Empirical Analysis of Non-immersive Virtual Reality on Behavioral Intentions: The Moderating Role of Openness to Experience

a Mahnoor Yousaf, b Ayesha Mohsin, c Shahzad Ali

a M. Phil in Economics (Candidate), Department of Economics and Commerce, Superior University, Lahore
b M. Phil in Commerce and Finance (Candidate), Department of Economics and Commerce, Superior University, Lahore
c Lecturer, Chaudhry Abdul Rehman Business School, Superior University, Lahore, Pakistan

ARTICLE DETAILS

History:
Accepted 11 June 2023
Available Online June 2023

Keywords:
VR Visit, (Attitude Toward Service Provider), (Playfulness), Attitude Toward the Product, Presence, Knowledge Of Properties, Behavioral Intention, Openness to Experience

JEL Classification:
P24, P29

DOI: 10.47067/ramss.v6i2.322

ABSTRACT

This research is used to scrutinize the impact of virtual reality in real estate and the properties of offering consumers non–an immersive Virtual reality (VR) experience through broadly existing technology, to allow them to view real estate products. This study also emphasizes the use of such technologies to improve customer experience, opinions, and behaviors in the highly competitive real estate industry. Data have been collected from the consumer of the real estate sector. 302 consumers filled out the questionnaires and finally, binding responses 206 have been used for the PLS Structural Equation Modeling (SEM) analysis. The systematic conclusions revealed improved "visiting" experiences as well as more favorable feelings toward both the products and the agency. Further, results postulate that knowledge of properties mediates the positive relationship between the visiting real estate properties through VR and behavioral intention. Furthermore, Openness to experience moderates the positive effect between visiting real estate properties and behavioral intention. This study provides valuable implications on a realistic level, this study also stressed the importance of offering consumers an enhanced experience of promoted products for practitioners to positively impact consumer's attitudes and behavioral intentions.

© 2023 The authors. Published by SPCRD Global Publishing. This is an open-access article under the Creative Commons Attribution-NonCommercial 4.0

Corresponding author’s email address: mahnoorbutt2232@gmail.com

1. Introduction

A growing number of studies are focusing on customer experience (CX), which can be described as the “customer's emotional, cognitive, sensorial, social and behavioral responses to a firm's contributions throughout the customer's complete purchase journey” (Lemon & Verhoef, 2016). The development of a competitive advantage that offers customers ironic and
pleasurable involvements is a good move for marketers (Antébian, Filser, & Roederer, 2013). Technological advancement offers marketers fresh options while embracing the experimental test.

The potential advantages of using an experienced approach seem intriguing in the real estate industry. There are many consumers whose demands in the real estate market can be satisfied. Real estate agents should give buyers enough information so they can picture themselves engaging with the property, which encourages good reactions to the connected service and product. This international service, which operates successfully, is closely linked to the advancement of digital technologies, which has had a substantial effect on the sector in recent years. Among these tools, virtual reality (VR) technologies are crucial. These type of technologies manufacture an immersive virtual environment that simulate real-life experiences and let users manage and find the way for their events in the virtual world (Zeng & Richardson, 2016). “There, a behavioral intention refers to a person’s individual prospect that he will execute some behavior,” (Fishbein & Ajzen, 1977). Consumer purchase decisions are significantly influenced by perceived value, which suggests that behavioral intention results from perceived value. The analysis of two variables helped to predict behavioral intention: sound-of-mouth behavior and intentions to revisit. When customers get high value from the consumer experience, they would be likely to express positive behavioral purpose (Zeithaml, 1988; Suki et al., 2022; Nazar et al., 2022; Chaudhry et al., 2022; Hameed et al., 2021; Islam et al., 2022; Ali et al., 2021; Hassan et al., 2020; Fatima et al., 2021; Meo et al., 2021; Sun et al., 2022; Chang et al., 2022; Numan et al., 2022).

