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Technology Readiness and Technology Acceptance in Virtual Reality Tourism: An Integration of TOE and TAM Frameworks

Tran Tuyen
University of Social Sciences and Humanities, Ho Chi Minh City, Vietnam
Vietnam National University, Ho Chi Minh City, Vietnam
Email: tuyentran@hcmussh.edu.vn

Nguyen Thi Van Hanh (Corresponding author)
University of Social Sciences and Humanities, Ho Chi Minh City, Vietnam
Vietnam National University, Ho Chi Minh City, Vietnam
Email: nguyenthivanhanh@hcmussh.edu.vn

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Abstract

Virtual reality (VR) tourism presents a creative way to improve travel experiences and offers smart travel. On the other hand, compared to wealthy nations with sophisticated information infrastructure and smart tourism support, the exploitation of VR tourism in emerging tourism economies looks to be limited. Focusing on Ho Chi Minh City, Vietnam, a case study for growing tourism businesses, this paper attempts to establish a model identifying elements involving VR tourism acceptance in developing markets. Expanding the Technology Acceptance Model (TAM) with the Technology, Organization, and Environment (TOE) framework helps this model to emphasize elements like organizational readiness and knowledge of VR tourism in developing countries. Using partial least squares structural equation modeling (PLS-SEM) on data set of 260 tourism companies, the results show that perceived ease of use is less important, perceived usefulness of VR tourism has the largest effect on adoption intentions. Policy variables have little effect; critical elements are technological developments and organizational ability, compatibility. Therefore, in growing tourism industries, innovation, usefulness and availability of VR tourism play the most significant role. These findings suggest theoretical and practical implications on VR tourism adoption in developing markets.

Keywords: Virtual reality tourism, technology acceptance model (TAM), technology, organization and environment (TOE) framework, tourism enterprises.

1. Introduction

Virtual reality (VR) tourism has transformed the travel sector in many developed nations by providing immersive experiences that enable visitors to visit distant locations without ever leaving their homes (Verma et al., 2022; Zhang & Hwang, 2024). In addition to changing how tourists engage with destinations, VR tourism has provided businesses with new opportunities to market, deliver engaging experiences, and meet tourists' growing travel demands. (Guttentag, 2010). Moreover, VR tourism makes travel planning more participatory and informed by allowing users to preview locations, experiences, and attractions before deciding.

However, as compared to countries with mature tourism economies, VR tourism adoption has been slow and remains very limited in the emerging market. Although the adoption of technology is growing quickly in some metropolitan areas, the tourism industry as a whole confronts technological, financial, and infrastructure obstacles that prevent VR tourism from becoming widely used (Idris et al., 2021; Jude & Ukekwe, 2020). Tourism businesses in these areas are still struggling to realize the full potential of VR tourism, and instead of embracing all of its advantages, much of the attention is still on removing these obstacles. Travel agencies, unlike other types of tourism firms, rarely use VR tourism in marketing activities, product development, or smart tourism services. Therefore, it is necessary to find out the reasons behind the limited use of VR tourism by these businesses.

This problem also affects scholarly study. There is almost limited study on how tourism enterprises in developing economies use VR tourism, in contrast to the abundance of studies on the influence of VR on tourists' behaviors and experiences (Yung & Khoo-Lattimore, 2019). There is a glaring knowledge vacuum on the factors that encourage or hinder companies from implementing this kind of tourism, and the existing research methods are not tailored to these markets' particular requirements. This research gap should be contributed through studying the uses of VR tourism from the tourism businesses side.

Ho Chi Minh city, Vietnam, a typical case study in this context. Despite the city’s rich historical and cultural offerings, as well as Vietnam’s overall growth in tourism, technological advancements in this sector have not yet reached their full potential (Tuyen & Van Hanh, 2024). Therefore, understanding the factors that influence the adoption of VR tourism by tourism businesses in such settings is crucial for capitalizing on VR tourism’s potential to drive growth, innovation, and competitiveness.

This study seeks to close that gap by creating a new research model that focuses on the elements driving VR tourism adoption by travel agencies in developing nations, especially in Ho Chi Minh City. A suitable setting for researching VR integration in tourism is Ho Chi Minh City, Vietnam, a significant economic and cultural center. Unlike much of the existing research, which tends to center on tourists’ experiences and behavioral responses to VR tourism (Guttentag, 2010; Yung & Khoo-Lattimore, 2019), this study offers a fresh

perspective by concentrating on the business adoption of VR tourism in emerging markets. By means of identification and evaluation of these aspects, this study offers a new model that might form the basis for next research on the acceptability of VR tourism in like developing economies, particularly Asian tourism growing markets. Apart from the factors themselves, the model proposed here shows how economic and technological aspects affect the business environment in developing countries. This study could enable travel companies to better understand how to use VR tourism to boost offers, improve services, and expand customer base. This solves a clear knowledge gap in the field of tourism strategy and academics.

The study is organized into five sections: introduction, literature review with hypothesis development, results, discussion and implications, and an exploration of the study's limitations and suggestions for future research.

2. Literature Review

2.1. Virtual Reality Tourism and Tourism Enterprise Adoption

Some scholars define virtual reality (VR) tourism as the use of VR technology into activities connected to tourism (Yung et al., 2021; Zhang & Hwang, 2024). They underline that VR tourism is the experience of travel in a virtual environment made feasible by technology advances. For instance, Beck, Rainoldi, and Egger (2019) claim that VR tourism comprises 360-degree experiences and other tools allowing guests to use their hearing, vision, and other senses (Beck et al., 2019). Stanley (2017) similarly characterizes VR tourism as a type of travel that gives potential visitors the chance to investigate sites, activities, and events within their native country, therefore supporting their decision-making process for next trips (Kim et al., 2020).

In addition, some studies indicate that VR tourism ought to be regarded as a technological trend during the pandemic, possessing marketing value rather than being considered a distinct tourism product. However, this perspective is uncommon and infrequently referenced in tourism literature. Currently, the concept of VR tourism is mainly approached as follows: VR tourism is a travel experience based on electronic devices as a replacement for physical travel (Prideaux, 2005). VR tourism serves as a form of substitute tourism, enabling travel without physical movement, or as a means to enhance tourism experiences (Beck et al., 2019; Verma et al., 2022; Wiangkham et al., 2025). VR tourism can be characterized as follows based on the previously discussed perspectives: VR tourism refers to a form of travel that utilizes technology, particularly advanced virtual reality systems. It improves the travel experience and supports sustainable tourism development by allowing individuals to engage with various locations virtually or by providing supplementary experiences at those sites.

From the standpoint of travel agencies, VR tourism and associated technologies provide a multitude of uses for a variety of commercial endeavors. In addition to supporting sustainable tourism development, these include marketing and promotion, sharing

information about tourism, improving visitor experiences, diversifying tourism products, building relationships with tourists, and enhancing the reputation of tourism businesses (Beck et al., 2019; Guttentag, 2010; Yung & Khoo-Lattimore, 2019). Furthermore, tourism businesses can develop VR experiences at tourism destinations to enhance on-site visitor engagement and support business growth. The COVID-19 pandemic underscored the viability of VR as a substitute for physical travel, highlighting the advantages of this technology (Kwok & Koh, 2021; Park & Jones, 2021). To facilitate interaction for distant tourists, various tourism enterprises and individuals have invested in creating immersive virtual reality experiences, particularly for heritage tourism and historical site tours (Chin & Wong, 2024).

