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Leveraging Virtual Reality Experiences to Shape Tourists' Behavioral Intentions: The Mediating Roles of Enjoyment and Immersion

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Abstract: This study investigates how virtual reality (VR) experiences influence tourists' intentions to visit Da Lat, Vietnam, as a botanical destination, emphasizing the mediating roles of enjoyment and immersion. By integrating flow theory with the Information Systems Success model, this research develops a comprehensive framework explaining how content quality, system quality, and VR vividness shape user engagement and travel intentions. Using Structural Equation Modeling (SEM), the study analyzes survey data from 231 valid responses out of 240 participants. The findings reveal that content quality, system quality, and vividness significantly enhance enjoyment and immersion, which subsequently have a positive impact on travel intentions. The study contributes to the tourism and consumer experience literature by demonstrating how multisensory engagement in VR fosters decision-making. Theoretical implications include extending flow theory within virtual tourism and highlighting the joint influence of technological and perceptual factors on user behavior. Practically, these insights inform tourism marketers on optimizing VR environments to evoke emotional engagement and enhance destination appeal through immersive technology.

Keywords: virtual reality; destination marketing; travel intentions; enjoyment; immersion; flow states

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1. Introduction

Virtual reality (VR) has emerged as a transformative tool in the tourism industry, offering destination marketers a novel approach to enhancing promotional efforts through immersive sensory experiences [1]. Unlike traditional marketing methods that rely on static images or descriptions, VR enables tourists to interactively explore and experience destinations, supporting their information-seeking and decision-making processes. As Cho, Wang, and Fesenmaier [1] suggest, "When tourists seek information about a destination, they want to know not only its natural features but also what the experience of that destination feels like". VR allows potential visitors to explore and form impressions of destinations from the comfort of their homes, creating a stronger emotional connection and increasing the likelihood of choosing these destinations [2].

The growing application of VR in tourism marketing is a response to intensifying competition between destinations. As the tourism market becomes increasingly saturated, destination marketers must innovate to capture the interest of potential visitors. VR offers a significant advantage over traditional promotional methods, providing immersive experiences that foster emotional connections between tourists and destinations. According to Hays, Page, and Buhalis [3], VR's appeal lies in its ability to offer vivid, sensory-rich

experiences that promote a sense of presence, which is crucial for creating high levels of engagement in virtual environments [4,5].

This technological revolution, driven by VR, has reshaped how tourists plan and book their trips. The widespread use of the Internet has already transformed tourist behavior, altering how information is gathered and travel decisions are made [6]. As one of the most notable advancements in digital marketing, VR can dramatically shift destination management practices by offering richer, more engaging experiences than traditional brochures or websites [7]. VR enables users to "try before they buy", allowing potential tourists to evaluate a destination remotely, enhancing familiarity and sentiment toward the location [8].

Several studies have highlighted VR's potential to enhance destination image through immersive experiences [9]. VR-generated content allows tourists to explore destinations in lifelike virtual environments, creating an "almost-there" effect that increases excitement and engagement. This effect can be especially influential when potential visitors are comparing multiple destinations [10,11]. These VR experiences, enhanced by vivid content and high-quality systems, provide tourists with valuable information that can outperform conventional media in terms of engagement and memorability [1].

Recent research on tourist behavior in VR contexts has focused on behavioral intentions and the factors influencing them. For example, Suhartanto et al. [12] found that destination experience quality significantly impacts tourist satisfaction and, in turn, behavioral intentions. However, VR tourism experiences differ from traditional experiences due to their reliance on content quality and system quality [13]. To create a compelling VR tourism experience, high-quality systems and vivid images are essential. Researchers have increasingly explored the importance of content quality, system quality, and vividness in virtual tourism [14], yet a gap remains regarding the separate and specific impacts of content and system quality on tourist behavioral intentions.

Despite the undeniable potential of VR as a marketing tool, further theoretical research is needed to determine the key factors that drive tourists to visit destinations explored virtually. Guttentag [7] highlights VR's strength in providing deep sensory information, a feature that suits the tourism industry, which is known for the intangibility of its products. For tourists, VR offers clear benefits, such as an enhanced travel experience that provides more than just a superficial understanding of a destination's appeal [15]. This study aims to build on existing research by examining the role of enjoyment and immersion—two psychological states induced by VR experiences—in shaping behavioral intentions. Specifically, it hypothesizes that enjoyment and immersion mediate the relationship between sensory inputs from VR and behavioral outcomes, leading to stronger travel intentions.