This study focuses on quasi virtual reality (VR), which offers a comprehensive contribution, and the real estate industry. It is hoped that consumers' use of non-immersive VR technologies will have a optimistic consequences on their behaviour toward (1) the sense of occurrence in a virtual environment (also known as presence), (2) playfulness (enjoyment), (3) attitudes and behavioral intentions toward the product, (4) attitudes toward the service provider, (5) knowledge of properties (such as room layouts and building materials), and (6) openness to new experiences. However, there hasn't been much research done on whether VR is a simple tool that can increase how consumers perceive real estate items. This study looked at how non-immersive VR visits affected consumers' visits and their attitudes regarding the service provider and the items (apartments) (the real estate agency). The term "non-immersive" in this study refers to technologies that demonstrating the content on a computer screen without the need for additional tools (Suh & Prophet, 2018). The lack of examination of the effect of VR technology on changes in users' understanding of properties (e.g., room arrangement, construction materials) and openness to experience is one of the theoretical gaps I uncovered in my investigate.

The foremost goal of this research article is to investigate how customer experiences influence attitudes about real estate and service providers, as well as the capacity to reason, learn, and have an understanding of things. The research also considers the benefits of providing a non-immersive VR experience to a customer via extensively accessible technology, allowing them to assess and evaluate the real estate product. The benefits of these technologies were also discussed in this study to improve consumer perceptions and experiences, particularly in an extremely competitive real estate market.

2. Literature Review
2.1 Theoretical Background

We used the S-O-R theory in this research. The S-O-R theory is frequently employed to focus
on the interaction between stimulus (inputs), organism (processes), and response (Mehrabian & Russell, 1974) (outputs). The Stimulus-Organism-Response (SOR) theory states that people often respond to their surroundings in one of two ways: either by avoiding it or by approaching it. Averting behaviours include the contradictory desire not to positively act, whereas approaching behaviours consist of all positive actions, such as the aspiration to explore, reside connect, and effort (Mehrabian & Russell, 1974). It specifically explains how the organism's (i.e., consumers’) cognitive and emotional states are prejudiced by the stimuli (in terms of contextual cues, such as products offered through VR technology). Responses to the stimuli include avoidance or approach behavior (e.g., happiness, acquire intention). The S-O-R framework concentrates on the results of immersive technology as well as the user's perception of immersion psychological condition level (Loureiro, Guerreiro, Eloy, Langaro, & Panchapakesan, 2019). Thus, researchers may find the S-O-R theory to help explore the factors associated with VR. (Eroglu, Machleit, & Davis, 2003). In addition, recent research has emphasized on the S-O-R model is efficient in predicting user behavior while using communication and information technologies (Chen & Yao, 2018). This study looks at the relationship between good organism experiences (playfulness, presence, and pleasantness) and potential responses by employing a non-immersive VR as a "stimulus" (i.e., attitude toward the products and the organization and behavioral intentions). In the tourism context, VR can be distinct as an interactive digitally created middle that enable to partakers build replicated experiences of imaginary environments using a head-mounted demonstration of a VR device (Williams & Hobson, 1995). As technology develops, VR tourism provides a whole picture of hotels and destinations and also reduces the customer’s professed apprehension or jeopardy by familiarizing consumers with unfamiliar destinations (Lee & Oh, 2007). In VR tourism-related areas, six principles have been used: education, heritage preservation planning and management, marketing, convenience, and entertainment (Guttentag, 2010).

2.2 VR Technology And presence, Playfulness, And Attitude Towardsthe Environment

In a psychological state, Presence refers to the user in which he feels immersed or lost in a mediated environment to the degree in which the user feels physically "present" in the virtual environment (Schubert, Friedmann, & Regenbrecht, 2001). Research has revealed that a higher wisdom of presence in virtual environments has been related to pleasure and enjoyment in cooperating with this environment (Larsson, Västfjäll, & Kleiner, 2001). Previous research shows that playfulness plays an important role to enhance users' intention and attitude to use a website (Ahn, Ryu, & Han, 2007). Playfulness is a fascinating concept that is related to the presence and the user's experiential factors during the use of VR (Kang, Shin, & Ponto, 2020). Playfulness can also be explained as a suitable creation of study of human-computer and technology communications as computer technologies integrate spirited features like multimedia, graphics, and animation (Poncin, Garnier, Mimoun, & Leclercq, 2017). The feeling of being "present" is a major psychological effect that relates to users in the virtual environment (Larsson et al., 2001). Furthermore, some studies also emphasized that there is a positive impact of VR technologies on playfulness (Kang et al., 2020). Preceding studies also considered that there is a positive impact of VR on consumers' attitudes toward environments (Jeng, Pai, & Yeh, 2017).

**H1a.** Using VR technology to tour real estate properties is linked to a stronger sense of presence than using pictures.

