

Capturing an infinite number of details, but losing the big picture? Drivers and barriers of VR adoption in cultural tourism¹

*Domenico De Fano², Piera Buonincontri³, Roberto Micera⁴,
Tommasina Pianese³ and Carla Rossi⁴*

Abstract

This study explores the motivations and barriers influencing the use of Virtual Reality (VR) in cultural and heritage tourism. VR is recognized for its ability to create immersive, computer-generated 3D environments, offering significant potential in enhancing tourist experiences and marketing destinations. Despite its promise, VR has not achieved mainstream adoption in tourism, especially among cultural tourists. Thus, this research aims to examining the primary factors driving or limiting VR adoption in cultural and heritage experiences. Using in-depth interviews with 40 participants from various Italian regions, the study provides insights into the diverse motivations and barriers associated with VR technologies. Key motivations include curiosity, preparation, enhanced experiences, and increased accessibility. Barriers identified are technical issues, lack of familiarity, costs, and fictitious experiences. The findings suggest that addressing these barriers is crucial for enhancing the adoption of VR in cultural and heritage tourism. By improving VR technology's reliability, reducing costs, and addressing perceptual challenges, tourism and cultural marketers can better leverage VR to enrich visitor experiences and broaden access to cultural heritage sites. This research contributes to a deeper understanding of the complexities of VR adoption.

Keywords: VR, Immersive Technology, Motivation, Barrier, Cultural Heritage, Tourism

1. Introduction

The application VR in tourism has been a topic of academic interest since the 90s (Williams & Hobson, 1995). This has given rise to an ongoing debate, as evidenced by recent reviews (Yung & Lattimore, 2017; de Lurdes Calisto & Sarkar, 2024). Most of the literature highlights, from a business perspective, the positive impact of VR on tourism (Guttentag, 2010), although some studies also explore barriers to adoption (Sousa et al., 2024). However, few studies have examined this phenomenon from the perspective of individual tourists, despite their adoption being key to the success of these technologies. Despite increased familiarity with VR during the pandemic, it has yet to achieve mainstream

¹ This work has been supported by the project "REVeRT" funded by PRIN Bando 2022 - CUP B53D23009730006

² Research Fellow at ISMed-CNR

³ Researcher at ISMed-CNR

⁴ Associate Professor at University of Basilicata

adoption in tourism, particularly in cultural and heritage tourism, a promising area for its application (Beck et al., 2019; Zeng et al., 2022).

This study aims to fill this gap by exploring the motivations and barriers influencing visitors' decisions to use or not use VR in cultural and heritage tourism. By conducting in-depth interviews with several participants from various Italian regions, this study provides a comprehensive understanding of the factors driving or hindering the adoption of VR technologies in this context. The findings offer insights into the complexities of VR adoption among cultural tourists.

2. Theoretical Background

Recent unexpected events have altered tourist behavior and slowed the industry, prompting calls for innovative research and recovery strategies (Lu et al., 2022). A key challenge is leveraging technology for destination marketing, where VR can play a vital role. By offering immersive 3D environments that simulate real-time interactions, VR outperforms traditional promotional tools, creating symbolic connections and enhancing marketing of intangible tourism experiences (Guttentag, 2010; Beck et al., 2019).

VR adoption in tourism has been studied through models like Technology Acceptance Model (TAM) (Yung & Lattimore, 2017) and Unified Theory of Acceptance and Use of Technology (UTAUT2), which highlights factors like performance expectancy and personal innovativeness (Wen et al., 2023). Enjoyment is crucial for continued use (Ja Kim & Hall, 2019; Kichan et al., 2023), while anxiety, perceived risks and perceived isolation can hinder adoption (Merkx & Nawijn, 2021; Zhu et al., 2023; Cham et al., 2024).

Nevertheless, even though the growing popularity of VR, existing research has not yet sufficiently explored the motivations and constraints of VR use for tourists in the specific context of cultural heritage sites, leading to the need to consider which factors are driving or limiting the use of VR as a tool to effectively disseminate culture and enhance the cultural visit experience.

