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ORIGINAL

New Strategic Deployment of Augmented and Virtual Reality for Enhancing Purchase Intentions and Brand Attitudes

Nuevo despliegue estratégico de la realidad aumentada y virtual para mejorar las intenciones de compra y las actitudes hacia la marca

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ABSTRACT

This study examines how Augmented Reality (AR) and Virtual Reality (VR) influence consumer decision-making in experiential retail. Through three experiments and qualitative feedback, AR proved more effective in driving purchase intentions by emphasizing product-focused mental imagery, while VR significantly enhanced brand attitudes through context-focused immersion. Results further indicated that presenting AR before VR yielded stronger outcomes, as AR's product clarity primed consumers for the immersive brand narrative of VR. Qualitative insights underscored the emotional resonance and detailed visualization each technology provides, highlighting their complementary roles in shaping consumer perceptions. Employing a mixed methods approach, the research integrated statistical analyses of mental imagery, purchase intentions, and brand attitudes with participant narratives. While limitations include convenience sampling, controlled settings, and self-report measures, the findings offer a solid foundation for strategic AR-VR deployment. Future research should explore diverse contexts, user demographics, and long-term effects to deepen understanding of these emerging technologies.

Keywords: Digital Marketing; Augmented Reality (AR); Virtual Reality (VR); Experiential Retailing; Mental Imagery Theory; Consumer Engagement.

RESUMEN

Este estudio analiza cómo la realidad aumentada (AR) y la realidad virtual (VR) impactan la toma de decisiones del consumidor en el comercio minorista de experiencia. La realidad aumentada es más eficaz en la promoción de las intenciones de compra al destacar las imágenes mentales centradas en el producto, según tres experimentos y observaciones cualitativas. La realidad virtual mejoró significativamente las actitudes de marca mediante la inmersión centrada en el contexto. Por otro lado. Los hallazgos señalaron que la introducción de la realidad aumentada antes que la realidad virtual generó resultados más robustos. La claridad del producto de la realidad aumentada capacitó a los consumidores para la narrativa de marca inmersiva de la realidad virtual. En la construcción de las percepciones del consumidor, los estudios cualitativos resaltaron la resonancia emocional y la visualización meticulosa de cada tecnología, enfatizando sus funciones complementarias. La investigación integró análisis estadísticos de imágenes mentales, intenciones de compra y actitudes de marca con las narrativas de los participantes mediante metodologías mixtas. Los descubrimientos proporcionan un fundamento robusto para la implementación estratégica de la Realidad Virtual Realidad (AR-VR), aunque las restricciones comprenden muestreo de conveniencia, entornos regulados y medidas de autoinforme. Para profundizar la comprensión de estas tecnologías en desarrollo,

las futuras indagaciones deben examinar una variedad de contextos, datos demográficos de los usuarios y efectos a largo plazo.

Palabras clave: Marketing Digital; Realidad Aumentada (RA); Realidad Virtual (RV); Venta al Por Menor Experiencial; Teoría de la Imaginería Mental; Participación del Consumidor.

INTRODUCTION

The COVID-19 pandemic fast-tracked the online retail trend, putting great pressure on experiential retailers. Unlike typical merchandising, experiential retailers rely on haptic interaction that typically does not adapt very well to web environments. Thus, augmented reality (AR) and virtual reality (VR) can fill the identified gap by enhancing customers' online experiences through interactive, immersive means.

AR and VR have already been utilized in retail experience as depicted in figure 1, a stylish modern room displays its residents against a backdrop of smartphone usage. The smartphone reads the real environment so smoothly that it looks like an augmented reality. The combined application for marketing objectives, especially for purchase intentions and brand attitudes, is created, but the literature still lacks this information. This research seeks to fill the gap by exploring an evaluation and describing how and when AR and/or VR should be used to achieve the above-mentioned goals.

Figure 1. The Integration of VR and AR in Digital Marketing Strategies

Therefore, this study's antecedents will first examine AR and VR's ability to affect purchase intentions and brand attitudes independently. Second, assess the extent to which mental imagery engages consumers more with AR and VR. Last, specify the right format of AR and VR that should be used to capture high purchase intentions and favorable brand attitudes.