The adoption of VR in tourism varies across different enterprises. Cultural parks, amusement parks, museums, and historical heritage sites have actively integrated VR to enhance visitor experiences (Hassapopoulou, 2018; Hsiao et al., 2021; Ji et al., 2023). In contrast, travel agencies, hotels, and restaurants have been slower to adopt this technology, mainly due to uncertainties about its business value. For attractions, VR offers immersive storytelling, virtual site visits, and interactive experiences, making it a valuable tool for engagement (Lee et al., 2020; Yung & Khoo-Lattimore, 2019). However, service-based businesses like travel agencies may struggle to justify VR's impact on bookings, while hotels and restaurants may see limited benefits beyond virtual facility tours (McLean & Barhorst, 2021; Zeng et al., 2020).

Existing research has largely focused on VR's technological and experiential aspects rather than its business implications (Yung & Khoo-Lattimore, 2019; Zhang & Hwang, 2024). Research using the technology acceptance model shows how simple virtual reality technology and equipment are. Research seeks to elucidate the virtual reality experience through users' perceived advantages and perceived ease of use (Xian, 2020; Zhang & Hwang, 2023).

The literature review demonstrates that VR tourism is a noteworthy area of research attracting considerable interest in the tourism sector. Despite varying perspectives on insights and roles within tourism, the majority of studies concur on the necessity of their application. Research frequently emphasizes the experiences of tourists and provides extensive details (Yung & Khoo-Lattimore, 2019). Research on the business aspects of tourism remains limited due to the lack of specific studies, particularly concerning the capacity for VR application. This challenge is even more pronounced in emerging tourism markets, where technological adoption faces additional barriers. This research gap needs to be explored to understand the feasibility, effectiveness, and potential impact of VR on different types of tourism enterprises. Further investigation can provide insights into the strategic integration of VR, helping businesses maximize its benefits and overcome adoption challenges.

2.2 Conceptual Framework for Research on the Adoption of Virtual Reality in the Tourism Industry

A wide range of conceptual frameworks have been developed for particular aims, with the Technology Acceptance Model (TAM) acknowledged as the most widely utilized option (Bryan & Zuva, 2021). The Technology Acceptance Model (TAM), introduced by Fred Davis in his PhD thesis in 1986, has been extensively utilized and further refined by several scholars to examine, predict, and evaluate the adoption of developing technologies.

The Technology Acceptance Model (TAM), as proposed by Davis (1989), considers perceived usefulness, perceived ease of use, and intention to use as the three primary factors influencing user motivation (Davis, 1989). TAM 2 (Venkatesh & Davis, 2000), TAM 3 (Venkatesh & Bala, 2008), and the Unified Theory of Acceptance and Use of Technology (UTAUT) represent notable adaptations of the original TAM model that have emerged over time (Zhang & Hwang, 2023).

The TAM has been utilized to analyze tourist behavior regarding the adoption of technology within VR tourism. The scope of TAM is still limited, even with its expansion through the incorporation of additional models. The primary focus of these hybrid models is the experiences of visitors in the virtual world.

A significant gap exists in the development of conceptual frameworks specifically designed for tourism-related enterprises.

In the business domain, there is an absence of comprehensive theoretical frameworks that sufficiently address the effective use of technology (Awa et al., 2015). The Technology–Organization–Environment (TOE) framework has been employed to elucidate the comprehensive dimensions of technology utilization in corporate environments (Bryan & Zuva, 2021). Since its conception, researchers have enhanced the TOE model by incorporating additional factors into its three components (Bryan and Zuva, 2021). This strategy is essential for tourism businesses to strengthen preparedness for technology integration across all dimensions, as it evaluates technology applications and pinpoints areas for improvement (Bryan & Zuva, 2021; Liu, 2019).

Building upon the insights from the aforementioned review of conceptual frameworks in VR tourism research, this research aims to make a contribution by expanding the academic framework, derived from the integrated perspective of TOE along with TAM in the tourism field. This approach extends beyond the confines of existing research models, offering a more comprehensive understanding of technology adoption and digital transformation in tourism firms, especially for VR tourism intention adoption.

2.3 Hypotheses Development

2.3.1 Effect of Perceived Ease of Use and Perceived Usefulness on VR Tourism Adoption Intention

Upon examining relevant empirical studies concerning the TAM model, it has been consistently validated that perceived ease of use and perceived usefulness impact technology adoption intentions (Davis, 1989). In the context of VR tourism, it can be construed as a technology-driven form of tourism, incorporating features of virtual reality and other relevant technologies (Verma et al., 2022). Consequently, VR tourism products are likely to create users' perceptions of ease of use and usefulness when experiencing it (Yang et al., 2022). Consequently, it follows that the intention to adopt VR tourism is indeed influenced by these two critical factors: perceived ease of use and perceived usefulness. Following hypotheses were therefore proposed:

- H1: Perceived ease of use of VR tourism has a positive effect on intention to use this kind of tourism product.
- H2: Perceived usefulness of VR tourism has a positive effect on intention to use this kind of tourism product.

Studies show that customers' perceptions of the utility of technology enhance when its ease of use is perceived positively (Zhang & Hwang, 2023). Users tend to perceive new technology as valuable and suitable for their needs when it is straightforward and easy to use. Conversely, consumers may perceive a complex technology as insufficient for their needs, resulting in a reduced assessment of its utility, especially if it necessitates multiple devices and involves a significant learning curve. This article proposes the following hypothesis:

- H3: Perceived ease of use of VR tourism has a positive effect on perceived usefulness.

2.3.2 Effect of Technological Improvement on Perceived Ease of Use, Perceived Usefulness and Organizational Competency, Compatibility and Readiness

The present state of technological progress and the extent to which enterprises may readily integrate innovative technology to enhance their competitive advantages exemplify technological advancement (Zhang & Hwang, 2023). Technological progress in virtual reality refers to its accessibility and availability (Verma et al., 2022). Tourism enterprises can readily implement this technology, among other relevant innovations (Kramar et al., 2021). Furthermore, the use of virtual reality may catalyze growth and provide travel-related enterprises with a competitive advantage (Verma et al., 2022; Zhang & Hwang, 2023). Consequently, the subsequent theories have been formulated:

- H4: Technological improvement has a positive effect on perceived ease of use.
- H5: Technological improvement has a positive effect on perceived usefulness.

- H6: Technological improvement has a positive effect on organizational competency, compatibility and readiness.