3. Methodological Approach

This study aims to investigate the motivations and barriers influencing the use of VR in cultural and heritage tourism. Forty in-depth interviews were conducted from March to May 2024. Participants were selected using purposive sampling to ensure a diverse representation from different Italian regions, with varying socio-demographic characteristics and levels of technological familiarity. Additionally, the selection sought to reflect a range of competencies related to both the knowledge and use of virtual reality and the experience of visiting cultural sites. This method ensured a comprehensive understanding of the diverse factors influencing the use of VR in cultural and heritage tourism. The interviews were analyzed in NVivo following Braun and Clarke's (2006) thematic analysis guidelines. Through the systematic application of thematic analysis, several key themes and sub-themes were identified.

THEME	SUB-THEME	CODE EXAMPLE	CO DE FR Q
Motivations for Using VR	Accessibility and Convenience	<i>Immersive VR is inclusive and especially useful for those with physical limitations.</i>	6
		<i>Non-immersive VR offers a low-cost way to revisit sites and share experiences with others.</i>	4
	Enhanced Experience	<i>During the visit, immersive VR provides me with an immersive and detailed experience.</i>	7
	Curiosity and Interest	<i>I am very curious to try immersive VR before visiting the site.</i>	5
	Preparation and Planning	<i>(VR) helps me better plan my itinerary and prepare myself on what to expect.</i>	4
Barriers to Using VR	Technical Issues	<i>I am afraid that VR equipment may be malfunctioning or difficult to use.</i>	6
		<i>There were some technical problems while using immersive VR.</i>	5
	Lack of Familiarity and Comfort	<i>I am not very familiar with immersive VR technology, and I feel a little uncomfortable.</i>	4
		<i>Immersive VR does not seem that immersive or intuitive to me.</i>	3
	Cost	<i>The high cost and limited availability of immersive VR are major obstacles.</i>	5
	Fictitious Experience	<i>Non-immersive VR is often considered less realistic than immersive VR.</i>	3
	Alienation and isolation	<i>There is a risk of isolation also resulting from the replacement of real experience with virtual experience.</i>	2

Table 1: Coding results

4. Discussion

The qualitative analysis reveals that the motivations for using VR in cultural and heritage tourism are multifaceted, primarily driven by curiosity and interest, preparation and planning, enhanced experience, and accessibility and convenience. Curiosity and interest emerged as significant motivators, with participants expressing a strong desire to explore new technologies to visit cultural sites. For instance, one participant noted, " *I am very curious to try immersive VR before visiting the site*" underscoring the role of curiosity in encouraging the use of VR. Similarly, another participant highlighted the importance of VR in preparation and planning the visit to cultural and heritage sites. This indicates that VR serves as a valuable tool for visitors to plan their trips more effectively by providing a preview of the site, which is particularly useful in case of large sites. The enhanced experience provided by VR was frequently mentioned. One visitor remarked, "*Immersive VR provides an engaging and detailed experience*", reflecting how VR can significantly enrich the visitor experience through detailed and involving visualizations. Additionally, VR's ability to enhance accessibility and convenience was emphasized, particularly for individuals with physical limitations. As one participant stated, "*Immersive VR is inclusive and especially useful for those with physical limitations*" highlighting the inclusive nature of VR, which allows broader access to cultural sites, even in fragile contexts. Conversely, several barriers to using VR were identified. Technical problems were a significant concern, indicating apprehension about the usability of VR equipment. The lack of familiarity and comfort with VR technology also emerged as a notable barrier. High costs and limited

availability of VR technology further aggravate these challenges. Finally, some visitors perceived a fictitious experience in VR settings.

Therefore, this study highlights key theoretical implications for VR adoption in cultural and heritage tourism. The analysis revealed two types of barriers: those directly related to technology itself, such as usability challenges and high costs, and those tied to the visitor's personal perception of the experience through technology. It highlights the importance of integrating cost-related barriers into existing models to offer a more holistic understanding of VR adoption (Yung & Lattimore, 2017). Moreover, the integration of emotional and psychological factors, such as curiosity and comfort, is essential for understanding VR engagement, supporting the use of models like HMSAM (Ja Kim & Hall, 2019). Finally, the context-specific nature of VR adoption underscores the need for theoretical models to consider variables unique to cultural and heritage tourism settings, enhancing their predictive accuracy (Escandon Barbosa et al., 2023). In terms of practical implications, cultural heritage marketers should enhance the technical reliability and user-friendliness of VR experiences to ensure seamless and enjoyable usage. By offering affordable VR options through ticket packages, rentals, and partnerships with VR technology providers, marketers can increase accessibility and attract a broader audience. Additionally, creating high-quality, immersive, and authentic VR content that accurately represents historical and cultural details will enhance engagement. Finally, to mitigate alienation risks in heritage tourism, managers should invest in solutions that allow group experiences so that tourists can stay in contact with others and promote the use of VR as a complement to, rather than a substitute for, real experiences. In other words, marketers should emphasize hybrid experiences that combine virtual and physical site exploration and create opportunities for social interaction within the VR environment.

