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From Perception to Intention: How Virtual Reality-Augmented Reality Quality Shapes User Satisfaction and Travel Decision-Making

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Abstract. Virtual reality (VR) and augmented reality (AR) technologies are increasingly important in tourism, offering immersive experiences that influence travel planning and decision-making. However, the effectiveness of VR/AR depends on users' perceptions of its quality. Satisfaction considering the mediating role of satisfaction, this study investigates the impact of VR/AR quality attributes (information, system, security, usefulness, ease of use) on travel intention. Drawing on the Information Systems Success (ISS), Technology Acceptance (TAM), and Stimulus-Organism-Response (SOR) models, we propose and test a conceptual model using survey data from 408 Vietnamese consumers. Structural equation modelling results show that VR/AR quality attributes significantly influence perceived VR/AR quality, which in turn predicts satisfaction and travel intention. Satisfaction partially mediates the effect of perceived VR/AR quality on travel intention. The study extends our understanding of VR/AR adoption in tourism, highlighting the importance of quality perceptions and user satisfaction. Implications for VR/AR design and tourism marketing are discussed, emphasizing the need to prioritize information quality, system performance, security assurance, usefulness, and ease of use to enhance travel intention. Limitations and future research directions are also noted.

Keywords: Augmented Reality, Virtual Reality, Satisfaction, Travel Intention, Perceived Quality

1. Introduction

Virtual reality (VR) and augmented reality (AR) are emerging technologies in the tourism industry, and the quality of VR/AR has been explored by numerous studies in relation to consumers' behavioral intentions. However, there currently needs to be more research investigating the specific quality factors of VR/AR that influence users' visit intention to destinations. Some studies have examined the impact of VR or AR technology on tourist behavior, such as exploring the effect of VR quality on tourists' destination visit intention and allowing customers to experience products, services, or locations before making a purchase (Chung et al., 2015; Kim et al., 2020; Zhang et al., 2022). As noted by Guttentag (2010), the key attributes of VR are immersion, visual appeal, presence, and interactivity. In contrast, AR technology supplements digital information such as graphics and overlays virtual elements onto the physical environment; AR represents the integration of real and virtual environments using computer-generated imagery displayed through a device.

Previous studies have investigated the impact of VR on consumer behavior in tourism, such as measuring the experimental experience of VR content quality in the selection of attractive destinations (Guttentag, 2010; Tussyadiah et al., 2018; Ronaghi & Ronaghi, 2022). The perceived quality of VR has been affirmed through the characteristic attributes of this intelligent technology. The presence and information quality are two essential attributes of VR, and they have a positive impact on tourists' intentions, serving as a crucial tool in destination marketing strategies. VR has been proven to be an innovative marketing medium that can elevate tourism to new heights (Wei, 2019). Research has shown that VR enhances satisfaction, enjoyment, engagement, creativity, and overall sound and graphic quality, which are key factors contributing to user satisfaction; Users' perceptions of technological features in VR and AR across various contexts, such as fashion retail, can significantly impact their level of satisfaction (Kim et al., 2019; Shelstad et al., 2017; Wu & Kim, 2022).

Perceived technology quality of VR/AR can significantly impact user satisfaction and usage intention. Research has found that factors such as perceived ease of use, perceived usefulness, enjoyment, and subjective norms influence customer satisfaction and intention to use brands through AR technology; perceived AR quality is related to enhancing attitudinal aspects of the experience, such as in museum visits, where inspiration and AR quality perception are crucial (Wang et al., 2023; Wu et al., 2023). VR/AR is both an intangible product (its attributes like information, systems, security, usefulness, ease of use, etc.) and a tangible product (the tools users can wear on their heads to experience it). Perceived quality has been proposed as a measure for VR users to be immersed in the virtual world, highlighting its importance in understanding user satisfaction. VR/AR has unique characteristics that influence user perceptions, where AR allows real and virtual elements to coexist, impacting user satisfaction (Xu et al., 2022; Yuen et al., 2011).

Prior studies have only examined the attributes of either VR or AR individually in user experiences, thus limiting the understanding of user satisfaction when experiencing both VR and AR technologies together. Furthermore, there still need for consensus on measuring the quality of VR or AR through information, system, risk, immersion, presence, or the overall user experience in VR and AR environments. Research on privacy issues, such as the exploration of security attributes in VR and AR experiences, has been yet to be thoroughly investigated in previous studies, particularly in the context of the integration of VR and AR. Consumer satisfaction, which is the user user's emotional state in VR/AR experiences, has also been yet widely explored. This exploration is essential for tourism-related businesses to leverage the potential of VR/AR technology expertly. Additionally, it is essential to evaluate the effectiveness of VR/AR in providing alternative tourism experiences and their impact on consumer perceptions of tourism destinations.

To address this gap, the current study measures the integration of both VR and AR technologies, which is expected to enhance user satisfaction after the experience. By considering the combined effects of VR and AR, rather than examining them in isolation, the research can provide a more comprehensive understanding of how these technologies influence user perceptions and behaviors in the tourism

context. This study also analyzes the measurement of the influence of VR/AR quality based on the demographic variable of gender, to see how consumer behavior in tourism differs. This is a significant distinction of this study compared to previous research, as measuring both VR/AR technologies will yield different impacts than measuring only one of the VR or AR technologies.

The Technology Acceptance Model (TAM) (Davis et al., 1989) suggests that the factors of perceived usefulness and perceived ease of use directly influence a user's intention to use technology. However, in this research model, perceived usefulness and ease of use do not directly impact the user's intention to use the technology; rather, they act as independent factors that influence the perceived quality of VR/AR products. With this approach, the study has proposed a new theoretical framework based on the integration of the Information System Success (ISS) model, TAM, and the Stimulus-Organism-Response (SOR) model to measure the central role of perceived VR/AR quality in the causal relationship between VR/AR technology attributes and travel intention, mediated by satisfaction.

The purpose of the research on perceived quality of VR/AR technology in virtual tourism is to improve understanding of the effectiveness of VR and AR experiences and their influence on visit intention. The research must achieve three specific objectives: (1) Investigate the attributes of VR/AR that influence users' perceptions of their quality; (2) Measure the relationship between perceived VR/AR quality and visit intention through the mediating role of tourist satisfaction; (3) Compare how gender differences influence visit intention behavior.

The research must answer the following questions: (RQ1) What attributes of VR/AR influence tourists' perceived quality of VR/AR technology? (RQ2) To what extent do the attributes of VR/AR technology influence tourists' perceived quality of VR/AR technology? (RQ3) To what extent does perceived VR/AR quality influence visit intention through the mediating role of tourist satisfaction? (RQ4) How do the differences between male and female tourist groups influence visit intention? (RQ5) What managerial implications can help tourism managers and businesses develop VR/AR technology to attract tourists?

The findings of this research can clarify the role of VR/AR product quality in predicting user behavior towards destinations by integrating ISS, TAM, and SOR models. Furthermore, this research proposes managerial implications for tourism stakeholders. The results of this research will help manufacturers improve product quality, and contribute to developing marketing strategies for businesses to attract tourists.

2. Literature Review and Research Model

2.1. The Information System Success Model (ISS)

The Information System Success model has been a significant framework for evaluating the success of information systems (DeLone & McLean, 2003). This model has been widely recognized and applied in various research areas to measure the effectiveness of information systems (Lin et al., 2021). Studies have explored various factors influencing the success of information systems based on the ISS model. These factors include system quality, information quality, use, user satisfaction, individual impact, and organizational impact (Althunibat et al., 2021). The ISS model has been integrated with frameworks like the Unified Theory of Acceptance and Use of Technology (UTAUT) to explore students' satisfaction and continuance intention in online learning (Mahmoud Jebril, 2021). Studies have applied the ISS model to investigate factors influencing the continuance usage intention of travel applications among Chinese tourists (Liu et al., 2023). Additionally, research has delved into new developments in tourism and hotel demand modeling and forecasting, underscoring the importance of information systems in predicting and understanding tourism trends (Wu et al., 2017). Furthermore, the ISS model has been employed to assess the quality of information systems in virtual reality tourism, highlighting the role of technology in enhancing tourist experiences (Sobarna, 2023).

