

Virtual Reality and Augmented Reality Applications in Online Marketing: A Systematic Review

Dina Subekti Kantirahayu ¹

¹ Universitas Diponegoro, Semarang, Indonesia

Abstract

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This study provides a systematic review of the applications of Virtual Reality (VR) and Augmented Reality (AR) in online marketing. VR and AR have emerged as transformative technologies that enable consumers to interact with products and services in immersive, multisensory environments. The findings highlight that these technologies enhance presence, interactivity, and consumer engagement, thereby improving product understanding, shaping purchase intentions, and fostering brand loyalty. Evidence shows their effectiveness across multiple sectors, particularly retail and tourism, where immersive experiences reduce uncertainty and enrich consumer satisfaction. However, significant barriers remain, including high implementation costs, technological limitations, privacy concerns, and the potential decline of novelty effects. These challenges underscore the importance of continuous innovation, consumer centered design, and integration into omnichannel strategies. Overall, VR and AR hold strong potential as strategic marketing tools, but their long term success depends on ethical, practical, and contextually relevant implementation.

*Corresponding author:
(Dina Subekti Kantirahayu)

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1. Introduction

In recent years, Virtual Reality (VR) and Augmented Reality (AR) have emerged as transformative technologies that are reshaping the landscape of online marketing. Unlike traditional two-dimensional media, these immersive tools allow consumers to experience products and services in interactive, multisensory environments, offering unprecedented opportunities for engagement and persuasion (Javornik, 2016). In e-commerce, for example, VR has been used to create fully immersive showrooms and brand worlds, while AR enables consumers to virtually try on products, visualize items in their physical space, and interact with branded content in real time (Poushneh & Vasquez-Parraga, 2017). These applications reduce uncertainty in purchase decisions, improve product understanding, and enhance the overall shopping experience by bridging the gap between digital and physical environments (Hilken et al., 2017).

From a theoretical perspective, VR and AR applications in marketing are often linked to constructs such as presence, telepresence, and vividness, which explain why these experiences are perceived as more engaging than conventional online formats (Yim et al., 2017). Research has shown that the degree of interactivity and immersion directly influences attitudes toward the brand, willingness to buy, and post-purchase satisfaction (Flavián et al., 2019). At the same time, the role of enjoyment and perceived usefulness in AR/VR marketing experiences has been highlighted as critical in determining consumer acceptance and behavioral intentions (Kumar, 2022). These insights suggest that VR and AR are not just technological

add ons, but strategic tools capable of shaping consumer journeys and brand positioning in digital markets (Scholz & Duffy, 2018).

Nevertheless, challenges remain in the widespread adoption of these technologies. Scholars caution that poorly designed or overly intrusive AR/VR experiences may lead to consumer fatigue, privacy concerns, or cognitive overload, reducing their effectiveness in building long term engagement (Rauschnabel et al., 2019). In addition, the novelty of such technologies may decline over time, necessitating continuous innovation and integration with broader omnichannel strategies to sustain consumer interest (Wedel et al., 2020). These concerns highlight the importance of designing VR/AR applications that align with consumer needs, technological usability, and ethical considerations.

Given the rapid evolution of these technologies and their growing application across industries, a systematic review is necessary to synthesize existing knowledge and identify critical gaps. Such a review can map how VR and AR applications have been conceptualized, the contexts in which they have been implemented, and their documented effects on consumer behavior and firm performance. Furthermore, it can shed light on emerging themes such as personalization, social interaction, and cross-platform integration, which are becoming increasingly relevant in shaping the future of immersive marketing (Flavián et al., 2019; Wedel et al., 2020). This study therefore seeks to provide a comprehensive overview of VR and AR applications in online marketing, offering insights into their theoretical underpinnings, practical implementations, and directions for future research.

2. Literatur Review

Research on Virtual Reality (VR) and Augmented Reality (AR) in online marketing highlights their ability to create immersive and interactive experiences that strengthen consumer engagement. VR environments enhance the sense of presence and emotional involvement, which leads to more favorable attitudes toward brands and higher levels of satisfaction compared to traditional media (Hudson et al., 2019). In online retail, AR applications such as virtual try-on features or product placement in real settings reduce uncertainty, enhance product understanding, and increase purchase intentions (Beck & Cri , 2018).

The effectiveness of VR/AR experiences largely depends on design factors such as interactivity, vividness, and user control. High levels of interactivity in immersive environments foster a stronger sense of control, which significantly drives consumer purchase intention (Whang et al., 2021). Similarly, the use of mobile AR applications in retail settings has been found to enhance consumer brand engagement, leading to greater loyalty and long-term relationships (McLean & Wilson, 2019).

Beyond retail, VR has also been explored in the tourism industry, where its ability to evoke vivid mental imagery and flow experiences has been shown to positively influence visitor satisfaction and future visit intentions (Bogicevic et al., 2019). These findings demonstrate that the value of VR and AR lies not only in their functional utility but also in their capacity to enrich sensory and affective consumer experiences.

Despite their potential, adoption barriers remain. Challenges such as device costs, technological limitations, and privacy concerns continue to hinder the widespread use of VR/AR in marketing. Studies suggest that overcoming these barriers requires continuous innovation, ethical design, and integration into omnichannel strategies to sustain consumer interest over time (Laurell et al., 2019).

