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Challenges in Consumer Adaptation to Immersive Technologies: A Comprehensive Literature Review

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This study examines the challenges consumers face in adopting immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR) in consumer behavior, with the primary aim of exploring barriers and developing strategies to enhance technology adoption. Utilizing a comprehensive literature review method, the research analyzes peer-reviewed articles and industry reports published between 2016 and 2023. The findings indicate that while VR and AR hold significant potential to transform consumer experiences by providing rich, interactive environments, several challenges hinder widespread adoption. Key obstacles include high costs, complex user interfaces, and substantial training and education needs. Additionally, data privacy issues and the need for seamless integration with existing systems are highlighted as major concerns. These findings are crucial for both academia and industry; for academics, the research contributes to the theoretical understanding of consumer behavior in the context of immersive technologies, while for industry practitioners, it offers insights into overcoming practical adoption barriers. Recommended strategies include developing more affordable and user-friendly devices, enhancing educational resources, and effectively addressing privacy concerns to foster greater consumer engagement and adoption. The study underscores the potential of VR and AR to revolutionize marketing and consumer interactions, provided these challenges are effectively managed. Furthermore, by addressing these barriers, companies can leverage immersive technologies to create richer, more engaging consumer experiences, thereby driving higher levels of customer satisfaction and loyalty. This comprehensive approach ensures that both theoretical and practical aspects of immersive technology adoption are considered, paving the way for successful implementation in various sectors.

Keywords: Augmented Reality, Consumer Behavior, Immersive Technologies, Technology Adoption, Virtual Reality

Introduction

In the last decade, rapid advancements in immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR) have created new opportunities for richer and more profound consumer interactions. According to Statista (2023), global spending on VR and AR is expected to grow from over 29 billion USD in 2023 to 100 billion USD by 2026 (Alsop, 2023). This increased expenditure indicates a swift adoption of AR and VR technologies across various sectors, particularly retail and entertainment, which promise experiences that not only enhance customer engagement but also potentially influence purchasing decisions (Javornik, 2016). Despite their

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significant potential, immersive technologies also present substantial challenges, especially concerning consumer adaptation.

The main problem addressed in this study is the gap in understanding the barriers to the full adoption of immersive technologies among consumers, particularly Generations Y and Z, who have grown up in an era of rapid technological advancements and are accustomed to using electronic devices, the internet, and digital applications from an early age (Gentina, 2020). Although these younger generations are familiar with technology, several internal factors such as designers' and managers' perceptions and attitudes toward new technologies, combined with external challenges like funding, technical support, training, and business strategies, influence the speed and effectiveness of technology adoption (Saleem et al., 2017). Additionally, a significant barrier among design professionals is the lack of knowledge about the most suitable hardware and software for design processes, necessitating better education and training programs along with adequate funding (Hoang et al., 2019).

Existing solutions have been proposed to address these challenges, emphasizing the role of personalization in AR applications to significantly increase consumer engagement, which in turn leads to higher conversion rates and deeper connections between brands and consumers (Liberatore & Wagner, 2021). Furthermore, the importance of interactivity in AR applications has been highlighted as a critical factor in enriching user experiences and significantly boosting purchase likelihood (Scholz & Smith, 2016). The immersive quality of AR enhances user engagement and improves information processing capabilities, making it highly valuable for modern marketing efforts.

Innovations proposed in this study include developing integrated VR and AR platforms that prioritize user privacy through enhanced security features and creating adaptive user interfaces that simplify user experiences across different demographics. These innovations aim to address the root causes of the identified barriers, offering more holistic and sustainable solutions.

The primary goal of this research is to fill the existing knowledge gap by providing a detailed analysis of the barriers to immersive technology adoption and proposing actionable strategies to overcome these obstacles. By addressing both technical and systemic challenges, this study aims to contribute to the theoretical understanding of consumer behaviour in the context of immersive technologies and offer practical insights for industry practitioners.

Ultimately, the study aims to provide a comprehensive framework for enhancing the adoption of VR and AR technologies, leveraging their full potential to revolutionize consumer interactions and marketing strategies. This involves not only developing more accessible and user-friendly technologies but also creating a supportive ecosystem that addresses privacy concerns and facilitates seamless integration into everyday use. To better understand the current landscape and identify areas for improvement, it is essential to examine previous research on the potential and challenges associated with immersive technologies.

