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Predictors of Behavioural Intention and the Mediating Effects of Hotel Virtual Reality Experience and Cognitive Absorption

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Abstract

The study explores the influence of vividness, content quality, and system quality in virtual reality (VR) experiences on guests' behavioural intentions in the hotel industry in the National Capital Region. It specifically examines how these factors affect guests' engagement and decision-making processes. Using the Partial Least Square with Hierarchical Component Model Analysis, the results highlight the importance of immersive and high-quality VR content in enhancing guest experiences and influencing their future behaviours, such as revisiting or recommending the hotels. Additionally, the study underscores the role of system quality in ensuring a seamless and engaging VR experience. The findings through the use of the mediating effect, suggest that investment in superior VR technology can be a strategic tool for hotels to differentiate themselves in a competitive market and align with evolving consumer preferences as well as the cognitive absorption of the hotel guests.

Keywords: Content quality, system quality, virtual reality, NCR Philippines, PLS-SEM

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Introduction

Information and communication technologies (ICTs) have given rise to the idea of smart tourist destinations, which has been hailed as being essential for the travel and tourism sector. An associated concept is smart tourism, which is defined as the collection and accumulation of data from tourist operators, infrastructure, and humans associated with a specific location. The term "smart tourism destinations" refers to destination management as a plan for tourism locations to undergo a "digital transformation." Through an emphasis on sustainability, experience, and effectiveness, this data is digitalised to deliver profitable and human value for all who visit the venue. According to Um & Chung (2021), smart tourism not only increases tourism assets but also makes it easier to supervise tourism, raises the overall quality of life, and fosters communication. The development of virtual reality (VR) as a component of smart tourism demonstrates the technology's potential as a new tourism service while also providing information about locations and attractions. The marketing and promotion opportunities that virtual reality technology offers have recently piqued the interest of the hospitality and tourist sectors. This is because virtual reality technology has the potential to reproduce a realistic virtual environment with interaction and the sense of presence that comes from being there. Several well-known companies have already used it to create immersive experiences, whether in the tourist and hospitality industries or in other fields. The Virtual Reality market is anticipated to continue growing in the coming years, thus now is the time to capitalise on this rapidly growing industry (Statista, 2022). According to Loureiro et al. (2021), this has been recognised as an important tool that will have an impact on the tourism and hospitality sectors' future and may be used to persuade customers to make a purchase. According to Cowan & Ketron (2019), virtual reality provides customers with a distinct virtual dimension vision, which helps with product sales and the growth of consumer-brand interactions.

Virtual reality is appealing to individuals who work in the hospitality and tourism industries because it allows visitors to be virtually transported to a hotel or tourist destination. Virtual reality has grown in importance because the ordinary consumer needs so much information before making a hotel reservation. This form of "try before you buy" marketing gives customers the chance to experience products first-hand rather than reading descriptions, which might or might not be accurate. Because it generates more volume and grabs customers' attention, virtual reality (VR) can be a potent marketing tool for hotels. The question of whether virtual reality has quality attributes that satisfy customers' expectations and fulfil their virtual aspirations by completely immersing them in the hotel as their intended accommodation at the location must be addressed by virtual reality developers and industry professionals. Although virtual reality is being used to engage customers and promote products, its use in the hospitality sector is still in its infancy. This instrument's propensity may have also been helpful, but gradually, because of visitors' incapacity to keep up with modern technology. Hence, this study aims (1) to explore how experiential quality influences hotel virtual reality experience and cognitive absorption; (2) how virtual reality experience influences behavioural intention; and finally, (3) how cognitive absorption influences behavioural intention.

Hypotheses development

The following hypotheses are derived from the literature and conceptual framework which were developed in order to solve research challenges:

H1a. Content quality has a significant effect on hotel virtual reality experience.

In the study of Orus et al. (2021), that through virtual and augmented reality, businesses may better engage with their customers. They have looked into how VR affects people's sense of presence and how that affects their pre-hotel experiences. Researchers found that content with high levels of factual reality (such as 360-degree videos) had a beneficial impact on viewers' feelings

of presence, ease of imagination, and visual attractiveness — all of which were associated with booking intent. It was also supported in the study of Yang et al. (2021), that consumer usage in VR tourism revealed that when consumers love VR tourism content, their flow state is likely to be well developed, which increases their subjective well-being having an optimal experience that makes an activity the most joyful, and in a mental state in which a person is completely absorbed in the activity's positive feelings. Caserman et al. (2022) underscored the necessity of immersive content and high-quality visuals to improve user comfort and reduce distress during VR experiences. This implies that the quality of content is a critical factor in the overall well-being and user experience of VR environments.

H1b. Content quality has a significant effect on cognitive absorption.

This theory of cognitive absorption has been used in the context of the virtual world. As described in the study by Yang et al. (2021), consumer usage in VR tourism revealed that when consumers love VR tourism content, their flow state is likely to be well developed, which increases their subjective well-being. This was supported by the study of Tabacof et al. (2021), Cognitive absorption and cognitive function are positively impacted by high-quality content. This emphasizes the critical role of content quality in facilitating cognitive assimilation, particularly in the context of virtual reality applications for individuals. In addition, Appel et al (2020) stated that high-quality VR tour content has the potential to captivate the attention and cognitive engagement of users, thereby affecting cognitive absorption. Cognitive absorption is the optimal experience that makes an activity the most joyful, and the flow state is a mental state in which a person is completely absorbed in the activity's positive feelings. These emotions include cognitive efficiency, motivation, and happiness.

H2a. System quality has a significant effect on hotel virtual reality experience.

The quality of a system indicates its dependability, ease of access, reaction time, and flexibility. Additionally, system quality boosts client experiences by enabling them to feel present. Aspects such as close-up images and zoom capabilities, 3D virtual product presentation, and video material enhance consumer perceptions, enjoyment, and engagement. Moreover, graphics, colour, and links have a good effect on intention, whereas menus have a negative effect on arousal and enjoyment associated with online purchasing. Additionally, the way things are presented—website structure and design—significantly promotes client loyalty (Lee et al., 2020). Cruz-Neira et al. (2023) underscored the significance of system quality in the development of a tour experience that is both immersive and realistic for users. The study underscored the importance of convincing audio, accurate motion tracking, and high-resolution displays in improving the overall quality of the VR system.