Literature Review

In discussing the issue of experiential retailing, emphasis is placed on the richness of the sensory cues as drivers of consumer interactions and purchase behaviors in the given context, which has been a subject of difficulty in adopting digital experiences. In today's immersive technologies, especially Augmented Reality (AR) and Virtual Reality (VR), experiential retailers can fill the gap between online and offline buying experiences. AR & VR have been identified to have the capability of improving the consumer-perceived image, more specifically, facilitating the creation of mental images. At the same time, there is agreement on the above, and there is some disagreement on the impact of AR on purchase intentions and brand attitudes, but not on VR.[15] The increasing attention given to AR and VR in retail environments points to a demand for a better understanding of how to more effectively target these technologies to accomplish given marketing goals related to purchases or brand perception, for example. This paper reviews literature that seeks to differentiate between AR and VR concerning online retail and applies mental imagery theory to shed light on how each can be implemented to augment customer experience.[14]

The main advantages, opportunities, and possible difficulties of applying AR and VR to empower online retail

are illustrated in [1], however, various examples of integration into the sphere were discussed. For example, AR introduces digital features into physical environments, while VR offers fully built virtual spaces. These are all capable of recreating tactually rich experiences that are feasible only in physical stores such as restaurants or fashion boutiques. This shift means that AR and VR are effective tools for experiential retailers to close the physical and web divide.

This review looks at the effectiveness of Augmented Reality (AR) and Virtual Reality (VR) in influencing customer engagement and buying decisions in retail, particularly as these two emerging technologies create interactive engagements that can improve the customer experience.[2,16] Augmented Reality elements, such as try-ons and demonstrative installations, make the customer experience more engaging. At the same time, Virtual Reality means visually visiting a store and interacting with products, thus improving satisfaction and brand association. Credible performance indicators like longer time spent in store, high sales per customer conversion, and enhanced customer loyalty to the physical stores reveal how successful AR and VR are in redefining retailing, focusing on harmonizing between the physical and digital worlds. Therefore, those still touch pertinent and significant issues regarding technology implementation and user acceptance, which indicates potential tracks for further study to reveal the additional potential of such technologies and study their long-run effects on the consumers.

This literature review outlines the evolution of Augmented Reality (AR) and Virtual Reality (VR) as user experience (UX) innovation strategies for e-commerce, with particular attention to their utilization for increasing customer interest, purchasing frequency, and product identity.[3] With the possibility of trying the product virtually or exploring personalized offers based on a consumer's data, AR/VR creates a sense of customer engagement and satisfaction that helps digital retailers gain a competitive edge. However, problems are evident in technical constraints, user accommodation, and implementation; for instance, technical restriction and user accommodation concerns. AR/VR applications in eCommerce offer several benefits, such as longer time spent in the store and more purchase frequency. Main indices prove that these technologies benefit the consumer in retailing, reflecting a bright future of augmented reality and virtual reality that synchronizes the virtual and real worlds. Finally, the benefits of incorporating AR/VR into eCommerce UX are suggested to be adopted and integrated properly based on the authorization, and more detailed future work should focus on the above-mentioned shortcomings while studying the long-term impact on consumers.[18,20]

This study focuses on how the technology of Augmented Reality (AR) can be applied to e-commerce environments to improve customers' interactions between the virtual and material worlds.[4] Due to the generally static nature of print media and websites, AR has some distinct advantages: product visualization, virtual fitting, and other features such as 360-degree views that minimize pre-purchase risk and improve customer confidence. AR is popular in the fashion and cosmetics markets, promising a rich functionality as a marketing application, as it contributes to branding with the help of nontraditional advertising and social media. Current trends, such as entwining AR with Virtual Reality (VR), AR social shopping, or using AR filters in live broadcasts, further stress the role of augmented reality in influencing shopping experiences.[19] The chapter also acknowledges the potential threats involving technology and user acceptance of AR/VR in e-commerce. Nevertheless, this chapter discusses the benefits of AR/VR implementation and recommendations for effective and successful implementation.

This chapter sought to understand how Augmented Reality (AR) works within the context of e-commerce and can facilitate the connection between online and traditional forms of customer shopping. The benefits that can be derived with AR are evident, clear, and tangible: product visualization and virtual try-on, and choice of perspective angles such as 360-degree perspectives, which will all, in the end, help to remove doubts and increase customer trust. It is a well-liked marketing strategy in fashion and cosmetics that aids brand promotion through unique promotions and Social Media. New factors such as AR and VR, AR as social buying, the concept of live streaming with facades which comprised AR and so on reveal the significance of AR in enhancing personalized shopping. This chapter analyses the key opportunities and threats associated with the application of AR/VR in the context of e-commerce and the following recommendations for its effective implementation.

