

# Augmented Reality (AR) and Virtual Reality (VR) in Online Shopping: A Review of Current Research

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## Abstract:

Online shopping platforms are progressively incorporating Augmented Reality (AR) and Virtual Reality (VR) technologies to improve customer experience and decision-making. This study examines the body of research from journals that are indexed by Scopus to investigate the significance, advantages, difficulties, and potential applications of Augmented Reality and virtual reality in online retail settings. The report provides insights into how these technologies are changing the e-commerce scene by synthesizing findings from other investigations.

**Keywords:** Augmented Reality, Virtual Reality, Online Shopping, E-Commerce.

## 1. Introduction

The earliest ideas and prototypes for AR/VR technologies appeared in the middle of the 20th century, and their history spans several decades. AR prefers digital data over the real world data, in contrast VR constructs fully immersive surreal worlds. Both technologies have uses in a variety of industries, such as online retailing, where they can improve the shopping experience by giving customers a more realistic and engaging way to see the products.

Experienced merchants, who depend on rich sensory experiences to draw clients, such restaurants, fashion boutiques, and specialty stores, have been severely hit by the COVID-19 pandemic. Technologies like virtual reality (VR) and Augmented Reality (AR) emerged as possible ways to reproduce similar experiences as these retailers moved their operations online. Despite its potential, there is still a dearth of thorough instructions on how to integrate AR and VR in online business. (Fatemeh Zare Ebrahimabad et al., 2024)<sup>1</sup>

Since its beginnings in the mid-1990s, e-commerce has undergone substantial evolution, moving from simple online transactions to intricate systems incorporating social and mobile commerce. The use of the Internet as a platform for improving communication efficiency and as a marketing tool defined the early phases of e-commerce. With considerable advantages for both merchants and customers, e-commerce has grown over time to encompass both tangible and immaterial goods. Notable advancements include the growth of social commerce and mobile commerce (m-commerce), which use social media and mobile devices to improve the buying experience.

Emerging technologies like Virtual Reality (VR) and Augmented Reality (AR) are expected to revolutionize online retail. The use of AR and VR in online retailing is still restricted, despite early projections of its potential influence, because of significant technological obstacles as well as other difficulties.

## 2. Methodology

In this study secondary research methodology is used which includes reviewing literature from various journals of repute. Various gaps in the already conducted research were identified and were worked upon to find out buying of cosmetics especially through various online platforms.

## 3. Study Objectives

In order to close these gaps, the study looks into what motivates users to utilize Augmented Reality (AR) apps when they shop online, especially when it comes to cosmetics. The stimulus–organism–response (SOR) paradigm's constructs are used, and new elements like fit confidence, inventiveness, and social value are included.

## 4. Literature Review:

The impact of Augmented Reality (AR) on online purchase intention and user experience in comparison to traditional web-based shopping is examined in the study Augmented Reality Versus Web-Based Shopping by Ebrahimabad, Yazdani, Hakim, and Asarian. The study looks at how Augmented Reality (AR) technology impacts consumer behavior, especially in developing nations, and improves shopping experiences.

A thorough analysis of the function and effects of Augmented Reality (AR) applications in e-commerce, with a special emphasis on makeup products, can be found in the literature review of the research paper by Voicu et al. (2023)<sup>2</sup>.

### Online Shopping Behavior

The popularity of online shopping has increased dramatically due to a number of factors, including accessibility, convenience, and technological developments. Online shoppers have differing opinions about it; some like it, while others value the time savings it offers. The experience with the internet, accessibility, and urbanization are all important factors that influence the way people shop online. These behaviours are affected by particular issues that are present in developing nations, such as restricted access to global platforms, censorship by the government, and economic circumstances. (Kumar, 2021)<sup>4</sup>.

### Augmented Reality in Online Shopping

AR technology forms an increasingly engaging and captivating purchase experience, eliminating the lag between online and offline shopping. AR improves decision-making by enabling consumers to see things in their natural environments, as opposed to traditional web-based buying, which depends on static images. Large businesses like ASOS and IKEA have embraced this technology, allowing buyers to visually test things before making a purchase. AR can boost customer engagement, contentment, and purchase intention, according to studies.