2.3.3 Effect of Organizational Competency, Compatibility and Readiness on Perceived Ease of Use and Perceived Usefulness

Organizational competency and readiness can be defined as the organization's alignment and compatibility with new technologies through empirical research using the TOE model (Al Hadwer et al., 2021; Chatterjee et al., 2021). This includes things like leadership support, staff competencies, and budget planning (Awa et al., 2015). Managers' and employees' perceptions of virtual reality technologies are influenced by organizational competency and readiness. Managers and staff find VR tourism more useful and accessible for their product development when these preparations are made (Chatterjee et al., 2021).

Additionally, when thinking about adopting technology, an organization's compatibility is also quite important (Al Hadwer et al., 2021). The ease with which virtual reality technology can be integrated and aligned with an organization's current procedures and infrastructure is known as organization compatibility (Huang et al., 2016). Managers may view the adoption of new technology as difficult and not especially advantageous for their organizations if the enterprise's current state does not support it. The following hypotheses have been developed in light of the aforementioned analysis:

- H7: Organizational competency, compatibility and readiness have positive effects on perceived ease of use.
- H8: Organizational competency, compatibility and readiness have positive effects on perceived usefulness.

2.3.4 Effect of Environmental Support on Perceived Ease of Use, Perceived Usefulness and Organizational Competency, Compatibility and Readiness

The environmental context (Bryan and Zuva, 2021; Liu, 2019) is the influence of the external environment on an organization comprising aspects such as government aid and competitive pressure. Particularly in cities, smart tourism and digital transformation clearly show a trend (Moorhouse, 2019). This trend greatly influences the methods of strategy formulation and technology adoption in tourism companies. Particularly the competitive pressures in the travel sector, the growing demand from visitors for a range of experiences, and the influence of social support help to further describe the environmental setting (Awa et al., 2015).

Once these elements are known, enterprise managers could start to consider VR tourism as a potential travel industry trend (Zhang and Hwang, 2023). Consequently, the apparent value and convenience of use of VR tourism might rise, which could affect the attitude of their company to apply it (Chatterjee et al., 2021). Given the evidence offered, the following hypotheses have developed:

- H9: Environmental support has a positive effect on perceived ease of use.

- H10: Environmental support has a positive effect on perceived usefulness.
- H11: Environmental support has a positive effect on organizational competency, compatibility and readiness.

Based on the literature review and the hypotheses put forward, the proposed conceptual model comprises six variables: technological improvement, organizational competency, compatibility, and readiness, environmental support, perceived ease of use, perceived usefulness, and intention of use. The relationships among these variables are depicted in the following research model.

In a general context, the proposed study model is delineated as illustrated in Figure 1.

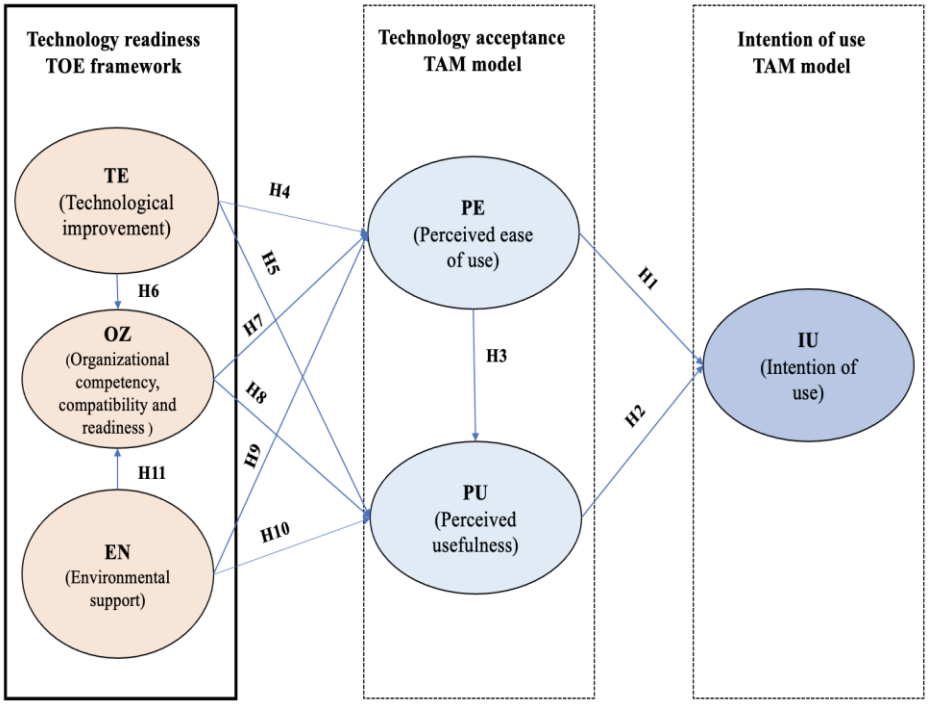

Figure 1: Proposed Conceptual Framework

3. Methodology

3.1 Participants

The current study centers on travel businesses located in Ho Chi Minh City, Vietnam. Designed for both domestic and international visitors, these travel agencies create and promote multi-day itinerues. Key players, they are very important in using VR tourism to

advertise locations, improve brand equity, and raise visitor experiences and satisfaction. The approach of participant recruitment was convenient sampling. Travel companies classified by type, domestic, international, or both, as well as all districts where the companies are located evenly received the survey. This method guarantees that the sample fairly reflects the whole population of travel agencies in Ho Chi Minh City. The study covers managers in higher levels of Head of Division and above who are in charge of product development inside their companies.

The minimum sample size for a qualified PLS-SEM analysis should be 10 times the number of paths pointing to the most influential structure, claims Hair et al. (2021). Moreover, according to Hair et al. (2021), the minimum sample size for exploratory research is 50, ideally favoring 100 or more. Based on these ideas and with regard for the time, tools, and resources at hand for data collecting, the project included 260 representatives from travel companies in Ho Chi Minh City.

3.2 Measurement

Two well-known models, TAM and TOE framework, guided the design of the questionnaire for this study. A standardized scale with 11 questions was applied to evaluate the technological readiness of tourism companies; this scale has been extensively used and shown successful in many studies on technology acceptance (Marangunić & Granić, 2014). With relation to the TOE model, it is noteworthy that it lacks a consistent scale as the TAM (Bryan and Zuva, 2021). Using a Likert scale spanning 1 (strongly disagree) to 5 (strongly agree), study participants will be asked to indicate their degree of agreement with these items.

The scale creation process involved a thorough literature review and input from experts (Henseler et al., 2018). This draft questionnaire then underwent a rigorous review, including consultation with 12 scholars in the tourism field. Also, a panel of 6 managers from tourism businesses assessed the questionnaire for clarity, these participants were chosen using the snowball method. After receiving input from these experts and practitioners, a final questionnaire was tested with 75 participants to assess its reliability and evaluate its measurement model for convergent and discriminant validity (Hair et al., 2021).

3.3 Data Collection

The data collection process was conducted online, with a survey distributed via email to tourism enterprises between May and September 2023. Each business representative was limited to completing one survey, a restriction managed through the functionality of Google Forms. The email database was provided by the Ho Chi Minh City Department of Tourism, facilitated through an introduction by Vietnam National University, Ho Chi Minh City.

