

Exploring the Role of Augmented Reality in Transforming E-Commerce Experiences: Innovations, Challenges, and Opportunities

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Abstract

Augmented Reality (AR) is emerging as a transformative technology in e-commerce, enabling consumers to interact with products through immersive and digitally enhanced shopping experiences. This study explores the role of AR in transforming e-commerce by examining its major innovations, practical challenges, and future opportunities. AR applications allow customers to visualize products in real-world environments, virtually try on clothing and accessories, examine product features, and assess size, appearance, and compatibility before making purchasing decisions. These capabilities can reduce uncertainty, increase consumer engagement, and potentially improve satisfaction and confidence in online purchases. The study reviews the integration of AR with mobile commerce, artificial intelligence, computer vision, and personalized recommendation systems, highlighting how these technologies can create more interactive and customer-oriented shopping environments. At the same time, the adoption of AR presents several challenges, including high development costs, device compatibility, technical limitations, privacy concerns, data security, usability issues, and varying levels of consumer technological acceptance. The study further considers opportunities for businesses to use AR as a tool for product differentiation, customer retention, personalized marketing, and enhanced brand experiences. It concludes that AR has significant potential to reshape e-commerce by narrowing the gap between physical and digital shopping. However, its sustainable adoption will depend on technological accessibility, user trust, effective implementation, and the ability of businesses to deliver meaningful rather than purely novelty-driven experiences.

Keywords: Augmented Reality, E-Commerce, Digital Shopping, Consumer Experience, Virtual Try-On, Immersive Technology, Artificial Intelligence, Personalization, Customer Engagement, Retail Innovation.