Previous research has extensively explored the potential and challenges associated with immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR). According (Suh & Prophet, 2018), in their systematic literature review published in "Computers in Human Behaviour," analysed 54 articles from SSCI journals, highlighting the significant interest in these technologies across education, marketing, business, and healthcare, but noting the need for further research on effective utilization. Scholz and Smith (Scholz & Smith, 2016), in "Business Horizons," provided a comprehensive framework for integrating AR into marketing, emphasizing its potential to revolutionize brand-consumer interactions through more interactive experiences and proposing actionable recommendations for maximizing consumer engagement. Schnack, Wright, and Holdershaw (Schnack et al., 2020), in "Consumer Behaviour," explored the use of deep immersive VR to simulate store environments, finding that VR can accurately mimic real shopping experiences and provide valuable insights into shopper behaviour. Liberatore and Wagner (Liberatore & Wagner, 2021), in "Virtual Reality," assessed the performance of VR, AR, and mixed

reality (MR) technologies, concluding their significant potential across various domains but highlighting the need for consistency in application and further research to optimize their use. Wedel, Bigné, and Zhang (Wedel et al., 2020), in the "International Journal of Research in Marketing," examined VR and AR in consumer marketing, presenting a conceptual framework that integrates consumer experiences throughout the customer journey and highlighting the technologies' capabilities to enhance customer engagement and create immersive experiences. Collectively, these studies underscore the transformative potential of immersive technologies while emphasizing the need for ongoing research to address adoption barriers and optimize their application in various fields.

Methods

This study employs a literature review methodology. The primary objective of this method is to collect, analyze, and synthesize published research findings related to immersive technologies and their impact on consumer behavior. The review aims to identify and integrate findings from previous studies, uncover gaps in the existing research, and suggest directions for future research.

Time Frame and Data Sources

This review includes sources published from 2016 to 2023, encompassing journal articles and recognized case studies in the fields of immersive technology, digital marketing, and consumer behavior. The eight-year period was chosen to capture the latest developments in rapidly evolving technologies and ensure the relevance of findings to the current market context.

Literature Search Process

The initial search was conducted using keywords such as "virtual reality," "augmented reality," "consumer behaviour," "immersive technology," "retail," and "marketing" in databases like Google Scholar and Scopus. For example, in Google Scholar, the search utilized keywords: ("virtual reality" OR "augmented reality") AND ("consumer behaviour" OR "consumer engagement" OR "retail") with filters set to full articles available, English language, and published between 2016 and 2023. In Scopus, the search employed keywords: (TITLE-ABS-KEY("virtual reality" OR "augmented reality") AND TITLE-ABS-KEY("consumer behaviour" OR "marketing" OR "engagement")) with filters applied to journal articles, English language, and published between 2016 and 2023. Screening and selection involved reviewing abstracts to assess relevance and alignment with the research theme, excluding articles that did not meet the inclusion criteria or were not relevant to the research focus.

Selection Criteria and Data Analysis

A. Selection Criteria

Inclusion Criteria:

1. Studies relevant to the use of immersive technologies (Virtual Reality, Augmented Reality) in the context of consumer behavior.
2. Research exploring the impact of immersive technologies on purchase decisions or consumer engagement.
3. Studies published in English.
4. Peer-reviewed journal articles.
5. Publication years: 2016-2023.
6. Open-access documents, ensuring all data can be freely accessed and reviewed by other researchers.

Exclusion Criteria:

1. Studies not directly related to immersive technologies like VR or AR in the context of consumer behavior.
2. Research not explicitly examining the impact of technology on consumer behavior or engagement.
3. Studies not available in English.
4. Research available only as abstracts or summaries without full-text access.
5. Studies published before 2016.
6. Non-open-access research, which limits the ability to fully review and utilize the data.

B. Study Categorization

Studies meeting the inclusion criteria were categorized based on the type of immersive technology used (VR or AR), the focus of application (such as retail, education, or entertainment), and the impact reviewed (e.g., influence on purchase decisions, increased engagement). This categorization facilitates a systematic and structured analysis of the effects of immersive technologies on consumer behavior, helping to identify trends and gaps in the existing research.

