



International Journal of Management Practice

ISSN online: 1741-8143 - ISSN print: 1477-9064

<https://www.inderscience.com/ijmp>

Determinants of customer experience, satisfaction and willingness to purchase from virtual tour of a retail store

Swati Bhatnagar, Rajan Yadav

DOI: [10.1504/IJMP.2023.10052016](https://doi.org/10.1504/IJMP.2023.10052016)

Article History:

| | |
|-------------------|------------------|
| Received: | 06 August 2020 |
| Last revised: | 18 December 2020 |
| Accepted: | 11 June 2021 |
| Published online: | 14 December 2022 |

Determinants of customer experience, satisfaction and willingness to purchase from virtual tour of a retail store

Swati Bhatnagar*

Amity Business School,
Amity University,
Noida, Sector 125, 201313,
Uttar Pradesh, India
Email: swati_bhatnagar2002@hotmail.com
*Corresponding author

Rajan Yadav

Delhi School of Management,
Delhi Technological University,
Bawana Rd., Shahbad Daultpur Village,
Rohini, 110042,
Delhi, India
Email: rajan.yadav.dsm@gmail.com

Abstract: Virtual tours are increasingly being used by e-commerce firms to attract customers and to overcome the limitation of tangibility associated with online shopping. The purpose of this paper is to study the dimensions of customer experience in context of virtual tours and its impact on satisfaction of the customer and his willingness to purchase. A virtual tour stimulus was given to the respondents in the form of a link of a popular sunglass store before they took the survey. A sample of 240 responses was drawn from the National Capital Region (NCR) of Delhi to which an integrative technique of structural equation modelling (SEM) and neural networks (NN) was applied. The empirical results indicate information privacy concern, perceived enjoyment, sensory experience, intellectual experience and peace of mind significantly influenced customer satisfaction and willingness to purchase. Neural network results ranked information privacy concern as the most important factor in a virtual tour customer experience.

Keywords: virtual tour; customer experience; customer satisfaction; neural networks.

Reference to this paper should be made as follows: Bhatnagar, S. and Yadav, R. (2023) 'Determinants of customer experience, satisfaction and willingness to purchase from virtual tour of a retail store', *Int. J. Management Practice*, Vol. 16, No. 1, pp.38–58.

Biographical notes: Swati Bhatnagar is an Assistant Professor at the Amity Business School, Amity University, Noida. She is graduated from the Delhi University and obtained her MBA from the ICFAI Business School, ICFAI University. She is UGC NET Qualified and currently pursuing her PhD from the Delhi School of Management, Delhi Technological University in the area of

Distribution Channel Conflict. She has financial industry experience of five years and academic experience of more than 11 years. Her area of academic specialisation and research is sales, behavioural and structural dimensions of distribution channel management.

Rajan Yadav is a Professor and the Head of the Delhi School of Management, Delhi Technological University. He graduated from the Delhi University and obtained his Master's in Business Management from the MD University and awarded PhD in the area of Organized Retail. He is actively involved in teaching, research and administration. He has been teaching MBA students for more than 18 years and prior to joining DTU; he has held the position of Associate Professor in the Indraprastha Engineering College where he was instrumental in setting-up the management department. His interest area includes behavioural dimensions of technology diffusion, online social networks and student community-related social marketing issues.

1 Introduction

Digital retail technology has brought about significant changes in consumer buying behaviour and has given rise to new opportunities to retailers to provide a seamless and real-time customer experience (CE). Organisations, today have incorporated the designation of chief experience officer (CXO) in their hierarchy, as the complete focus of businesses is shifting towards real-time CE. The same is obvious as managers have realised that products tend to get commoditised over a period of time but it is the CE which is the real differentiator. Growing number of retailers are making significant investment in the integration of such technologies to deliver better shopping experience to their customers (Lee and Leonas, 2018). Retail formats are experimenting with emergent technologies like virtual reality (VR), augmented reality (AR), 3D modelling, virtual fitting rooms, smart mirrors, check out free stores, voice-based and visual search, chatbots and more recently delivery by drones. Such smart technologies provide immersive and enhanced CE to the new age digital customer who is more creative, engaged and emotional (EM) with retail brands (Cognizant, 2020). These technologies also have the ability to address the challenges created in shopping behaviour due to the recent COVID-19 pandemic. A unique and innovative offering by a specific retailer, enhances the shopping experience and similar expectations arise from other retailers operating in that specific domain (EY, 2015). Thus, it is pertinent for all kinds of retailers to understand the attitude and perception of the customer towards adoption of these technologies to make their business model more sustainable and competitive at each stage of customer journey (Madan and Yadav, 2019).