2.2. The Technology Acceptance Model (TAM)

The TAM model (Davis et al., 1989) explains the factors that affect individuals' acceptance of technology use. The three factors in the TAM model include perceived usefulness, perceived ease of use, and attitude toward use. The TAM has been applied in various studies within the tourism industry to understand consumer behavior and technology adoption and investigate the impact of virtual reality experience quality on destination visit intention (Kim et al., 2019; Moro et al., 2019; Du et al., 2022; Sobarna, 2023). However, critiques have pointed out limitations in the model. One key criticism is its focus on perceived usefulness and perceived ease of use as the main determinants of behavioral intention to use a system. While important, the model neglects social factors influencing technology adoption (Thomas-Francois et al., 2023). Additionally, the TAM model has been faulted for continually expanding by adding variables to address the complexities of the evolving IT landscape, potentially leading to unclear perceptions formation and manipulation for technology acceptance (Chen & Levkoff, 2015; Yousafzai et al., 2007). Concerns have also been raised about its suitability in non-Western cultures, indicating potential cultural constraints (Lee, 2016). Critics argue that the TAM model may not fully encompass the multidimensional factors affecting system adoption and use, suggesting the necessity for an integrated hybrid research model to address these limitations (Li et al., 2012). Therefore, the authors integrates the TAM, ISS and SOR models to investigate consumer intentions in the tourism context.

2.3. Stimulus–Organism–Response Model (SOR)

SOR is the foundational theory for consumer action research. This model has three elements: the stimulus, subject (emotions, human psychology), and response; this model was developed by (Mehrabian & Russell, 1974). Researchers have applied the SOR model to investigate a wide range of phenomena, including consumer behavior in virtual reality tourism (Kim et al., 2020), e-commerce engagement (Hu & Chaudhry, 2020), social anxiety during the COVID-19 pandemic (Zheng et al., 2020), personalized recommendations and rewards on customer behavior (Jeong & Shin, 2020), consumer confusion in e-hospitality (Sharma et al., 2023), eWOM and destination preference (Yadav et al., 2022).

2.4. Virtual Reality and Augmented Reality in Tourism

VR/AR have become increasingly important in the tourism industry. These technologies offer immersive experiences that can enhance tourism marketing, provide virtual tours, and improve visitor satisfaction. VR and AR applications have been shown to influence tourists' attitudes and behaviors (Tussyadiah et al., 2018). They allow for creating virtual environments that simulate real-world settings, enabling users to explore destinations remotely (Yerden & Uydacı, 2022). Moreover, VR and AR technologies can potentially transform cultural tourism by offering new ways to engage with heritage sites and artifacts (Garau, 2014). In the context of the COVID-19 pandemic, VR and AR have played a crucial role in promoting tourism while ensuring safety. Virtual tours and experiences have allowed travelers to engage with destinations virtually, thus supporting tourism promotion during times when physical travel may be restricted (Pahlevi et al., 2021). The adoption of VR and AR technologies has been identified as a critical strategy for the recovery of the tourism industry post-pandemic (Pinto et al., 2022). Although VR/AR technology plays a vital role in the tourism sector, research exploring its attributes, such as security, information, system etc, still needs to be improved, especially in the context of tourism in Vietnam.

2.5. Hypothesis Development

The information quality of VR/AR technology is specifically the quality of content, including that system's image and sound quality. In the IS success research, DeLone and McLean (2003) stressed the significance and applicability of content quality. Research has demonstrated that critical dimensions such as performance anticipation, effort anticipation, referent power, facilitating factors, perceived

value, and perceived risk are precursors of behavioral intentions towards adopting AR and VR based tourism products (Samaddar & Mondal, 2024). Furthermore, the significance of content quality experience has been emphasized in influencing the behavioral intention of visiting a tourism destination through VR and in the context of app-based mobile tour guides (Lai & Shi, 2015; Sobarna, 2023). Travel destination descriptions comprise the information found in VR's tourist content (M. Lee et al., 2020). In their research, Dieck et al. said that the information quality factor will make users curious and intend to use AR (Dieck et al., 2016). Additionally, Du et al. highlighted that the information quality of VR technology positively influences teachers' perceived usefulness, although it does not affect perceived ease of use (Du et al., 2022). In conclusion, the amalgamation of these references indicates that information quality and perceived quality in AR and VR technologies significantly influence tourists' behavioral intentions, satisfaction, and overall experiences in the tourism sector. Based on this argument, the following hypothesis is proposed:

H1a: Information has a positive impact on the perceived quality of VR/AR

System quality has been identified as a crucial factor influencing satisfaction and behavioral intentions in the context of VR tourism (Sobarna, 2023). Prior studies have affirmed the significance of system quality across a range of technological applications, such as augmented reality (Jung et al., 2015), mobile commerce, and mobile broadband services (Wang et al., 2019). Jung et al. emphasized how system quality affects customer responses and how important it is for consumers' pleasure and loyalty when they use augmented reality technologies (Jung et al., 2015). Information technology systems are essential tools that integrate information inside to help users use and interact. The effectiveness and user experience of VR/AR technologies are significantly influenced by system quality. Based on this argument, the following hypothesis is proposed:

H1b: System has a positive impact on the perceived quality of VR/AR

Security is one of the very vital attributes of VR/AR technology that affects user safety. Because security affects users' personal information when they use technology, it is a significant issue that system users are concerned about (Huang et al., 2017). Users will not use it if they feel unsafe. Conversely, people will feel more at ease utilizing technology if it increases their sense of security. Travelers will not finish the transaction out of fear for their safety and privacy if they believe that the security of their personal information is in jeopardy (Jeong et al., 2019; Lee et al., 2018). These studies collectively suggest that security considerations in VR and AR technologies can significantly impact the perceived quality of travel experiences, influencing factors such as perceived risk , destination image and ease of use, thereby shaping tourists' overall satisfaction and engagement with tourism-based AR/VR. Based on this argument, the following hypothesis is proposed:

H1c: Security has a positive impact on the perceived quality of VR/AR

The perceived usefulness of VR/AR technologies is likely a key factor contributing to the overall perceived quality of the user experience. Research and interest in the relationship between the perceived quality and usefulness of VR and AR in the travel industry are expanding. The impact of authentic experiences, learner immersion, perceived usefulness, and system quality on the perceived quality of tourism experiences in AR/VR technology has been explored in previous studies (Kim et al., 2019; Moro et al., 2019; Sobarna, 2023; Wei, 2019). These factors are said to have significantly enhanced the overall quality of AR/VR applications in the tourism sector. According to studies, travelers' intentions can be influenced by how much they think they enjoyed their virtual reality travel experiences (Leung et al., 2023). Flow experience and visitor engagement are directly impacted by how VR technology is perceived, with flow experience acting as a partial mediator between the two (Xie et al., 2022). Customer satisfaction and usage intention in retail settings are influenced by the perceived ease of use, usefulness, and enjoyment of AR technology (Wang et al., 2023). Based on this argument, the following hypothesis is proposed:

H1d: Usefulness has a positive impact on the perceived quality of VR/AR

Perceived ease of use of a new technology is the degree to which users perceive the difficulty or ease of using that new technology (Venkatesh et al., 2003). The degree to which consumers perceive a technology to be user-friendly and low-maintenance indicates their intention to utilize and eventual

decision to use it. One important factor influencing user adoption and involvement in VR and AR tourism is the correlation between the technology's perceived quality and ease of use. Research has indicated that consumers' intentions to adopt VR technology for travel planning are significantly influenced by perceived ease of use (Du et al., 2022). Furthermore, it has been discovered that users' experiences and happiness with VR tourist activities are positively impacted by the perceived simplicity of VR technology, which in turn influences users' inclination to engage in VR tourism (Sobarna, 2023). Based on this argument, the following hypothesis is proposed:

H1e: Ease of use has a positive impact on the perceived quality of VR/AR

The correlation between usability and ease of use in the tourism industry substantially impacts user adoption and interaction with technology. Studies show that accepting information technology strongly correlates with perceived usefulness and ease of use (Davis, 1989). In adopting virtual tourism technology, perceived ease of use positively impacts perceived usefulness, highlighting their interplay in shaping users' intentions to adopt new technologies in the tourism sector (Senalasari et al., 2022). Based on the above arguments, the following hypothesis is proposed:

H1f: Ease of use has a positive impact on the usefulness

In the relationship between producers and distributors, the issue of product quality is critical, positively affecting satisfaction (Russo et al., 2019). Some past studies confirm the positive relationships between perceived quality and customer satisfaction (Baumgarth & Binckebanck, 2011). Tourists' perceptions positively influence their satisfaction (Geng et al., 2021). VR in tourism has been associated with unique, authentic, and enjoyable activities, increasing satisfaction and intention to visit travel destinations (Sobarna, 2023). Furthermore, the significance of preserving authenticity in AR tourism experiences is highlighted because, in the context of AR, the experience's authenticity positively predicts visitor pleasure (Zhu et al., 2023). Based on the above arguments, the following hypothesis is proposed:

H2: Perceived quality of VR/AR has a positive impact on user satisfaction

In the context of tourism, tourist satisfaction is his or her psychological state when feeling about tourism activities including the quality of tourism; good quality of tourism services, attractive destinations (Li et al., 2021). Satisfied users are more likely to be interested in the objectives that have been stated (Yuce et al., 2020). The general assessment of utilizing AR technology while traveling is known as "AR satisfaction" (Chung et al., 2015). The relationship between destination attitude, behavioral intention, and AR satisfaction (Chung et al., 2018). Based on the above arguments, the following hypothesis is proposed:

H3: Satisfaction has a positive impact on the travel intention

The quality of VR/AR experiences significantly influences individuals' intentions to visit destinations. Research has shown that VR capabilities, such as inducing a sense of presence and immersion, lead to more favorable attitudes toward destinations depicted in VR, ultimately affecting the intention to visit these destinations (Tussyadiah et al., 2018). VR experiences in tourism stimulate interest, create positive attitudes, and influence travel decision-making and visit intentions (Assiouras et al., 2024). VR's ability to induce presence, generate enjoyment, and create positive attitude changes results in increased visit intentions (Melo et al., 2024). Furthermore, the quality and vividness of VR positively influence customers' attitudes and telepresence, thereby increasing the intention to visit destinations (Jorge et al., 2023). It can be affirmed that satisfaction plays an essential mediating role in the relationship between the perceived quality of VR/AR and travel intention. Based on the above arguments, the following hypothesis is proposed:

H4: Perceived quality of VR/AR has a positive impact on the travel intention

Based on TAM, ISS, and SOR foundation theories, inheriting relevant previous research, and developing hypotheses, the authors have proposed a research model (Figure 1):

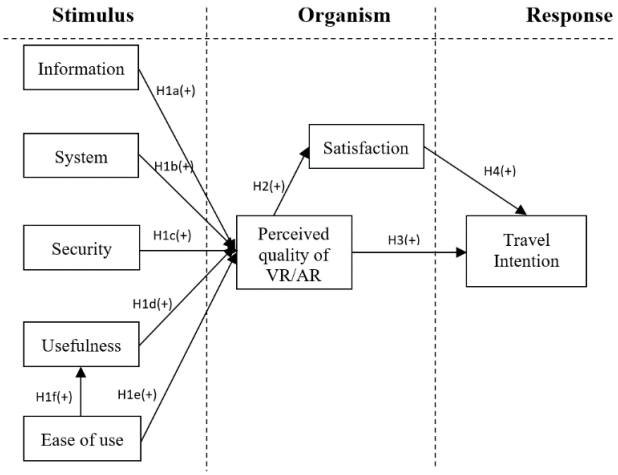

Fig. 1: Proposed research model

3. Research Methodology

3.1. Measurements

After proposing the research model, the authors developed a measurement scale based on this model. The process of developing the measurement scale was carried out through a review of previous studies related to the research topic. Subsequently, focus group discussions were conducted with four experts with extensive experience using VR/AR and working in the tourism industry, as well as four tourists who had previously used VR/AR and had travel experience. To construct the survey questionnaire, the authors used a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree.

During the group discussions, the group members identified some questions with overlapping content and consolidated them into a single, unique question. The content of the questions was also adjusted to ensure that the respondents could easily understand and provide answers. The questionnaire items were also pre-tested before the main survey. Demographic questions, including age, gender, education level, occupation, and monthly income, were included in the survey questionnaire for statistical analysis purposes.

The initial measurement scale was developed in English, and the authors translated it into Vietnamese to facilitate the responses of Vietnamese participants. The survey questionnaire in the initial study included 37 observed variables and 8 factors: information, system, security, usefulness, ease of use, perceived quality of VR/AR, satisfaction, and travel intention. The questions were adapted from previous studies, specifically:

Information of VR/AR included 5 items adapted from the studies of Dieck et al. (2016) and Sharma & Sharma (2019). System of VR/AR included 5 items adapted from the studies of Dieck et al. (2016), Elci et al. (2017), Sharma & Sharma (2019), and Zheng et al. (2013). Security of VR/AR included 4 items adapted from the studies of Huang et al. (2017) and No & Kim (2015). Usefulness of VR/AR included 4 items adapted from the studies of Dieck et al. (2016) and Do et al. (2020). Ease of use of VR/AR included 5 items adapted from the studies of Dieck et al. (2016) and Do et al. (2020). Perceived quality of VR/AR included 4 items adapted from the studies of Bayraktar et al. (2012), Garvin (1984), and Nguyen & Nguyen (2011), which were adjusted to fit the context related to the quality of VR/AR technology in tourism (e.g., "Manufacturer X provides us with high-quality products" was adjusted to "Manufacturers provide users with high-quality VR/AR technology products in travel experiences"). Satisfaction included 5 items adapted from the studies of Chung et al. (2018), Li et al. (2021), and Oh et al. (2007). Travel Intention included 5 items adapted from the studies of Chung et al. (2015), Kim et

al. (2020), Sobarna (2023), and Tussyadiah et al. (2018). Table 1 shows the measurement scales inherited from previous studies.

Table 1. Research Instruments

No	Factors	Items	References
1	Information (INF)	INF1: Timeliness of information INF2: Relevance of information INF3: Attractiveness of information INF4: Provides accurate information INF5: Provides complete information	(Dieck et al., 2016; Sharma & Sharma, 2019)
2	System (SYS)	SYS1: VR can be used to find information on travel destinations SYS2: Accuracy of the system SYS3: Navigation Quality SYS4: Personalization according to interests SYS5: Has fast response to my requests	(Dieck et al., 2016; Elci et al., 2017; Sharma & Sharma, 2019; Zheng et al., 2013)
3	Security (SEC)	SEC1:Smart tourism technologies protect my personal and sensitive information SEC2: Smart tourism technologies respect my privacy and the safety of my transactions. SEC3: Smart tourism technologies are trustworthy and reliable SEC4: Smart tourism technologies adequate security to protect my personal information	(C. D. Huang et al., 2017; No & Kim, 2015)
4	Usefulness (PU)	PU1: Alternative to traditional visit PU2: Convenience of gathering information PU3: Using Mobile AR apps while traveling enables me to find the travel product easily PU4: Product information on Mobile AR apps while traveling is clear and understandable.	(Dieck et al., 2016; Do et al., 2020)
5	Ease of use (PEU)	PEU1: Costs of effort PEU2: Instructions needed to facilitate handling PEU3: Learning to use Mobile AR apps would be easy for me PEU4: It would be easy for me to become skillful at using Mobile AR PEU5: I find the Mobile AR apps easy to use	(Dieck et al., 2016; Do et al., 2020)
6	Perceived quality of VR/AR (PEQ)	PEQ1: Manufacturers provide users with high-quality VR/AR technology products in travel experiences. PEQ2: Manufacturers always meet users' quality standards for VR/AR technology products in travel experiences. PEQ3: Manufacturers' VR/AR technology products are very reliable in travel experiences. PEQ4: VR/AR technology products are suitable for use in travel experiences.	(Bayraktar et al., 2012; Garvin & Quality, 1984; Nguyen & Nguyen, 2011)
7	Satisfaction (SAT)	SAT1: I am satisfied with the quality of information provided by the AR SAT2: I am satisfied with the visual interface design (such as graphics) of the AR SAT3: The AR service makes my tourist experience more interesting SAT4: Using VR will help me choose my destination in a better and more comfortable way SAT5: I am satisfied with the system stability and speed of the AR	(Chung et al., 2018; Li et al., 2021; Oh et al., 2007)
8	Travel Intention (INT)	INT1: I am planning to visit a destination that I have observed in a virtual reality tourist environment INT2: I plan to visit the destination I viewed in a virtual reality travel environment in the near future INT3: I am willing to visit the destination I observed in a virtual reality tourism environment as soon as possible	(Chung et al., 2015; Kim et al., 2020; Sobarna,