**H1b.** Visiting a real estate property with VR technology (instead of photographs) is linked to a more playful experience.

**H1c.** VR property visits are related to a more favorable opinion about real estate properties than images.
Focusing on user attitudes is one tactic for developing a theoretical foundation for understanding the constructs and processes concerned to a user's acceptance or rejection of information technologies in the workplace (Hogarth, 1991). “A behavioral intention, refers to a person’s personal prospect that he will perform some behavior”(Fishbein & Ajzen, 1977). In count, recent findings show that the positive impacts of VR technologies may contain when it comes to behavioral intentions (Willems, Brengman, & Van Kerrebroeck, 2019). It was therefore implied that VR would have a favorable effect on customers' inclination to schedule a real visit to the properties (which is a major objective for any real estate agency). Consumer purchase decisions are heavily influenced by perceived value, which suggests that behavioral intentions are a direct result of perceived value. The behavioral intention had been studied by examining the two variables: (1) intention to return and (2) word of mouth. When customers get high value from the consumer experience, they tend to express positive behavioral intent (Zeithaml, 1988).

**H2a.** The real estate properties in person is higher when viewing them through virtual reality (vs. photographs) (i.e., behavioral intention).

**H2b.** A greater sense of presence leads to a greater desire to visit the places in person (i.e., behavioral intention).

### 2.3 Attitude toward the real estate product and the feeling of presence(i.e., behavioral intention)

Additionally, the stimuli (in terms of contextual signals, like products offered via VR (technologies) stimulus the consumer’s cognitive and emotional states. The resulting responses include behaviors like approach or prevention (e.g., purchase intention, satisfaction). As such, unlike other theoretical accounts (e.g., flow theory), the S-O-R framework allows not only a emphasis on the user's sense of absorption (psychological state level) but also on the consequences of immersive technology (Loureiro et al., 2019). In addition, modern research has emphasized that the S-O-R model is effective for predictinguseractions and behaviors while using communication and information technologies (Chen & Yao, 2018). Modern research suggests that in the field of tourism (Tussyadiah, Wang, Jung, & tom Dieck, 2018) insense of person in the virtual environment directly results in the improvement of consumer's attitudes towards their environment and this attitude would lead to a change of a higher intention to visit.

**H2c.** The relationship between the perception of presence and the desire to visit the properties is mediated by one's attitude toward the real estate product (i.e., behavioral intention).

### 2.4 Playfulness and Visiting real estate properties through photos, and service provider

In the tourism context, VR can be defined while ancooperating digitally generated middle that allows the partakers to build stimulating experiences for imaginary environments using the head-mounted demonstration of a VR device (Williams & Hobson, 1995). VR tourism provides more comprehensive pictures of hotels and termini moreover it lessens the customer's apparentunese or risk by explaining consumers with different destinations (Lee & Oh, 2007). Six principal tourism-related areas: (1) accessibility, (2) marketing,(3) education, (4) planning and management, (5) entertainment, and (6) heritage preservation. (Guttentag, 2010). The service provider has to manage customers who are gradually more sensitive to compelling, playful, and enjoyable experiences (Garrett, 2006). Evidence of a link between experience when using a website and the user’s attitude toward the website has been provided in the research. Particularly, researchers have shown that playfulness has an important role in enhancing consumer evaluations such that it serves as a notable predecessor of attitude toward the product (Ahn et al., 2007). The author may have a reasonable assumption that a pleasant experience affects a customer's attitude toward both the service provider
and the product as a whole.

**H3a.** A greater sense of playfulness felt during the virtual visit leads to a more favorable opinion of the service provider.

**H3b.** Visits to real estate properties through virtual reality (vs. photographs) are linked to a more favorable opinion of the service provider.

### 2.5 Knowledge of properties and VR visiting real estate properties

The areas of the structure share many of the factual and experiential qualities that define the building as a whole, including experiential qualities like experiential space, architectural style, and beauty, and functional qualities like enclosing, servicing, and furnishing. Sustainable building is positively impacted by behavioral intention. To avoid using more multifaceted resolutions, which are frequently used throughout the post-design stage, it is important to choose the room layout and building layout wisely early on in the design process. Commonly, a practice of building design, building imitation software is work to study the current relief performance after deciding the space strategy and arrangement (Attia, Gratia, De Herde, & Hensen, 2012).