H2b. System quality has a significant effect on cognitive absorption.

In the study of Li & Zhu (2022), it was stated that system characteristics have significant effects on perceived usefulness, thus affecting users' intention to use the application. Users think that if the system is easier to use, it will be more easily accepted by users. Cruz-Neira et al. (2023) have emphasised the significance of system reliability in guaranteeing a tour experience that is both seamless and uninterrupted for users. They underscored the necessity of durable hardware and software components to reduce the occurrence of technical glitches and system malfunctions during virtual excursions. This realization emphasizes the importance of system stability in providing a consistent and pleasant VR experience for users. Chaccour et al. (2020) investigated the potential of terahertz technology to facilitate high-rate, reliable, low-latency communications for wireless VR. The study predominantly concentrated on communication aspects; however, it underscored the significance of system quality in the delivery of immersive and seamless VR experiences. The results emphasize the importance of reliable wireless communication in order to facilitate cognitive absorption during VR excursions, which is facilitated by robust VR systems.

H3a. Vividness has a significant effect on hotel virtual reality experience.

The study by Lee et al. (2020), has shown that customers' attitudes and telepresence are positively affected by the quality and vividness of the content, system and system design which leads to a positive behavioural intention to visit the location. Akhtar et al. (2021) examined the impact of vividness on behavioural intentions, attitudes toward VR, perceived utility, and perceived delight in various contexts. It was discovered that vividness had substantial positive impacts on perceived efficacy and perceived delight, which in turn influenced behavioural intentions and attitudes toward VR. These results emphasize the significance of vividness in the tourism industry, where it enhances consumer experiences and brand awareness in VR environments.

H3b. Vividness has a significant effect on cognitive absorption.

Loureiro et al. (2021) stated that because vividness conveys an inner motivation to be in the virtual reality environment, they are regarded to be a conative component of the organism. Conation serves as the connective tissue that connects knowledge and affection to actions. It contributes to our understanding of how cognitive and emotional states are manifested in behaviour. Favorable emotional events, when accompanied by higher virtual brain activation, produce a perception of increased vividness and a sense of presence. Thus, good emotions can enhance the impression of being in a virtual reality setting. Thapa et al.

(2020) investigated the impact of a VR-based intervention program on cognition in older individuals with moderate cognitive impairment. The randomised control trial conducted by the researchers demonstrated that VR interventions can have a positive impact on cognitive function, potentially as a result of the increased engagement and assimilation caused by VR technology. These results underscore the potential of VR to improve cognitive processes and indicate that the vividness effect is a critical factor in this regard.

H4. Hotel virtual reality experience has a significant influence on behavioural intention.

Given the extensive usage of Virtual Reality (VR) technology as a marketing tool in the tourist industry, virtual reality applications may enable consumers to experience a place without physically visiting it. Additionally, virtual reality tours may provide potential tourists with educational opportunities and destination-related information (Wen & Leung, 2021). The majority of existing research on virtual reality in tourism has focused on destination marketing. Several studies concluded that utilising VR to evaluate different locations enables consumers to make more informed choices; others concluded that, from a marketing standpoint, VR technology enables the creation of a sensory experience for a destination or attraction. Virtual reality technology can be used to bridge the gap between potential tourists and a destination. As a result, using VR as a promotional tool significantly enhances the possibility of future visits to the place.

H5. Cognitive absorption has a significant influence on behavioural intention.

According to Huang et al. (2018) in his study that flow is a pleasurable feeling that occurs as a result of complete attention on a task. Cognitive absorption can aid in the development of user loyalty. Cognitive absorption is preceded by immersion and presence, which occur most frequently when persons are engaged in an enjoyable and challenging activity. Cognitive absorption gives enjoyment, a sense of fun, and novelty, implying that individuals experience satisfaction and are compelled to repeat the same task in response to positive feedback. As a result, mental states may affect individuals' behaviour and attitude toward re-engagement in similar tasks, necessitating research into the establishment of flow in virtual tours. According to Kim (2022), consumers' behavioural intentions in virtual settings, such as a virtual community, have been explored as a significant component in determining their loyalty to the virtual environment. This is because the behavioural intention construct leads to actual user behaviour, such as active participation and continued consumption of the virtual environment's digital material in their daily life. Thus, behavioural intention is commonly defined as consumers' enhanced commitment to a virtual environment as a result of positive behavioural intentions (for example, willingness to spend more and positive word of mouth, stay intention). The quality, efficacy, and suitability of employment in tourism or other ventures are determined by consumer behaviour, whether in tourism or other consumption situations. Tourist behaviour happens during the development and implementation phases of vacations, as well as when they return home. According to Lee et al. (2020) in their study on the quality of virtual reality and its impacts on behavioural intention, the results have shown that experiential quality in terms of content, system, and vividness positively influences customers' attitude and telepresence which leads to positive behavioural intention to visit the destination. This was seconded in the study of Lee et al. (2020) that a total VR experience creates a positive effect on visit intention; and that, customer experiences are known to influence consumer behaviour (Loureiro et al, 2021). Thus, the following hypothesis is proposed:

H6a. Hotel virtual reality experience has a mediating effect on the link between content quality and behavioural intention.