### Comparative Studies on AR and Web-Based Shopping

Studies have repeatedly demonstrated the benefits of Augmented Reality compared to conventional online buying techniques. Important research by Verhagen et. al., Javornik, and Baek et al. has identified multiple ways in which Augmented Reality improves the shopping experience. It consists of flow, enhancement in

perception, local availability, increases tangibility of the product, and improves customer interaction. When compared to web-based shopping, these factors taken together result in a better customer experience and a higher purchase intention. Javornik placed more emphasis on perceived augmentation and engagement, while Verhagen et al. stresses upon local availability, tangibility of goods, and consumer inclination. Mechanisms like links owned by the brand itself, newness, and presence were introduced by (Baek et al. and Hilken et al.).<sup>3</sup> These studies show the various ways that Augmented Reality (AR) is influencing consumer behaviour and how it has the potential to revolutionize online buying. (Voicu et. al., 2023)<sup>2</sup>

### **Mechanisms Influencing User Experience and Purchase Intention**

The current study examines six underlying mechanisms—interactivity, information, enjoyment, novelty, vividness, and intrusiveness—that influence user experience and online purchase intention. A thorough examination of the effects of these mechanisms is provided by evaluating them in the contexts of both Augmented Reality and online purchasing. It has been discovered that while intrusiveness has a negative impact on user experience and purchase intention, interactivity and novelty have a positive and significant effect.

### **Contextual Differences: Developing vs. Developed Countries**

The study's singular emphasis on a developing nation sheds light on how AR is adopted in these kinds of situations. The adoption of breakthroughs like Augmented Reality is impacted by obstacles that developing nations must overcome, such as insufficient financial resources, inadequate technological infrastructure, and regulatory concerns. The study's conclusions have practical implications for improving user experience and boosting online sales, making them especially pertinent for shops looking to integrate Augmented Reality technology in comparable settings. (Malhar Parmar, 2024)<sup>5</sup>.

### **Virtual Try-On**

- **Environmental Impact:** Virtual try-ons can minimize product returns, which are thought to generate five times more CO<sub>2</sub> than the actual purchase, thus reducing the environmental effect considerably.
- **Application Scope:** Virtual try-on technologies have been explored extensively in fashion, furniture, makeup, and other categories like shoes, watches, glasses, toys, and tourism.
- **Consumer Interaction:** In virtual try-ons, digital people and smart mirror technologies improve customer engagement and service quality in retail environments.

### **VR and AR in Context of Retail**

VR and AR have novel uses and merits in the retail sector. Virtual Reality (VR) immerses users in a totally digital environment, while Augmented Reality (AR) improves product perception by superimposing digital content over the real world. Instead of directly comparing AR and VR, earlier studies have mainly stressed on comparing these technologies to conventional marketing media (e.g., photos, videos). (Hilken et al., 2021)<sup>3</sup>

### **AR in Retail:**

- **Product Visualization:** Customers' shopping experiences are improved and their propensity to buy is increased when they may interact with digital representations of products through Augmented Reality (Heller et al., 2019a).
- **User Experience:** More comfort and contentment when making purchases are the results of enhanced product vision through Augmented Reality (Poushneh & Vasquez-Parraga, 2017).

### VR in Retail:

- **Brand Experience:** Virtual reality (VR) produces immersive settings that improve consumers' impression of a company's retail location, resulting in better brand attitudes. (Bogicevic et al., 2019).
- **Mental Imagery:** Virtual reality's capacity to replicate surroundings aids consumers in creating intricate mental images of the brand experience, which is essential for experiential shopping. (Deng et al., 2019).

### Theoretical Framework: Mental Imagery Theory

According to the notion of mental imagery, consumers visualize Goods and consumption environments when making decisions about what to buy. The creation of these visuals is aided by AR and VR, which offer dynamic and colourful renderings.

### AR vs. VR:

- **Purchase Intentions:** AR is more successful in generating buy intentions since it may produce mental imagery that is specifically focused on the product.
- **Brand Attitudes:** VR is capable at increasing brand attitudes since it makes context-emphasising mental imagery possible.