**H4a.** The favorable association between virtual reality visits to real estate properties and the desire to see the properties in person is mediated by knowledge of the properties (i.e., behavioral intention).

### 2.6 Openness to experience and the intention to visit the properties for real (i.e., behavioral intention).

Openness to Experience is a word that is generated in the type of word "intellect" which can be described as "the ability to learn and reason and the capacity for knowledge and understanding" (Abercrombie, 1996). The individual lofty in Openness to experience, experienced wonder only when they chose complex and reflective music (Pilgrim, Norris, & Hackathorn, 2017). Incount, people who attain high Openness to experience are open to new experiences, aesthetically sensitive or imaginative, and value arts and beauty (Kaufman et al., 2010).

**H5a.** Openness to experience moderates the positive effect between the VR visiting real estate properties and the intention to visit the properties for real (i.e., behavioral intention).

### 3. Research Model

The foremost concerned of this research to investigate the Non-immersive virtual reality on behavioral intentions, knowledge of properties used as mediating variable and openness to experience used as moderating variable to shown the uniqueness of the study to fulfillment of the objective.
4. Methodology

4.1 Sample Design and Data Collection

Customers in the real estate sector were the study’s target group. Customers in the targeted areas have provided the data. By using a survey questionnaire and the cross-sectional methodology, data were personally collected. 266 of the 302 questionnaires that were distributed for the survey were returned (we removed unfounded questionnaires that involve too many missing items or have unqualified answers). Finally, 266 legitimate responses were used to analyze the data.

4.2 Questionnaire and Pre-Test

All scales have been used in this research were modified from previous literature. The questionnaires were developed on closed-ended questions. We used five-point Likert scale questionnaires which range starting from (strongly disagree) 1 to (strongly agree) 5 were used for data collection. A 3-item scale which is developed by (Schubert et al., 2001) was used to determine presence. This study used the (Batra & Stephens, 1994) scale on attitude toward the products which has 3 items. This study also used 1 item scale developed by (Batra & Stephens, 1994). We adopted a four-item scale form (Mathwick, Malhotra, & Rigdon, 2001) which is intended to measure attitude toward the service provider. A 3-item scale which is developed by (Mathwick et al., 2001) measures playfulness. This study used the 6-item scale which is developed (DeYoung, Quilty,
Peterson, 2007) was used to measure Openness to experience. A 2-item scale was developed which measures the knowledge of properties (Pamungkas, Meytasari, & Trieddiantoro, 2018).

5. Data Analysis and Findings

PLS-SEM is used for hypothesis testing by Smart PLS 3 because it is extensively use and held as a current estimation method in all production areas, mainly in tourism and warmth areas (Ali, Rasoolimanesh, Sarstedt, Ringle, & Ryu, 2018). This research aims to calculate or explain the calculated covert variables based on modern theory. Furthermore, it is a elastic method for classical evaluation (Ringle, Wende, & Will, 2005). PLS-SEM was used in this research to avoid issues with sample size and data normality. The bootstrapping and PLS algorithm techniques are used to obtain factor loadings for testing and constructing the validity and inner constancy reliability (Ali et al., 2018), path coefficients and the resulting significant level. First, a measurement model was created, and then estimation were generated throughout the structure.

5.1 Common Method Bias

Because our data was collected solely from management workers, it is possible that it was influenced by Common Method Bias (CMB) due to the study’s specific circumstances. Prior research suggests conducting a comprehensive collinearity test using structural equation modelling (SEM) within the framework of partial least squares (PLS-SEM) techniques to determine whether the data is polluted by CMB (Kock, 2015). In line with this, the objective of our study was to estimate CMB by exploratory the variance inflation factors (VIF) computed during the collinearity test (Kock, 2015). The VIF analysis exposed that none of the VIF values exceeded the 3.3 threshold, indicating the lack of CMB in the tested model. As a result, CMV was not a apprehension in this research, allowing for additional empirical analysis.