Selected Articles

To deepen the analysis of consumer adaptation challenges to immersive technologies, the articles listed in Table 1 have been identified as particularly relevant and informative. These articles were selected based on methodological rigor, topic relevance, and their significant contributions to understanding the phenomenon under study. This review aims to provide comprehensive insights into various barriers faced in integrating immersive technologies into consumers' daily lives and strategies to overcome these challenges.

Table 1. List of Selected Articles.

Author	Article	Focus Technology
(Scholz & Smith, 2016)	Augmented reality: Designing immersive experiences that maximize consumer engagement	AR
(Saleem et al., 2017)	Design and deployment challenges in immersive and wearable technologies	AR, VR
(Suh & Prophet, 2018)	The state of immersive technology research: A literature analysis	AR, VR
(Liberatore & Wagner, 2021)	Virtual, mixed, and augmented reality: a systematic review for immersive systems research	MR
(Cowan & Ketron, 2019)	A dual model of product involvement for effective virtual reality: The roles of imagination, co-creation, telepresence, and	VR
(Schnack et al., 2020)	An exploratory investigation of shopper behaviour in an immersive virtual reality store	iVR
(Hoang et al., 2019)	Adopting immersive technologies for design practice: The internal and external barriers	AR, VR, MR
(Wedel et al., 2020)	Virtual and augmented reality: Advancing research in consumer marketing	VR, AR
(Meißner et al., 2020)	How virtual reality affects consumer choice	VR
(Ambika et al., 2023)	Immersive technologies and consumer behavior: A systematic review of two decades of research	AR
(Pratisto et al., 2022)	Immersive technologies for tourism: a systematic review	VR
(Uwaoma et al., 2023)	Mixed reality in U.S. retail: A review: Analyzing the immersive shopping experiences, customer engagement, and potential	MR
(Rejeb et al., 2023)	How augmented reality impacts retail marketing: a state-of-the-art review from a consumer perspective	AR

Author	Article	Focus Technology
(Xu et al., 2021)	The application of virtual reality in food consumer behavior research: A systematic review	VR
(Bretos et al., 2023)	Applying virtual reality and augmented reality to the tourism experience: a comparative literature review	VR, AR

Results

In today's digital era, immersive technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) are revolutionizing human-technology interactions. In the consumer context, particularly within the design industry, these technologies open new avenues for innovation in product development and presentation. However, the implementation of immersive technologies often faces challenges that can hinder adoption by end-users.

In the design industry, immersive technologies offer revolutionary potential in conceptualizing and visualizing work by designers. These technologies enable designers to enter and interact directly with virtual design spaces, transforming traditional workflows into more dynamic and interactive processes. Despite these advantages, several internal barriers exist, including resistance to change from traditional methods, lack of technical expertise, and high implementation costs. Additionally, there are external barriers such as technological limitations that do not yet provide fully efficient solutions and incomplete regulatory frameworks.

To illustrate various aspects of these challenges, this section compiles and analyses numerous studies that explore the difficulties in adapting to immersive technologies. Table 2 summarizes the findings from the reviewed literature, providing an overview of the various barriers faced, along with specific examples from related studies.

Table 2. Immersive Technology Challenges

Author	Main Challenges	Focus Technology	Application Focus	Reviewed Impact	Description of Challenges
(Scholz & Smith, 2016)	Understanding and Integration	AR, VR	Education, Healthcare, Entertainment, Marketing	Enhancement of learning experiences, engagement, and creativity	Examines various uses of immersive technology and integration challenges in different application contexts.
(Saleem et al., 2017)	Authenticity of shopper behavior	iVR	Retail	Consistency of shopper behavior in VR with real-world behavior	Explores shopper behavior in immersive virtual stores and compares it with behavior in real stores.
(Suh & Prophet, 2018)	Enhancing consumer engagement	AR	Marketing	Maximizing consumer engagement through AR campaigns	Provides recommendations for increasing consumer engagement in marketing campaigns using AR.
(Liberatore & Wagner, 2021)	Effectiveness and Implementation	VR, AR	Marketing	Enhancing consumer experience and marketing effectiveness	Provides a framework and overview of VR/AR applications in marketing practice and related research.
(Cowan & Ketron, 2019)	Integration in Design Processes	MR	Design	Increasing efficiency and innovation in design	Analyzes how MR can integrate and enhance traditional design processes.