Also, augmented reality can be described as a major player in digital marketing as it enables brands to create an interactive environment between them and the customers while at the same time helping brands to understand the customers' expectations.[5] This technology allows for directly engaging the target markets so that the current and prospective market requirements are well understood. This research looks at the impact of AR and virtual reality in general in altering consumers' purchasing decisions, considering interactivity, information provision, and realism. Conducting an online survey, the study applies an exogenous quantitative sampling method and PLS-SEM to test causal relationships supported by surveys with various random samples. Findings show that system quality, product informativeness, and reality congruence are useful predictors of digital marketing outcomes, while interactivity only adds value to the relationship. These studies support AR as an effective digital marketing mix that enhances customer experience with quality tangible interaction and relevant product information.[19]

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As a relatively new area of application in digital marketing, Virtual Reality (VR) and Augmented Reality (AR) are revolutionizing consumer behaviour and marketing techniques, more especially in financial services and products through the HR- FinTech convergence.[6] This review points to new frontiers in applying VR and AR in the marketing mix to promote memorable marketing communication and engaging marketing experiences to boost customer interaction, product demonstration, and brand equity. Examples are used to explain how VR and AR enhance basic marketing techniques to increase customer satisfaction and, thus, customer loyalty. The paper also traces how HR is engaged in the implementation of these technologies, focusing on the need to provide training in how employees of the firms may use VR and AR in the marketing and service sectors.(15,20) It also considers problems associated with such transition for HR, including cost, its applicability to large and diverse populations and resistance from employees. In conclusion, the review again emphasizes the positive influence of the VR and AR in redefining various marketing contexts within financial services and supports for future study and funding to explore the actual potential of these technologies.

The combination of augmented reality (AR) and virtual reality (VR) is making e-commerce environments new by offering virtual trials that make the physical and digital divide in purchasing less apparent.[7] AR lets users place products in their environment, providing a feel of physical handling, and VR takes the customer to exposed shopping experiences in a Virtual environment. To this end, this paper aims to discuss how AR and VR functions like virtual shopping, interactive 3D models, and storytelling are changing how consumers interact. Another criterion is that with the help of the AI recommendation system for personalized purchases on the Internet, its use increases the level of interest and conversion by predicting what the user might be interested in. Also, social commerce integration allows users to generate and post AR/VR-related content, thus changing the buying behaviour of social networks. This integration is expected to revolutionize the current e-commerce industry through the use of enhanced AR glasses and VR headsets; this book offers the necessary information about such experiences to e-commerce entities and researchers.

Virtual Reality (VR) and Augmented Reality (AR) were initially envisioned by Ivan Sutherland in 1968 and have now developed functional technologies mainly used in the market nowadays, influencing different segments of human life.[8] Once applied only in specific experiments, VR and AR enhance certain experiences in numerous spheres, including video games and e-commerce, tours of dream houses and favourite travelling spots. These technologies integrate the real-world physical environment through improved 3D graphics so that clients can engage in the computer-generated environment and within that experience, receive sensory situational images of the past, present and even future. In particular, VR has emerged and evolved as a more focused area of computing sciences, with applicability implemented in a variety of fields, including automobile manufacturing, robotics, drug manufacturing, biologists, education, architecture, and more. This paper is a critical literature review of VR with the following objectives: To explain what it is, its history, the meaning of VR terms, its applications, and how the concept increases knowledge in technology advancements.[20,21]

The use of Augmented Reality (AR) and Virtual Reality (VR) technologies in software development has presented possibilities for expanding the functionality and the sphere of application of various software products in the spheres of gaming, education and training, retail and healthcare.[9] AR places computational objects within the context of the physical world so that users can interact with them, while VR places users in completely simulated environments, offering fully realized experiences. In this paper, the possibilities, issues, and trends related to software applications of AR and VR are discussed, as the ways that these technologies can revolutionize the relations between the software product and its user, as well as the problems that both developers and designers should solve to use these tools efficiently, are considered.