5.2 Measurement Model Assessment

The composite reliability (CR), factor loadings and average variance extracted were castoff to calculate convergent validity and the measurement model (AVE). For more information, Table 1 and Figure 2. With a few exclusions, the majority of factor loadings met the suggested threshold of 0.60. Furthermore, all CR values exceeded the suggested value of 0.70, indicating high internal uniformity. Furthermore, all AVE values exceeded the recommended threshold of 0.50, signifying good convergent validity (Joseph F Hair, Hult, Ringle, Sarstedt, & Thiele, 2017). Items with the lowest factor loadings of 0.50 were removed to improve the measurement model. Table 4 also shows the outcomes of the Heterotrait-Monotrait Ratio (HTMT), which authenticates the measurement's discriminant validity. All HTMT values were found to be less significant than the researchers' advised cutoff value of 0.85 (Guy et al., 2011). This means that the measurement has discriminant validity. Overall, these resultssanction that the measurement model used in the current study has acceptable discriminant validity.

Table 1: Convergent Validity
The Average Variance Extracted (AVE) method used to evaluate convergent validity. The AVE values were examined to ensure convergent validity. The convergent validity results, as shown in the table below, show that all latent constructs had AVE values better than the acceptable threshold of 0.5. The AVE values ranged from 0.49 to 0.899. An AVE value greater than 0.5 specifies the covert constructs accounted for greater than 50% of the variance in their respective indicators.
### Table 2: Discriminant Validity (Fornell)

Fornell-Larcker criterion and the Cross-loadings used to measure discriminant validity. The initial focus of the analysis was on cross-loadings, in conformity with the recommendation of (Joe F Hair, Sarstedt, Ringle, & Mena, 2012) who recommend consistent loading estimates of 0.5 or higher, preferably 0.7 or higher. Items with low loadings of less than 0.4 were deemed unsuitable and were removed (J. Hair, Joe F, Sarstedt, Matthews, & Ringle, 2016). Overall, the measurement model showed strong discriminant validity across the constructs. The table below represents the discriminant validity of constructs. Table 2 shows that the square root of the Average Variance Extracted (AVE) values exceeded the correlation values among the latent variables, indicating the presence of distinct entities within the model. Furthermore, Table 2 shows that the outer loadings of the items were greater than the cross-loadings of other constructs, all of which surpassed the 0.5 threshold. This authorizes the expected result of indicators aligning well with their respective constructs, indicating the absence of indicator cross-loadings.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Loadings</th>
<th>Alpha</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude toward the products</td>
<td>AP1</td>
<td>0.434</td>
<td>0.394</td>
<td>0.701</td>
<td>0.574</td>
</tr>
<tr>
<td></td>
<td>AP2</td>
<td>0.98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude toward the service</td>
<td>ASP1</td>
<td>0.856</td>
<td>0.435</td>
<td>0.703</td>
<td>0.523</td>
</tr>
<tr>
<td>provider</td>
<td>ASP2</td>
<td>0.706</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASP4</td>
<td>0.391</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of properties</td>
<td>KP1</td>
<td>0.993</td>
<td>0.009</td>
<td>0.435</td>
<td>0.499</td>
</tr>
<tr>
<td></td>
<td>KP2</td>
<td>-0.115</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness to experience</td>
<td>OE3</td>
<td>0.339</td>
<td>0.484</td>
<td>0.686</td>
<td>0.758</td>
</tr>
<tr>
<td></td>
<td>OE4</td>
<td>0.599</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OE5</td>
<td>0.949</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presence</td>
<td>P2</td>
<td>0.275</td>
<td>0.206</td>
<td>0.626</td>
<td>0.525</td>
</tr>
<tr>
<td></td>
<td>P3</td>
<td>0.987</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Playfulness</td>
<td>PF1</td>
<td>0.712</td>
<td>0.467</td>
<td>0.783</td>
<td>0.646</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>AP</th>
<th>ASP</th>
<th>BI</th>
<th>KP</th>
<th>PF</th>
<th>P</th>
<th>OE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP1</td>
<td>0.758</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AP2</td>
<td>0.057</td>
<td>0.679</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BI</td>
<td>0.365</td>
<td>0.047</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KP</td>
<td>0.108</td>
<td>0.154</td>
<td>0.205</td>
<td>0.707</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PF</td>
<td>0.212</td>
<td>0.505</td>
<td>0.107</td>
<td>0.259</td>
<td>0.803</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.178</td>
<td>0.37</td>
<td>0.131</td>
<td>0.054</td>
<td>0.43</td>
<td>0.724</td>
<td></td>
</tr>
<tr>
<td>OE</td>
<td>-0.17</td>
<td>0.396</td>
<td>-0.126</td>
<td>0.229</td>
<td>0.132</td>
<td>0.224</td>
<td>0.677</td>
</tr>
</tbody>
</table>
Table 3: Cross Loadings

