

## **ANALYSIS OF THE ADOPTION LEVEL AND IMPACT OF VIRTUAL REALITY (VR) AND AUGMENTED REALITY (AR) TECHNOLOGY IMPLEMENTATION IN TRAVEL AGENCIES IN INDONESIA**

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**Abstract** - The development of Virtual Reality (VR) and Augmented Reality (AR) technologies has significantly transformed the tourism industry, including travel agencies in Indonesia. This study aims to analyze the adoption level and impact of VR and AR technology implementation in travel agencies in Indonesia. Using the Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical framework, this research combines a literature review, case studies, and interviews as the research methodology. The case studies involve ten of the largest travel agencies in Indonesia that have implemented VR and AR technologies in their marketing strategies. Semi-structured interviews were conducted with representatives from these travel agencies to gain an in-depth understanding of the experiences, challenges, and benefits of implementing VR and AR technologies. The researcher carried out data triangulation by comparing findings from the literature review, case studies, and interviews to ensure the validity of the research findings. The results indicate that the adoption of VR and AR technologies by travel agencies in Indonesia is still in its early stages. However, travel agencies implementing VR and AR technologies report significant positive impacts, such as increased tourist interest, enhanced product differentiation, and improved customer engagement. The case studies demonstrate that implementing VR and AR technologies helps travel agencies promote tourist destinations more innovatively and attractively. Nevertheless, several challenges are also encountered, such as the high cost of developing VR and AR content, regular content updates, and the limited human resources skills needed to operate these technologies. This research contributes to understanding the adoption and impact of VR and AR technology implementation in travel agencies in Indonesia. The findings of this study can assist travel agencies in evaluating the potential adoption of VR and AR technologies and developing effective implementation strategies.

**Keywords:** *Virtual Reality, Augmented Reality, travel agencies, adoption level, implementation impact.*

### **INTRODUCTION**

Tourism is one of the world's most dynamic and rapidly growing economic sectors. In Indonesia, tourism has become one of the main drivers of economic growth, employment, and foreign exchange earnings. 2019 tourism contributed 4.80% to Indonesia's GDP and employed 12.6 million people (Kemenparekraf, 2021). However, amidst intensifying global competition and changes in tourist behavior driven by technological advancements, the Indonesian tourism industry faces challenges to continuously innovate in enhancing destination attractiveness, service quality, and tourist experiences.

Virtual Reality (VR) and Augmented Reality (AR) are technological developments gaining increasing attention in the tourism industry. VR refers to a digital environment that completely immerses users and provides an immersive experience as if they are in a real or imaginary world (Guttentag, 2010), while AR refers to technology that overlays digital content onto the natural world in real-time (Azuma, 1997). In tourism, VR and AR offer significant opportunities to transform how destinations and tourism service providers, including travel agencies, interact with potential and actual tourists.

Some examples of VR and AR applications in the tourism industry include virtual destination tours, visualization of accommodations and tourist attractions, immersive pre-visit experiences, interactive travel guides, and enhancement of on-site tourist experiences through AR content (Beck et al., 2019; Yung & Khoo-Lattimore, 2019). Previous studies have shown that VR and AR can increase visit intentions, tourist satisfaction, and loyalty toward destinations (Jung et al., 2016; Tom Dieck et al., 2018). These technologies can also assist travel agencies in providing more personalized, interactive, and value-added services, thereby enhancing their competitiveness in an increasingly digital market.

Nevertheless, the adoption level and actual impact of VR and AR technologies in the Indonesian tourism industry, particularly in the travel agency sector, have yet to be widely explored. Most research on VR and AR adoption in tourism focuses on developed countries (Yung & Khoo-Lattimore, 2019). However, understanding the diffusion of these technologies in developing countries like Indonesia is limited. Existing

research tends to focus on tourist perspectives (Usadi et al., 2018) or the general adoption of VR and AR in the tourism industry (Aditya & Nugroho, 2020) without examining the context of travel agencies.