	INT4: I plan to save money and time to visit a destination I've seen in a virtual reality travel environment INT5: I want to know more about new travel destinations	2023; Tussyadiah et al., 2018)

3.2. Data Collection

A survey of consumers using VR/AR in tourism was deemed appropriate to utilize as the data collection method (Huang et al. 2013). However, to ensure the diversity of survey methods and the availability to provide clearer explanations to respondents, the authors combined face-to-face surveys with online surveys. The survey samples were collected through both online and direct methods using a convenience sampling approach; the survey participants were individuals aged 18 to 55 who have travel interests and had previously used VR/AR in tourism. In terms of the survey scope, the authors distributed questionnaires to tourists in Ho Chi Minh City and Da Nang City, as these are two cities with well-developed tourism industries and diverse tourist populations, resulting in higher representativeness compared to other locations. Moreover, with the convenience sampling method, the authors had easier access to tourists in these two cities. Some survey questionnaires were randomized in question order to reduce response bias.

The survey was conducted over a period of more than two months, from February 2024 to April 2024, with 700 survey samples distributed (650 online surveys via email and social media channels such as Facebook, Instagram, and Twitter, and 50 face-to-face surveys). For the face-to-face surveys, 50 questionnaires were distributed, and all 50 were received (100% response rate), while for the 650 online surveys, 382 samples were received (59% response rate). This indicates that the direct survey method achieved an absolute and more effective response rate compared to the online survey. After receiving 432 samples and excluding 24 invalid responses, the remaining 408 valid survey samples were used for the official research. The invalid responses were due to respondents who had never used VR/AR but still answered the question; furthermore, some tourists provided the same level of response (e.g., all rating 5 or 4) across all questions. According to (Hair et al., 2010), the sample size should be considered in relation to the number of estimated parameters when using the Maximum Likelihood (ML) estimation method, where the minimum sample size should be between 100 and 150. Additionally, (Bollen, 1989) suggests a minimum of five observations per estimated parameter (5:1 ratio). On the other hand, (Raykov & Widaman, 1995) state that Structural Equation Modeling (SEM) requires a large sample size as it is based on large-sample distribution theory. Experience suggests that a sample size of 300 is good, 500 is very good, and 1000 is excellent (Tabachnick & Fidell, 1983). Therefore, a sample number of 408 could be included in the analysis for this study.

3.3. Data Analysis

This study uses SEM to test the proposed research model. The tool used to perform the analysis is AMOS 28 software, which uses a maximum likelihood estimation method. SPSS 25 was used for Exploratory Factor Analysis (EFA). Based on the main data collected, the research diagram and hypothesis will be analyzed. Confirmatory Factor Analysis (CFA) and Average Variance Extracted (AVE) were used to evaluate the measurement model.

4. Research Results

4.1. Profile of the Sample

Table 2 provides an overview of the demographic characteristics of the research sample. Within this sample, the female demographic constituted 63.5%, while the male demographic represented 36.5%. Regarding age distribution, individuals aged 18 to 30 comprised 36.8%, those aged 31 to 40 constituted 42.9%, and individuals aged 41 to 55 accounted for 20.3%. Notably, the latter age group exhibited a pronounced interest in travel-related activities. For the question "*Have you ever used VR/AR?*", the number of people who answered Yes is 349, accounting for 85.5%, and the number of people answering No is 59, accounting for 14.5%; this proves this technology is trendy among tourists. For the question "*Are you*

satisfied with VR/AR technology after using it?", the number of people who answered Yes is 318, accounting for 77.9%, and the number of people answering No is 31, accounting for 7.6%.

Table 2. Research sample size and structure

No	Characteristics	Frequency	Percentage
1	Gender		
	Male	149	36.5
	Female	259	63.5
2	Age		
	18-30 years old	150	36.8
	31-40 years old	175	42.9
	41-55 years old	83	20.3
3	Education		
	High school	44	10.8
	Bachelor	220	53.9
	Postgraduate	104	25.5
	Others	40	9.8
4	Occupation		
	Private Employee	109	26.7
	Student	130	31.9
	Entrepreneur	82	20.1
	Others	87	21.3
5	Have you ever used VR/AR?		
	Yes	349	85.5
	No	59	14.5
6	Are you satisfied with VR/AR technology after using it?		
	Yes	318	77.9
	No	31	7.6

4.2. Assessment of Measurement Model

Check the reliability of the scale using Cronbach's alpha. The criteria for calculating the reliability of the variables are as follows: the threshold value of Cronbach's Alpha coefficient is 0.7 (Hair et al., 2014). After analyzing Cronbach's alpha, 33 variables remained that qualified for EFA.

EFA analysis was performed in two steps (Anderson & Gerbing, 1988). Step one analyzes each independent factor to more clearly determine the content that needs to be considered when testing the reliability of the scale. In the second step, the oblique rotation method is used to test the convergent and discriminant validity of all variables in the model. EFA results for 33 variables, using the oblique rotation method, show the factor loading coefficient of variable INF3 was less than 0.5, so this variable was eliminated and 32 variables were eligible to conduct CFA. Performing a second EFA analysis on the 32 variables showed a KMO value of 0.903 and a Bartlett's test with a Sig value of 0.000. The factor loading coefficients are all greater than 0.5, satisfying the required conditions. The results of EFA analysis of 32 variables show that the concepts of the research model achieve convergent and discriminant validity (Table 3).

Table 3. Reliability and validity measures

Factors	α	Items	Factors Loading	VE (%)	CR	AVE (%)
INF	0.790	INF2	0.688	62.4	0.801	57.3
		INF4	0.762			
		INF5	0.631			
SYS	0.806	SYS2	0.765	63.5	0.811	51.9
		SYS3	0.693			
		SYS4	0.655			
		SYS5	0.636			
SEC	0.823	SEC1	0.636	65.3	0.824	53.8

		SEC2	0.758			
		SEC3	0.768			
		SEC4	0.618			
PU	0.838	PU1	0.681	67.3	0.839	56.5
		PU2	0.760			
		PU3	0.707			
		PU4	0.765			
PEU	0.850	PEU1	0.815	55.3	0.851	58.8
		PEU2	0.748			
		PEU3	0.793			
		PEU4	0.629			
PEQ	0.814	PEQ1	0.674	65.4	0.826	54.4
		PEQ2	0.786			
		PEQ3	0.816			
		PEQ4	0.589			
SAT	0.808	SAT1	0.619	63.6	0.810	51.6
		SAT2	0.705			
		SAT3	0.751			
		SAT4	0.728			
INT	0.860	INT1	0.694	64.2	0.861	55.6
		INT2	0.725			
		INT3	0.726			
		INT4	0.859			
		INT5	0.686			

The minimum α and CR values were 0.790 and 0.801, respectively. Related to convergent validity, the threshold of the AVE (0.5) and the minimum factor loadings (0.589) were commonly applied (Chin, 1998; Hair et al., 2019). In this study, the factor loadings were higher than 0.6 and the AVE was above 0.5.

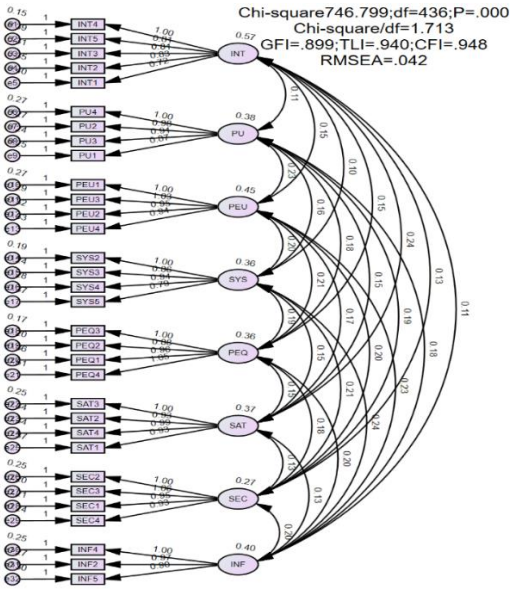

Fig.2: CFA model

The indicators used to evaluate the model must meet the following conditions: CMIN/df ≤ 2 (McIver & Carmines, 1981), or CMIN/df ≤ 3 in some cases; GFI, TLI, CFI ≥ 0.9 (Bentler & Bonett, 1980). According to (Hair et al., 2010), a GFI value less than 0.9 can still be accepted.