Author	Main Challenges	Focus Technology	Application Focus	Reviewed Impact	Description of Challenges
(Schnack et al., 2020)	Technological Dependence	AR, VR	Marketing	Increasing user acceptance of technology	Explores challenges in the design and deployment of wearable and immersive technologies.
(Hoang et al., 2019)	Internal and External Barriers	AR, VR, MR	Design	Enhancing collaboration and quality of design processes	Identifies and addresses internal and external barriers in adopting immersive technologies in design firms.
(Wedel et al., 2020)	Involvement and Interactivity	VR	Retail, E-commerce	Impact on purchase decisions	Proposes a dual involvement model for VR effectiveness, emphasizing imagination and co-creation.
(Meißner et al., 2020)	Understanding Consumer Behavior	VR	Education, Retail	Enhancing customer experience and interaction	Investigates how VR influences consumer behavior in retail and education contexts.
(Ambika et al., 2023)	Technology Adoption and Interaction	AR	Marketing, Education	Enhancing engagement and interactivity	Studies the impact of AR on consumer engagement and interaction in marketing and education.
(Pratisto et al., 2022)	Technology Integration and Interactivity	VR	Education	Enhancing engagement and learning processes	Highlights the integration of VR in education to improve interactivity and student engagement.
(Uwaoma et al., 2023)	Technology Adoption and Consumer Engagement	MR	Retail	Enhancing shopping experience and customer engagement	Explores the impact of MR on improving consumer engagement and shopping experiences in retail.
(Rejeb et al., 2023)	Transportation Innovation and Efficiency	AR	Transportation	Enhancing operational efficiency and safety	Investigates how AR can improve efficiency and safety in the transportation industry.
(Xu et al., 2021)	Educational Application and Development	VR	Education	Deepening understanding and improving learning outcomes	Focuses on the use of VR to enrich teaching methods and learning outcomes in education.
(Bretos et al., 2023)	Technology Integration and Methodology	VR, AR	Tourism	Enhancing tourist experience and marketing effectiveness	Reviews and compares literature on VR and AR applications in tourism to create a cohesive research framework.

Here are the results for the impact and challenges in consumer adaptation to immersive technologies:

1. **Reliability of Technology and User Interface Complexity:** Consumers often face issues with the reliability and complexity of immersive technology. Problems such as hardware reliability, software glitches, and the learning curve associated with user interfaces can hinder widespread adoption.

2. **Integration with Existing Systems:** Integrating immersive technologies like VR, AR, and MR into operational frameworks or daily routines remains a significant barrier. This includes challenges in organizational settings (such as design and retail environments) as well as personal use.
3. **Economic Barriers and Accessibility:** The cost of developing technology and the need for specialized equipment can limit accessibility to a broader audience, affecting consumer adoption rates.
4. **Perceived Value and Usability:** Consumers tend to evaluate new technology based on its perceived practical value and usability. If the benefits are not apparent or significant, the adoption process can be slow.
5. **Social Acceptance and Privacy Concerns:** There are still concerns regarding social acceptance, particularly about how technologies like AR glasses are perceived in public spaces. Privacy issues, especially related to the use or sharing of personal data, add complexity to consumer acceptance.
6. **Need for Education and Training:** Effective training and adequate educational resources are necessary to enhance user competence and comfort with immersive technology. A lack of these resources can impede adoption.
7. **Consumer Engagement and Interaction:** Technologies that can enhance consumer engagement through quality interactions are more likely to be accepted. Studies show that immersive technologies must provide significant improvements in user interaction with products or environments.

Implications of Immersive Technology on Generation Y and Z

Generation Y and Z in Indonesia, known for their digital proficiency, show a higher tendency to adopt new technologies, including immersive technologies like Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). According to (Hoang et al., 2019), these technologies offer dynamic interactions and deep experiences that align well with the desires of these generations, relevant in both entertainment and education contexts.

Consumers from Generation Y and Z in Indonesia highly value experiences that offer socialization and personalization, which can be enhanced by immersive technology. They seek experiences that not only meet personal needs but can also be socially shared with friends through social media platforms. (Saleem et al., 2017) indicate that technologies like AR, which allow integration of social elements and real-time experience sharing with their social networks, have great potential to become popular among this generation.

Although there is high enthusiasm for new technologies, price sensitivity often becomes a major consideration for many young consumers in Indonesia. Economic factors, such as the cost of VR or AR devices, frequently act as a significant barrier. This necessitates innovative pricing strategies and potentially flexible business models, such as subscription-based access or rentals, to enhance affordability.