According to Kim (2022), consumers' behavioural intentions in virtual environments have been investigated as a critical factor in determining their loyalty to the virtual environment, such as a virtual community. This is because the behavioural intention construct results in users' actual activities, such as active involvement and ongoing consumption of the virtual environment's digital content in their daily lives. Thus, behavioural intention is frequently expressed as consumers' increased commitment to a virtual environment as a result of good behavioural intentions, such as readiness to spend more and positive word-of-mouth, visit intention). Yang & Lee (2018) investigated the user behaviour of virtual personal assistant devices. The study provided insight into the factors that influence user behaviour in the context of interactive technology, even though it did not specifically examine hotel VR experiences. The results suggested that the perceived quality of the interaction and the overall experience are the determining factors in user interaction with virtual assistant devices. By applying this to hotel VR experiences, it is possible to infer that the quality of interaction and overall experience within the VR environment may mediate the relationship between the quality of content and the behavioural intention of users. Using an extended technology acceptance model, Jang et al. (2021) investigated the potential of augmented reality and virtual reality for educational purposes. Although the study concentrated on educational contexts, it offered valuable insights into the factors that influence the acceptability and adoption of AR and VR technologies by users. The results underscored the importance of perceived utility and user experience in determining users' intentions to utilize AR and VR. This implies that the overall user experience within the virtual environment may serve as a mediating factor in the determination of users' behavioural intentions in the context of hotel VR experiences.

H6b. Hotel virtual reality experience has a mediating effect on the link between system quality and behavioural intention.

The balance between task difficulty and the users' abilities was emphasised, and it was stated that flow is influenced by this balance. To ensure that an activity flows smoothly, the application's complexity level should be appropriate for the users' abilities. Hence, flow experience becomes a significant predictor of behaviour intention (Liu, 2017). In addition, Tao et al. (2021) underscored the influence of the hedonic and utilitarian value of the virtual hotel experience on the likelihood of consumers booking travel accommodations. The prospective customer's perceived enjoyment and utility were found to be enhanced by the immersive experience of telepresence, which in turn influenced their behavioural intention. This implies that the experiential components of VR are essential in the formation of consumer decisions.

H6c. Hotel virtual reality experience has a mediating effect on the link between vividness and behavioural intention.

It was posited in the study of Lee (2020), that to encourage clients to feel a sense of presence in the destination and to build a pleasant VR experience, VR material should be developed in a user-friendly, interactive, and vividly rich format. Positive attitudes toward the VR and their emotions of presence eventually result in respondents' intention to visit the destination. In contrast to desktop computers and mobile phones, virtual reality devices stimulate more positive affective responses and higher levels of psychological and behavioural engagement, according to a study conducted by Kim et al. (2020). The study also emphasized the mediating function of emotions and psychological engagement in the impact of embodied virtual reality devices on behavioural engagement. This implies that the immersive nature of virtual reality has a substantial impact on consumer engagement and behaviour. Lee et al. (2020) conducted a study on the efficacy of virtual reality and its effects on behavioural intention. The findings indicated that social presence was a critical factor in the explanation of perceived enjoyment, perceived value, and behavioural intention. Furthermore, it was determined that behavioural intention was substantially predicted by perceived value. These results underscore the significance of perceived value and social presence in the formation of consumer intentions within the context of virtual reality experiences.

H7a. Cognitive absorption has a mediating effect on the link between content quality and behavioural intention.

In the study of Kim et al. (2020), the results have shown that a positive feedback experience of the consumers towards virtual reality enhanced cognitive absorption, which, in turn, increased interest and visit intention toward the store. This was supported by the study of Bilgihan (2016), that after experiencing the flow, customers improve their recognition and recall of a certain brand, which has a favourable effect on their attitude toward that brand. Thus, hotel booking services that enable clients to participate in the flow experience might benefit their brand awareness which may lead to an intention to visit. Zanjani et al. (2015) also argued that flow positively leads to behaviour intention which means individuals who experience higher levels of flow online will be more likely to make purchase decisions.

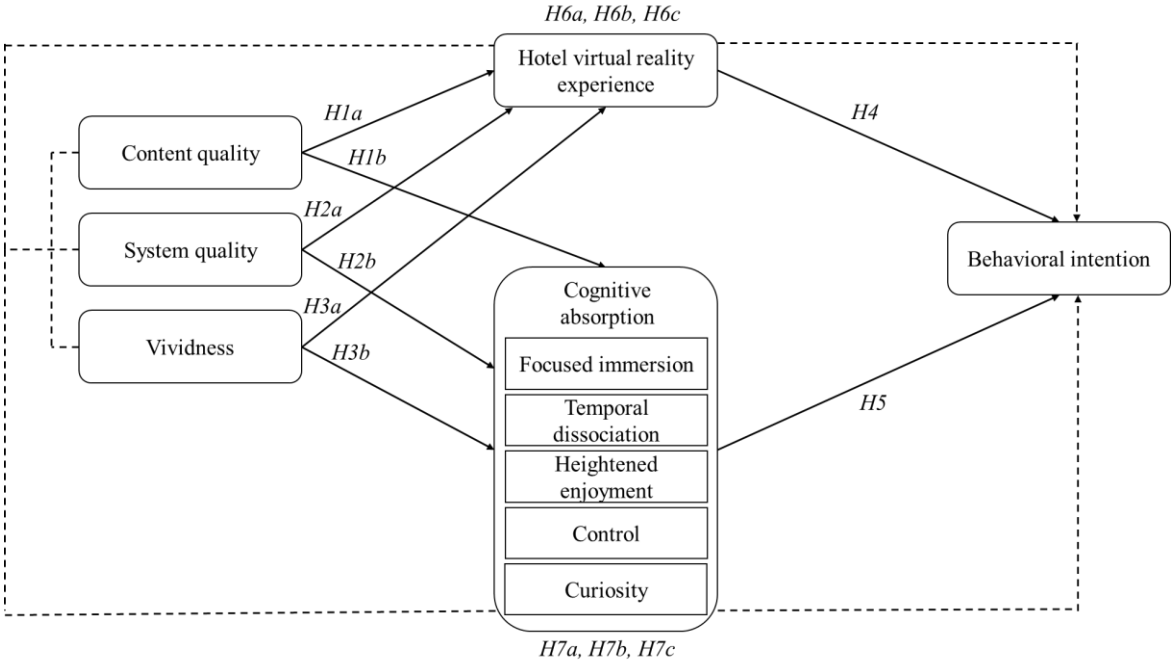
H7b. Cognitive absorption has a mediating effect on the link between system quality and behavioural intention.