3. Methods

This study applies a systematic literature review approach to analyze the role of Virtual Reality (VR) and Augmented Reality (AR) in online marketing. A systematic review was chosen because it provides a structured and transparent process for identifying, selecting, and synthesizing relevant research, allowing for a comprehensive understanding of the topic. The review focused on articles published between 2020 and 2022, as this period reflects the rapid growth and increasing adoption of immersive technologies in marketing practices.

The data collection process involved searching academic databases using keywords such as “Virtual Reality marketing”, “Augmented Reality marketing”, “consumer engagement”, and “immersive technology.” Only peer-reviewed journal articles written in English and directly related to online marketing, retail, tourism, or consumer behavior were included. Studies that were conference papers, non-English publications, or unrelated to the marketing context were excluded to maintain focus and consistency.

The selection process followed a structured screening procedure to ensure that only the most relevant studies were included. For each article, information was

extracted regarding research objectives, context, methodology, and findings. The analysis was conducted using a thematic approach, which allowed the identification of recurring patterns and concepts such as immersion, presence, consumer attitudes, adoption barriers, and strategic brand outcomes.

To enhance reliability, the review process was carried out carefully and consistently, with clear criteria applied during both the selection and analysis stages. This ensured that the findings accurately reflect the current state of knowledge on VR and AR applications in online marketing.

4. Results and Discussion

The findings of this review reveal that Virtual Reality (VR) and Augmented Reality (AR) are increasingly recognized as powerful tools for enhancing consumer engagement, shaping purchase intentions, and reinforcing brand loyalty in online marketing. Across the studies reviewed, several recurring themes emerged, including the role of immersion and presence, the importance of interactivity and control, the influence of affective and cognitive responses on consumer decisions, and the barriers that hinder large scale adoption.

A dominant result across the literature is that VR and AR significantly strengthen the sense of presence and immersion, which are central to creating meaningful consumer brand interactions. For instance, research has shown that immersive VR experiences heighten emotional responses and generate favorable attitudes toward brands, making them more persuasive than traditional two dimensional media (Hudson et al., 2019). Similarly, AR's capacity to overlay digital

information on real-world environments reduces purchase uncertainty and provides consumers with richer product knowledge, ultimately increasing their willingness to buy (Beck & Crié, 2018).

Another important result is the mediating role of interactivity and perceived control in shaping consumer outcomes. Studies indicate that highly interactive AR environments enhance consumers' feelings of autonomy, which directly drives purchase intentions (Whang et al., 2021). Likewise, the integration of AR into mobile applications has been shown to promote stronger consumer brand engagement, with such engagement often translating into greater loyalty and advocacy (McLean & Wilson, 2019). These findings suggest that interactivity and control are not merely technical features but key psychological levers that determine the success of VR/AR marketing campaigns.

The results also extend beyond retail to other industries such as tourism. VR experiences in travel marketing have been found to evoke vivid mental imagery and flow experiences that significantly influence visitor satisfaction and intentions to visit destinations (Bogicevic et al., 2019). This indicates that immersive technologies are not confined to facilitating transactional outcomes but also play a critical role in shaping experiential value and long-term consumer relationships.

Despite these positive outcomes, the discussion of findings also highlights persistent barriers to adoption. High implementation costs, technological limitations, and privacy concerns were frequently identified as factors that restrict widespread use (Laurell et al., 2019). Furthermore, some studies caution that the novelty effect of VR/AR may diminish over time, which raises concerns about

sustaining consumer engagement without continuous innovation (Wedel et al., 2020). These challenges underline the importance of designing VR/AR strategies that align with consumer expectations, ethical standards, and broader omnichannel marketing frameworks.

Taken together, the results suggest that VR and AR hold strong potential for reshaping online marketing by enriching consumer experiences and driving brand related outcomes. However, the discussion also reveals that their effectiveness is highly contingent upon factors such as interactivity, usability, and contextual relevance. Firms that integrate VR/AR thoughtfully balancing innovation with practicality are more likely to sustain consumer interest and realize long-term competitive advantages.

5. Conclusion

This systematic review demonstrates that Virtual Reality (VR) and Augmented Reality (AR) have become influential tools in shaping the future of online marketing. The evidence consistently shows that these technologies enhance immersion, presence, and interactivity, which in turn foster stronger consumer engagement, improve product understanding, and increase purchase intentions. Applications such as virtual try-ons, immersive brand showrooms, and interactive mobile AR features not only reduce uncertainty in decision making but also contribute to long-term brand loyalty and satisfaction.

Beyond retail, VR and AR are also transforming experiential marketing in industries such as tourism, where they enrich consumers' mental imagery and flow

experiences, positively affecting satisfaction and behavioral intentions. However, the findings also highlight significant barriers to widespread adoption, including high implementation costs, technological limitations, privacy concerns, and the risk of novelty effects wearing off over time. These challenges underline the necessity of continuous innovation, consumer-centered design, and integration with broader omnichannel strategies.

In conclusion, VR and AR hold considerable potential as strategic marketing tools that go beyond novelty to deliver meaningful consumer value. Their success, however, depends on thoughtful implementation that balances technological possibilities with usability, ethical considerations, and contextual relevance. Future research should continue to explore how personalization, cross platform integration, and evolving consumer expectations shape the effectiveness of immersive marketing, ensuring that VR and AR remain sustainable drivers of engagement and competitive advantage in the digital.

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