The global trend toward VR tourism has gained momentum, although VR adoption in the Vietnamese tourism industry remains in its early stages. Nevertheless, VR is gradually gaining traction in Vietnam, with several destinations adopting the technology to offer new experiences. For example, tourists at the Sun World Ba Na Hills resort in Da Nang can engage in VR activities like skiing, mountain adventures, and racing along peaks. Additionally, the 2020 Vietnam International Travel Mart (VITM) introduced VR-based tours that allowed visitors to explore Vietnam's cultural heritage sites, including a virtual walk through the historic streets of Hoi An. Recognizing VR's potential, the World Travel & Tourism Council (WTTC) has encouraged governments to increase budgets and leverage VR to promote destinations, especially during challenges such as the COVID-19 pandemic [16]. Furthermore, the World Economic Forum [17] projects the VR tourism industry to reach $200 billion by 2027, underscoring the need for further investigation into VR's impact on tourism marketing and management.

This study aims to explore how VR technology influences tourists' behavioral intentions within destination marketing. By focusing on the mediating roles of enjoyment and immersion, it seeks to provide insights into how VR can enhance tourism marketing strategies, with practical implications for the development of VR-based destination promotion.

2. Literature Review

2.1. Key Concepts

Virtual reality (VR) is increasingly recognized as a powerful tool in tourism marketing, offering immersive experiences that simulate real-life environments [7,18]. Defined as a digital medium that creates 3D replicas of real-world settings, VR engages users through visual and auditory stimuli [19]. Applications like Google Maps and Google Street View allow potential tourists to explore destinations virtually, enhancing their tourism experience and appealing to their interests. By integrating sound, imagery, and 3D visualization, VR fosters strong emotional connections to simulated environments, making it a valuable asset across various sectors, including retail and tourism [20,21].

In tourism, VR fulfills several roles: it enables virtual interaction with destinations, enhances emotional bonds, and assists in travel decision-making by providing previews of tourist sites [22–24]. These virtual experiences can reduce anxiety associated with unfamiliar places, promoting confidence in travel planning [25]. The intention to travel in VR contexts refers to an individual's motivation to visit a specific destination, which relates to future travel behaviors [22]. Chen and Tsai [26] operationalize travel intention through indicators like information gathering and revisitation, affirming that VR tourism significantly enhances travel intentions compared to traditional marketing methods.

Research indicates that both intrinsic and extrinsic motivators in VR tourism marketing positively impact tourists' intentions to visit [26]. Chen and Tsai [26] emphasize the connection between positive emotions and travel intentions, suggesting that VR engagement drives tourist intent.

Understanding VR engagement involves two key constructs: enjoyment and immersion. Enjoyment, defined as the inherent pleasure of an activity, influences post-experience behaviors [27]. Immersion, described by Gutierrez et al. [28] as the degree of disconnection from reality, enhances users' feelings of presence in virtual environments.

This study is underpinned by Csikszentmihalyi's [29] Flow Theory, which posits that optimal engagement occurs when skills align with challenge levels. Flow is characterized by total immersion and altered time perception—conditions fostered by VR environments [30]. Flow theory has been applied effectively in both online and educational contexts [31,32], indicating its relevance to VR tourism, where flow experiences impact engagement and travel intentions [33].

2.2. Research Framework

Understanding tourist behavioral intentions and the factors influencing them is crucial in tourism research. Satisfaction with destination experiences significantly affects behavioral intentions. For instance, Suhartanto et al. [12] found that destination experience plays a key role in influencing tourist satisfaction, ultimately leading to positive behavioral intentions. However, VR tourism experiences differ from traditional tourism, as they are shaped by content quality and system quality [13,34]. High-quality content and systems are essential for fostering positive behavioral intentions in VR tourism [31,35].

Emotional engagement through VR enhances the user's sense of realism [36], with full emotional immersion increasing perceptions of authenticity, thus promoting behavioral intentions to visit actual destinations [7]. Emotional engagement is conceptualized through immersion, enjoyment, and connection with tourism activities [37]. Flow theory explains

how complete involvement in VR experiences can enhance user engagement and influence potential tourist behavior [34,37].

This study proposes a research model based on the Information Systems (IS) Success Model, positing that VR tourism components—content quality, system quality, and VR vividness—affect perceived enjoyment and immersion, which subsequently influence tourists' behavioral intentions (see Figure 1). Building on DeLone and McLean's [38] IS model, which highlights system quality, information quality, and user satisfaction as the key to digital system success, we adapt these components to VR tourism. By integrating flow theory with the IS model, this study offers a comprehensive framework for understanding how VR influences tourists' emotional and behavioral responses, addressing the gap in research on flow's impact on real-world travel intentions.