To create a sense of flow, websites and mobile applications must stimulate and respond to their consumers. In the absence of this, boredom, anxiety, and indifference set in. Boredom happens when the user interface (UI) or website is not sufficiently challenging, whereas anxiety develops when the system is overly complex or difficult to use. When users' abilities and the challenges presented by websites, applications, and games are insufficient, indifference results, whereas cognitive absorption occurs when users' skills equal the degree of the interaction or situation's challenges. In essence, cognitive absorption occurs when individuals acquire effortless attention and enjoy themselves while executing a task or aim that requires responses and feedback, whether at work, at home, during leisure time, or in social circumstances (Mahfouz et al., 2020). Cognitive absorption is a critical factor that affects the relationship between the quality of a system and the intention of users to engage in specific behaviour, as per Jin et al. (2015). This implies that cognitive assimilation may significantly influence user responses to system quality, potentially influencing their intentions to interact with or use a specific system. The influence of self-service technology (SST) service quality on customer loyalty and behavioural intention was investigated in a study conducted by Iqbal, Hassan & Habibah (2018). The authors discovered that the relationship between SST service quality and behavioural intention was mediated by customer satisfaction. This discovery is relevant to the current research topic because it implies that cognitive and affective factors, including satisfaction, can mediate the relationship between behavioural intention and system quality. Additionally, Saima & Khan (2020) investigated the impact of social media influencer marketing on consumers' purchase intentions, with an emphasis on the mediating nature of credibility. Although this study does not explicitly address system quality, it offers a deeper understanding of the mediating function of cognitive factors, such as credibility, in influencing behavioural intention. This emphasizes the importance of cognitive processes in determining the responses of individuals to marketing stimuli, a phenomenon that may be applicable to other contexts, including system usage and interactive behaviour.

H7c. Cognitive absorption has a mediating effect on the link between vividness and behavioural intention.

From the perspective of Tussyadiah et al. (2018), the enjoyment of virtual tourists derived from experiencing a travel destination in a virtual tour led to a higher interest in the travel destination to visit. This means that heightened enjoyment leads to a greater interest in the destination. Kim (2022) added that participants are most likely to seek something they are unable to experience

in a virtual environment, and those who experience higher cognitive absorption tend to be more motivated to visit the actual location of the destination. An empirical model of user engagement with interactive media was proposed in a study conducted by Oh et al. (2018). The authors identified selecting, assessing, immersing, and sharing as critical elements of user engagement. Although their research did not explicitly examine the mediating effect of cognitive absorption, it provides insight into the cognitive aspects of user engagement, which may be pertinent to the mediation of behavioural intention and vividness.



Conceptual framework
Figure 1. The Conceptual Framework based on the given hypotheses

Method

A predictive-causal design was used to answer the objective of this research which is to assess the quality of experience of Filipino guests of five (5) star-hotels from all over the NCR or the National Capital Region of the Philippines of virtual reality applications and hotel virtual reality tours, the effects of Virtual Reality to them, and their intention to stay in the hotels after the experience. It also helps assess the effects of hotel virtual reality tours to their intent to stay in the hotels. The respondents' experience of hotel virtual reality tours will be acquired with a questionnaire through a Likert scale. The instrument was divided into three (3) sections, the first part was used to assessed the experience of virtual reality application in terms of the Realms of Experience (Education, Entertainment, Escapism, and Esthetic) for the second part, the respondents assessment based on their experience of hotel virtual reality tours in terms of Content Quality, System Quality, and Vividness, which were both adapted from the study of Lee et al (2020). The third part was used to assess the effects of virtual reality on them in terms of Focused Immersion, Temporal Dissociation, Heightened Enjoyment, Control, and Curiosity. For the last part, it consists of two (2) items to be assessed by the respondents in terms of their intention to stay in the accommodation which was adapted from the study of Kim et al (2022). A list of three industry experts validated the content of the given indicators and the reliability of the lower-order latent constructs was measured using Cronbach's alpha (CA) and composite reliability (CR). According to Kock (2014), the construct is said to be reliable when CA and CR coefficients are 0.70 and above (see Table 1). The sample size was calculated using a priori power analysis through the G*Power software. Based on the medium effect size of 0.15, alpha level of 0.05, and statistical power of 0.95, and 3 predictors, the calculated minimum sample size is 119. The researchers were able to gather 400 valid responses, more than the minimum sample size recommendation, thus, robustness of the results of hypothesis testing is guaranteed. In terms of data collection, no personal information was gathered and publicity released as the researchers prioritized the confidentiality of all respondents and strongly adhered to each hotel's data privacy and protection as well as the Data Privacy Act of 2012. The PLS-SEM or the Partial Least Square with Hierarchical Component Model Analysis was used to assess the relationships of each variable to each other namely the Vividness, Content and System Quality as the Predictors of Behavioural Intention. Lastly, mediation analysis was used to determine the mediating effects of Hotel Virtual Reality Experience and Cognitive Absorption between the relationship of vividness, content, and system quality to behavioural intention.

Results and discussion

Partial least squares – structural equation modelling (PLS-SEM) was used to statistically analyze the data. In PLS-SEM, the first assessment is the evaluation of the measurement model which establishes the validity and reliability of the constructs. Moreover, the second phase is the evaluation of the structural model where the hypotheses are tested.