References

- Beck, J., Rainoldi, M., & Egger, R. (2019). Virtual reality in tourism: a state-of-the-art review. *Tourism Review*, 74(3), 586-612.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Calisto, M. L., & Sarkar, S. (2024). A systematic review of virtual reality in tourism and hospitality: The known and the paths to follow. *International Journal of Hospitality Management*, 116, 103623.
- Cham, T. H., Tan, G. W. H., Aw, E. C. X., Ooi, K. B., Jee, T. W., & Pek, C. K. (2024). Virtual reality in tourism: Adoption scepticism and resistance. *Tourism Review*, 79(2), 337-354.
- Chung, N., Lee, H., Lee, S. J., & Koo, C. (2015). The influence of tourism website on tourists' behavior to determine destination selection: A case study of creative economy in Korea. *Technological Forecasting and Social Change*, 96, 130-143.

Escandon Barbosa, D., Salas-Paramo, J., & Castrillon Paque, V. (2023). The moderating effect of the use of virtual reality on cultural brand heritage tourism. *Communitas*, 28, 20-37.

Guttentag, D. A. (2010). Virtual reality: Applications and implications for tourism. *Tourism Management*, 31(5), 637-651.

Hyun, M. Y., & O'Keefe, R. M. (2012). Virtual destination image: The role of involvement in e-Word-of-Mouth. *Journal of Business Research*, 65(10), 1459-1465.

Ja Kim, M., & Hall, C. M. (2019). A hedonic motivation model in virtual reality tourism: The moderating effects of destination brand love. *Journal of Destination Marketing & Management*, 14, 100391.

Jung, T., Lee, H., Chung, N., & Tom Dieck, M. C. (2017). Cross-cultural differences in adopting mobile augmented reality at cultural heritage tourism sites. *International Journal of Contemporary Hospitality Management*, 30(2), 751-769.

Kichan, N., Baker, J., & Dutt, C. S. (2023). Does familiarity with the attraction matter? Antecedents of satisfaction with virtual reality for heritage tourism. *Information Technology & Tourism*.

Lu, L., Cai, R., & Gursoy, D. (2022). Developing and testing a technology adoption model for the tourism industry: A case of virtual reality headsets. *Tourism Management*, 95, 104622.

Merkx, C., & Nawijn, J. (2021). The future of travel: A market perspective on consumer demand for virtual reality experiences in tourism. *Tourism Management Perspectives*, 37, 100783.

Sousa, N., Melo, M., Losada, N., & Alén, E. (2024). Breaking barriers: Unveiling challenges in virtual reality adoption for tourism business managers. *Tourism and Hospitality Management*, 30(2), 269–282

tom Dieck, M. C., Jung, T., & Han, D. I. (2017). Mapping requirements for the wearable smart glasses augmented reality museum application. *Journal of Hospitality and Tourism Technology*, 8(3), 287-301.

Wen, X., Sotiriadis, M., & Shen, S. (2023). Determining the key drivers for the acceptance and usage of AR and VR in cultural heritage monuments. *Sustainability*, 15.

Williams, P., & Hobson, J. P. (1995). Virtual reality and tourism: fact or fantasy?. *Tourism management*, 16(6), 423-427.

Yung, R., & Lattimore, J. (2017). Exploring the power of virtual reality technology for marketing tourism. *Journal of Hospitality and Tourism Technology*, 8(1), 33-46.

Zeng, Y., Xu, R., & Liu, L. (2022). The Effects of a Virtual Reality Tourism Experience on Tourist's Cultural Dissemination Behavior. *Tourism and Hospitality*, 3(1), 314-329

Zhu, C., Wu, D. C. W., Hall, C. M., Fong, L. H. N., Koupaie, S. N., & Lin, F. (2023). Exploring non-immersive virtual reality experiences in tourism: Empirical evidence from a world heritage site. *International Journal of Tourism Research*, 25(3), 372-383.