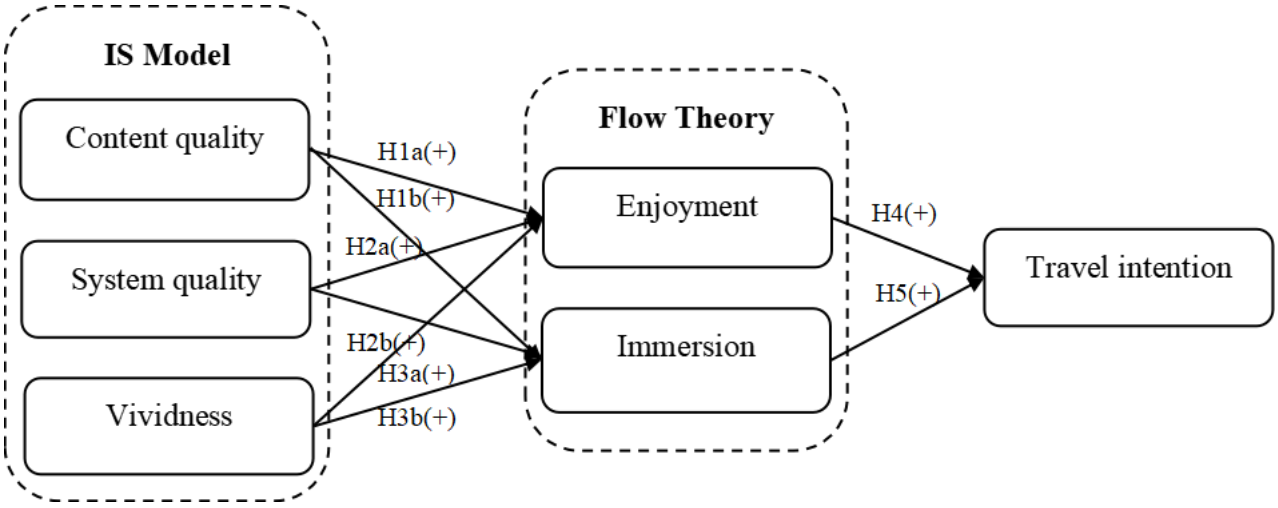


Figure 1. Research Model.

The proposed framework suggests that content quality, system quality, and vividness positively impact enjoyment and immersion, which subsequently enhance travel intentions. Based on this, the following hypotheses are developed.

2.3. Hypotheses Development

2.3.1. Content Quality

Content quality in virtual reality (VR) tourism encompasses the accuracy, usefulness, understandability, duration, and integrity of the information presented [22]. Previous research emphasizes that high-quality content—characterized by rich visuals, accurate information, and engaging presentations—enhances user enjoyment and immersion, thereby increasing the likelihood of future visits to real destinations [34,39]. This leads to the following hypotheses:

H1a. *Content quality positively impacts the enjoyment of VR users.*

H1b. *Content quality positively impacts the immersion of VR users.*

2.3.2. System Quality

System quality refers to the seamless integration of system components, which enhances accessibility, response time, and flexibility [22]. A high-quality system facilitates ease of use and ensures a smooth user experience in VR tourism [18,40]. When the system operates efficiently, users are more likely to enjoy their experience, increasing their

overall satisfaction and intention to visit destinations. Thus, the following hypotheses are proposed:

H2a. *System quality positively impacts the enjoyment of VR users.*

H2b. *System quality positively impacts the immersion of VR users.*

2.3.3. Vividness

Vividness in VR is defined by the richness of sensory experiences, which significantly influences user engagement and emotional responses [41]. A vivid VR presentation enhances immersion and enjoyment by providing realistic and engaging representations [34,42]. Consequently, we propose:

H3a. *Vividness positively impacts the enjoyment of VR users.*

H3b. *Vividness positively impacts the immersion of VR users.*

2.3.4. Enjoyment

Enjoyment plays a crucial role in shaping user attitudes and intentions toward adopting technologies [43]. Prior studies indicate that perceived enjoyment directly influences users' behavioral intentions [18,44]. In the context of VR tourism, it is hypothesized that enjoyment derived from VR experiences positively correlates with actual travel intentions:

H4. *Enjoyment has a positive effect on travel intentions.*

2.3.5. Immersion

Immersion is a key aspect of VR that significantly enhances user engagement and presence [45]. Research shows that higher levels of immersion facilitate better evaluations of destinations and increase the likelihood of travel intentions [7,34]. Therefore, we propose:

H5. *Immersion has a positive effect on travel intentions.*

3. Research Methods

3.1. Research Design

This study adopted a mixed-method approach, combining qualitative and quantitative methods. The research process began with a qualitative phase to refine the conceptual model and questionnaire, followed by a quantitative survey to test the hypothesized relationships using Structural Equation Modeling (SEM).

