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Computer-Mediated Marketing Communication and Brand Engagement: A Technology-Driven Perspective

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***Abstract*— Computer-Mediated Marketing Communication (CMMC) has evolved into an interactive, technology-driven process shaped by Artificial Intelligence (AI), Augmented Reality (AR), and algorithmic personalization. This paper investigates how these emerging technologies influence Consumer Brand Engagement (CBE) and examines the psychological mechanisms that determine whether technology-driven interactions enhance or undermine engagement. Using a meta-synthetic review of empirical studies published between 2021 and 2025, the research integrates findings from chatbot experiments, AR-based online shopping studies, personalization–privacy surveys, and virtual influencer research. The analysis reveals that AI agents and AR applications enhance cognitive, emotional, and behavioral engagement through increased social presence and psychological ownership. However, excessive or opaque personalization generates perceived creepiness and weakens engagement outcomes. A key contribution of this study is the identification of perceived autonomy as a central mediating variable that moderates consumer responses to advanced marketing technologies. The paper concludes that sustainable CMMC effectiveness depends not on technological sophistication alone, but on transparent design, user control, and the preservation of consumer agency.**

***Keywords*— Computer-Mediated Marketing Communication, Consumer Brand Engagement, Artificial Intelligence, Augmented Reality, Personalization, Consumer Autonomy**

I. Introduction

Advancements in digital technologies have fundamentally transformed marketing communication from one-way information transmission to interactive, technology-mediated engagement. Computer-Mediated Marketing Communication (CMMC) now incorporates AI-driven chatbots, virtual influencers, and immersive Augmented Reality (AR) interfaces that actively shape consumer–brand interactions. As a result, traditional performance metrics such as reach and exposure are increasingly inadequate for evaluating marketing effectiveness in digital environments.

In this context, Consumer Brand Engagement (CBE) has emerged as a critical construct, capturing consumers' cognitive, emotional, and behavioral investment in brand interactions.

Prior research consistently links higher levels of engagement with stronger brand loyalty, advocacy, and purchase intention. However, the rapid adoption of intelligent and immersive technologies has also introduced new challenges. While personalization and automation increase relevance and convenience, they may simultaneously trigger privacy concerns, perceived manipulation, and reduced trust.

This paper addresses this technology–engagement paradox by synthesizing recent empirical evidence to examine how AI, AR, and personalization influence CBE and to identify the psychological conditions under which technology-driven engagement remains effective. The study contributes to CMMC literature by highlighting perceived autonomy as a key mechanism linking emerging technologies and sustainable brand engagement.

II. Theoretical Background

This study draws on three complementary theoretical perspectives to explain consumer responses to technology-mediated marketing interactions. Social Presence Theory suggests that digital interfaces capable of conveying responsiveness, interactivity, and human-like cues create a sense of psychological presence, thereby enhancing emotional engagement. In contemporary CMMC, AI agents and immersive interfaces can generate social presence despite the absence of human communicators.

Media Richness Theory posits that communication effectiveness depends on a medium's capacity to convey information and reduce ambiguity. Rich media such as AR provide multiple sensory cues and immediate feedback, making them particularly suitable for experiential product evaluation and complex decision-making tasks.

The Stimulus–Organism–Response (S–O–R) framework is employed to model engagement outcomes. Within this framework, technological features such as interactivity, anthropomorphism, and personalization act as stimuli that influence internal psychological states, including social presence, trust, and perceived autonomy, which in turn shape engagement responses. Privacy Calculus Theory further explains how consumers weigh personalization benefits against perceived privacy risks, highlighting autonomy as a critical determinant of acceptance.

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III. Methodology

The study adopts a meta-synthetic research design, integrating findings from peer-reviewed empirical studies published between 2021 and 2025. Data sources include experimental research on AI chatbots, survey-based and structural equation modeling studies on AR-enabled shopping, personalization and privacy perception studies, and comparative analyses of virtual and human influencers.

Only studies employing validated measurement scales for engagement, social presence, and autonomy were included to ensure methodological rigor and comparability across contexts.

Table I presents the key constructs synthesized across the reviewed studies and their conceptual relevance to technology-driven brand engagement.

Table I
Key Technology–Engagement Constructs

Construct	Description
Social Presence	Perceived sense of human-like interaction in digital interfaces
Interactivity	Degree of user control and real-time system responsiveness
Psychological Ownership	Feeling of personal connection or possession toward a product
Perceived Personalization	Extent to which content is tailored to individual preferences
Perceived Autonomy	Consumer's sense of control and freedom of choice
Consumer Brand Engagement	Cognitive, emotional, and behavioral brand investment

IV. Findings And Discussions

The synthesized findings indicate that AI-driven chatbots and virtual influencers enhance cognitive and emotional engagement by increasing perceived social presence, particularly when interactions are functional, transparent, and responsive.

Utility-oriented AI agents are more effective than highly anthropomorphic designs when task performance is prioritized.

AR-based applications significantly strengthen engagement by enabling interactive product exploration and psychological ownership. Virtual try-on and visualization tools reduce uncertainty and increase perceived brand authenticity, leading to higher purchase intention and behavioral engagement.

In contrast, personalization exhibits an inverted U-shaped relationship with engagement. Moderate personalization enhances relevance and engagement, whereas excessive or opaque personalization increases perceived creepiness and ad avoidance. Perceived autonomy emerges as a critical mediator: when consumers feel informed and in control of personalization processes, engagement outcomes improve; when autonomy is undermined, engagement deteriorates.

Fig. 1 summarizes the technology-driven engagement mechanism using the S–O–R framework.

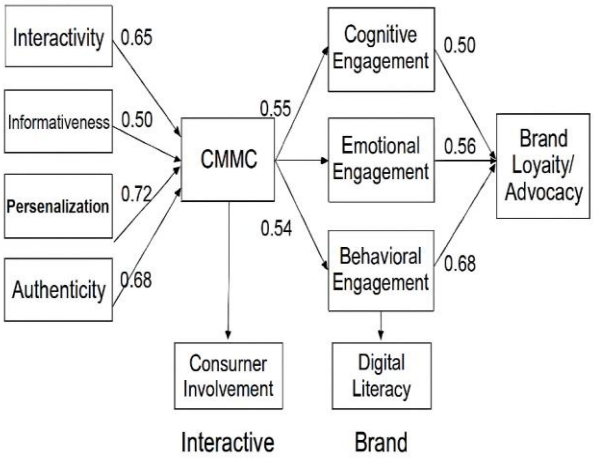

Fig. 1. Technology-Driven Consumer Brand Engagement Model

V. Discussion And Implications

The findings suggest that technology-driven engagement is not a direct outcome of increased technological sophistication. Instead, engagement depends on how technologies are designed and experienced by consumers. Transparency, interactivity, and user control are essential for sustaining trust and engagement in CMMC.

From a managerial perspective, organizations should prioritize autonomy-supportive personalization strategies, such as opt-in mechanisms and user-controlled preference settings. AR should be deployed as a functional tool for product evaluation rather than a purely promotional feature. AI agents should emphasize reliability and clarity over excessive human-like simulation.

VI. Conclusion

This study demonstrates that emerging technologies such as AI, AR, and personalization can significantly enhance Consumer Brand Engagement when they support social presence, interactivity, and consumer autonomy. However, technology alone does not guarantee engagement. Sustainable CMMC effectiveness depends on transparent design and the preservation of consumer agency.

By identifying perceived autonomy as a central mediating mechanism, this paper contributes to a more balanced and psychologically grounded understanding of technology-driven brand engagement.

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