<table>
<thead>
<tr>
<th></th>
<th>AP</th>
<th>ASP</th>
<th>BI</th>
<th>KP</th>
<th>OE</th>
<th>P</th>
<th>PF</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP1</td>
<td>0.434</td>
<td>0.104</td>
<td>-0.036</td>
<td>-0.13</td>
<td>-0.17</td>
<td>0.034</td>
<td>0.131</td>
</tr>
<tr>
<td>AP2</td>
<td>0.98</td>
<td>0.038</td>
<td>0.401</td>
<td>0.145</td>
<td>-0.145</td>
<td>0.184</td>
<td>0.2</td>
</tr>
<tr>
<td>ASP1</td>
<td>0.128</td>
<td>0.856</td>
<td>0.161</td>
<td>0.031</td>
<td>0.132</td>
<td>0.318</td>
<td>0.503</td>
</tr>
<tr>
<td>ASP2</td>
<td>-0.079</td>
<td>0.706</td>
<td>-0.184</td>
<td>0.127</td>
<td>0.353</td>
<td>0.173</td>
<td>0.314</td>
</tr>
<tr>
<td>ASP4</td>
<td>-0.005</td>
<td>0.391</td>
<td>0.028</td>
<td>0.303</td>
<td>0.603</td>
<td>0.279</td>
<td>0.073</td>
</tr>
<tr>
<td>BI1</td>
<td>0.365</td>
<td>0.047</td>
<td>1</td>
<td>0.205</td>
<td>-0.126</td>
<td>0.131</td>
<td>0.107</td>
</tr>
<tr>
<td>KP1</td>
<td>0.109</td>
<td>0.162</td>
<td>0.194</td>
<td>0.993</td>
<td>0.265</td>
<td>0.034</td>
<td>0.265</td>
</tr>
<tr>
<td>KP2</td>
<td>0.001</td>
<td>0.059</td>
<td>-0.104</td>
<td>0.292</td>
<td>-0.115</td>
<td>-0.174</td>
<td>0.032</td>
</tr>
<tr>
<td>OE3</td>
<td>-0.036</td>
<td>0.096</td>
<td>-0.054</td>
<td>0.033</td>
<td>0.339</td>
<td>0.141</td>
<td>0.109</td>
</tr>
<tr>
<td>OE4</td>
<td>-0.057</td>
<td>0.239</td>
<td>-0.123</td>
<td>0.182</td>
<td>0.599</td>
<td>-0.015</td>
<td>0.137</td>
</tr>
<tr>
<td>OE5</td>
<td>-0.18</td>
<td>0.383</td>
<td>-0.102</td>
<td>0.211</td>
<td>0.949</td>
<td>0.246</td>
<td>0.094</td>
</tr>
<tr>
<td>P2</td>
<td>-0.163</td>
<td>0.135</td>
<td>-0.182</td>
<td>0.149</td>
<td>0.213</td>
<td>0.275</td>
<td>-0.007</td>
</tr>
<tr>
<td>P3</td>
<td>0.212</td>
<td>0.359</td>
<td>0.166</td>
<td>0.031</td>
<td>0.195</td>
<td>0.987</td>
<td>0.445</td>
</tr>
<tr>
<td>PF1</td>
<td>0.167</td>
<td>0.254</td>
<td>0.192</td>
<td>0.28</td>
<td>0.132</td>
<td>0.235</td>
<td>0.712</td>
</tr>
<tr>
<td>PF2</td>
<td>0.178</td>
<td>0.517</td>
<td>0.018</td>
<td>0.166</td>
<td>0.092</td>
<td>0.428</td>
<td>0.886</td>
</tr>
</tbody>
</table>

Table 4: Discriminant validity (HTMT Ratio)