Given the very limited access to tourism business representatives, convenience sampling was seen to be more appropriate for this study design. Furthermore, some companies that

approached or expressed interest in VR tourism were also included so that more particular evaluations would be possible. To maximize representativeness, the study aimed to guarantee the completeness of business types and sizes during the sampling process.

3.4 Data Analysis

The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the intricate interactions among latent variables. PLS-SEM is superior to CB-SEM in handling small sample numbers and does not necessitate the assumption of normally distributed data. Furthermore, PLS-SEM is a better option than CB-SEM because the study model is exploratory (to confirm current models) (Ali et al., 2018; Hair et al., 2021).

The measurement model and the structural model are the two distinct models that are examined in this article using SmartPLS 4.0 (copyrighted). One tool for assessing research ideas is the bootstrap method. According to Hair et al. (2021), this approach consists of N replacement-drawn samples that are then averaged to determine the estimated results. The population distribution, which is frequently hard to ascertain precisely, is usually reflected in this distribution (Hair et al., 2021).

4. Results

4.1 Sample Profile

Table 1: Sample Profile (N=260)

Category		Freq	Percent
Size of tourism enterprise	Under 30 employees	133	51.2
	From 30 employees to under 60 employees	92	35.4
	From 60 employees to under 90 employees	31	11.9
	From 90 employees to under 120 employees	2	0.8
	Over 120 employees	2	0.8
	Total	260	100.0
Capital of tourism enterprise	From 250 million Vietnam Dong to under 500 million Vietnam Dong	87	33.5
	From 500 million Vietnam Dong to under 1 billion Vietnam Dong	83	31.9
	From 1 billion Vietnam Dong to under 2 billion Vietnam Dong	65	25.0
	From 2 billion Vietnam Dong to under 4 billion Vietnam Dong	18	6.9
	Over 4 billion Vietnam Dong	7	2.7
	Total	260	100.0

The demographic profile of tourism enterprises provides a broad understanding of their size and capital allocation, based on a dataset of 260 respondents. Remarkably, 51.2% of firms employ fewer than 30 people, while 35.4% of businesses employ between 30 and fewer than 60 people. Furthermore, only 0.8% of companies employ 90 or fewer individuals, while 11.9% of companies employ 60 to 90 or fewer. Likewise, 0.8% of the companies polled employ more than 120 people. Of the enterprises with capital, 31.9% have between 500 million and less than 1 billion Vietnamese Dong, and 33.5% have between 250 million and less than 500 million. Additionally, 6.9% of businesses have capital between 2 billion and less than 4 billion Vietnam Dong, whilst 25% have capital between 1 billion and less than 2 billion. Finally, 2.7% of companies claim to have capital above 4 billion Vietnamese Dong.

4.2 Assessment of Measurement Model

In assessing the quality of the observed variables, it was observed that all outer loadings surpassed the critical threshold of 0.708 (Hair et al, 2021).

In the examination of the measurement model, three fundamental parameters were considered, namely: reliability, convergent validity, and discriminant validity (Table 2).

Cronbach's α values, which varied from 0.726 for EN to 0.874 for PU, were used to assess reliability. Additionally, every Cronbach's α value was higher than the suggested cutoff of 0.7. In a similar vein, Composite Reliability values, which ranged from 0.846 for EN to 0.920 for PE, were continuously above 0.7. For every variable, the Average Variance Extracted (AVE) was used to assess convergent validity. The findings showed that each variable's AVE values, which ranged from 0.647 for EN to 0.794 for PE, exceeded the crucial cutoff point of 0.5 (Hair et al., 2021).

Table2: Measurement Properties

	Items	EN	IU	OZ	PE	PU	TE
EN1	The competitive pressures from the tourism industry environment drive businesses to engage in VR tourism.	0.851					
EN2	The increasing demand for enhanced tourist experiences creates a necessity for businesses to venture into VR tourism.	0.748					
EN3	External support, including policies, consultations, and resources, influences businesses' decisions to engage in VR tourism.	0.811					
IU1	We apply VR tourism to enhance the experience for travelers		0.876				
IU2	We apply VR tourism to create new tourism products/services		0.866				

IU3	We apply VR tourism as a promotional channel.		0.870				
OZ1	Our business is technologically prepared to operate VR tourism.			0.872			
OZ2	Our business is financially prepared to operate VR tourism.			0.832			
OZ3	Our business is staffed with the necessary personnel to operate VR tourism.			0.856			
OZ4	Our business leaders support the development of VR tourism.			0.760			
PE1	VR tourism is easy to operate for employees				0.927		
PE2	VR tourism does not require a large investment for development				0.903		
PE3	VR tourism is simple for travelers to use				0.841		
PU1	VR tourism enhances the experience for travelers					0.795	
PU2	VR tourism creates new tourism products					0.865	
PU3	VR tourism is a promotional tool for businesses					0.866	
PU4	VR tourism helps businesses operate more efficiently					0.728	
PU5	VR tourism supports sustainable tourism development					0.821	
TE1	The development of technology enables businesses to apply virtual reality in tourism.						0.822
TE2	Virtual reality technology is suitable for travel companies to use alongside related technologies.						0.911
TE3	Observing changes and business effectiveness can be possible when using virtual reality technology in tourism.						0.903
	Cronbach's alpha	0.726	0.842	0.851	0.871	0.874	0.854
	Composite reliability (rho_c)	0.846	0.904	0.899	0.920	0.909	0.911
	Average variance extracted (AVE)	0.647	0.758	0.691	0.794	0.667	0.774

In the assessment of discriminant validity, it was observed that the square root of the Average Variance Extracted (AVE) for each variable consistently exceeded the correlation coefficient between that specific variable and any other variable. This observation signifies that the variables indeed exhibited a clear distinction from one another. To further fortify the rigor of the discriminant validity assessment, the study employed the heterotrait-monotrait ratio (HTMT) proposed by Hair et al. in 2009 (Hair et al, 2021). A HTMT value exceeding 0.85 would raise concerns regarding discriminant validity (Hair et al, 2021). In our analysis, as presented in Table 4, the majority of HTMT values fell within the range of 0.588 to 0.838, well below the critical threshold of 0.85.

Table 3: Discriminant Validity Test (HTMT Method)

	EN	**IU**	**OZ**	**PE**	**PU**	**TE**
EN	-					
IU	0.794	--				
OZ	0.758	0.799	-			
PE	0.682	0.777	0.684	-		
PU	0.652	0.816	0.590	0.588	-	
TE	0.734	0.838	0.679	0.750	0.687	-

4.2 Structural Model and Hypotheses Testing

Concerning Variance Inflation Factor (VIF), the Inner VIF values remained comfortably below the conventional threshold of 3 (Hair et al, 2021), with the highest value observed at 2.055 (for the relationship between PE and PU).