3.2. Qualitative Research

The qualitative phase aimed to validate the research instrument and ensure cultural relevance. A questionnaire was adapted from prior studies and translated into Vietnamese. To enhance its clarity and contextual appropriateness, in-depth interviews were conducted with 10 participants, comprising office workers and students familiar with VR tourism.

The qualitative phase was structured into two rounds: (i) Participants evaluated the conceptual factors and measurement items derived from existing literature (e.g., [1,14,30,45,46]). Their feedback informed refinements to improve clarity and contextual alignment; (ii) A pilot survey was conducted with the same participants to assess the comprehensibility and relevance of the questionnaire items, particularly those measuring content quality, system quality, vividness, immersion, enjoyment, and travel intentions.

3.3. Quantitative Research

3.3.1. Sampling and Data Collection

The finalized questionnaire was administered to a sample of potential tourists in Ho Chi Minh City. Following Hair et al.'s [47] recommendation of a minimum 5:1 ratio of observations to variables, a target sample size of 240 respondents was set. Convenience sampling was employed, and data collection was conducted online via Google Forms from May to June 2024.

To ensure data quality, participants were screened using preliminary questions regarding their VR tourism experience and prior visits to Da Lat, Vietnam. Eligible respondents then viewed a 360-degree video simulating a VR experience of Da Lat before completing the survey.

3.3.2. Measurements

The questionnaire measured multiple constructs using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree; see Appendix A), including (i) Content quality: perceived value and informativeness of the VR content; (ii) System quality: technical performance and ease of use of the VR platform; (iii) Vividness: sensory richness and clarity of the VR experience; (iv) Immersion: degree of deep engagement with the VR environment; (v) Enjoyment: emotional satisfaction and pleasure derived from the VR experience; and (vi) Travel intentions: likelihood of visiting Da Lat as a result of the VR experience.

3.4. Data Analysis

Structural Equation Modeling (SEM) was employed to test the hypothesized relationships among the study variables using SPSS 26 and AMOS 24.

4. Results and Discussion

4.1. Sample Description

After filtering, 231 valid responses were retained, achieving a response rate of 91%. The detailed statistical description of the sample is presented in Table 1.

Table 1. Sample Characteristics.

Characteristics		N = 231	%
Gender	Male	102	43.9
	Female	129	56.1
Age	Under 30 years	111	47.9
	30 to 45 years	108	46.9
	Over 45 years	12	5.1
Education Level	Below undergraduate	80	34.8
	Undergraduate	87	37.6
	Postgraduate	64	27.6
Marital Status	Single	164	71.2
	Married	67	28.8

Regarding gender distribution, among the 231 official quantitative surveys, there were 102 male respondents (43.9%) and 129 female respondents (56.1%). This data indicates a relatively balanced representation between genders.

In terms of age, the distribution was as follows: 111 respondents (47.9%) were under 30 years old, 108 respondents (46.9%) were between 30 and 45 years old, and 12 respondents (5.1%) were over 45 years old, indicating a predominance of younger participants.

For educational background, the breakdown shows that 80 respondents (34.8%) had below-university education, 87 respondents (37.6%) held a bachelor's degrees, and 64 respondents (27.6%) were postgraduates. This highlights that the majority of the participants held university degrees.

4.2. Measurement Testing

4.2.1. Reliability

According to Hair et al. [47], a Cronbach's Alpha value from 0.8 to nearly 1 indicates good reliability, while values between 0.7 and 0.8 are acceptable, and values above 0.6 are acceptable in the context of new or contextually unique constructs.

When deciding whether to eliminate any variables, researchers can rely on two coefficients: Cronbach's Alpha if the item is deleted and the item-total correlation. If the former is higher than the overall Cronbach's Alpha, it suggests that removing the variable may increase the overall reliability. Additionally, an item-total correlation below 0.3 signals that the observation variable may be a candidate for removal to improve the scale's coherence. The results of the Cronbach's Alpha analysis are shown in Table 2.