The two methods for evaluating discriminant validity: the criterion-based approach and the statistical test utilizing the HTMT ratio (Afthanorhan, Ghazali, & Rashid, 2021). In the criterion-based approach, the HTMT ratio should be below 0.85 (Klein, 2014) or below 0.90 (Gold, Malhotra, & Segars, 2001) to ensure discriminant validity. If the HTMT ratio exceed these thresholds, it indicates a potential issue with discriminant validity. Table 4 displays the HTMT ratio values for each construct. As demonstrated in Table 4, all HTMT ratio values for the constructs were below 0.90, meeting the HTMT<0.90 criterion (Gold et al., 2001). Therefore, these results confirm the establishment of discriminant validity for all constructs. To ensure discriminant validity in the criterion-based approach, the HTMT ratio should be less than 0.85 (Klein, 2014) or less than 0.90 (Gold et al., 2001). Hence, there are two approaches to assessing discriminant validity: the criterion-based approach and the statistical test based on the HTMT ratio (Henseler, Ringle, & Sarstedt, 2015). If the HTMT ratio surpasses these limits, it specifies a possible problem with discriminant validity. The HTMT ratio values for each construct are shown in Table 4. As shown in Table 4, all of the constructs' HTMT ratio values were less than 0.90, meeting the HTMT 0.90 criterion (Gold et al., 2001). As a result, these conclusions support the presence of discriminant validity for all constructs.
5.3 Structural model Assessment

The structural model evaluation has been used in the approximation of the hypothesis in the acuity of industrialization enterprises after determining if the model is effective and reliable through the estimate of the extent model. The path coefficient values indicated whether or not the hypothesis was supported. Path coefficients, t-values and standard errors are generated to conclude whether the model and correlations are significant given the data. In smart PLS 3 (Sarstedt, Henseler, & Ringle, 2011), the bootstrapping procedure was used to calculate the main and moderation effects. As shown in Table 5 and Figure 3, playfulness is significantly and positively associated with attitude toward service providers (β = 0.505, t = 6.391; LL=0.354, UL= 0.608), indicating that H1 is supported. The results also show a statistically noteworthy relationship between attitude toward product and behavioural intention (β = 0.336, t= 1.942; LL= 0.026, UL= 0.525), indicating that H2 is supported. Furthermore, because attitude toward service provider has a significant relationship with presence (β= 0.37, t = 1.72; LL = -0.091, UL = 0.49), H3 is not supported. Furthermore, it was discovered that playfulness has a significant and positive relationship with property knowledge (β= 0.259, t = 1.49; LL = -0.105, UL = 0.331), inferring that H4 is not supported. According to Table 5 and Figure 3, there was an insignificant relationship between openness to experience and attitude toward products (β = -0.229, t = 1.362; LL = -0.174, UL = 0.331) and behavioural intention (β = 0.165, t = 1.104; LL = -0.274, UL = 0.509), so H5 and H6 are not supported. Moreover, there was an insignificant relationship between attitude toward the service provider and attitude toward the product (β = 0.148, t = 1.086; LL = -0.362, UL = 0.352), indicating that H7 is not supported. Finally, presence mediates the relationship between VR and behavioural intention insignificantly (β = 0.062, t = 0.271; LL = -0.405, UL = 0.348), so H8 is not supported.
Table 5: Path Analysis

<table>
<thead>
<tr>
<th>Relationships</th>
<th>Beta</th>
<th>S.D</th>
<th>t-value</th>
<th>P.values</th>
<th>Decision</th>
<th>L.L</th>
<th>U.L</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>ASP -&gt; PF</td>
<td>0.505</td>
<td>0.079</td>
<td>6.391</td>
<td>0</td>
<td>Supported</td>
<td>0.354</td>
</tr>
<tr>
<td>H2</td>
<td>AP -&gt; BI</td>
<td>0.336</td>
<td>0.173</td>
<td>1.942</td>
<td>0.026</td>
<td>Supported</td>
<td>0.026</td>
</tr>
<tr>
<td>H3</td>
<td>ASP -&gt; P</td>
<td>0.37</td>
<td>0.215</td>
<td>1.72</td>
<td>0.043</td>
<td>Not Supported</td>
<td>-0.091</td>
</tr>
<tr>
<td>H4</td>
<td>PF -&gt; KP</td>
<td>0.259</td>
<td>0.174</td>
<td>1.49</td>
<td>0.068</td>
<td>Not Supported</td>
<td>-0.105</td>
</tr>
<tr>
<td>H5</td>
<td>OE -&gt; AP</td>
<td>-0.229</td>
<td>0.168</td>
<td>1.362</td>
<td>0.087</td>
<td>Not supported</td>
<td>-0.174</td>
</tr>
<tr>
<td>H6</td>
<td>KP -&gt; BI</td>
<td>0.165</td>
<td>0.15</td>
<td>1.104</td>
<td>0.135</td>
<td>Not supported</td>
<td>-0.274</td>
</tr>
<tr>
<td>H7</td>
<td>ASP -&gt; AP</td>
<td>0.148</td>
<td>0.136</td>
<td>1.086</td>
<td>0.139</td>
<td>Not supported</td>
<td>-0.362</td>
</tr>
<tr>
<td>H8</td>
<td>P -&gt; BI</td>
<td>0.062</td>
<td>0.23</td>
<td>0.271</td>
<td>0.393</td>
<td>Not supported</td>
<td>-0.405</td>
</tr>
</tbody>
</table>

