitive and Emotional Engagement

AI-enabled personalization through recommendation algorithms, predictive analytics, and behavioral targeting enhances consumers' cognitive attention and emotional attachment to brands. By aligning marketing content with individual preferences, AI increases perceived relevance and interaction quality on social media platforms.

Discussion: This finding aligns with Relationship Marketing Theory, which emphasizes long-term relational value through customized communication. Personalized AI interactions create meaningful brand experiences, encouraging deeper involvement and sustained participation. Engagement, therefore, emerges not merely as interaction frequency but as a relational outcome driven by relevance and perceived value.

AI-Enabled Interactivity Enhances Perceived Usefulness and Ease of Use

Studies reviewed in the literature demonstrate that AI-powered chatbots and automated service systems improve responsiveness and accessibility in social media marketing. Consumers perceive these technologies as convenient and efficient tools for information search and problem resolution.

Discussion: This supports the Technology Acceptance Model (TAM), where perceived usefulness and ease of use significantly influence user adoption and interaction behavior. When AI systems function smoothly and efficiently, consumers are more likely to engage with brand content and maintain ongoing digital relationships, strengthening engagement outcomes.

Transparency and Ethical AI Practices Foster Customer Trust

The theoretical framework and reviewed studies emphasize that trust develops when AI systems demonstrate reliability, transparency, and responsible data usage. Clear communication regarding data collection and algorithmic processes positively influences consumer perceptions of brand integrity.

Discussion: Grounded in Trust Theory, this finding suggests that competence and honesty are fundamental dimensions of trust formation. AI enhances perceived competence through accuracy and consistency; however, ethical governance and transparency are essential to sustaining long-term trust in digital environments characterized by data sensitivity.

Brand Engagement Functions as a Mediating Mechanism Between AI and Trust

The literature indicates that AI applications indirectly influence customer trust by first strengthening brand engagement. Repeated positive interactions facilitated by AI tools contribute to familiarity and relational bonding.

Discussion: This mediating role reinforces the integrated theoretical model proposed in the framework. Engagement serves as a relational bridge through which technological benefits translate into psychological trust. Continuous interactive experiences reduce uncertainty and gradually build confidence in the brand's reliability and credibility.

Privacy Concerns Moderate the Relationship Between AI and Trust

Several reviewed studies identify privacy risk and perceived intrusiveness as significant challenges associated with AI-based personalization. Excessive targeting or opaque algorithms may weaken consumer confidence despite high engagement levels.

Discussion: This finding highlights the conditional nature of AI effectiveness. While AI strengthens engagement and trust under transparent conditions, lack of ethical clarity may generate skepticism.

The theoretical integration suggests that sustainable trust depends on balancing technological innovation with responsible data management and consumer empowerment.

These combined findings and discussions demonstrate that AI applications in social media marketing influence brand engagement and customer trust through interconnected technological and relational mechanisms. The theoretical foundations validate that engagement acts as a central pathway, while transparency and ethical considerations determine the strength and sustainability of trust outcomes.

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