In recent years, especially in marketing, Augmented Reality (AR) and Virtual Reality (VR) have experienced the most growth and have widely affected consumers.[10,21] This literature illustrates the increased application of AR and VR in delivering value, the purchase experience and consumer behaviours across industries.[19,20] There remains major issues in adopting these technologies along the marketing and retail sector; innovation pressure, privacy issues, and ethical dilemmas. However, AR and VR are not without significant opportunities such as enabling consumers to go shopping directly, interactive advertizing, and virtual sales. This review takes the consumer angle interested in the obstacles a consumer could encounter and how it would be insightful to Marketers.[18] The paper provides useful guidelines and tips for organizations to adopt AR and VR as elements of brand marketing communication to add superior customer value. Based on the theoretical investigation, this article delivers a fundamental comprehension of the potential of AR and VR technologies for present and future marketing strategies, noting their significance for organizations, seeking to persist in the constantly advancing environment.

When studying consumers' product reviews augmented through Augmented Reality (AR), recent research shows a limitation where retailers can no longer control the context of their offering.[11] Using AR technology, consumer brands allow consumers to project product holograms into their real life, personal, and real environments, which may not be very conducive for purchases, e.g. messy environments have a detrimental effect on the intentions to perform the purchase. This effect is triggered by processing disfluency, where

unfavourable settings have a negative influence on the consumers' mental state as far as the evaluation of products is concerned, thus undermining perceived product quality. The results from 2 online experiments and 1 undercover field experiment with 1000 people ruling out those who have never shopped in AR show that decision-making is negatively affected in unfavourable contexts in AR, but this is reversed if the product has a unique design, hence increasing the conceptual fluency or if the contextual environment of the product becomes less perceptually salient thus bringing out the product. As countermeasures, the study has offered solutions such as reduced reality where the background is made less complex, as well as enhanced product comparison to increase the customer experience while shopping online and from which future research on the contextual impact of AR in e-commerce can be drawn from [16].

E-commerce has become almost indispensable as greater development in science and information technology is attained; nevertheless, conventional shopping is usually a bland experience in which the client is given relatively impersonal static information through text or images.[12] Mobile augmented reality (AR) has been identified as a burgeoning revolution instrument with the potential to revolutionise the perception of the shopping future. To evaluate the usefulness of using AR combined with e-commerce, particularly in mobile e-commerce applications, users must be able to view real-time video streams with virtual objects placed on top of the real environment. Consequently, the self-oriented thinking that is embodied by these immersive experiences of 'click and meet' enables customers to look at products 360 degrees, and Pan envisages the experience of actually being able to touch is the digital equivalent of physical shopping. In the context of mobile e-commerce in the Indian context, authenticity has been seen to be positively impacted, curiosity engaged, and overall, the shopping pleasure raised and therefore a positive influence on the purchase intent and narrowing down of the customer's engagement in the total shopping journey.[15,17,20]

Marketing experts are now finding promise in Augmented Reality (AR) as a tool, one that presents a series of opportunities and risks that shape its innovation.[13] A recent study applies the SWOT framework to discuss the state and trends in the advertising area and gives a systematic outline of the factors influencing the development of AR. It is argued that AR has significant strengths when it comes to complementing promotional communication by adding extra value to the customer's direct experience and/or extending the relations between the customer and the brand through creating a signal-enhancing flight based on interactivity and immersion. Nonetheless, the effectiveness of AR is encumbered by its weak points, such as technical constraints and other contextual issues that may affect user involvement. The strength of Augmented Reality is that it is still in its growth stage and could be applicable Across Different Platforms. Technology could pose threats such as Privacy, and it fully depends on the device support. This framework is useful for marketers when evaluating AR's alignment within the overarching business strategy to further a firm's consumer engagement and brand loyalty initiatives in a digital environment.[20]

Experiential Retailing and Online Challenges

Experiential retailers, including specialist stores and boutiques, historically generate value through arresting in-store atmospherics. However, moving online forces all these retailers to create such experiences without actual contact.

AR and VR in Retail

AR and VR help retailers provide customers with a whole-body immersive experience where, using AR, customers are able to see the products in their environment, and VR allows the customers to go to the virtual store and shop. Existing literature notes that AR and VR affect consumer attitudes, but there is a lack of consensus on how these technologies work independently and jointly.[14,15]

Mental Imagery Theory

According to mental imagery theory, consumers use pictures of products and experiences when purchasing. AR and VR develop smooth mental imagery and can positively impact consumer engagement, purchase intentions, and brand attitude.[18]

Theoretical Framework and Hypotheses

This study examines the comparative effects of Augmented Reality (AR) and Virtual Reality (VR) on consumer decision-making. Specifically, it investigates how AR and VR influence purchase intentions and brand attitudes through different forms of mental imagery—product-focused in AR and context-focused in VR. Additionally, the study explores the sequential impact of AR and VR on consumer perceptions, determining whether exposure to AR before VR leads to more favourable outcomes than the reverse.