The presented CFA analysis results show that the critical model is appropriate: Chi-Square/df = 1.713 (<3); GFI = 0.899 is smaller than the standard of 0.9 and within the acceptable limits; CFI = 0.948

(>0.9); TLI = 0.940 (>0.9); RMSEA = 0.042 (<0.08) meets the requirement (Hair et al. 2010). Table 3 presents the results of Variance Extracted, CR, and AVE. The results show that the corresponding parameters of the analysis methods all meet technical requirements.

4.3. Structural Model and Hypotheses Test

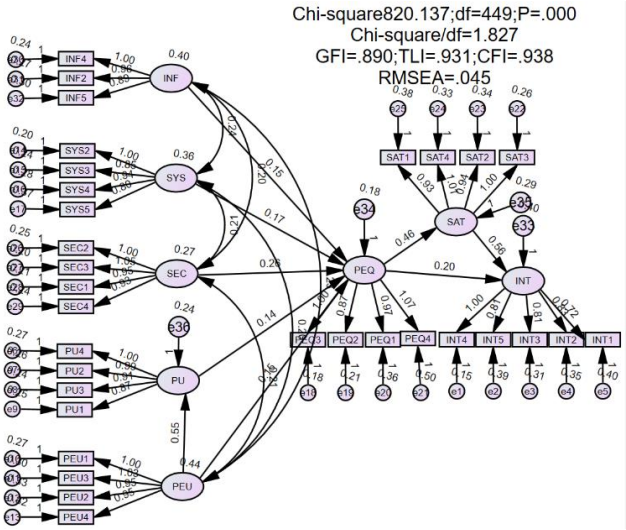

Fig.3: Test research hypotheses using SEM

Linear structural models represent cause-and-effect relationships between independent and dependent constructs (Hair et al., 2021). The indicators used to evaluate the model must meet the following conditions: CMIN/df ≤ 2 (McIver & Carmines, 1981), or CMIN/df ≤ 3 in some cases; GFI, TLI, CFI ≥ 0.9 (Bentler & Bonett, 1980). According to (Hair et al., 2010), a GFI value less than 0.9 can still be accepted. The results of the analysis are presented in Figure 3. The overall fit values of the model all meet technical requirements: GFI = 0.890 (smaller than the standard of 0.9 and within the acceptable limits); TLI = 0.928 (>0.9); CFI = 0.934 (>0.9); RMSEA = 0.045 (<0.08) meets the requirements.

Table 4. Discriminant validity test (Fornell-Larcker Criteria)

Structure	INF	SYS	SEC	PU	PEU	PEQ	SAT	INT
INF	**7.568**							
SYS	0.630	**7.205**						
SEC	0.607	0.669	**7.340**					
PU	0.453	0.429	0.579	**7.516**				
PEU	0.533	0.497	0.567	0.563	**7.671**			
PEQ	0.540	0.543	0.586	0.481	0.522	**7.381**		
SAT	0.325	0.409	0.423	0.406	0.416	0.401	**7.185**	
INT	0.225	0.218	0.336	0.247	0.297	0.343	0.527	**7.461**

The results of the discriminant validity test are presented in Table 4; the square root of AVE is larger than the correlation value in the rows and columns. Therefore, according to Fornell-Larcker criteria (Fornell & Larcker, 1981), the theoretical model's research concepts meet the discriminant validity requirement.

Research results show that the factors of information, system, security, usefulness, and ease of use have a positive impact on the Perceived quality of VR/AR, Perceived quality of VR has a positive impact on Satisfaction, and Satisfaction has a positive impact on the Travel intention (Table 5).

Table 5. Standardized regression weights of theoretical relationships

Hypotheses	Relationship			Weight	S.E	C.R	P	Conclusion
H1a	INF	→	PEQ	0.146	0.071	2.065	0.039	Supported
H1b	SYS	→	PEQ	0.166	0.079	2.097	0.036	Supported
H1c	SEC	→	PEQ	0.256	0.094	2.720	0.007	Supported
H1d	PU	→	PEQ	0.137	0.062	2.225	0.026	Supported
H1e	PEU	→	PEQ	0.151	0.072	2.085	0.037	Supported
H1f	PEU	→	PU	0.552	0.056	9.822	***	Supported
H2	PEQ	→	SAT	0.462	0.062	7.381	***	Supported
H3	PEQ	→	INT	0.202	0.076	2.670	0.008	Supported
H4	SAT	→	INT	0.565	0.080	7.041	***	Supported

R^2 for perceived quality of VR/AR = 0.468; R^2 for satisfaction = 0.202; R^2 for travel Intention = 0.296. Nine hypotheses were developed to confirm the conceptual framework of the study. Following the criteria proposed by Hair et al. (2019), we evaluated the relationships proposed in the hypotheses based on the explained variance (R^2) of the dependent variables and the path coefficients (β). As presented in Table 5, all the proposed hypotheses were supported at the $p < 0.05$ level. The results indicate that information quality (β = 0.146, p = 0.039), system quality (β = 0.166, p = 0.036), security (β = 0.256, p = 0.007), perceived usefulness (β = 0.137, p = 0.026), and ease of use (β = 0.151, p = 0.037) have a positive impact on perceived VR/AR quality, supporting H1a, H1b, H1c, H1d, and H1e. Ease of use (β = 0.552, p = 0.000) has a positive impact on perceived usefulness, supporting H1f. Furthermore, perceived VR/AR quality (β = 0.462, p = 0.000) has a positive impact on satisfaction, supporting H2. Perceived VR/AR quality (β = 0.202, p = 0.008) has a positive impact on travel intention, supporting H3. Satisfaction (β = 0.565, p = 0.000) has a positive impact on travel intention, supporting H4. The meaning of each path is explained as follows:

VR/AR Quality Attributes -> Perceived VR/AR Quality: This is an important path, as the perceived quality of the VR/AR technology is hypothesized to be a key driver of user satisfaction and travel intention.

Perceived VR/AR Quality -> Satisfaction: Study indicates that perceived VR/AR quality is expected to positively predict user satisfaction with the VR/AR experience. This relationship highlights the key role of quality perceptions in shaping the emotional/attitudinal response (satisfaction) of users.

Satisfaction -> Travel Intention: The study suggests that user satisfaction with the VR/AR experience will positively influence their travel intention or willingness to visit the destination. This path connects the attitudinal/emotional response (satisfaction) to the behavioral intention outcome of interest (travel intention).

Mediation Effect of Satisfaction: Satisfaction is expected to partially mediate the effect of perceived VR/AR quality on travel intention. This indicates that perceived quality influences travel intention both directly and indirectly through the intermediary of satisfaction. Exploring the mediating role of satisfaction provides a more nuanced understanding of the underlying mechanisms linking technology quality perceptions to behavioral intentions. The research results show that satisfaction mediates the relationship between the perceived quality of VR/AR and travel intention. With Sig coefficient =0.002<5%, the regression coefficient is 0.321, which means that the SAT factor will be better (increased by 1 unit), boosting the positive relationship between PEQ and INT by 0.321 units (Table 6).

Table 6. Standardized Indirect Effects

	INF	SEC	SYS	PEU	PU	PEQ	SAT	INT
PU	.000	.000	.000	.000	.000	.000	.000	.000
PEQ	.000	.000	.000	.085	.000	.000	.000	.000
SAT	.071	.102	.075	.115	.064	.000	.000	.000
INT	.057	.082	.061	.092	.052	**.204**	.000	.000

4.4. Test the difference between two groups of male and female tourists

According to survey results, the number of male tourists is 149 people, accounting for 36.5% while the number of female tourists is 259 people, accounting for 63.5% (Table 2). Perform multi-group analysis to test the difference between two groups of male and female tourist (Figure 4).