This study aims to fill this gap by analyzing the adoption level and impact of VR and AR technology implementation in travel agencies in Indonesia. Using the theoretical framework of the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003), this research seeks to understand the factors influencing the acceptance and use of VR and AR technologies by travel agencies, as well as their impact on business performance and customer experience. Although the potential application of VR and AR technologies in travel agencies is considerable, such as in enhancing customer engagement, enriching travel experiences, and expanding market reach (Beck et al., 2019), travel agencies in Indonesia also face challenges in adopting these technologies, such as infrastructure limitations, high investment costs, and lack of skilled human resources (Aditya & Nugroho, 2020). We need a more profound understanding of the extent to which travel agencies in Indonesia have adopted VR and AR technologies and the impact of implementing these technologies on their business performance.

This research expects to provide a comprehensive picture of travel agencies' experiences, challenges, and benefits in implementing VR and AR technologies by employing a qualitative approach through a literature review, case studies, and interviews. We expect the findings of this study to contribute to developing business strategies for travel agencies in Indonesia, particularly in utilizing VR and AR technologies to enhance competitiveness and provide more attractive experiences for tourists. Furthermore, the findings of this study can also serve as a reference for future research related to the application of VR and AR technologies in the Indonesian tourism industry.

## **LITERATURE REVIEW**

Virtual Reality (VR) and Augmented Reality (AR) are two innovative technologies that have rapidly developed in recent years. VR technology allows users to immerse themselves in a computer-generated virtual environment fully. At the same time, AR is a technology that combines digital elements with the real world, creating interactive experiences for users (Flavián et al., 2019). VR typically uses specialized headsets that display 3D graphics, while AR can be accessed through mobile devices with cameras and screens (Yung & Khoo-Lattimore, 2019). Both technologies have the potential to be applied in various industries, including tourism.

The global tourism industry has begun to adopt VR and AR technologies to enhance tourist experiences and attract more visitors. According to a report by Global Industry Analysts, Inc. (2020), the global market for VR in tourism is expected to reach US\$4.2 billion by 2026, with a compound annual growth rate (CAGR) of 32.2% during the analysis period. VR can be used to preview potential tourists' destinations, allowing them to explore exciting places virtually before deciding to visit them physically (Beck et al., 2019). AR, conversely, can enhance tourist experiences at destinations by providing additional information about tourist attractions, translating signs, or even creating interactive attractions (Cranmer et al., 2020). Applying VR and AR in the tourism industry can help increase tourist engagement and make more memorable experiences.

As key players in the tourism industry, travel agencies have undergone significant changes in recent years, especially with the emergence of online booking platforms and shifts in consumer preferences (Gössling et al., 2020). To remain competitive, travel agencies must adapt to the latest trends and adopt technologies to enhance their services. Some travel agencies have started integrating VR and AR technologies as marketing tools to increase competitiveness or improve customer experiences (Yung & Khoo-Lattimore, 2019; Huang et al., 2020). Although research on the adoption of VR and AR technologies in the tourism industry has developed, studies explicitly examining the adoption level and impact of implementing these technologies in travel agencies in Indonesia still need to be completed. Most research on VR and AR adoption in tourism focuses on developed countries (Yung & Khoo-Lattimore, 2019). However, understanding the diffusion of these technologies in developing countries like Indonesia has yet to be widely explored.

This study aims to fill this gap by analyzing the adoption level and impact of VR and AR technology implementation in travel agencies in Indonesia using the theoretical framework of the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003). UTAUT combines eight previous technology acceptance models and identifies four key factors influencing technology adoption: performance expectancy, effort expectancy, social influence, and facilitating conditions.