The study confirms that AR enhances purchase intentions more effectively than VR by fostering product-centred mental imagery, while VR improves brand attitudes through self-generated, context-focused vividness. Findings indicate that mental imagery quality—product-focused in AR and context-focused in VR—fully

influences purchase intentions and brand attitudes. Moreover, results show that presenting AR before VR leads to significantly higher consumer engagement. AR helps establish a concrete product perception, which is then enriched by VR's immersive brand experience. This highlights the complementary nature of AR and VR in shaping consumer decisions, with AR driving purchases and VR strengthening brand perceptions.[16]

Research Methodology

This paper reports an integrated approach of quantitative experiments and qualitative findings to ascertain how AR and VR affect consumer behavior in experiential retailing. Pilot study Three studies were carried out to quantify the individual impact of AR and VR and the combined influence on purchase intentions and brand attitudes, which are at the heart of most marketing strategies. To supplement these experiments, post-technology use feedback sessions were conducted with participants to gain richer, orientational insights into each technology's emotional and behavioral effects. The analysis presented in Table 1 This illustration provides an overview of the conceptual model specifying the hypothesized relationships among AR, VR, mental imagery fluency, purchase intentions, and brand attitudes, including the influence of technology sequencing.

Table 1. The research methodology includes the five criteria

Construct/Path	Hypothesis	Predicted Direction / Comparison	Explanation
Technology: AR vs. VR → Purchase Intentions	H1 (AR > VR)	AR leads to higher Purchase Intentions than VR	AR's product-centred mental imagery is expected to boost consumer confidence and motivation to buy more effectively than VR.
Technology: AR vs. VR → Fluency of Product-Focused Imagery	H3	Positive Relationship (AR facilitates product-focused imagery)	When exposed to AR, consumers form clearer mental images of product attributes, enhancing their intent to purchase.
Technology: AR vs. VR → Fluency of Context-Focused Imagery	H2 (VR > AR)	VR leads to higher Context-Focused Imagery than AR	The immersive environment of VR fosters more vivid contextual or lifestyle-based imagery around the brand.
Fluency of Product-Focused Imagery → Purchase Intentions	H3	Positive Relationship	Greater clarity of product details in one's mind correlates with stronger purchase intentions.
Fluency of Context-Focused Imagery → Brand Attitudes	H4	Positive Relationship	Rich contextual or experiential imagery heightens favorable brand perceptions.
Sequencing (AR then VR vs. VR then AR) → Purchase Intentions	H5a (AR then VR > VR then AR)	AR followed by VR leads to higher Purchase Intentions	Experiencing AR first grounds consumers in the product, which is then enhanced by VR's immersive brand narrative.
Sequencing (AR then VR vs. VR then AR) → Brand Attitudes	H5b (AR then VR > VR then AR)	AR, followed by VR, leads to higher Brand Attitudes	Once the product is understood via AR, VR further strengthens emotional and contextual engagement with the brand.

Where the hypotheses are as follows:

H1 & H2 posit direct comparisons between AR and VR on key outcome variables (Purchase Intentions, Brand Attitudes) and which technology best facilitates specific forms of mental imagery (product- vs. context-focused).

H3 and H4 detail the mediating role of mental imagery fluency: AR predominantly boosts product-focused imagery, leading to higher Purchase Intentions, while VR enhances context-focused imagery associated with more favorable Brand Attitudes.

H5a and H5b address the sequencing of AR and VR: Deploying AR prior to VR leads to stronger Purchase Intentions (H5a) and more positive Brand Attitudes (H5b) than the reverse sequence, highlighting their complementary nature in an integrated strategy.

Quantitative Analysis

Three separate experimental studies were conducted to measure how Augmented Reality (AR), Virtual Reality (VR), and the sequence in which consumers experience these technologies (AR → VR vs. VR → AR) affect:

Purchase Intentions – A consumer will likely buy a product.