Education and training on the effective use of immersive technologies are also crucial, especially to increase adoption among generations that may not fully understand the possibilities and full potential of these technologies. Educational initiatives designed to address initial barriers and build user confidence can accelerate adoption and optimal utilization of technology. Privacy and data security concerns are significant, particularly since technologies like AR and VR can collect large amounts of sensitive user data. Well-informed young generations in Indonesia are increasingly aware of privacy issues and often consider these factors before adopting new technology.

Implications of Immersive Technology for Companies

The integration of immersive technologies like Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) offers transformative opportunities for companies but also presents several significant challenges. As discussed by (Hoang et al., 2019), key issues include internal and external barriers faced by organizations. Internal barriers often involve employee and managerial reluctance to shift from traditional methods, lack of technical skills, and perceived high costs associated with adopting new technology. External barriers may involve limitations in existing technology, inadequate regulatory frameworks, and issues related to interoperability with existing systems.

Saleem (Saleem et al., 2017) highlight challenges in the design and deployment of immersive technologies, noting that reliability must be ensured to fully exploit the benefits of these technologies. They emphasize the need for continuous advancements in hardware and software to meet rising user expectations. The future success of wearable and immersive devices depends on the ability to provide timely, reliable, and resource-efficient solutions.

In the realm of hardware and software development, significant challenges remain, particularly in ensuring compatibility across various systems and platforms. Wearable technology, often part of a broader immersive technology ecosystem, requires consistent and seamless integration to function optimally. This integration is crucial not only for enhancing user experience but also for ensuring the robustness and efficiency of the technology.

More broadly, adopting immersive technology within companies often requires a substantial shift in corporate culture and business processes. Organizations must consider not only the technical and financial aspects of these technologies but also how they align with long-term business goals and strategies. This holistic approach is essential for overcoming various adoption barriers and fully leveraging the potential of VR, AR, and MR to transform business operations and customer interactions.

Implications of Immersive Technology for Marketers

The use of immersive technologies like Virtual Reality (VR) and Augmented Reality (AR) has transformed the marketing landscape by offering new and engaging ways to interact with consumers. VR and AR provide opportunities for marketers to create deeply immersive customer experiences, which can strengthen brand attachment and loyalty. Raji (Raji et al., 2024) emphasize that these technologies allow customers to experience products in controlled and realistic environments before making a purchase, increasing the likelihood of customer satisfaction and repeat purchases.

Moreover, personalization becomes more sophisticated with the utilization of immersive technology. Al-Ansi (Al-Ansi et al., 2023) show that AR and VR enable marketers to tailor experiences based on individual customer preferences, enhancing the relevance and effectiveness of marketing efforts. This feature not only boosts user engagement but also helps build more personal and meaningful relationships with consumers.

Using VR and AR also opens new opportunities in digital marketing. Advertising campaigns leveraging these immersive realities can create more engaging interactions and leave a stronger impression on consumers. This innovation not only enhances brand visibility but also allows companies to position themselves as leaders in technological innovation.

Immersive technology also provides better tools for measuring marketing performance. According to Al-Ansi (Al-Ansi et al., 2023), AR and VR allow real-time collection of customer behaviour data, providing deep insights into how consumers interact with products or campaigns. This data analysis can help marketers optimize future campaigns and target their marketing strategies more precisely.

Overall, immersive technologies like VR and AR are not only changing how companies communicate with consumers but also how they measure and optimize marketing efforts.

Leveraging these technologies in marketing strategies can provide significant competitive advantages, leading to greater consumer engagement and, ultimately, improved business outcomes.

Immersive Technology and Changes in Consumer Behavior

Immersive technologies have significantly transformed consumer interactions with various brands and products, bringing profound changes in consumer behavior across many sectors. The implementation of Virtual Reality (VR) and Augmented Reality (AR) in product design and presentation has allowed consumers to understand and experience products more interactively and deeply. This facilitates a more realistic experience before purchase, significantly enhancing consumer satisfaction and trust in a brand.

Challenges in the design and implementation of wearable and immersive technologies often relate to system reliability, which must be ensured through continuous advancements in hardware and software (Saleem et al., 2017). This reliability is crucial as modern consumers expect solutions that are not only innovative but also safe and comfortable to use.