Measurement model assessment

The reliability of the lower-order latent constructs was measured using Cronbach's alpha (CA) and composite reliability (CR). According to Kock (2014), the construct is said to be reliable when CA and CR coefficients are 0.70 and above. Based on the results in Table 1, hotel virtual reality experience (CA = 0.957; CR = 0.962), content quality (CA = 0.920; CR = 0.949), system quality (CA = 0.902; CR = 0.938), vividness (CA = 0.960; CR = 0.968), focused immersion (CA = 0.901; CR = 0.938), temporal dissociation (CA = 0.916; CR = 0.941), heightened enjoyment (CA = 0.911; CR = 0.944), control (CA = 0.874; CR = 0.923), curiosity (CA = 0.912; CR =0.945), and behavioural intention (CA = 0.896; CR = 0.951) exhibit internal consistency of items, thus, reliability is established. In terms of validity, convergent and discriminant validity tests were performed. In the convergent validity test, factor loadings and average variance extracted (AVE) were measured. According to Kock & Gary (2012), convergent validity occurs where the factor loadings are 0.50 and above and must be significant. Furthermore, AVEs must be at least 0.50. In cases where the factor loadings are low (< 0.50), these loadings must be omitted as they are considered offending items (Kock, 2022). Based on the findings in Table 1, the following items were deleted due to low factor loadings – focused immersion (FI1), Temporal dissociation (TD4), and heightened enjoyment (HE3). Based on the results in Table 1, hotel virtual reality experience (AVE = 0.658), content quality (AVE = 0.862), system quality (AVE = 0.836), vividness (AVE = 0.833), focused immersion (AVE = 0.834), temporal dissociation (AVE = 0.800), heightened enjoyment (AVE = 0.849), control (AVE = 0.799), curiosity (AVE = 0.851), and behavioural intention (AVE= 0.906) exhibit convergent validity.

Table 1: Reliability measures and convergent validity of the lower-order latent constructs

Lower-order construct	Factor loading	Average variance extracted	Cronbach's alpha	Composite reliability
Hotel virtual reality experience		0.658	0.957	0.962
HVR1	0.798			
HVR2	0.829			
HVR3	0.826			
HVR4	0.827			
HVR5	0.822			
HVR6	0.829			
HVR7	0.799			
HVR8	0.774			
HVR9	0.780			
HVR10	0.784			
HVR11	0.830			
HVR12	0.822			
HVR13	0.824			
Content quality		0.862	0.920	0.949
CQ1	0.928			
CQ2	0.926			
CQ3	0.931			
System quality		0.836	0.902	0.938
SQ1	0.906			
SQ2	0.923			
SQ3	0.913			
Vividness		0.833	0.960	0.968
VI1	0.909			
VI2	0.912			
VI3	0.924			
VI4	0.915			
VI5	0.910			
VI6	0.905			
Focused immersion		0.834	0.901	0.938
FI1	D			
FI2	0.909			
FI3	0.919			
FI4	0.912			
Temporal dissociation		0.800	0.916	0.941
TD1	0.890			
TD2	0.911			
TD3	0.912			
TD4	D			
TD5	0.863			
Heightened enjoyment		0.849	0.911	0.944
HE1	0.917			
HE2	0.925			
HE3	D			
HE4	0.923			
Control		0.799	0.874	0.923
CO1	0.912			
CO2	0.857			
CO3	0.912			
Curiosity		0.851	0.912	0.945
CU1	0.930			
CU2	0.920			
CU3	0.917			
Behavioral intention		0.906	0.896	0.951
BI1	0.952			
BI2	0.952			

All factor loadings are significant (p < 0.001). D-deleted.

Discriminant validity of the latent constructs was measured using heterotrait-monotrait ratio of correlations (HTMT). According to Gold et al. (2001), to claim that the construct possesses discriminant validity, the HTMT ratios must be at most 0.90. Based on the results in Table 2, all lower-order latent constructs passed the discriminant validity test. Since the study utilised a higher-order formative construct – cognitive absorption – hierarchical component model analysis (HCM) must be

performed. The disjoint two-stage method (Agarwal & Karahanna, 2000; Becker et al., 2012, Lacap & Sicat, 2022) was utilised to perform this analysis. The presence of a higher-order formative construct requires an assessment of indicator weight and the corresponding p-value, variance inflation factor (VIF), and full collinearity VIF (FCVIF). Ramayah et al. (2018) noted that each indicator weight must be significant, where the corresponding p-values be at < 0.05.

Table 2: Discriminant validity using HTMT ratios

	HVR	CQ	SQ	VI	FI	TD	HE	CO	CU	BI
HVR										
CQ	0.845									
SQ	0.854	0.874								
VI	0.821	0.849	0.873							
FI	0.790	0.745	0.811	0.812						
TD	0.742	0.699	0.772	0.759	0.894					
HE	0.815	0.743	0.791	0.797	0.837	0.841				
CO	0.715	0.643	0.735	0.723	0.788	0.848	0.812			
CU	0.795	0.771	0.755	0.814	0.776	0.806	0.848	0.765		
BI	0.779	0.796	0.719	0.757	0.752	0.738	0.787	0.674	0.829	

HVR-hotel virtual reality experience; CQ-content quality; SQ-system quality; VI-vividness; FI-focused immersion; TD-temporal dissociation; HE-heighted enjoyment; CO-control; CU-curiosity; BI-behavioral intention.

Based on the results in Table 3, cognitive absorption as a higher-order formative construct passed the required threshold. Additionally, the VIF of each indicator must be at most 3.30 (Kock, 2014). Whereas the FCVIF threshold must also be 3.30 (Kock, 2015; Kock, 2022) to claim that cognitive absorption is free from any collinearity problems – lateral and vertical. Based on the results in Table 3, cognitive absorption as a higher-order formative construct passed all the measurement evaluation requirements.

Table 3: Hierarchical component model analysis

Higher-order formative construct	Indicator weight	p-value	Variance inflation factor	Full collinearity variance inflation factor
Cognitive absorption				3.246
FI	0.225	<0.001	3.246	
TD	0.231	<0.001	3.135	
HE	0.228	<0.001	3.285	
CO	0.218	<0.001	2.765	
CU	0.220	<0.001	2.929	

FI-focused immersion; TD-temporal dissociation; HE-heighted enjoyment; CO-control; CU-curiosity.

Structural model assessment

The evaluation of the structural model includes the assessment of the path coefficients, p-values, standard error, and effect sizes (v). Figure 1 and Table 4 present the results of the evaluation of the structural model.