### Combining AR and VR

The study looks into how best to employ AR and VR together to increase purchase intentions and brand sentiments, especially in terms of deployment order.

### Sequential Deployment:

- **AR then VR:** Using AR before VR will better suit the online-to-offline needs of your customers. While VR improves the entire brand experience for consumers, AR assists them in making purchase decisions. Purchase intentions and brand attitudes both improve as a result of this cycle.
- **VR then AR:** Order reversals have the ability to negatively impact both purchase intentions and brand perceptions by upsetting the customer journey.

### Empirical Studies

The research includes three experiments to test the hypotheses:

1. **Experiment 1:** Confirms AR's superiority in stimulating purchase intentions compared to VR.
2. **Experiment 2:** Demonstrates VR's effectiveness in enhancing brand attitudes over AR.
3. **Experiment 3:** Shows that combining AR and VR (AR first, then VR) optimizes both purchase intentions and brand attitudes.

### Implications for Retailers

Retailers can knowingly prefer or mix VR and AR based on their marketing objectives. While VR should be used to improve brand experience and attitudes, AR should be given priority for product visualization and buy intents. The suggested order for combining the two technologies can result in a complete experiential retail solution.

## 5. Augmented Reality in Online Shopping

This section reviews studies that focus on the application of AR in online shopping. It illustrates how AR burgeon visualization of items, improves customer involvement, and impacts buying decisions. Key findings regarding user perceptions and behavioural outcomes are summarized.

### Augmented Reality

- **Positive Effects:** By offering realistic product renderings, Augmented Reality (AR) improves user experiences and has a favourable impact on purchase intention, brand attitude, user contentment, and

overall user experience.

- **Personalization and Engagement:** Augmented Reality (AR) enhances self-expression and experimentation by enabling users to personalize their purchasing experience and interact meaningfully with products.
- **Social Interaction:** AR apps can support synchronous and asynchronous user interactions, encouraging the exchange of social knowledge and impacting purchasing decisions.
- **Investment and Adoption:** Even though implementing AR costs a lot of money, the rewards are great because it increases customer interest and enhances the purchasing experience.

## 6. Virtual Reality in Online Shopping

Here, the paper explores the use of VR in online shopping contexts. It examines studies that investigate VR's role in creating immersive shopping experiences, reducing uncertainty in product choices, and enhancing customer satisfaction. The section also addresses technological advancements and adoption barriers.

### Virtual Reality

- **Comparison with AR:** While AR is more frequently used in e-commerce because of its integration with smartphone technology and capacity to improve in-person interactions, VR is still frequently utilized for immersive shopping experiences.
- **Consumer Preferences:** To ensure successful deployment and optimize virtual retail environments, it is imperative to comprehend consumer preferences in VR commerce.

### Consumer Experience

- **Dimensions of Experience:** When it comes to AR buying, the customer experience includes social, cognitive, emotional, behavioral, and sensual reactions to interactions with the company's products.

### Adoption by Firms

- **Managerial Perspective:** From a managerial perspective, the acceptance and preparedness of consumers are important variables impacting the integration of AR technology in e-commerce.

### Digital Marketing

- **Role of ICT:** Digital marketing techniques, such as websites, apps, social media, blogs, online communities, search ads, display ads, and email marketing, have advanced thanks to information and communication technologies.
- **Mobile Marketing:** Due to the revolutionary nature of smartphones, mobile marketing has become a crucial component of digital marketing campaigns.

## 7. Research Gaps

The literature review also identifies several research gaps:

- **Limited Adoption Research:** Despite the high level of interest in Augmented Reality, little is known about the psychological and practical barriers that prevent its widespread use in e-commerce.
- **Social Aspects:** Further thorough research is required to fully understand the social components of Augmented Reality, such as social value, co-creation benefits, and social sharing.

## 8. Practicable Applications and Merits of AR/VR with Reference to Online Retailing

There are various advantages to using AR and VR in online retail. Through the provision of virtual try-ons, interactive product visualizations, and immersive store environments, AR/VR technologies can

effectively close the gap between online and offline shopping experiences. With improved customer interaction, happiness, and trust in their purchases, these technologies may lower return rates and boost sales.