The bootstrapping procedure was implemented in the framework of PLS-SEM analysis to facilitate hypothesis testing. During this procedure, 5,000 resamples were generated, considering the original dataset of 260 cases. The value of R^2, which indicates the percent of variance explained in outcome variables, is 0.635 for IU, 0.513 for PE, 0.433 for PU and 0.457 for OZ. This suggests that a robust percentage of the variance in VR tourism intention of use is explained by PE and PU (Hair et al, 2021). Additionally, for PE and PU, TE, OZ, and EN demonstrate the ability to explain the variance fairly robustly.

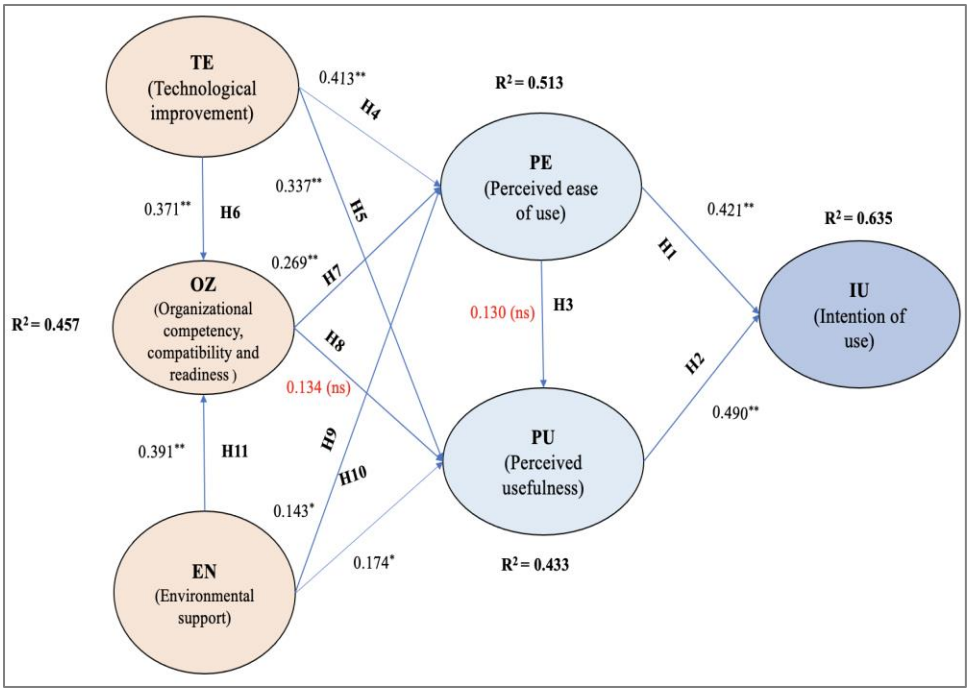

Figure 2: Validated Research Model

Table 4: Results of Path Weight

Hypothesis	Relationship	Path Weightage	Standard Deviation	P values	Remark
H1	PE -> IU	0.421	0.058	0.000	Supported
H2	PU -> IU	0.490	0.061	0.000	Supported
H3	PE -> PU	0.130	0.068	0.053	Not supported
H4	TE -> PE	0.413	0.059	0.000	Supported
H5	TE -> PU	0.337	0.062	0.000	Supported
H7	OZ -> PE	0.269	0.062	0.000	Supported
H8	OZ -> PU	0.134	0.070	0.053	Not supported
H9	EN -> PE	0.143	0.067	0.032	Supported
H10	EN -> PU	0.174	0.072	0.015	Supported
H6	TE -> OZ	0.371	0.063	0.000	Supported
H11	EN -> OZ	0.391	0.065	0.000	Supported

**Sig. at p<0.05, **Sig. at p<0.001*

The results reveal that all the hypotheses were found to be statistically significant (Table 4), with the exception of H3 (PE → PU), H7 (OZ → PU). Among the paths between the latent variables, the influence of PE on PU was particularly noteworthy, with a path coefficient of 0.130 (p = 0.053), while the relationship between OZ and PU exhibited a path coefficient of 0.134 (p = 0.053), both of which were not statistically significant. This suggests that H3 (PE → PU) and H7 (OZ → PU) were not supported by the data.

Conversely, both PE and PU exhibited positive associations with IU. However, PU exerted a more robust influence on IU (0.490**) compared to PE (0.421**). Among the exogenous variables, TE, OZ, and EN positively impacted both PE and PU, with the exception of OZ, which solely affected PE (0.269**). TE displayed the most substantial influence on both PE and PU, with path coefficients of 0.413** and 0.337**, respectively. After TE, OZ exhibited a positive relationship with PE, as evidenced by a path coefficient of 0.269**. EN had the weakest impact on both PE and PU, with path coefficients of 0.143* and 0.174*, respectively. Notably, both TE and EN equally influenced OZ, as indicated by path coefficients of 0.371** and 0.391**, respectively.

The study's findings provide valuable insights into the factors influencing the adoption of VR tourism by travel enterprises. The hypotheses H1, H2, H4, H5, H6, H7 and H11 were supported at a 1% significance level, while H9, and H10 were supported at a 5% significance level. The results indicate that technological improvements, organizational readiness, and external environmental influences significantly shape perceptions of both the usefulness and ease of use of VR tourism. These perceptions, in turn, positively influence the intention of travel enterprises to integrate VR tourism into their business operations.

The findings underscore the crucial role of perceived usefulness and perceived ease of use in shaping adoption intentions. Specifically, perceived usefulness exerts a stronger influence on adoption intention than perceived ease of use ($\beta = 0.490$ vs. $\beta = 0.421$). This suggests that travel enterprises are more likely to adopt VR tourism if they perceive it as beneficial to their operations, rather than merely easy to use. Interestingly, perceived ease of use does not have a statistically significant impact on perceived usefulness at a 5% significance level, implying that ease of use alone may not necessarily enhance perceptions of the technology's benefits.

Further analysis reveals that perceived ease of use is primarily driven by technological improvements ($\beta = 0.413$), followed by organizational readiness ($\beta = 0.269$) and external environmental influences ($\beta = 0.143$). This highlights the importance of advancements in VR technology in reducing perceived complexity and enhancing user experience. Similarly, perceived usefulness is most strongly influenced by technological improvements ($\beta = 0.337$), followed by external environmental influences ($\beta = 0.174$) and organizational readiness ($\beta = 0.134$). This suggests that while technological progress plays a key role in making VR tourism more appealing to businesses, external factors such as market trends and industry support also contribute to shaping its perceived value.

5. Discussion, Implications and Conclusion

5.1 Discussion

The purpose of this study was to determine the effect of technological, organizational, and environmental factors on perceptions of tourism enterprise managers regarding VR tourism (on perceived ease of use and perceived usefulness). The study expanded the TAM by adding the TOE framework, using PLS-SEM, with a sample of 260 tourism enterprise managers in Ho Chi Minh City, Vietnam.

The findings of this study demonstrate that PE and PU of VR tourism positively influence the intention to adopt (IU) this form of tourism. In the context of technological, organizational, and environmental factors, they have a positive influence on the perceptions of tourism enterprise managers regarding VR tourism (PE and PU). Furthermore, improving technology and receiving support from the environment can boost an organization's capabilities, adaptability, and readiness.