Case studies on adopting VR and AR technologies in other countries' tourism industries can provide benchmarks and valuable lessons for this research. For example, a leading tour operator in the UK, Thomas Cook, used VR technology to introduce travel destinations to customers through the "Thomas Cook Virtual Reality Holiday Experience" (Moorhouse et al., 2018). In Japan, the Fukuoka Convention & Visitors Bureau used AR to promote city tourist attractions through the mobile application "AR Fukuoka Castle" (Han et al., 2020). These case studies demonstrate the potential of VR and AR technologies in enhancing tourist experiences and strengthening the competitiveness of the tourism industry.

We expect this research to significantly contribute to the literature on VR and AR technology adoption in the context of the tourism industry in developing countries. By considering unique contextual factors, such as technological infrastructure, market readiness, and culture, this study extends the application of UTAUT in understanding VR and AR technology adoption in Indonesia. The findings of this study can assist travel agencies in developing effective technology adoption strategies and provide recommendations for policymakers to promote the diffusion of VR and AR technologies in the Indonesian tourism industry. Ultimately, this research has the potential to drive innovation and growth in the Indonesian tourism industry through optimal utilization of VR and AR technologies.

## **METHODS**

This research adopts a qualitative approach with a multiple case study strategy (Yin, 2018) to examine the adoption and impact of Virtual Reality (VR) and Augmented Reality (AR) technology on travel agencies in Indonesia. We selected the ten largest travel agencies as cases based on criteria such as revenue, market share, and brand reputation. Data collection involved an extensive literature review, semi-structured interviews with 20-30 participants from various roles within the travel agency (Creswell & Poth, 2018), and analysis of documents related to VR/AR initiatives. A rigorous thematic analysis (Braun & Clarke, 2021) was conducted, utilizing NVivo software and involving recursive coding, theme identification, and cross-case analysis. Strategies to ensure validity (McGrath et al., 2019) include triangulation, member checking, detailed description, researcher reflexivity, and audit trail. This methodology allows for an in-depth exploration of factors influencing VR/AR technology adoption, implementation best practices, and implications for business performance and customer experience in the context of the Indonesian travel industry.

## **RESULTS AND DISCUSSION**

Based on our analysis of data collected through literature review, case studies, and semi-structured interviews with representatives from 10 leading travel agencies in Indonesia, we can identify several key findings regarding the adoption level and impact of implementing Virtual Reality (VR) and Augmented Reality (AR) technologies in Indonesian travel agencies.

### **Adoption Level of VR and AR Technologies**

The research results indicate that the adoption level of VR and AR technologies among travel agencies in Indonesia varies. Some agencies have extensively adopted VR and AR technologies in their operations, both as marketing tools and to enhance customer experiences. However, most of the agencies studied are still in the early stages of adoption, with limited implementation of VR and AR technologies in pilot projects or small-scale initiatives.

These findings align with previous research highlighting that the adoption of VR and AR technologies in the tourism industry in developing countries is still in its early stages (Yung & Khoo-Lattimore, 2019). Nevertheless, the results of this study also reveal a high level of interest and awareness among travel agencies about the potential of VR and AR technologies in enhancing competitiveness and customer experiences.

### **Factors Influencing the Adoption of VR and AR Technologies**

Using the Unified Theory of Acceptance and Use of Technology (UTAUT) as a theoretical foundation, this research identifies several key factors influencing the adoption of VR and AR technologies by travel agencies in Indonesia:

- *Performance Expectancy*: Most travel agencies believe that VR and AR technologies can improve their business performance, particularly in marketing effectiveness, customer experience, and operational

efficiency. This belief is a primary driver for adopting VR and AR technologies, consistent with findings from previous research (Paulo et al., 2018).