Table 2. Cronbach's Alpha Coefficients.

Constructs	Cronbach's Alpha
Content Quality (CLND)	0.853
System Quality (CLHT)	0.810
Vividness (SSD)	0.859
Enjoyment (STT)	0.832
Immersion (SDC)	0.821
Travel Intention (YDDL)	0.843

The results show that all scales exhibit a Cronbach's Alpha value above the acceptable threshold of 0.8, indicating good reliability. Each scale's item-total correlations also exceeded 0.3, confirming that the measurements are robust. Consequently, a total of 24 observed variables are included for further EFA.

4.2.2. Exploratory Factor Analysis

EFA was conducted to examine the interdependencies among variables within the model [47]. Key criteria for evaluating EFA include the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity.

The KMO value for this study was found to be 0.846, which is above the threshold of 0.5, indicating that the data is suitable for factor analysis. Additionally, Bartlett's Test showed a significance $p = 0.000$, confirming the presence of correlations among the observed variables.

Following this, factor analysis was performed using Principal Components with Varimax rotation. The criteria examined included Average Variance Extracted (AVE) and the Eigenvalue of the factors. The AVE indicates the percentage of variance captured by the factors; a value of 50% or more is deemed acceptable. The Eigenvalue criterion suggests that only factors with values of 1 or greater should be retained in the model.

The results demonstrated that the 24 initial observed variables were grouped into six distinct factors. The total variance explained was 57.560%, which exceeds the 50%

requirement, indicating that these six factors account for a significant proportion of variance in the data. The lowest Eigenvalue among these factors was 1.634, confirming the retention of all six factors.

The factor loading matrix revealed that all factor loadings were above 0.5, with no variable loading onto more than one factor with similar loadings, thus confirming convergent and discriminant validity. There were no cross-loadings among the factors, suggesting a clear distinction between the variables corresponding to different factors.

4.2.3. Confirmatory Factor Analysis

In CFA, a model is considered to fit market data if the Chi-square test yields a *p*-value greater than 0.05. However, since the Chi-square statistic is influenced by sample size, model fit is also assessed using the Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI), both of which should range from 0.9 to 1.0. Additionally, the adjusted Chi-square statistic (CMIN/df) should be less than 2, and the Root Mean Square Error of Approximation (RMSEA) should be below 0.08 [48]. The results indicate that all fit indices meet the established criteria.

Furthermore, convergent validity, discriminant validity, and reliability were assessed in CFA. If these criteria are not met, it can lead to inaccurate analysis results [47]. In this study, the CR values ranged from 0.811 to 0.860, all exceeding the 0.7 threshold, which confirms the reliability of the survey instrument. The AVE values ranged from 0.519 to 0.605, all above 0.5, indicating satisfactory convergent validity. The MSV values were all lower than the respective AVE values, confirming that the scales achieved discriminant validity.

Lastly, following Fornell and Larcker's [49] recommendations, the square root of AVE for each construct was compared with the correlations among latent variables. The results indicate that the square roots of AVE for all constructs were greater than the correlations among the latent variables, confirming that the scales met the requirements for reliability and validity (see Table 3).

Table 3. Discriminant Validity Analysis.

	SSD	CLND	YDDL	SDC	STT	CLHT
SSD	**0.778**					
CLND	0.350	**0.770**				
YDDL	0.262	0.327	**0.758**			
SDC	0.311	0.350	0.324	**0.733**		
STT	0.424	0.457	0.312	0.300	**0.743**	
CLHT	0.265	0.407	0.391	0.397	0.381	**0.720**

The comprehensive results indicate that the measurement scales are reliable and valid, thus supporting the findings of this study.

4.3. Model Testing

4.3.1. Structural Model

Next, a linear SEM structural model test was conducted to evaluate the proposed hypotheses in the research model. In this analysis, the results of the linear structural model analysis are shown in Table 4.

The results indicate that all standardized regression estimates are statistically significant ($p < 0.05$), leading us to conclude that all proposed hypotheses are accepted.

Table 4. SEM Model Correlation Results.