First, perceived ease of use and perceived usefulness of VR tourism positively influence the intention to adopt (IU) this form of tourism within tourism enterprises in Ho Chi Minh City, Vietnam. This result underscored the importance of ensuring that virtual reality technology and related technologies employed in VR tourism are user-friendly and suitable for integration into tourism enterprises.

Previous studies on the adoption of technology in the travel industry have regularly shown consistent congruence (Lin et al., 2020; Zhang & Hwang, 2023). For instance, there is study shows that the choice to implement smart tourism applications in Vietnam is influenced by PE and PU positively (Hung et al., 2020). These results coincide with the research by Alqatan et al. (2019), in which PU was found to have a more significant influence than PE on the acceptability of M-commerce applications among small and medium-sized travel companies (Alqatan et al., 2019). In the framework of VR tourism, research by Zhang, Y., & Hwang, J. in 2023 indicates that users' positive reception of technology (Zhang & Hwang, 2024) points VR tourism toward expansion.

Using new technology calls for proving their practical value in the travel industry (Hung et al., 2020). Managers or staff members who see the useful benefit of a new technology for their operations usually intend to apply it. In terms of VR tourism, its value runs in several angles. By means of a study of literature and pragmatic application, this research implies that VR tourism might be a useful tool for tourism companies, so improving visitor experiences and broadening their offers (Verma et al., 2022; Zhang & Hwang, 2024). Moreover, VR tourism has been confirmed as a successful marketing tool (Chang & Chiang, 2022), so influencing actual tourism (Kim & Hall, 2019).

Though to a somewhat less degree than perceived utility, it also favorably affects the willingness to use VR tourism in terms of perceived ease of use. Research already in publication repeatedly emphasizes how much consumers' intentions to adopt new

technologies are shaped by their apparent simplicity of use (Bryan and Zuva, 2021). This can be explained in the framework of tourism businesses by the attraction of simple and user-friendly technology for staff members (Awa et al., 2015). Moreover, a major determinant of this choice is how well the technology fits the current technological setup of the company (Chatterjee et al., 2021).

Virtual reality and VR tourism also demand certain tools and technological expertise for their implementation in tourism businesses (Guttentag, 2010). In its simplest form, this might involve creating websites or mobile applications for tourism marketing and virtual travel experiences (Dong, 2010). At a more advanced level, these technologies can be integrated into on-site tourism activities using specialized professional equipment (Lee et al., 2020; Manghisi et al., 2017).

Within the framework of the TAM, it is established that PE should positively influence PU In the study by Chatterjee et al (2021), it was observed that PE positively impacts PU when understanding AI adoption in manufacturing and production firms using an integrated TAM-TOE model (Chatterjee et al., 2021). This implies that when users perceive a technology as easy to use, they are more likely to recognize its usefulness. However, in the specific context of Ho Chi Minh city, it was found that PE did not yield a statistically significant impact on PU. This can potentially be explained by the considerable familiarity of tourism enterprises in a growing urban hub like Ho Chi Minh City with technology applications. As a result, they might assess the usefulness of technologies based on their advantages rather than relying on the perception of ease of use. Likewise, they may choose to adopt VR tourism even if it is perceived as complex, as long as it aligns with their firm's needs and objectives. These findings are particularly applicable to other emerging destinations with a context similar to that of Ho Chi Minh City, Vietnam.

In the context of technological, organizational, and environmental factors, they have a positive influence on the perceptions of tourism enterprise managers regarding VR tourism (PE and PU), except for OZ not significantly impacting PU. Among these factors, TE exhibits the most pronounced impact on both PE and PU for VR tourism adoption, followed by OZ and EN. This relationship is rooted in the concept that technological advancements make technology more accessible and useful for users first. Then, the organizational factors, encompassing competency, compatibility, and readiness, significantly influence how managers and employees perceive and embrace new technology adoption. Furthermore, environmental support plays a crucial role in encouraging and facilitating tourism enterprises in the application of new technologies.

Prior research has indeed explored the positive influence of TE, OZ, and EN on PE and PU (Awa et al., 2015; Bryan & Zuva, 2021; Liu, 2019). In the study conducted by Pateli, et al (2020), which examined the organizational adoption of social media in the hospitality industry, it was found that among the three groups of factors considered, technological features were deemed to be the most influential in terms of their predictive capacity (Pateli et al., 2020). Furthermore, in a 2021 Chatterjee et al. study, TE, OZ, and EN were found to

positively influence PE and PU (Chatterjee et al., 2021). But in the study, a unique result surfaced whereby OZ had no appreciable impact on physical education. The rather smaller sample size (340 respondents) could be one possible cause for this discrepancy and help to explain the different result.

Regarding Ho Chi Minh City specifically, OZ was seen to affect PE but not PU. This outcome could be explained by several elements. Like the work of Chatterjee et al. (2021), one contributing element could very certainly be the sample size—260 respondents. But as was already mentioned, the great degree of knowledge among tourism businesses in a fast-expanding urban center with technological applications could be a major element producing this outcome. These businesses might evaluate the value of VR tourism mostly depending on technological developments and the help given by the travel sector, therefore reducing the impact of OZ on PU.

Moreover, the study also reveals that both TE and EN exert a positive influence on OZ. This suggests that when technology experiences improvement and receives support from the environment, it stimulates tourism enterprises to enhance their competency, compatibility, and readiness for the adoption of VR tourism.

5.2 Theoretical Implications

Theoretically, this study adds to the corpus of knowledge already in use in the sector of tourism by means of past studies. Particularly during and during the COVID-19 pandemic, VR tourism is a newly developing and somewhat popular type of travel (Verma et al., 2022). Although many researchers have examined its use from several angles, there is still a dearth of studies looking at the intention to use VR tourism from the standpoint of tourism businesses (Yung & Khoo-Lattimore, 2019).

Further development of VR tourism as a substitute product within the travel sector depends on an awareness of the goals of tourism companies on the acceptance of VR tourism. This study also provides a more all-encompassing view of the possible intents of these businesses, so clarifying their part in forming the scene of VR tourism.

Moreover, this effort improves the body of current knowledge by verifying its creative approach. Many research in the technology and commercial sectors have made great use of the TOE and TAM (Awa et al., 2015; Chatterjee et al., 2021). Nevertheless, given the particular context of the travel industry, the TOE paradigm has not been extensively embraced and there has been somewhat limited integration of TOE with TAM. Therefore, this work is one of the first ones to extend the TAM by using the TOE framework, so enabling an analysis of intention to embrace VR tourism.

Furthermore, this study adds to modern travel patterns, especially in relation to growing metropolitan areas actively supporting digital transformation and smart tourism growth (Afsarmanesh & Camarinha-Matos, 2000; Idris et al., 2021). Regarding Ho Chi Minh City, the findings of the study highlight the critical importance of technical development since

it affects PE and PU most of all, therefore impacting the intention to use VR tourism. These results have more general relevance and applicability than only Ho Chi Minh City, Vietnam; they also apply to other developing locations with comparable contextual features.