Research by Liberatore (Liberatore & Wagner, 2021) also shows that AR technology, in particular, has the potential to change how consumers shop and interact with products in retail environments. AR allows consumers to see how products might look in real life before making a purchase, which can greatly enhance the shopping experience and reduce uncertainty when buying new products.

These consumer behaviour changes induced by immersive technology highlight important trends in the evolution of modern markets, where consumers tend to value experiences more than just products. With the ability to test, explore, and even feel products in a virtual environment, consumers become more informed and likely to make more informed and memorable purchasing decisions. This marks a shift from passive consumption to active participation, where consumers are not just receivers of information but also participants in the value creation experience.

Challenges and Future of Immersive Technology

Despite the promising potential of immersive technologies like Virtual Reality (VR) and Augmented Reality (AR) to transform digital interactions, several challenges must be addressed to ensure widespread acceptance and effective integration into daily life and various industry sectors. The first challenge is developing more advanced and affordable hardware. Currently, the cost of VR and AR devices remains relatively high, limiting access for the average user. According to Raji (Raji et al., 2024), reducing costs and increasing the accessibility of hardware are key to broader adoption of immersive technologies, especially in education and professional training contexts.

Additionally, there are issues of comfort and safety in usage. Long-term use of VR headsets can cause physical discomfort, including dizziness or nausea, known as "VR sickness." This requires innovations in device design to improve comfort and address privacy and data security issues, as described by Al-Ansi (Al-Ansi et al., 2023), given that these devices often collect large amounts of personal user data.

In terms of content development, the main challenge is creating immersive experiences that are engaging and meaningful, maximizing the potential of these technologies. Creating content for VR and AR requires a combination of technical and creative skills, and there is still a need for more developers with this expertise.

Looking to the future, the potential of immersive technology greatly depends on how the industry addresses these challenges. Further integration with AI and machine learning can provide more adaptive interactions and better personalization, enhancing user experiences and expanding the applications of immersive technology in education, training, and entertainment. (Raji et al., 2024) emphasize that as immersive technologies evolve and mature, their educational applications will increase, allowing for more interactive and in-depth learning methods.

Therefore, to ensure a successful future for immersive technologies, it is crucial for the industry to continuously push the boundaries of innovation while addressing existing shortcomings. By doing so, immersive technologies have the potential to revolutionize many aspects of life and business, making digital interactions richer and more immersive.

Conclusion

This study provides insights into the challenges faced by consumers in adopting immersive technologies such as Virtual Reality (VR)) and Augmented Reality (AR). Over the past decade, these technologies have shown significant potential to transform consumer interactions with products and brands, particularly in the retail and entertainment sectors. These technologies offer deeper and more interactive experiences, potentially enhancing consumer engagement and loyalty. However, the adoption of immersive technologies faces several technical barriers, such as hardware and software capabilities and user interface complexity, which often hinder their widespread use. Additionally, integrating these technologies into existing marketing processes requires substantial time and resources. The high costs associated with the development and implementation of immersive technologies, along with accessibility issues, pose significant challenges for many companies and consumers. Generations Y and Z, known for their technological proficiency, show a higher tendency to adopt these immersive innovations. However, the adoption of technology by these generations is still influenced by economic factors, such as device costs, and the need for adequate education and training to understand and utilize the technology optimally. Therefore, companies and marketers must address these barriers with appropriate strategies to effectively leverage immersive technologies. This includes investing in reliable hardware and software, developing intuitive user interfaces, and providing comprehensive training and educational programs.

To enhance the adoption of immersive technologies among consumers, especially Generations Y and Z, technology companies should focus on developing more affordable and user-friendly hardware. Comprehensive learning processes and training programs should also be developed to improve user competence and comfort in using immersive technologies. Additionally, creating engaging and memorable content that leverages the potential of VR and AR should be a priority for developers and marketers. Companies should also consider flexible business models, such as subscription-based access or rentals, to improve the affordability of immersive devices. Furthermore, companies need to develop strong and transparent policies to address privacy and data security concerns. In terms of research, additional empirical studies are needed to further explore the impact of immersive technologies on consumer behaviour in various contexts and industries. Finally, collaboration between industry and academia should be enhanced to drive innovation and optimal utilization of immersive technologies in marketing and consumer interactions.

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