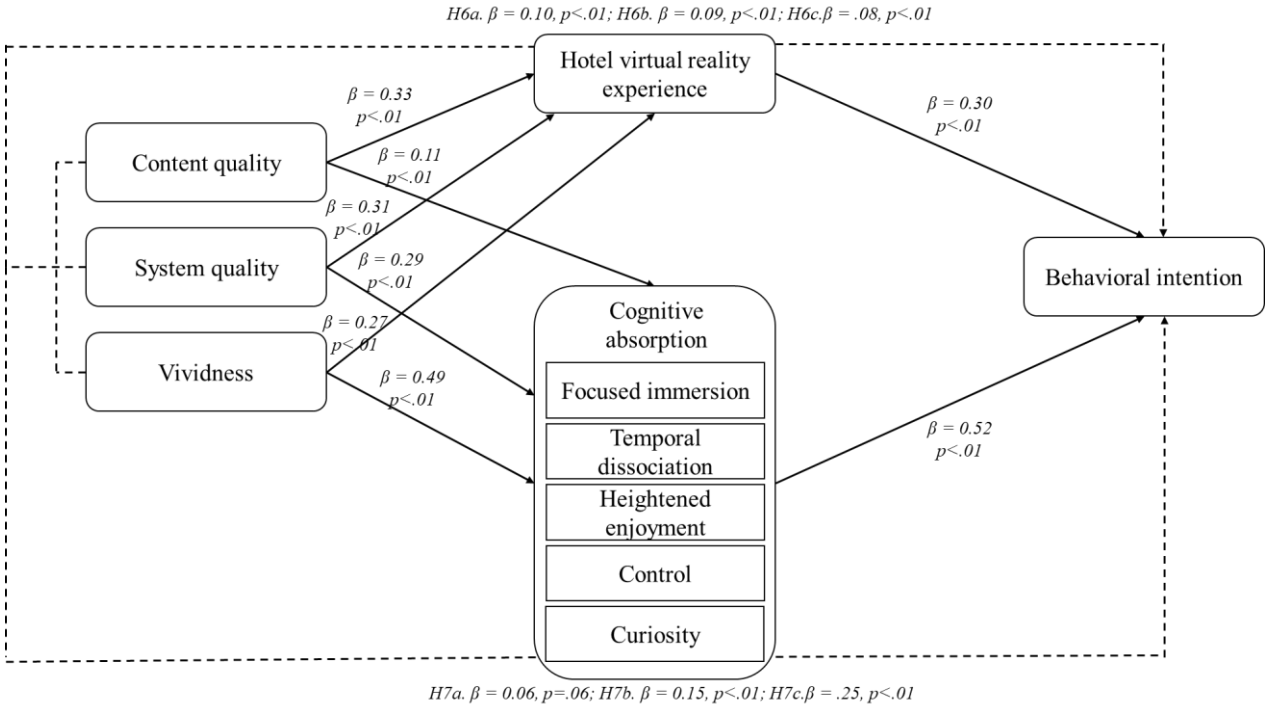


Figure 2. Structural model

Analysis of the data revealed that content quality has a significant and positive influence on hotel virtual reality experience (β = 0.326, p < 0.001, f^2 = 0.259) and cognitive absorption (β = 0.108, p = 0.015, f^2 = 0.080) with medium and small effect sizes respectively. These results imply that when the content of virtual reality in a hotel perceived to be good, it follows that

respondents' hotel virtual reality experience improves and cognitive absorption augments. Thus, H1a and H1b are supported. From the findings, it is clear that guests' assessments of virtual reality content quality in hotels carry weight. When this content is deemed superior or satisfactory by users, there is a subsequent enhancement in their overall virtual reality engagement within the hotel setting. Furthermore, alongside this improved experience, there is also a heightened level of cognitive immersion, indicating that users are more deeply engrossed and connected with the content presented to them. In essence, the better the quality of the virtual reality offerings in hotels, the more positive and immersive the experience for guests. This deep-rooted connection, fueled by high-caliber content, ensures that users are not merely observing but are genuinely absorbed in the virtual realm provided by the hotel. In the study of Orus et al. (2021), researchers stated that through virtual and augmented reality, businesses may better engage with their customers. They have looked into how VR affects people's sense of presence and how that affects their pre-hotel experiences. Researchers found that content with high levels of factual reality (such as 360-degree videos) had a beneficial impact on viewers' feelings of presence, ease of imagination, and visual attractiveness — all of which were associated with booking intent. Furthermore, as described in the study by Yang, T. et al., (2021), consumer usage in VR tourism revealed that when consumers love VR tourism content, their flow state is likely to be well-developed, which increases their subjective well-being. The findings also revealed that system quality significantly and positively influences hotel virtual reality experience ($\beta = 0.306$, $p < 0.001$, $f^2 = 0.245$) and cognitive absorption ($\beta = 0.293$, $p < 0.001$, $f^2 = 0.233$) with both medium effect sizes. The findings indicate that better system quality of virtual reality in hotels results in better hotel virtual reality experience and cognitive absorption among respondents. Therefore, H2a and H2b are supported. Furthermore, it underscores the pivotal role system quality plays in shaping the virtual reality experience within hotels. When the VR system's quality is elevated, it is observed that guests have a richer and more immersive virtual reality interaction in the hotel environment. This is not a mere marginal improvement; the effect size is notably medium, emphasising the significance of this relationship. According to Lee et al. (2021), the quality of a system indicates its dependability, ease of access, reaction time, and flexibility. This boosts client experiences by enabling them to feel present. Aspects such as close-up images and zoom capabilities, 3D virtual product presentation, and video material enhance consumer perceptions, enjoyment, and engagement. Moreover, it is not just the superficial experience that is enhanced. Alongside it, there is a pronounced deepening in cognitive engagement. This suggests that guests are not just passively navigating the virtual space; they are profoundly engrossed, drawing a direct link between the excellence of the VR system and the depth of user immersion. In the study of Li & Zhu (2022), it was stated that system characteristics have significant effects on perceived usefulness, thus affecting users' intention to use the application. Users think that if the system is easier to use, it will be more easily accepted by others.