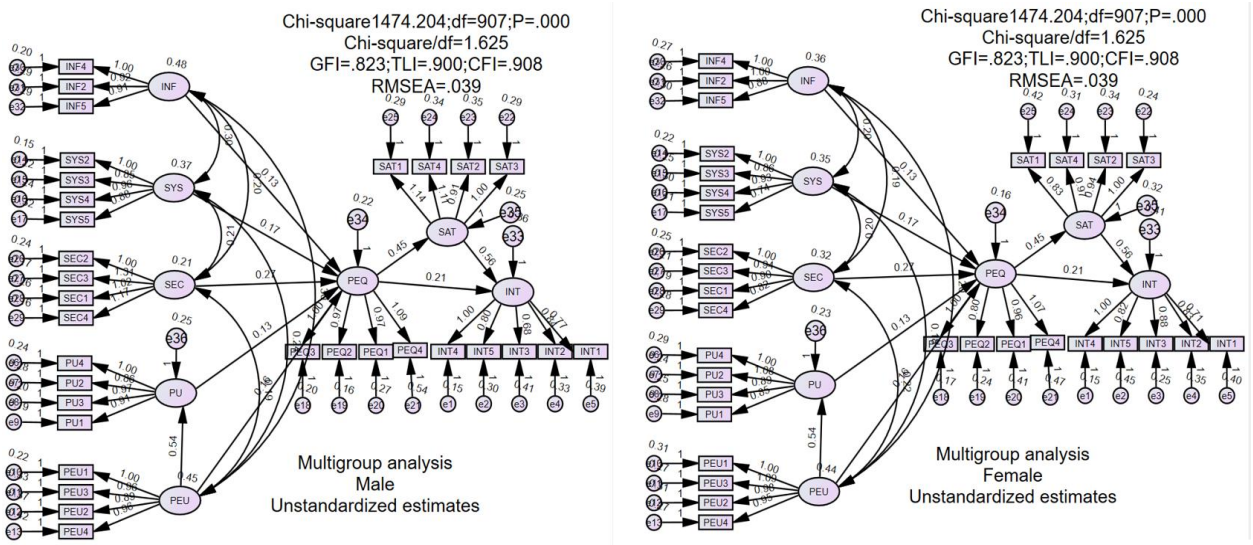

Fig.4: Model to test the relationship of male and female tourist groups

From the results of data analysis between two groups of male and female tourists; we can confirm that there is no difference between male and female tourists when evaluating the relationship between factors in the model. This means that male and female tourists have similar feelings about travel destinations.

5. Discussion

The results show that the attributes that affect VR/AR perceived quality are in the same direction as information (β = 0,146, p = 0,039), system (β = 0,166, p = 0,036), security (β = 0,256, p = 0,007), usefulness (β = 0,137, p = 0,026), and ease of use (β = 0,151, p = 0,037). This pivotal test supports previous studies (Dieck et al., 2016; Du et al., 2022; Jung et al., 2015; Jung et al., 2016; J. G. Lee et al., 2020); Zhang et al., 2022; Pai et al., 2020, which shows the importance of VR/AR technology information system quality on user perception in pre-trip experience. Ease of use affects usefulness int the same direction (β = 0,552, p = 0,000). This pivotal test supports previous studies (Chung et al., 2015; Dieck and Jung, 2015). The perceived quality of VR/AR significantly impacts satisfaction (β = 0,462, p = 0,000). This critical test supports previous studies (Lee et al., 2022; Jeong & Shin, 2019; (Russo et al., 2019; Sobarna, 2023; Zhu et al., 2023), affirming that users will be satisfied if the system has good quality. This reiterates that product quality, particularly in VR/AR, plays a pivotal role in user satisfaction. Satisfaction with the VR/AR experience is crucial, as it positively influences travel intention (β = 0,565, p = 0,000) in the indirection relationship between perceived quality of VR/ AR and travel intention, with Sig coefficient =0.002<5%, the regression coefficient is 0.204. This pivotal trial supports previous studies Jeong & Shin, 2019 (Chung et al., 2015; Tu et al., 2023). The study emphasizes that tourists' satisfaction using VR/AR significantly impacts their behavioral intentions toward the destination. The perceived quality of VR/AR significantly impacts travel intention (β = 0,202, p = 0,008). This critical test supports previous studies (Jeong & Shin, 2020; Sobarna, 2023; Wang et al., 2023). The PEQ has a direct effect on INT with a beta value of 0.202. This value is significantly smaller than the effect of PEQ on SAT (β = 0.46) and the effect of SAT on INT (β = 0.56). This emphasizes that although perceived quality of VR/AR experiences may lead to satisfaction, it is the

satisfaction that plays a more crucial role in enhancing travel intention.

Compared to prior studies, this research appears to take a more comprehensive approach by: (1) Examining the combined effects of both VR and AR technologies, rather than just VR or AR. (2) Investigating a broader set of quality attributes (information, system, security, usefulness, ease of use) as antecedents of perceived quality. (3) Explicitly testing the mediating role of satisfaction in the quality-intention relationship. (4) Comparing the effects across gender groups. This holistic model and multi-faceted analysis can provide deeper insights into how the specific features and characteristics of VR/AR technologies shape user perceptions, satisfaction, and ultimately their travel decision-making. The effect sizes for the individual paths will be important to understand the relative importance and practical significance of each relationship.

The study's findings provide crucial insights into consumer behavior towards innovative technology products, particularly in the context of the Vietnamese tourist industry, thereby underscoring its importance for the industry's growth and development. The proposed research model combines the ISS, TAM, and SOR models. The study emphasizes the importance of improving product quality for manufacturers and supporting businesses in attracting tourists to the destination. The research contributes to the theoretical understanding of consumer behavior towards VR/AR technology products. It provides practical implications for improving product quality and user intention in the tourism industry, making it highly relevant for manufacturers and supporting businesses.

This study reinforces VR/AR's impact on tourism and identifies critical factors influencing travel intention. Importantly, it empirically confirms the effectiveness of using VR/AR in tourism. The findings reveal a significant positive impact on VR/AR quality, satisfaction, and travel intention. The research indicators further elucidate that VR/AR attributes effectively provide information about the travel destination, satisfying the user's knowledge needs and fostering positive feelings and intentions about the destination.

6. Conclusion

This research investigates the factors influencing users' perceptions of the quality of VR/AR and their impact on satisfaction and travel intention in the context of Vietnamese tourism. Based on the ISS, TAM, and SOR frameworks, we propose and empirically test a conceptual model that links VR/AR quality attributes (information, system, security, perceived usefulness, perceived ease of use) to VR/AR quality, user satisfaction, and travel intention. The results largely support the proposed relationships, confirming the importance of perceived VR/AR quality and user satisfaction in shaping travel intention.

Theoretically, this study extends our understanding of VR/AR application in tourism by integrating insights from multiple theoretical perspectives and identifying core quality attributes that drive user perception and behavior. These findings emphasize the necessity to consider both technical (e.g., information, system) and user-centric (e.g., usefulness, ease of use) factors in the design and evaluation of VR/AR. The mediating role of satisfaction also highlights the emotional and experiential aspects of VR/AR use, beyond purely utilitarian considerations.

Practically, this research provides valuable insights for VR/AR developers and tourism marketers. To enhance travel intention, VR/AR applications should improve information quality, system reliability, security assurance, perceived usefulness, and perceived ease of use. Tourism service providers can leverage VR/AR to create rich and engaging experiences that meet user needs and preferences, ultimately driving visitation and destination choice.

This study has several limitations. First, the survey sample is small, so representativeness is low. Furthermore, the study only surveyed users between the ages of 18 and 55 in Ho Chi Minh City and Da Nang, so the results only reached a certain level of reliability. Therefore, the following research direction will expand the survey scope nationwide instead of only surveying users in Ho Chi Minh City and Da Nang. Expand the demographic scope, such as a more diverse survey age group, instead of limiting the age range from 18 to 55. Second, the research expands the investigation of factors affecting

the decision to choose a destination instead of just investigating the factors that influence travel intention as currently. Third, the cross-sectional survey design also precludes causal inferences and may be subject to common method biases. Future research could employ longitudinal designs or experiments to establish causal relationships and explore the boundary conditions of the proposed model. Extending the study to other countries and tourism segments would also enhance the external generalizability of the findings. Finally, the study will investigate differences between international and domestic tourist groups, income and age groups.