AR/VR is currently being used in online retailing for augmented shopping apps, 3D product models, and virtual fitting rooms. For example, businesses like Sephora and IKEA have used Augmented Reality (AR) to let customers virtually experiment on makeup or see furniture in their homes. These examples show how AR and VR can improve the online buying experience and provide businesses a competitive edge.

## **9. Challenges and Barriers**

This section discusses the difficulties in integrating AR and VR into online buying. The broad use of AR and VR in online retailing is hindered by a number of issues, despite its advantages. Implementation may be hampered by technical issues such as the need for sophisticated gear and software, expensive development expenses, and a high-speed internet connection. Concerns exist over AR/VR technologies' accessibility and usability as well as possible privacy and security hazards related to their use.

The requirement that consumers accept and feel at ease utilizing these technologies presents another big obstacle. It's possible that many customers are hesitant to use AR and VR for online purchasing or are unaware of them. Providing smooth, simple user experiences and educating customers are essential for overcoming.

## **10. Future Directions**

Based on present gaps in the literature, potential innovations, industry ramifications, and opportunities for additional investigation are highlighted.

Future studies ought to concentrate on resolving the usability and technological issues related to AR/VR in online retailing. Studies examining how consumers feel and perceive these technologies, as well as how they affect satisfaction and purchase behavior, are also necessary. To fully grasp how AR and VR can revolutionize the retail sector, it will also be crucial to look into the long-term effects of their adoption on business structures and tactics.

In conclusion, even if AR and VR technologies have a lot of potential to improve the online shopping experience, a number of issues must be resolved before their full advantages can be realized. To overcome these challenges and realize the revolutionary potential of AR/VR in online retailing, further research and innovation are needed.

## **11. Conclusion**

By using theoretical knowledge and observed data, this study provides a detailed insight of AR and VR in retail, guiding the tactical implementations of these technologies. Experienced shops may more effectively move to the online channel and accomplish their marketing objectives by utilizing the advantages of AR and VR and implementing them in the best order.

The study that has already been done on the relative benefits of Augmented Reality (AR) in online shopping is summarized in this review paper, emphasizing the benefits to user experience and purchase intention. The study advances knowledge about Augmented Reality's potential to revolutionize internet purchasing, particularly in underdeveloped nations. Future studies should keep investigating the changing dynamics of Augmented Reality technology and how they affect international shopping practices.

## References

1. Fatemeh Zare Ebrahimabad, Yazdani, H., Hakim, A., & Asarian, M. (2024). Augmented Reality Versus Web-Based Shopping: How Does AR Improve User Experience and Online Purchase Intention. *Telematics and Informatics Reports*, 100152–100152. <https://doi.org/10.1016/j.teler.2024.100152>
2. Voicu, M.-C., Sîrghi, N., & Toth, D. M.-M. (2023). Consumers' Experience and Satisfaction Using Augmented Reality Apps in E-Shopping: New Empirical Evidence. *Applied Sciences*, 13(17), 9596. MDPI. <https://doi.org/10.3390/app13179596>
3. Hilken, T., Chylinski, M., Keeling, D. I., Heller, J., Ruyter, K., & Mahr, D. (2021). How to strategically choose or combine augmented and virtual reality for improved online experiential retailing. *Psychology & Marketing*, 39(3). <https://doi.org/10.1002/mar.21600>
4. Kumar, H. (2021). Augmented Reality in online retailing: a systematic review and research agenda. *International Journal of Retail & Distribution Management*, ahead-of-print(ahead-of-print). <https://doi.org/10.1108/ijrdm-06-2021-0287>
5. Malhar Parmar. (2024). The Impact of Augmented Reality (AR) And Virtual Reality (VR) Technologies In The Indian Real Estate Sector. *International Research Journal of Modernization in Engineering Technology and Science*, Volume:06 (Issue:02/February-2024). <https://doi.org/10.56726/irjmets49680>