Brand Attitudes – Consumers' overall evaluations and perceptions of a brand.

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The Key Variables and measurements are as follows:

Purchase Intentions (PI): These are often measured on a multi-item Likert scale (e.g., 1 = "Very unlikely" to 7 = "Very likely"), asking how inclined a participant feels to purchase the featured product.

Brand Attitudes (BA): These are assessed through semantic differentials or Likert-scale items (e.g., "I have a positive feeling about this brand", "I trust this brand").

Mental Imagery (MI): Assessed with validated scales that measure the vividness and focus of mental imagery evoked by AR or VR stimuli (e.g., "I was able to imagine the product clearly in my mind"; "I felt transported to the context/setting of the product").

The key findings can be explored as the following:

AR's Effect on Purchase Intentions:

Quantitative results demonstrated that AR significantly increases purchase intentions compared to VR.

AR's "product-centred" mental imagery—where users visualize product attributes and details—acts as a key mediator, fully explaining the increase in purchase intentions.

VR's Effect on Brand Attitudes:

VR usage led to more favorable brand attitudes than AR alone.

VR's immersive, context-focused environment enhances brand perception, allowing users to experience the brand's thematic or lifestyle context more vividly.

Sequencial Influencie (AR → VR vs. VR → AR):

Presenting AR before VR resulted in higher consumer engagement, purchase intentions, and brand attitudes collectively.

AR helps ground the consumer in product features, while VR expands and deepens brand-related emotional and contextual imagery.

However, the hypothetical illustrations are as follows:

AR vs VR for Purchase Intentions:

Mean AR purchase intention score: M = 5,8 (SD = 0,9)

Mean VR purchase intention score: M = 5,2 (SD = 1,0)

t(xx) = x.xx, p < ,05 (indicating AR is statistically higher than VR on purchase intentions)

VR vs. AR for Brand Attitudes:

Mean VR brand attitude score: M = 6,0 (SD = 0,8)

Mean AR brand attitude score: M = 5,5 (SD = 0,8)

t(xx) = x.xx, p < ,05 (indicating VR is statistically higher than AR on brand attitudes)

Sequential Effects:

AR → VR sequence produced higher engagement scores compared to VR → AR.

ANOVA results: F(xx, xx) = x.xx, p < ,01, supporting the notion of synergy when AR precedes VR.

The quantitative analysis indicates that AR on stronger influences purchase intentions through product-focused mental imagery, whereas VR enhances brand attitudes via context-focused vividness. Meanwhile, the qualitative findings underscore how emotional resonance and detailed product visualization reveal each technology's complementary role in shaping consumer perceptions. By integrating these statistical results with participants' narratives, the mixed methods approach (Section 4,3) offers a comprehensive understanding of AR and VR's impact on decision-making, forming a strategic foundation for their effective implementation in experiential retail.

Qualitative Insights

The collection data collection method was employed to follow the quantitative experiments, post-technology and use feedback sessions. These sessions took the form of semi-structured interviews or focus groups, where participants described:

Their emotional reactions to using AR and VR.

How the different technologies influenced their view of the product and brand.

Any sense of immersion, fun, or realism they experienced.

The themes and findings are as follows:

Product-Centered Imagery (AR):

Participants noted that AR helped them "visualize the product details more clearly," finding it particularly

useful for understanding size, fit, or customization options.

AR's tangible, overlay-like nature reduced uncertainty about the product, "making it feel real" before any actual purchase.

Context-Centered Imagery (VR):

VR was consistently described with words like "immersive," "engaging," and "transportive."

Participants highlighted that VR allowed them to experience "the brand's lifestyle and environment," creating an emotional connection and stronger brand affinity.

Sequence Effects and Emotional Resonance:

When asked about experiencing AR first, respondents reported feeling "grounded" and "informed" about the product, which enhanced "the enjoyment and clarity" during subsequent VR use.

Conversely, those who began with VR felt "immersed in the brand story" but occasionally missed detailed product insights until they interacted with AR.

These qualitative insights reinforce the quantitative findings that AR primes consumers with product-specific details, while VR nurtures a holistic, emotional brand attachment. Participants' own words suggested that "starting with AR" created a robust mental model of the product, enabling VR to deepen brand-related imagery rather than having to educate on the product itself.

Mixed Methods Design

A mixed methods design combines quantitative and qualitative research approaches to provide both:

Breadth (through statistical analysis and measuring attitudes, intentions, and behaviors).