References

Althunibat, A., Almaiah, M. A., & Altarawneh, F. (2021). Examining the factors influencing mobile learning applications usage in higher education during the COVID-19 pandemic. *Electronics*, *10*(21), 2676.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, *103*(3), 411.

Assiouras, I., Giannopoulos, A., Mavragani, E., & Buhalis, D. (2024). Virtual reality and mental imagery towards travel inspiration and visit intention. *International Journal of Tourism Research*, *26*(2), e2646.

Baumgarth, C., & Binckebanck, L. (2011). Sales force impact on B-to-B brand equity: conceptual framework and empirical test. *Journal of product & brand management*, *20*(6), 487-498.

Bayraktar, E., Tatoglu, E., Turkyilmaz, A., Delen, D., & Zaim, S. (2012). Measuring the efficiency of customer satisfaction and loyalty for mobile phone brands with DEA. *Expert Systems with Applications*, *39*(1), 99-106.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological bulletin*, *88*(3), 588.

Bollen, K. A. (1989). *Structural equations with latent variables* (Vol. 210). John Wiley & Sons.

Chen, H., & Levkoff, S. E. (2015). Delivering telemonitoring care to digitally disadvantaged older adults: human-computer interaction (HCI) design recommendations. Human Aspects of IT for the Aged Population. Design for Everyday Life: First International Conference, ITAP 2015, Held as Part of HCI International 2015, Los Angeles, CA, USA, August 2-7, 2015. Proceedings, Part II 1,

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, *295*(2), 295-336.

Chung, N., Han, H., & Joun, Y. (2015). Tourists' intention to visit a destination: The role of augmented reality (AR) application for a heritage site. *Computers in Human Behavior*, *50*, 588-599.

Chung, N., Lee, H., Kim, J.-Y., & Koo, C. (2018). The role of augmented reality for experience-influenced environments: The case of cultural heritage tourism in Korea. *Journal of travel research*, *57*(5), 627-643.

Davis, F. D. (1989). Technology acceptance model: TAM. *Al-Suqri, MN, Al-Aufi, AS: Information Seeking Behavior and Technology Adoption*, 205-219.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, *19*(4), 9-30.

Dieck, M. C., Jung, T., & Han, D.-I. (2016). Mapping requirements for the wearable smart glasses augmented reality museum application. *Journal of Hospitality and Tourism Technology*, *7*(3), 230-253.

Do, H.-N., Shih, W., & Ha, Q.-A. (2020). Effects of mobile augmented reality apps on impulse buying behavior: An investigation in the tourism field. *Heliyon*, *6*(8).

Du, W., Liang, R.-y., & Liu, D. (2022). Factors influencing school teachers' continuous usage intention of using VR Technology for classroom teaching. *Sage Open*, *12*(3), 21582440221114325.

Elci, A., Abubakar, A. M., Ilkan, M., Kolawole, E. K., & Lasisi, T. T. (2017). The impact of travel 2.0 on travelers booking and reservation behaviors. *Business Perspectives and Research*, *5*(2), 124-136.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, *18*(1), 39-50.

Garau, C. (2014). From territory to smartphone: Smart fruition of cultural heritage for dynamic tourism development. *Planning Practice and Research*, *29*(3), 238-255.

Garvin, D. A., & Quality, W. D. P. (1984). Really mean. *Sloan management review*, *25*, 25-43.

Geng, D. C., Innes, J. L., Wu, W., Wang, W., & Wang, G. (2021). Seasonal variation in visitor satisfaction and its management implications in Banff National Park. *Sustainability*, *13*(4), 1681.

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

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*, *31*(1), 2-24.

Hair Jr, J., Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications.

Hair Jr, J. F., da Silva Gabriel, M. L. D., & Patel, V. K. (2014). Modelagem de Equações Estruturais Baseada em Covariância (CB-SEM) com o AMOS: Orientações sobre a sua aplicação como uma Ferramenta de Pesquisa de Marketing. *REMark-Revista Brasileira de Marketing*, *13*(2), 44-55.

Hu, M., & Chaudhry, S. S. (2020). Enhancing consumer engagement in e-commerce live streaming via relational bonds. *Internet Research*, *30*(3), 1019-1041.

Huang, C. D., Goo, J., Nam, K., & Yoo, C. W. (2017). Smart tourism technologies in travel planning: The role of exploration and exploitation. *Information & Management*, *54*(6), 757-770.

Huang, H., Gong, T., Ye, N., Wang, R., & Dou, Y. (2017). Private and secured medical data transmission and analysis for wireless sensing healthcare system. *IEEE Transactions on Industrial Informatics*, *13*(3), 1227-1237.

Huang, Y.-C., Backman, S. J., Backman, K. F., & Moore, D. (2013). Exploring user acceptance of 3D virtual worlds in travel and tourism marketing. *Tourism management*, *36*, 490-501.

Jeong, J., Mihelcic, J., Oliver, G., & Rudolph, C. (2019). Towards an improved understanding of human factors in cybersecurity. 2019 IEEE 5th International Conference on Collaboration and Internet Computing (CIC),

Jeong, M., & Shin, H. H. (2020). Tourists' experiences with smart tourism technology at smart destinations and their behavior intentions. *Journal of travel research*, *59*(8), 1464-1477.

Jorge, F., Losada, N., & Teixeira, M.-S. (2023). Behavioural intentions through virtual reality from a destination image perspective. *Journal of Place Management and Development*(ahead-of-print).

Jung, T., Chung, N., & Leue, M. C. (2015). The determinants of recommendations to use augmented reality technologies: The case of a Korean theme park. *Tourism management*, *49*, 75-86.

Jung, T., tom Dieck, M. C., Lee, H., & Chung, N. (2016). Effects of virtual reality and augmented reality on visitor experiences in museum. Information and Communication Technologies in Tourism 2016: Proceedings of the International Conference in Bilbao, Spain, February 2-5, 2016,

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.

Kim, S., Choi, M. J., & Choi, J. S. (2019). Empirical study on the factors affecting individuals' switching intention to augmented/virtual reality content services based on push-pull-mooring theory. *Information*, *11*(1), 25.

Lai, I. K. W., & Shi, G. (2015). The impact of privacy concerns on the intention for continued use of an integrated mobile instant messaging and social network platform. *International Journal of Mobile Communications*, *13*(6), 641-669.

Lee, H., Seo, H., & Geum, Y. (2018). Uncovering the topic landscape of product-service system research: From sustainability to value creation. *Sustainability*, *10*(4), 911.

Lee, J. G., Seo, J., Abbas, A., & Choi, M. (2020). End-Users' augmented reality utilization for architectural design review. *Applied Sciences*, *10*(15), 5363.

Lee, L. Y.-S. (2016). Hospitality industry web-based self-service technology adoption model: A cross-cultural perspective. *Journal of Hospitality & Tourism Research*, *40*(2), 162-197.

Lee, M., Lee, S. A., Jeong, M., & Oh, H. (2020). Quality of virtual reality and its impacts on behavioral intention. *International Journal of Hospitality Management*, *90*, 102595.

Leung, W. K., Chang, M. K., Cheung, M. L., & Shi, S. (2023). VR tourism experiences and tourist behavior intention in COVID-19: an experience economy and mood management perspective. *Information Technology & People*, *36*(3), 1095-1125.

Li, Y., Duan, Y., Fu, Z., & Alford, P. (2012). An empirical study on behavioural intention to reuse e-learning systems in rural China. *British Journal of Educational Technology*, *43*(6), 933-948.

Li, Y., Song, H., & Guo, R. (2021). A study on the causal process of virtual reality tourism and its attributes in terms of their effects on subjective well-being during COVID-19. *International Journal of Environmental Research and Public Health*, *18*(3), 1019.

Lin, X., Chang, S.-C., Chou, T.-H., Chen, S.-C., & Ruangkanjanases, A. (2021). Consumers' intention to adopt blockchain food traceability technology towards organic food products. *International Journal of Environmental Research and Public Health*, *18*(3), 912.

Liu, Y., Li, Q., Edu, T., & Negricea, I. C. (2023). Exploring the continuance usage intention of travel applications in the case of Chinese tourists. *Journal of Hospitality & Tourism Research*, *47*(1), 6-32.

Mahmoud Jebril, H. (2021). Exploring the Determinants of Students' Satisfaction and Continuance Intention Using Online Learning in Jordan.