Figure 3: Structural Model Assessment
6. Discussions

This research focuses the potential benefits of a widely used VR technology on consumers' experiences with products and services as well as their attitudes about such businesses. The outcomes showed how much the presentation had improved consumer intent to visit the properties. Finally, it influenced attitudes toward the service provider even more than attitudes toward the products in the line (Hilken et al., 2022), emphasising the importance of designing services with the customer experience in mind and shifting the emphasis away from a clear benefit approach and toward a more experiential point of view. The results also show that property knowledge mediates the advantageous relationship between virtual reality and behavioural intention. This outcome also made clear that openness to experiences moderates their favorable effects on behavioral intention and VR. The impact of VR usage extended beyond consumer perceptions of and attitudes toward the product, as these also translated into more favorable perceptions of the service provider.

6.1 Theoretical Contribution

This research in marketing on the use of VR has largely focused on its impact in terms of Consumer Experience (Loureiro et al., 2019). The S-O-R theory widely used (Mehrabian & Russell, 1974) focuses on stimulus (input), organism (processes), and response (output). Thus, researchers may discover that the S-O-R theory is a helpful means by which to look at the factors related to VR (Roschk, Loureiro, & Breitsohl, 2017). In turn, the stimuli make responses like avoidance behavior or approach e.g., purchase intention, and satisfaction. This theory work permits not only emphasis on the user's sense of involvement but also the consequences of immersive technology (Loureiro et al., 2019). In count, recent research has emphasized that the S-O-R model is efficient for predicting consumer behavior while using communication technologies and information (Chen & Yao, 2018).

6.2 Practical Implication

Practically speaking, this research highlights how critical it is to give consumers an improved experience of promoted products to have a beneficial influence on their views and interactive intentions. The results show that a VR experience may have a additional positive effect on a service provider's perceptions than it does on the perceptions of the products themselves. Using VR technology might be especially important when products are conducted by extensive service dimensions. Furthermore, a positive attitude might questionably increase the repurchase intentions of consumers, which is important for providers of professional services (Le & Supphellen, 2017). Conversely, in light of the impressive development in the use of VR applications, it could be argued that using VR technologies is about to become a more general practice in various business sectors. With this regard real estate particularly, reports have predicted that the virtual reality and amplified reality markets could exceed $2.5 billion by 2025 (Johnson, 2019). So, this development might result in putting the non-users at a competitive dis-advantages.

6.3 Limitations and Future Research Directions

Though the objectives of the present study have been met, it does have clear limitations. The properties' development prioritized visual information over the accurate information that is often integrated in real estate marketing (e.g., price, number of rooms, heating system, and living surface). These higher-level processes in decision-making and attitude information may not have benefited from this lack of rational knowledge, which may have led to notions with an emotive foundation receiving more weight, such as playfulness. Another drawback is that the current study did not investigate if the results could be easily applied to other company sectors. Additionally, depending on the type of properties, the effects of the VR technology employed within the real estate sector may
vary.

The potential moderating effects of various personality qualities (such as extroversion versus introversion) on VR outcome and experience should potentially be studied in future research. Finally expanding the existing experiment to immersive VR technology such as head-mounted displays is a clear prospect for future research. Implicitly, the deeper immersion that such technology would produce would magnify the subsequent repercussions.

7. Conclusion

According to this research study, virtual reality (VR) technologies be able to augment both the customer understanding and the effectiveness of VR technologies in real estate. As a result, this study also looks at the impact of giving consumers a non-immersive VR experience using broadly accessible technology so they may see real estate offerings. Along with improved "visiting" experiences, this study is linked to favorable perceptions of the organization and its offerings. This research study also advances such technology to improve client attitudes and experiences, particularly in the fiercely competitive real estate sector.

References