Relationship	Unstandardized Estimate	Standardized Estimate	S.E.	C.R.	*p*
STT <--- CLND	0.305	0.286	0.089	3.424	***
SDC <--- CLND	0.190	0.179	0.092	2.080	0.037
STT <--- CLHT	0.224	0.202	0.089	2.513	0.012
SDC <--- CLHT	0.322	0.290	0.096	3.341	***
STT <--- SSD	0.256	0.276	0.072	3.574	***
SDC <--- SSD	0.164	0.177	0.074	2.225	0.026
YDDL <--- STT	0.283	0.255	0.088	3.219	0.001
YDDL <--- SDC	0.300	0.270	0.089	3.357	***

Note: *** $p < 0.001$.

The results of the SEM model analysis show that Chi-square/df = 1.214 < 3, *p*-value = 0.013 < 0.05 (5%), RMSEA = 0.030 < 0.08, GFI = 0.910 > 0.8; CFI = 0.978 > 0.9, TLI = 0.974 > 0.9. Therefore, the model fits well with the data collected from the market.

4.3.2. Bootstrapping Model

Bootstrapping was performed to test the bias between the standardized estimates in the SEM model and the average standardized estimates of the bootstrap. If this bias is very small, we can conclude that the initial estimates in the SEM model are reliable. The number of resampling iterations without replacement was set to 1000. The bootstrap analysis results are shown in Table 5.

Table 5. Bootstrapping (n = 1000).

Relationship	SE	SE-SE	Mean	Bias	SE-Bias
STT <--- CLND	0.1	0.002	0.303	−0.002	0.002
STT <--- CLHT	0.11	0.002	0.229	0.004	0.002
STT <--- SSD	0.077	0.001	0.258	0.002	0.002
SDC <--- SSD	0.087	0.001	0.163	−0.001	0.002
SDC <--- CLHT	0.096	0.002	0.327	0.005	0.002
SDC <--- CLND	0.106	0.002	0.192	0.002	0.002
YDDL <--- STT	0.095	0.001	0.279	−0.004	0.002
YDDL <--- SDC	0.091	0.001	0.304	0.005	0.002

The results show that the bias (Bias column) is very small, indicating that the parameter estimates of the model are reliable.

4.4. Results Discussion

At a 95% confidence level, the results presented in Table 4 indicate that all hypotheses (H1 to H5) are accepted, as reflected in the *p*-values. Specifically, the analysis demonstrates that content quality positively affects user enjoyment in VR, with β = 0.286, $p = 0.000$, thus confirming the hypothesis H1a. This suggests that higher-quality content in VR enhances user enjoyment, aligning with Wismantoro et al. [14,15], who state that well-integrated and presented content positively influences tourists' enjoyable experiences and behavioral intentions. Content quality also positively impacts user immersion in VR, with β = 0.179, $p = 0.037$, meaning hypothesis H1b is accepted. This result indicates that better content quality leads to increased user immersion, consistent with Wismantoro et al. [24,25], who

highlight the positive effect of effectively integrated content on immersive experiences, which in turn boost tourists' behavioral intentions.

The analysis shows that system quality positively affects user enjoyment in VR, with $\beta = 0.202$, $p = 0.012$, confirming hypothesis H2a. This finding suggests that improved system quality in VR enhances user enjoyment. System quality also positively influences user immersion in VR, with $\beta = 0.290$, $p = 0.000$, thus confirming hypothesis H2b. This indicates that better system quality enhances user immersion, providing new insights into the role of system quality in VR experiences.

The vividness of VR positively affects user enjoyment, with $\beta = 0.276$, $p = 0.000$, confirming hypothesis H3a. This result supports Nguyen, Le, and Chau [32], who found that the vividness of VR enhances enjoyment and positively influences attitudes and intentions to visit among tourists. The vividness of VR also positively impacts user immersion, with $\beta = 0.177$, $p = 0.026$, thus confirming hypothesis H3b. This finding aligns with Nguyen, Le, and Chau [32], suggesting that vividness enhances immersion, fostering positive attitudes and intentions to visit the destination.

User enjoyment positively affects travel intentions, with $\beta = 0.255$, $p = 0.001$, thus confirming hypothesis H4. This finding suggests that higher enjoyment increases customers' travel intentions, consistent with research by Utami et al. [45], Ho et al. [50], and Kim et al. [51]. User immersion also positively influences travel intentions, with $\beta = 0.270$, $p = 0.000$, confirming hypothesis H5. This result indicates that greater immersion enhances customers' travel intentions, in line with findings by Utami et al. [45], Kim et al. [51], and Gao et al. [52].