5.3 Practical Implications

This study possesses practical implications for the tourism industry. The research findings are applicable to tourism enterprises in emerging tourism sectors and are pertinent to the intersection of tourism and technological advancement.

This study examines the potential advantages of VR tourism for travel companies and the factors influencing its adoption in emerging tourism markets. It can enrich tourists' experiences, expand their product options, function as a potent marketing instrument, and advocate for environmentally sustainable travel. Utilizing these advantages, businesses can integrate VR tourism into their strategy, aiding cities in embracing digital technology and fostering more intelligent tourist behaviors (Idris et al., 2021). Additionally, municipal authorities and tourism businesses ought to regard VR tourism as a strategy for advancing ecologically sustainable travel. VR tourism can mitigate the adverse impacts of tourism on destinations while simultaneously aiding in the preservation and restoration of cultural heritage (Yung & Khoo-Lattimore, 2019; Zhang & Hwang, 2023).

Second, the simplicity of use and perceived utility of VR tourism are two major factors influencing the tourism industry's willingness to adopt it. The utility and ease of virtual travel can be improved as technology advances. To ensure that virtual reality technology and related technologies are compatible with the operations of tourism firms, there is a huge need to improve them in the context of VR tourism (Verma et al., 2022). This upgrade should be adapted to the various virtual tourism application tiers. This includes more advanced versions that leverage technology in homes and tourism attractions, as well as simpler implementations on websites or mobile apps. Furthermore, VR tourism should be adaptable enough to meet a variety of needs (Verma et al., 2022). It can be a beneficial tool for those with physical travel restrictions, such as the elderly, people with disabilities, or those with restricted availability. It can also allow you to investigate places that would otherwise be inaccessible or non-existent.

Third, as the city grows, environmental support will be vital to fostering a positive view of VR tourism (Idris et al., 2021). The government's efforts to design legislation incentivizing travel agencies to use VR tourism may be generating this support. These rules may include labor training programs, financial incentives, and technological help. A robust infrastructure for digital transformation in tourism firms is critical in a rapidly rising metropolis like Ho Chi Minh metropolis, Vietnam. The competitive nature of the travel and tourism industry further encourages these enterprises to embrace VR tourism. This measure boosts their marketing initiatives while also widening their product offerings.

Finally, it is vital to consistently seek out new ways to improve an organization's capabilities, flexibility, and preparation. These aspects have a significant impact on consumers' impressions of VR tourism's usability and convenience of use, which in turn determines their inclination to use the service. We could focus on environmental support and technological developments to help an organization. As a result, it makes sense to enact rules that encourage businesses to develop their technology in a growing city. By encouraging enterprises to prepare for the transition to digital methods, these policies boost their competitiveness and readiness to accommodate VR tourism.

5.4 Study Limitations and Future Recommendations

This work has certain limitations. First, although this work tried to create a suitable model to examine the desire to embrace VR tourism among tourism businesses, there could be additional elements that could be included in next studies. Thus, by always extending the present model, there is the possibility for a more polished one in the future. The study exclusively assessed the supplier perspective, neglecting the tourist viewpoint within the emerging tourism economy. Future studies should create a model to investigate visitors' intentions regarding VR tourism. Considering both supply and demand elements, this will offer a more complete knowledge of VR tourism inside the travel sector. The current research model employs only combination of TAM and TOE. However, additional theories from the business domain, such as the Diffusion of innovation theory and Transaction cost theory, remain available for exploration. The integration of these theories may yield significant insights. Moreover, future research should investigate specific characteristics of VR tourism, including flow, immersion, and hedonic elements, to enhance the research model.

5.5 Conclusions

The paper studied important factors influencing the ambitions of tourism companies to apply VR tourism in a growing travel market. Emphasizing perceived usefulness and simplicity of use, the study examined how environmental, organizational, and technological components help to define these impressions. The Technology Acceptance Model (TAM) was extended in the study using the Technology, Organization, and Environment (TOE) framework, therefore offering a whole framework with deep theoretical analysis.

The results reveal that VR tourism is more likely adopted by tourism organizations when they see clear operational advantages since adoption intentions are more driven by perceived usefulness than by perceived ease of use. Technical development was shown to be the most significant factor; organizational competency, fit, preparation, and environmental support came second. This underlines the importance of access to current tourism technologies in developing countries as well as the need of organizational preparation with the required resources, technology, and leadership support.

The results show that the tourism industry needs a digital transformation strategy to advance VR tourism. Tourism organizations can improve adaptation and readiness with strong processes. These protocols improve technological resource integration, environmental assistance, and digital integration. These tips can help developing travel businesses capitalize on VR tourism and adapt to smart tourism.

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REFERENCES

Afsarmanesh, H., & Camarinha-Matos, L. M. (2000). Future smart-organizations: A virtual tourism enterprise. *Proceedings of the 1st International Conference on Web Information Systems Engineering, WISE 2000*, *1*, 456–461.

Al Hadwer, A., Tavana, M., Gillis, D., & Rezania, D. (2021). A Systematic Review of Organizational Factors Impacting Cloud-based Technology Adoption Using Technology-Organization-Environment Framework. *Internet of Things*, *15*, 100407.

Alqatan, S., Noor, N. M. M., Man, M., & Mohemad, R. (2019). An empirical study on factors affecting the acceptance of M-commerce application among small and medium-sized tourism enterprises by integrating TTF with TAM. *International Journal of Business Information Systems*, *31*(1), 106–135.

Awa, H. O., Ojiabo, O. U., & Emecheta, B. C. (2015). Integrating TAM, TPB and TOE frameworks and expanding their characteristic constructs for e-commerce adoption by SMEs. *Journal of Science and Technology Policy Management*, *6*(1), 76–94.

Beck, J., Rainoldi, M., & Egger, R. (2019). Virtual reality in tourism: a state-of-the-art review. *Tourism Review*, *74*(3), 586–612.

Bryan, J. D., & Zuva, T. (2021). A Review on TAM and TOE Framework Progression and How These Models Integrate. *Advances in Science, Technology and Engineering Systems Journal*, *6*(3), 137–145.

Chang, H. H., & Chiang, C. C. (2022). Is virtual reality technology an effective tool for tourism destination marketing? A flow perspective. *Journal of Hospitality and Tourism Technology*, *13*(3), 427–440.

Chatterjee, S., Rana, N. P., Dwivedi, Y. K., & Baabdullah, A. M. (2021). Understanding AI adoption in manufacturing and production firms using an integrated TAM-TOE model. *Technological Forecasting and Social Change*, *170*, 120880.

Chin, C. H., & Wong, W. P. M. (2024). The behavioral intention of young travelers to use virtual reality technology in cultural tourism destinations: An application of technology acceptance model. *Pakistan Journal of Commerce and Social Sciences*, *18*(3), 552–570.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339.

Dong, H. (2010). Review on the websites and virtual tourism of World Heritage sites in China. *2nd International Conference on Information Science and Engineering, ICISE2010 - Proceedings*, 6112–6114.

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

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R*. Springer International Publishing.