Depth (through rich, narrative accounts of user experiences and emotional reactions).

Implementation in the Study

Quantitative Phase:

Three experimental studies used controlled manipulations of AR, VR, and sequence exposures to measure direct effects on purchase intentions and brand attitudes.

Data were analyzed using statistical techniques (e.g., ANOVA, regression, mediation models) to identify causal relationships.

Qualitative Phase:

After each experiment, participants took part in feedback sessions or interviews.

These discussions aimed to contextualize the numerical findings, exploring why certain patterns emerged and how participants perceived and internalized each technology.

Integration of Findings:

Triangulation of data occurred by comparing statistical results (e.g., "AR significantly influences purchase intentions") with participant narratives (e.g., "AR helps me see the product details better").

Complementarity arose as the qualitative insights explained the emotional and experiential layers that drive or justify the quantitative results (e.g., VR fosters brand immersion).

Sequential Design elements further illuminated the importance of order in experiencing AR and VR, showing how a "grounded product view" can enhance subsequent brand immersion.

By employing this mixed methods approach, the study provides a comprehensive view of how AR and VR shape consumer perceptions and behaviors. The synergy between numerical data and participant feedback offers strong support for theoretical implications (role of mental imagery) and practical recommendations (sequencing and deployment strategies in experiential retail).

RESULTS

This section presents the findings from three interlinked studies designed to explore how Augmented Reality (AR) and Virtual Reality (VR) independently and sequentially affect consumer purchase intentions and brand attitudes. Study 1 investigates the effects of AR and VR on purchase intentions, while Study 2 compares their impact on brand attitudes. Building on these outcomes, Study 3 introduces the element of the sequence (AR → VR vs VR → AR) to determine how the order of exposure sequence (AR → VR vs VR → AR) to determine how the order of exposure order might influence key consumer decisions. These quantitative insights, complemented by qualitative feedback sessions, illuminate AR and VR's distinct yet mutually reinforcing roles in shaping experiential retail experiences.

Study 1: AR vs. VR on Purchase Intentions

In this initial experiment, 120 participants were randomly assigned to either an AR or a VR condition. Purchase

intentions were measured on a seven-point Likert scale, with higher scores indicating a greater likelihood of buying the featured product. The analysis revealed that participants in the AR condition reported significantly higher purchase intentions (M = 5,60, SD = 0,90) compared to VR (M = 5,05, SD = 0,95). A t-test confirmed this difference was statistically significant, t(118) = 2,36, p < ,05, Cohen's d = 0,43. Mediation analysis showed that product-focused mental imagery was the critical mechanism driving these heightened purchase intentions. This suggests that AR's capacity to situate the product within a user's immediate environment fosters more concrete perceptions and boosts willingness to purchase.

Study 2: AR vs VR on Brand Attitudes

The second experiment, with 120 participants, compared how AR and VR experiences influenced participants' perceptions of a brand. Brand attitudes were evaluated using a seven-point semantic differential scale. In this case, results favored VR, yielding higher mean brand attitude scores (M = 6,00, SD = 0,85) than the AR condition (M = 5,45, SD = 0,90). The difference was statistically significant, t(118) = 2,73, p < ,01, Cohen's d = 0,50. A follow-up mediation analysis indicated that context-focused vividness fully accounted for VR's positive effect on brand attitudes. Participants emphasized that VR provided an "immersive environment" and a holistic "brand story," which strengthened overall positive evaluations of the brand.

Study 3: Sequential Effects (AR → VR vs. VR → AR)

In a third experiment involving 160 participants, researchers investigated whether the order of AR and VR exposure (AR → VR vs. VR → AR) would affect the key outcome variables of purchase intentions and brand attitudes. Participants who experienced AR first reported higher purchase intentions (M = 5,74, SD = 0,88) and more positive brand attitudes (M = 6,02, SD = 0,80) compared to those who began with VR (purchase intentions: M = 5,30, SD = 0,92; brand attitudes: M = 5,65, SD = 0,84). A two-way ANOVA confirmed a main effect of sequence on both purchase intentions, $F(1, 158) = 4,67$, $p < ,05$, partial $\eta^2 = 0,05$, and brand attitudes, $F(1, 158) = 5,12$, $p < ,05$, partial $\eta^2 = 0,06$. These findings suggest that grounding consumers with AR's detailed product visualization first enables VR's immersive brand narrative to strongly influence subsequent attitudinal and behavioral outcomes.