The analysis reveals significant relationships between the variables of interest. The Structural Equation Modeling (SEM) analysis shows that content quality, system quality, and vividness all positively influence enjoyment and immersion. Specifically, the standardized beta coefficients indicate that content quality has a stronger influence on enjoyment ($\beta = 0.286$) than on immersion ($\beta = 0.179$), while system quality has a greater impact on immersion ($\beta = 0.290$) than on enjoyment ($\beta = 0.202$). The vividness of the VR environment significantly influences both enjoyment ($\beta = 0.276$) and immersion ($\beta = 0.177$).

In terms of the effects of enjoyment and immersion on travel intentions, both flow states significantly predict tourists' behavioral intentions. Enjoyment positively affects travel intentions ($\beta = 0.255$), as does immersion ($\beta = 0.270$). These findings suggest that tourists who experience higher levels of enjoyment and immersion during their VR experience are more likely to develop intentions to visit the destination in real life.

These results are consistent with previous studies on VR in tourism, which have demonstrated that VR can enhance tourists' emotional engagement with destinations and increase their likelihood of visiting. For example, Kim and Hall [23] found that the vividness of a VR environment positively influenced users' emotional responses and behavioral intentions. The current study confirms the role of sensory input in shaping tourists' flow states and subsequent travel decisions.

5. Conclusions and Implications

5.1. Conclusions

This study aimed to investigate the relationship between information systems, flow states, and travel intentions following virtual reality (VR) experiences. Specifically, it examined how content quality, system quality, and vividness—key components of the information systems model—affect flow states and subsequent travel intentions after a VR experience. The results indicate that content quality significantly enhances user enjoyment and immersion in VR. System quality also positively influences enjoyment and immersion,

while vividness further contributes to these flow states. In turn, both enjoyment and immersion were positively associated with travel intention.

This study offers several theoretical contributions. First, it provides empirical evidence for the mediating roles of enjoyment and immersion in connecting VR experiences to travel intentions, extending flow theory within the context of virtual tourism. Second, by integrating flow theory with the Information Systems Success model, this research develops a comprehensive framework that explains how technological and perceptual factors jointly shape user engagement and behavioral intentions. Third, the findings contribute to the broader tourism and consumer experience literature by reinforcing the role of multisensory engagement in shaping attitudes and behavioral outcomes. By demonstrating how specific VR attributes facilitate flow states, this study deepens the understanding of how digital experiences influence decision-making in tourism.

From a practical perspective, tourism marketers should focus on enhancing sensory richness and vividness within VR environments. By creating more immersive and enjoyable VR experiences, marketers can foster stronger emotional connections with the destinations, potentially increasing tourists' motivation to visit. Additionally, the study highlights the significance of system quality, particularly the responsiveness and usability of VR systems, in sustaining user immersion and engagement. Investing in high-quality VR technology is essential to achieving these marketing goals.

From a managerial standpoint, the findings provide actionable insights for tourism businesses aiming to use VR as an effective promotional tool. First, visually appealing, high-quality VR content should be a priority, as the vividness of virtual environments is key to capturing attention and fostering immersion. Second, technical aspects of VR, including ease of use and responsiveness, are crucial for maintaining user engagement. Tourism businesses are encouraged to invest in advanced VR technology to enhance the overall user experience.

In summary, as VR technology continues to evolve and becomes more integrated into tourism marketing strategies, its potential to influence tourists' decision-making will likely grow. This study adds to the growing body of literature on VR in tourism by demonstrating that flow states like enjoyment and immersion play a mediating role in the relationship between VR experiences and travel intentions. Future research should consider additional factors, such as social presence and personalization, to further enhance VR's effectiveness as a tool in tourism marketing.

5.2. Managerial Implications

The rapid advancements in VR technology offer significant opportunities for the tourism sector to integrate VR content into its promotional strategies. Earlier studies by Mills and Law [53] and Schuemie et al. [54] highlighted the potential of VR in enhancing tourism by providing interactive, engaging experiences and offering comprehensive destination information to potential travelers.

5.2.1. Enhancing VR System Quality

The results underscore that system quality has a strong impact on user immersion in VR ($\beta = 0.290$), though its effect on enjoyment is somewhat lower ($\beta = 0.202$). Descriptive statistics indicate that system quality ratings ranged from 3.5758 to 3.6147, with interactivity being particularly valued (CLHT3 = 3.6147). However, system responsiveness received a lower rating (CLHT2 = 3.5758), suggesting that accessibility issues could hinder the user experience. Managers should prioritize designing user-friendly VR systems. Incorporating intuitive controls, simplified login processes (such as social media integration), and clear instructions will significantly enhance user engagement. Furthermore, ensuring compre-

hensive navigation and integrating multimedia elements (e.g., text, images, videos) will improve the virtual tour experience.