- *Effort Expectancy*: Travel agencies vary in their perception of the ease of use of VR and AR technologies. Some consider these technologies easily integrated into their operations, while others feel that significant effort is required to adopt and utilize them effectively. These findings underscore the importance of designing user-friendly VR and AR technologies that travel agencies can quickly implement in the tourism industry.
- *Social Influence*: Pressure from competitors, customer demands, and industry trends are significant social influences driving the adoption of VR and AR technologies. Travel agencies must adopt these technologies to remain competitive and relevant. These findings are consistent with previous research highlighting the critical role of social influence in technology adoption in the tourism industry (Yung & Khoo-Lattimore, 2019).
- *Facilitating Conditions*: The availability of technological infrastructure, technical support, and adequate human resources are crucial factors in promoting the adoption of VR and AR technologies. Travel agencies with better-facilitating conditions tend to be more successful in implementing these technologies. However, some travel agencies face investment costs, lack of technical skills, and infrastructure limitations. All companies agree that government assistance is needed in producing accessible content for leading national tourist attractions so that they can use this content as a quality marketing and promotional tool.

### **Impact of Implementing VR and AR Technologies**

Travel agencies that have adopted VR and AR technologies report positive impacts on various aspects of their business:

- *Increased Customer Engagement*: VR and AR technologies in marketing and customer service have significantly increased customer engagement. Customers show higher interest and enthusiasm towards travel products and services promoted through VR and AR experiences.
- *Improved Conversion Rates*: Some travel agencies report increased conversion rates after implementing VR and AR technologies. Destination preview experiences through VR and contextual information presented through AR assist customers in making purchasing decisions and increase the likelihood of booking.
- *Brand Differentiation*: Adopting VR and AR technologies has helped travel agencies differentiate their brands and stand out among competitors. These innovative technologies create a more modern, progressive, customer-experience-oriented brand image.
- *Operational Efficiency*: Some travel agencies report improved operational efficiency after adopting VR and AR technologies. For example, VR in staff training allows for the simulation of real-life situations and reduces the costs of field training. AR also streamlines airport check-in processes and navigation at tourist destinations.

Despite the reported benefits, several challenges in implementing VR and AR technologies have also been identified, such as high content development costs, the need for regular content updates, and staff with limited technical skills. Travel agencies need to develop strategies to overcome these challenges and optimally leverage the potential of VR and AR technologies.

### **Theoretical and Practical Implications**

The findings of this research provide empirical support for the application of UTAUT in understanding the adoption of VR and AR technologies in the tourism industry, particularly in the context of developing countries like Indonesia. From a practical perspective, the results of this study can assist travel agencies in developing effective VR and AR technology adoption strategies. By considering factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions, travel agencies can design more targeted approaches to implementing these technologies. The research findings also highlight the importance of collaboration among stakeholders, including the government, industry associations, and technology providers, in creating a conducive ecosystem for adopting VR and AR technologies in the Indonesian tourism industry.

### Limitations and Suggestions for Future Research

This study has several limitations that we can address in future research. *First*, this study focuses on ten leading travel agencies in Indonesia, which may only partially represent the diversity of the Indonesian tourism industry. Future research can expand the sample coverage by involving travel agencies with more diverse scales and characteristics.

*Second*, this study employs a qualitative approach, which provides an in-depth understanding of the phenomenon under investigation. However, future research can use a quantitative approach to measure the relationships between UTAUT variables and VR and AR technology adoption intentions or behaviors more precisely.

*Lastly*, we conducted this study in the Indonesian context, with unique cultural and tourism industry characteristics. Researchers can conduct similar research in other developing countries to explore similarities and differences in adopting VR and AR technologies in the tourism industry.

### CONCLUSION

This study provides important insights into the adoption level and impact of implementing VR and AR technologies in Indonesian travel agencies. Using UTAUT as a theoretical foundation, this research reveals the key factors influencing the adoption of VR and AR technologies and the positive impacts and challenges faced in their implementation. The findings of this study contribute to the development of literature on technology adoption in the tourism industry, particularly in the context of developing countries. The results also provide practical implications for travel agencies in developing effective technology adoption strategies and for other stakeholders in creating an environment that supports the diffusion of VR and AR technologies in the Indonesian tourism industry. Although further research is still needed, this study lays a strong foundation for understanding the adoption of VR and AR technologies in the Indonesian tourism industry. It provides valuable insights for academics and practitioners interested in this topic.

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