Additionally, vividness was found to have a significant and positive effect on hotel virtual reality experience ($\beta = 0.274$, $p < 0.001$, $f^2 = 0.217$) and cognitive absorption ($\beta = 0.494$, $p < 0.001$, $f^2 = 0.408$) with medium and large effect sizes respectively. These results imply that vividness of virtual reality in the hotels translates into better hotel virtual reality experience and cognitive absorption among participants. Hence, H3a and H3b are supported. The data further highlights the integral role of vividness in augmenting the virtual reality experience within hotels. When the virtual environment is rendered with heightened vividness, participants find themselves more engrossed and appreciative of their virtual experiences. The impact is noteworthy, with a medium effect size emphasising the enhancement of the overall virtual interaction due to this vividness. The study by Lee et al (2020), has shown that customers' attitudes and telepresence are positively affected by the quality and vividness of the content, system and system design which leads to a positive behavioural intention to visit the location. Furthermore, this increased clarity and lifelikeness in virtual reality doesn't just superficially improve the experience; it also deepens cognitive engagement, registering a substantial, large effect size. This further explains that when VR displays in hotels resonate with lifelike vividness, guests do not merely observe, they immerse. This backs up the claims made in H3a and H3b, reinforcing their validity. Loureiro et al. (2021) stated that because vividness conveys an inner motivation to be in the virtual reality environment, they are regarded to be a conative component of the organism. Conation serves as the connective tissue that connects knowledge and affection to actions. It contributes to our understanding of how cognitive and emotional states are manifested in behaviour. Favorable emotional events, when accompanied by higher virtual brain activation, will produce a perception of increased vividness and a sense of presence. Thus, good emotions can enhance the impression of being in a virtual reality setting. In terms of the link between hotel virtual reality experience and behavioural intention, the findings showed that these two constructs are significantly and positively related ($\beta = 0.304$, $p < 0.001$, $f^2 = 0.221$) with medium effect size. Favourable hotel virtual reality experience leads to favourable behavioural intentions among respondents. Thus, H4 is supported. This further explains that the research data sheds light on the interplay between guests' experiences with virtual reality in hotels and their subsequent behavioural intentions. A clear and positive correlation emerges between these two aspects, as evidenced by a medium effect size. When guests encounter a rewarding virtual reality experience within the hotel, it acts as a catalyst, influencing their future actions or intentions in a positive direction. Furthermore, this is not a fleeting or superficial connection. The strength of their virtual reality engagements directly mirrors in the nature of their behavioural preferences. In simpler terms, a more enriched VR journey in a hotel setting translates to more favourable future actions or decisions by the guests, endorsing the validity of hypothesis H4. Given the extensive usage of Virtual Reality (VR) technology as a marketing tool in the tourist industry, virtual reality applications may enable consumers to experience a place without physically visiting it. Additionally, virtual reality tours may provide potential tourists with educational opportunities and destination-related information (Wen & Leung 2021).

Concerning the relationship between cognitive absorption and behavioural intention, the results showed that these two constructs are also significantly and positively related ($\beta = 0.515$, $p < 0.001$, $f^2 = 0.394$) with a large effect size. When cognitive absorption occurs, favourable behavioural intention among respondents is likely to occur as well. Thus, H5 is supported. The

results of the study delved into the complex connection between cognitive absorption in hotel virtual reality and the subsequent behavioural intentions of users. A pronounced correlation was observed, with data indicating a strong link underscored by a large effect size. Essentially, when guests are deeply engrossed and immersed in experiencing cognitive absorption in the virtual reality environment provided by the hotel, there is a heightened likelihood that their future actions or inclinations lean towards a positive direction. In a broader perspective, this finding underscores the potency of immersion within the VR landscape. The more participants lose themselves in the virtual world, getting absorbed cognitively, the stronger their positive behavioural responses are. This result not only affirms the symbiotic nature of these two facets but also robustly bolsters the claim presented in hypothesis H5. According to Huang et al. (2018) in his study that flow is a pleasurable feeling that occurs as a result of complete attention on a task. Cognitive absorption can aid in the development of user loyalty. Cognitive absorption is preceded by immersion and presence, which occur most frequently when persons are engaged in an enjoyable and challenging activity.

Table 4: Hypothesis testing results

Hypothesis	Path coefficient	p-value	Standard error	Effect size	Decision
Direct effects					
H1a. CQ → HVR	0.326	<0.001	0.048	0.259	S
H1b. CQ → CA	0.108	0.015	0.049	0.080	S
H2a. SQ → HVR	0.306	<0.001	0.048	0.245	S
H2b. SQ → CA	0.293	<0.001	0.048	0.233	S
H3a. VI → HVR	0.274	<0.001	0.048	0.217	S
H3b. VI → CA	0.494	<0.001	0.047	0.408	S
H4. HVR → BI	0.304	<0.001	0.048	0.221	S
H5. CA → BI	0.515	<0.001	0.047	0.394	S
Mediating effects					
H6a. CQ → HVR → BI	0.099	0.002	0.035	0.072	S
H6b. SQ → HVR → BI	0.093	0.004	0.035	0.060	S
H6c. VI → HVR → BI	0.083	0.009	0.035	0.059	S
H7a. CQ → CA → BI	0.055	0.058	0.035	0.040	NS
H7b. SQ → CA → BI	0.151	<0.001	0.035	0.098	S
H7c. VI → CA → BI	0.254	<0.001	0.034	0.179	S

HVR-hotel virtual reality experience; CQ-content quality; SQ-system quality; VI-vividness; BI-behavioral intention; CA-cognitive absorption. Effect sizes evaluation (Cohen, 1988): 0.02 – small; 0.15 – medium; 0.35 – large. S-supported; NS-not supported.