5.2.2. Improving VR Content Quality

Content quality emerged as a critical factor influencing enjoyment (β = 0.286), although its effect on immersion was weaker (β = 0.179). Descriptive statistics revealed average content quality ratings between 3.4762 and 3.5887, with comprehensive destination views being particularly well-rated (CLND3 = 3.5065). Enhancing the quality of video and 3D images can lead to higher user immersion. Tourism agencies should collaborate with local stakeholders to create VR programs that showcase the destination's key attractions, culture, and experiences. Strategic investments in infrastructure, paired with high-quality VR content, can further attract potential tourists. Partnerships with influential brands or social media influencers could increase visibility and engagement.

5.2.3. Enhancing VR Vividness

Vividness was found to significantly influence enjoyment (β = 0.276), with a lesser effect on immersion (β = 0.177). Descriptive statistics indicate average vividness ratings between 3.3766 and 3.4675. To improve user engagement, VR developers should focus on crafting immersive environments that help users form meaningful connections with destinations. Providing serene, visually rich atmospheres with accurate, detailed information throughout the virtual tour can stimulate emotional responses. By carefully designing symbolic and mimetic elements, developers can foster a deeper sense of enjoyment and engagement in the virtual experience.

5.3. Limitations and Future Research

This study acknowledges several limitations that could offer opportunities for future research. First, the diverse preferences for VR technology among respondents suggest that individual characteristics should be considered in future studies to better understand different user perceptions. Second, the study sample predominantly comprised university students, graduate students, and office workers from Ho Chi Minh City, limiting its representativeness. Future research should include more diverse geographical regions and cultural contexts to explore potential cultural differences. Lastly, the reliance on cross-sectional data analysis may not capture the long-term psychological effects of VR experiences. Longitudinal studies are recommended to examine how VR experiences impact users' attitudes and behaviors over extended periods [55].

Despite these limitations, this study highlights the significant influence of VR experiences on tourists' behavioral intentions, mediated by flow states of enjoyment and immersion. The findings underscore the importance of content quality, system quality, and vividness in shaping emotional responses to VR environments, which, in turn, affect travel intentions. By enhancing these elements of the VR experience, tourism marketers can develop more engaging and effective strategies that encourage tourists to explore and ultimately visit real-world destinations [53,55].

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Institutional Review Board Statement: In accordance with ethical guidelines, this study obtained approval from the Ethics Committee at Ho Chi Minh City Open University. The study was conducted in compliance with their ethical standards, and informed consent was obtained from all participants prior to their participation in the study. The approval reference number for this study is E2022.06.2.

Data Availability Statement: Data associated with this research are available upon request.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Measurement of Constructs.

No.	Items	Sources
Content quality		
1	The virtual tour gave me an overview of Da Lat.	[1,14]
2	The virtual tour provided information about Da Lat, suitable for my future travel plans.	
3	The virtual tour is very useful for me to plan my trip to Da Lat.	
4	The quality of the content and the quality of the 3D images are visually appealing.	
System quality		
5	The virtual tour is easy to control or navigate on the screen.	[1]
6	The overall system responsiveness as well as the content delivery is quite smooth.	
7	The virtual tour meets my interaction needs with other users.	
8	The functional icons on the VR system are very concise and clear.	
Vividness		
9	The images of this virtual tour are very realistic.	[1]
10	The images of this virtual tour are very sharp.	
11	The images of this virtual tour are very lively.	
12	The images of this virtual tour are displayed clearly.	
Enjoyment		
13	Using VR in the Da Lat travel experience is very enjoyable.	[1,45]
14	I am very happy to use VR to experience travel in Da Lat.	
15	I feel satisfied after experiencing travel through VR technology.	
16	I feel wonderful after using VR to experience travel in Da Lat.	
Immersion		
17	When using VR, I am unaware of what is happening around me.	[14,30]
18	When using VR, I feel disconnected from the outside world.	
19	I feel like I am actually traveling during the VR experience.	
20	During the VR experience, I feel like I am in another world.	
Travel intentions		
21	I am planning to visit Da Lat with friends after watching the VR.	[1,14]
22	I intend to visit Da Lat after watching the VR in the near future.	
23	I am ready to visit Da Lat soon, which I saw in VR.	
24	I intend to invest money and time into visiting Da Lat after watching the VR.	

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