Hair, J., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM) (3nd ed.)*. SAGE Publications.

Hassapopoulou, M. (2018). Playing with history: collective memory, national trauma, and dark tourism in virtual reality docugames. *New Review of Film and Television Studies*, *16*(4), 365–392.

Henseler, J., Müller, T., & Schuberth, F. (2018). New guidelines for the use of PLS path modeling in hospitality, travel, and tourism research. In F. Ali, S. M. Rasoolimanesh, & C. Cobanoglu (Eds.), *Applying Partial Least Squares in Tourism and Hospitality Research* (pp. 17–33). Emerald Group Publishing Ltd.

Hsiao, T.-C., Yan, R., Chang, C.-Y., Chen, C.-C., & Guo, M. (2021). Application of Virtual Reality Technology to Display of "Maritime Silk Route" Culture. *Sensors and Materials*, *33*(2), 815–823.

Huang, Y. C., Backman, K. F., Backman, S. J., & Chang, L. L. (2016). Exploring the Implications of Virtual Reality Technology in Tourism Marketing: An Integrated Research Framework. *International Journal of Tourism Research*, *18*(2), 116–128.

Hung, N. T., Anh, L. H., Hien, D. T. T., & Hang, V. T. T. (2020). A studying on factors affecting decision to use smart tourism applications using extended TAM. *WSEAS Transactions on Business and Economics*, *17*, 288–299.

Idris, I., Adi, K. R., Firmansyah, R., Nadhianty, A., Mobaroq, M. H., Putri, P. G., Pratama, A. S., & Wahono, E. R. (2021). Developing smart tourism using virtual reality as a tourism promotion strategy in Indonesia. *Geojournal of Tourism and Geosites*, *35*(2), 332–337.

Ji, F., Wang, F., & Wu, B. (2023). How does virtual tourism involvement impact the social education effect of cultural heritage? *Journal of Destination Marketing and Management*, *28*, 100779.

Jude, O. C., & Ukekwe, C. (2020). Tourism and virtual reality (VR) in developing nations. *African Journal of Hospitality, Tourism and Leisure*, *9*(2), 1–16.

Kim, M. J., & Hall, C. M. (2019). A hedonic motivation model in virtual reality tourism: Comparing visitors and non-visitors. *International Journal of Information Management*, *46*, 236–249.

Kim, M. J., Lee, C. K., & Jung, T. (2020). Exploring Consumer Behavior in Virtual Reality Tourism Using an Extended Stimulus-Organism-Response Model. *Journal of Travel Research*, *59*(1), 69–89.

Kramar, O., Skorenkyy, Y., Rokitskyi, O., & Kramar, T. (2021). Application of virtual and augmented reality technologies for creation of a digital museum of scientific and cultural heritage of ivan puluj. *CEUR Workshop Proceedings*, *3039*, 285–293.

Kwok, A. O. J., & Koh, S. G. M. (2021). COVID-19 and Extended Reality (XR). *Current Issues in Tourism*, *24*(14), 1935–1940.

Lee, H., Jung, T. H., tom Dieck, M. C., & Chung, N. (2020). Experiencing immersive virtual reality in museums. *Information and Management*, *57(5)*, 103229.

Lin, L.-P. L., Huang, S.-C. L., & Ho, Y.-C. (2020). Could virtual reality effectively market slow travel in a heritage destination? *Tourism Management*, *78*, 104027

Liu, C. (2019). Understanding Electronic Commerce Adoption at Organizational Level: Literature Review of TOE Framework and DOI Theory International Journal of Science and Business. *International Journal of Science and Business*, *3*(2), 179–195.

Manghisi, V. M., Fiorentino, M., Gattullo, M., Boccaccio, A., Bevilacqua, V., Cascella, G. L., Dassisti, M., & Uva, A. E. (2017). Experiencing the Sights, Smells, Sounds, and Climate of Southern Italy in VR. *IEEE Computer Graphics and Applications*, *37*(6), 19–25.

Marangunić, N., & Granić, A. (2014). Technology acceptance model: a literature review from 1986 to 2013. *Universal Access in the Information Society 2014 14:1*, *14*(1), 81–95.

McLean, G., & Barhorst, J. B. (2021). Living the Experience Before You Go.. but Did It Meet Expectations? The Role of Virtual Reality during Hotel Bookings. *Journal of Travel Research*, *61*(6), 1233-1251.

Park, M., & Jones, T. (2021). Going Virtual: The Impact of COVID-19 on Internships in Tourism, Events, and Hospitality Education. *Journal of Hospitality and Tourism Education*, *33*(3), 176–193.

Pateli, A., Mylonas, N., & Spyrou, A. (2020). Organizational Adoption of Social Media in the Hospitality Industry: An Integrated Approach Based on DIT and TOE Frameworks. *Sustainability*, *12*(17), 7132.

Prideaux, B. (2005). Cyber-tourism: A new form of tourism experience. *Tourism Recreation Research*, *30*(3), 5–6.

Tuyen, T., & Van Hanh, N. T. (2024). Unveiling the Influence of Perceived Limitations: Exploring Tourist Acceptance and Usage Intentions Towards Virtual Tourism in Ho Chi Minh City. *Lecture Notes in Networks and Systems*, *848*, 448–455.

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, *39*(2), 273–315.

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, *46*(2), 186–204.

Verma, S., Warrier, L., Bolia, B., & Mehta, S. (2022). Past, present, and future of virtual tourism-a literature review. *International Journal of Information Management Data Insights*, *2*(2), 100085.

Wiangkham, A., Kieanwatana, K., & Vongvit, R. (2025). Journey into virtual reality: Identifying behavioral intentions to use virtual reality in tourism through spectral clustering. *Journal of Open Innovation: Technology, Market, and Complexity*, *11*(1), 100442.

Xian, X. (2020). Consumer acceptance and use of virtual reality: An empirical investigation. *Journal of Nonlinear and Convex Analysis*, *21*(8), 1719–1726.

Yang, C., Yan, S., Wang, J., & Xue, Y. (2022). Flow Experiences and Virtual Tourism: The Role of Technological Acceptance and Technological Readiness. *Sustainability (Switzerland)*, *14*(9), 5361.

Yung, R., & Khoo-Lattimore, C. (2019). New realities: a systematic literature review on virtual reality and augmented reality in tourism research. *Current Issues in Tourism*, *22*(17), 2056–2081.

Yung, R., Khoo-Lattimore, C., & Potter, L. E. (2021). Virtual reality and tourism marketing: conceptualizing a framework on presence, emotion, and intention. *Current Issues in Tourism*, *24*(11), 1505–1525.

Zeng, G., Cao, X., Lin, Z., & Xiao, S. H. (2020). When online reviews meet virtual reality: Effects on consumer hotel booking. *Annals of Tourism Research*, *81*, 102860.

Zhang, Y., & Hwang, J. (2024). Dawn or Dusk? Will Virtual Tourism Begin to Boom? An Integrated Model of AIDA, TAM, and UTAUT. *Journal of Hospitality and Tourism Research*, *48*(6), 991–1005.