Mediation analysis revealed that hotel virtual reality experience has a mediating effect between content quality and behavioural intention (β – 0.099, p = 0.002, f2 = 0.072); system quality and behavioural intention (β = 0.093, p = 0.004, f2 = 0.060), and vividness and behavioural intention (β = 0.083, p = 0.009, f2 = 0.059), with small effect sizes for each link. Thus, H6a, H6b, and H6c are supported. It can be further analysed that the assessment delved deeper into the relationship of various factors and their influence on behavioural intention within the hotel's virtual reality. Findings suggest that the hotel virtual reality experience serves as a pivotal intermediary or acts as a mediator, bridging factors like content quality, system quality, and vividness with behavioural intentions. Each of these relationships, though intertwined with the hotel VR experience, demonstrates a subtle, yet discernible impact, as evidenced by the small effect sizes in the mediation paths. Furthermore, while factors such as the richness of content, the robustness of the system, and the lifelikeness (vividness) of VR contribute to shaping a guest's behavioural intentions, it is the main hotel virtual reality experience that channels these influences. It acts as the key player connecting these individual elements to the ultimate behavioural responses of guests, lending credence to hypotheses H6a, H6b, and H6c. It was posited in the study of Lee (2020), that to encourage clients to feel a sense of presence in the destination and to build a pleasant VR experience, VR material should be developed in a user-friendly, interactive, and vividly rich format. Positive attitudes toward the VR and their emotions of presence eventually result in respondents' intention to visit the destination. On the other hand, cognitive absorption was found to mediate the links between system quality and behavioural intention (β = 0.151, p < 0.001, f2 = 0.098) and vividness and behavioural intention (β = 0.254, p < 0.001, f2 = 0.179) with small and medium effect sizes respectively. Contrary, cognitive absorption was found to have no mediating influence on the link between content quality and behavioral intention (β = 0.055, p = 0.058, f2 = 0.040). Thus, H7b and H7c are supported, while H7a is not. From the perspective of Tussyadiah et al. (2018), they discovered that the enjoyment of virtual tourists derived from experiencing a travel destination in a virtual tour which led to a higher interest in the travel destination to visit. This means that heightened enjoyment leads to a greater interest in the destination. Kim (2022) added that participants are most likely to seek something they are unable to experience in a virtual environment, and those who experience higher cognitive absorption tend to be more motivated to visit the actual location.

Implications of the study

The managerial implications are twofold. Firstly, the study highlights the crucial role of high-quality, vivid content in virtual reality (VR) experiences within the hotel industry. Hotel managers should focus on enhancing the quality and vividness of their VR content to improve customer engagement and satisfaction. The results are also congruent to the study of Jonson & Masa (2023) where high and satisfied customer engagement can lead to increased tourist satisfaction, positive word-of-mouth and enhanced destination loyalty, attracting more visitors and fostering sustainable tourism growth This approach does not only enhance the guest's virtual experience but also positively influences their behavioural intentions, such as revisit or recommendation intentions. Secondly, the study underscores the importance of system quality in the efficacy of VR experiences. Managers should invest in robust and user-friendly VR systems to ensure a seamless and immersive experience for guests. High system quality, characterized by reliability, easy accessibility, and interactive features, not only improves the user experience but also significantly enhances cognitive absorption. This is also parallel to the study of Chamboko-Mpotaringa & Tichaawa (2021) that these results may add also to digital marketing tools in tourism as well as in the future trends of

technology. This increased engagement and immersion in the virtual environment can lead to stronger behavioural intentions, such as increased willingness to book a stay or recommend the hotel to others. Therefore, investing in both content and system quality in VR applications is a strategic move for hotel managers aiming to leverage technology for enhanced customer experience and business growth.

Conclusion

In conclusion, the study offers valuable insights into the impact of vividness, content, and system quality in virtual reality experiences within the hotel industry. It emphasises the significant role these factors play in shaping customer perceptions and behavioural intentions. By focusing on enhancing VR content and system quality, hotel managers can effectively leverage technology to elevate guest experiences, thereby influencing positive behavioural outcomes like increased bookings and recommendations. Furthermore, this study will contribute to our understanding of how cognitive and emotional states are manifested in behaviour. Favourable emotional events, when accompanied by higher virtual brain activation, will produce a perception of increased vividness and a sense of presence from the end of the guests as this will also give a better understanding of the service through the facilities of the hotels. Thus, good emotions can enhance the impression of being in a virtual reality setting. This strategic focus on technological innovation not only positions hotels favourably in a competitive market but also paves the way for future advancements in customer experience and engagement. Lastly, alongside this improved experience, there is also a heightened level of cognitive immersion, indicating that users are more deeply engrossed and connected with the content presented to the guests. Essentially, when guests are deeply engrossed and immersed in experiencing cognitive absorption in the virtual reality environment provided by the hotel, there is a heightened likelihood that their future actions or inclinations lean towards a positive direction.

Recommendation

To strategically enhance guest experiences in the hotel industry, it is recommended to focus on the development and deployment of high-quality virtual reality (VR) systems. These systems should emphasise creating immersive and vivid content that can captivate and engage guests. In addition, new systems and internet connectivity should be part of the robust revitalisations in the hotel industry in the Philippines as this is also a main struggle not only in the virtual reality adaptations which were shown in the results of this study. Additionally, ensuring the VR technology is user-friendly and reliable is crucial for maximizing its impact on customer satisfaction and behavioural intentions, such as the likelihood of return visits or recommendations. This approach not only differentiates a hotel in a competitive market but also aligns with evolving technological trends and customer expectations. Having a good facility, customer service, and guest interaction between the guests and the hotel staff which are part of the videos and experienced through the technology being used or VR experience should also be part of the revitalisation and enhancement as these are also congruent and correlated with each other. Lastly, future researchers may adopt artificial intelligence (AI) in the VR as this will play and provide a seamless interactive experience between the guests and the hotels this will give a more vivid experience. AI also is a correlated technology that is in trend with digital and technological enhancement not only in the hotel industry but also in different businesses in the Philippines and across the world.

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