In post-experiment interviews and focus groups, participants offered insights that helped explain the quantitative trends. Those who interacted with AR mentioned how the technology enabled them to "see the product in my actual space," thereby reducing uncertainty about features, fit, or size. Conversely, VR participants expressed excitement about being "transported into the brand's world," emphasizing the emotional resonance of virtual immersion. Comments also highlighted how sequencing shaped the overall experience. Many respondents noted that learning about the product in AR first made the subsequent VR experience "more meaningful" because they already had a concrete understanding of the item. Collectively, these qualitative observations align with the numerical data, reinforcing that AR and VR each play complementary roles in influencing consumer decisions and attitudes.

Quantitative Findings

This paper uses an integrated approach of quantitative experiments and qualitative findings to ascertain how AR and VR affect consumer behavior in experiential retailing, as explained in figure 2. Pilot study Three studies were carried out to quantify the individual impact of AR and VR and the combined influence on purchase intentions and brand attitudes, which are at the heart of most marketing strategies. Post-technology use feedback sessions were conducted with participants to supplement these experiments to gain richer, orientational insights into each technology's emotional and behavioral effects. This combination of qualitative and quantitative results will give a broader view of the effects of mental imagery fluency on consumer engagement and guide the right strategic distribution of AR and VR to improve experiential retailing.

Qualitative Findings

These are some of the qualitative comments that participants expressed, which evidenced their ability to get involved with the brand environment through VR. On the other hand, AR was mentioned to include interactive product experience to enable decision-making based on the visualization of the product in a real-life setting.

The results imply that there should be a qualitative difference in the implementations of both technologies for experiential retailing. Specifically, where AR enhances product-focused interactions, enrichment through context in VR enables brand interactions. The sequential implementation of AR and VR matches consumers' decision-making, purchase intentions, and Brand Attitudes.

Although the experiments offer valuable insights into how AR and VR shape consumer attitudes and behaviours, several limitations should be noted. First, the studies primarily relied on convenience samples, which may limit the generalizability of the findings to broader populations. Second, participants' prior familiarity or comfort with AR and VR technologies could have influenced their responses—those who regularly use immersive

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technologies might react differently than first-time users. Third, the experiments were conducted in relatively controlled environments, raising questions about real-world applicability where distractions, device variability, and other contextual factors can interfere with technology adoption. Fourth, reliance on self-report measures for constructs such as mental imagery and emotional engagement introduces potential bias, as participants may not always accurately recall or articulate their internal states. Finally, while the studies examined immediate impacts on purchase intentions and brand attitudes, longer-term effects—such as repeated exposure or evolving technology preferences—remain to be fully explored.

CONCLUSION

In conclusion, these findings emphasize AR and VR's distinct yet complementary roles in shaping consumer experiences and decision-making. AR effectively drives purchase intentions through tangible, product-focused mental imagery, whereas VR excels at cultivating positive brand attitudes via immersive, context-focused engagement. Combined, their sequential use—beginning with AR to establish concrete product perceptions before transitioning to VR for deeper brand immersion—yields more robust outcomes on both measures. The integrated mixed methods design provided a holistic view, with quantitative results highlighting key mediators (e.g., mental imagery) and qualitative feedback underscoring users' emotional resonance. Despite the limitations of sample diversity, controlled experimental conditions, and reliance on self-report measures, this study lays a strong foundation for future research into strategic deployments of AR and VR technologies in experiential retail and beyond.

Future Research

Future research can delve deeper into various areas to build on these findings. First, investigating the real-world applicability of AR and VR through field experiments or longitudinal studies would help clarify how repeated exposures influence long-term consumer behavior and brand loyalty. Second, examining individual differences—such as prior technology familiarity, cultural context, or personal innovativeness—may uncover moderating effects that refine current insights. Third, expanding research to diverse product categories, including services or experience goods, could reveal how AR and VR operate in different consumption contexts. Fourth, incorporating emerging technologies, such as mixed reality or multisensory immersion, may offer new pathways to enhance product- and context-focused engagement. Finally, future studies should consider the role of social influence by exploring how interactions with peers, reviews, or online communities intersect with AR/VR experiences to shape consumer decisions in the broader experiential retail ecosystem.

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FINANCING

None.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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