McIver, J., & Carmines, E. G. (1981). *Unidimensional scaling*. sage.

Melo, M., Gonçalves, G., Jorge, F., Losada, N., Barbosa, L., Teixeira, M. S., & Bessa, M. (2024). The impact of virtual reality and biological sex on the promotion of tourist destinations: effects on destination image, place attachment, and behavioural intention. *Journal of Hospitality and Tourism Technology*, *15*(1), 18-36.

Moro, S., Rita, P., Ramos, P., & Esmerado, J. (2019). Analysing recent augmented and virtual reality developments in tourism. *Journal of Hospitality and Tourism Technology*, *10*(4), 571-586.

Nguyen, T. D., & Nguyen, T. T. (2011). Enhancing relationship value between manufacturers and distributors through personal interaction: Evidence from Vietnam. *Journal of Management Development*, *30*(4), 316-328.

No, E., & Kim, J. K. (2015). Comparing the attributes of online tourism information sources. *Computers in Human Behavior*, *50*, 564-575.

Oh, H., Fiore, A. M., & Jeoung, M. (2007). Measuring experience economy concepts: Tourism applications. *Journal of travel research*, *46*(2), 119-132.

Pahlevi, A. S., Sayono, J., & Hermanto, Y. A. L. (2021). Design of a virtual tour as a solution for promoting the tourism sector in the pandemic period. *KnE Social Sciences*, 368-374.

Pinto, A. S., Abreu, A., Costa, E., & Paiva, J. (2022). Augmented reality for a new reality: using UTAUT-3 to assess the adoption of mobile augmented reality in tourism (MART). *Journal of Information Systems Engineering and Management*, *7*(2), 14550.

Raykov, T., & Widaman, K. F. (1995). Issues in applied structural equation modeling research. *Structural Equation Modeling: A Multidisciplinary Journal*, *2*(4), 289-318.

Ronaghi, M. H., & Ronaghi, M. (2022). A contextualized study of the usage of the augmented reality technology in the tourism industry. *Decision Analytics Journal*, *5*, 100136.

Russo, I., Confente, I., Gligor, D., & Cobelli, N. (2019). A roadmap for applying qualitative comparative analysis in supply chain research: The reverse supply chain case. *International Journal of Physical Distribution & Logistics Management*, *49*(1), 99-120.

Samaddar, K., & Mondal, S. (2024). AR and VR-based travel: A responsible practice towards sustainable tourism. *International Journal of Tourism Cities*, *10*(1), 105-128.

Senalasari, W., Setiawati, L., & Wibisono, N. (2022). The Role of Technology Acceptance and Readiness on Intention to Adopt Virtual Tourism Technology during The New Normal Era. International Conference on Applied Science and Technology on Social Science 2022 (iCAST-SS 2022),

Sharma, A., & Sharma, R. (2019). Influence of Marketing Mavens on Consumer Switching: Role of Personality. *Journal of Marketing Development and Competitiveness*, *13*(2).

Sharma, A., Singh, J., & Prakash, G. (2023). Consumer confusion and its consequences in the e-hospitality marketplace: the mediating role of negative emotions. *Journal of Service Theory and Practice*, *33*(4), 488-510.

Shelstad, W. J., Smith, D. C., & Chaparro, B. S. (2017). Gaming on the rift: How virtual reality affects game user satisfaction. Proceedings of the human factors and ergonomics society annual meeting,

Sobarna, A. (2023). Virtual Reality Tourism: Linkage Tourist Intention, Satisfaction, and Quality: Moderating Role of Gender and Visiting Experience. *Journal of Marketing Innovation (JMI)*, *3*(1).

Tabachnick, B. G., & Fidell, L. S. (1983). *Using multivariate statistics*. HarperCollins Publishers.

Thomas-Francois, K., Somogyi, S., & Zolfaghari, A. (2023). The cultural acceptance of digital food shopping: conceptualisation, scale development and validation. *International Journal of Retail & Distribution Management*, *51*(3), 306-326.

Tu, R., Park, S. K., & Ding, Y. (2023). Travel intentions of travelers in the COVID-19 context: The moderation of fear of COVID-19. *Frontiers in Psychology*, *14*, 1136465.

Tussyadiah, I. P., Wang, D., Jung, T. H., & Tom Dieck, M. C. (2018). Virtual reality, presence, and attitude change: Empirical evidence from tourism. *Tourism management*, *66*, 140-154.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.

Wang, W.-T., Ou, W.-M., & Chen, W.-Y. (2019). The impact of inertia and user satisfaction on the continuance intentions to use mobile communication applications: A mobile service quality perspective. *International Journal of Information Management*, *44*, 178-193.

Wang, W., Cao, D., & Ameen, N. (2023). Understanding customer satisfaction of augmented reality in retail: a human value orientation and consumption value perspective. *Information Technology & People*, *36*(6), 2211-2233.

Wei, W. (2019). Research progress on virtual reality (VR) and augmented reality (AR) in tourism and hospitality: A critical review of publications from 2000 to 2018. *Journal of Hospitality and Tourism Technology*, *10*(4), 539-570.

Wu, C.-H., Lin, Y.-F., Peng, K.-L., & Liu, C.-H. (2023). Augmented reality marketing to enhance museum visit intentions. *Journal of Hospitality and Tourism Technology*, *14*(4), 658-674.

Wu, D. C., Song, H., & Shen, S. (2017). New developments in tourism and hotel demand modeling and forecasting. *International Journal of Contemporary Hospitality Management*, *29*(1), 507-529.

Wu, Y. F., & Kim, E. Y. (2022). Users' perceptions of technological features in augmented reality (AR) and virtual reality (VR) in fashion retailing: A qualitative content analysis. *Mobile Information Systems*, *2022*.

Xie, S., Yuan, Y., & Li, W. (2022). Research on the Impact of Virtual Reality Technology Perception on Tourist Engagement in the Context of Smart Tourism. Proceedings of the International Conference on Information Economy, Data Modeling and Cloud Computing, ICIDC 2022, 17-19 June 2022, Qingdao, China,

Xu, M., Niyato, D., Kang, J., Xiong, Z., Miao, C., & Kim, D. I. (2022). Wireless edge-empowered metaverse: A learning-based incentive mechanism for virtual reality. ICC 2022-IEEE International conference on Communications,

Yadav, N., Verma, S., & Chikhalkar, R. D. (2022). eWOM, destination preference and consumer involvement–a stimulus-organism-response (SOR) lens. *Tourism Review*, *77*(4), 1135-1152.

Yerden, N. K., & Uydacı, M. (2022). COVID 19 PANDEMİ SÜRECİNDE DESTİNASYON PAZARLAMASI BAĞLAMINDA MÜZELERDE SANAL TUR UYGULAMALARINA YÖNELİK KARŞILAŞTIRMALI ANALİZ. *Journal of Research in Business*, *7*(1), 229-248.

Yousafzai, S. Y., Foxall, G. R., & Pallister, J. G. (2007). Technology acceptance: a meta-analysis of the TAM: Part 1. *Journal of modelling in management*, *2*(3), 251-280.

Yuen, S. C.-Y., Yaoyuneyong, G., & Johnson, E. (2011). Augmented reality: An overview and five directions for AR in education. *Journal of Educational Technology Development and Exchange (JETDE)*, *4*(1), 11.

Zhang, Y., Sotiriadis, M., & Shen, S. (2022). Investigating the impact of smart tourism technologies on tourists' experiences. *Sustainability*, *14*(5), 3048.

Zheng, L., Miao, M., Lim, J., Li, M., Nie, S., & Zhang, X. (2020). Is lockdown bad for social anxiety in COVID-19 regions?: A national study in the SOR perspective. *International Journal of Environmental Research and Public Health*, *17*(12), 4561.

Zheng, Y., Zhao, K., & Stylianou, A. (2013). The impacts of information quality and system quality on users' continuance intention in information-exchange virtual communities: An empirical investigation. *Decision support systems*, *56*, 513-524.

Zhu, C., Io, M.-U., Ngan, H. F. B., & Peralta, R. L. (2023). Understanding augmented reality marketing in world cultural heritage site, the lens of authenticity perspective. *Journal of Vacation Marketing*, *29*(2), 242-255.