The 'brick and mortar' stores provide touch and feel, shopping thrills and instant gratification to the customers. Perhaps, such stores have restrictions in terms of shopping fatigue, over-crowding and restricted merchandise on display. While, 'click and mortar' models focuses on 'spatial and temporal' limitations free shopping experience, they lack in instant gratification and real touch and feel experience (Van et al., 2017). The smart technologies enable both the retail formats to address new age challenges and provides opportunities to merge both the models in an integrated platform for their customer irrespective of their stage of buying process of their customer journey. Such integration is

based on the premise that both the retail formats are complementary rather than competing to each other (Wang and Goldfarb, 2017; Baek et al., 2020). This has led to an increasing number of retail formats aggressively using smart technologies across different formats, as a single channel is no longer enough for a seamless CE (Deloitte, 2015).

Among the evolving smart technologies in retailing, many firms have embedded VR applications into their process to provide an experience-based value delivery that enhances customer engagement and retention. VR may be defined as a computer stimulated, realistic-3D environment which enables users to relate to the environment (Park et al., 2018). The user gets a sense and feel of presence as virtual tours engage users' sense like vision and hearing (Van et al., 2017). In addition to that, kinematic and proprioceptor experience make it more immersive and engaging (Walsh and Pawloski, 2002). Similar view was expressed by Bogicevic et al. (2019) in their study of application of VR in tourism sector. They demonstrated that VR induces greater mental imagery and a stronger sense of presence when compared to 360° images preview, leading to a much enhanced brand experience. Thus, during the virtual tour of a store, customers get a 'seemingly real' environment which enhance their engagement and experience (Spielmann and Mantonakis, 2018).

The extant body of literature that exists in this area emphasises on software and hardware part of VR (Cipresso et al., 2018). Research studies conducted by software and hardware companies together, have analysed VR essentially for commercial perspective. Empirical research on the nature and experience of VR for customers and the process by which customer-controlled interactivity leads to telepresence (an amplified state of immersion) remains shrouded (Spielmann and Mantonakis, 2018). Very few studies cover the behavioural dimensions in application and adoption intention of VR in retail context. There are lot of studies on adoption of VR and customer engagement in the hospitality and the tourism sector (like Bogicevic et al., 2019; Van et al., 2020) where virtual tours have become the new preamble. However, studies on customer's psychological acceptance in the retail sector and that too for a high involvement product category (like sunglasses in this study) that has a more hedonic shopping orientation (Pizzi et al., 2019), is still in its infancy (Lee et al., 2020). Considering these gaps in the literature this study contributes to the theory by integrating the dimension of CE of virtual tour with the marketing outcomes, i.e., customer satisfaction and his willingness to purchase (WTP). A clear understanding of these dimensions is essential for creating effective virtual shopping environment and in the development of suitable strategic framework for a seamless shopping experience to customers. Thus, this study addresses the following research questions:

RQ₁ What factors determine CE during their virtual tour in a retail store?

RQ₂ What is the influence of CE on the satisfaction of customers?

RQ₃ Does customer satisfaction leads to WTP after the virtual visit of a retail store?

The remaining section of the paper is organised in four parts. The first part provides proposed framework of the study and extant literature review. The second part addresses the research methodology applied for this study. Third part statistically analyses the theoretical model and tests the hypotheses. Finally, the paper summarises the results, outlines the implications and ends with limitations in the study and scope for further research.

2 Conceptual framework and literature review

The rapid growth of technology in the last decade has given a huge fillip to electronic and mobile commerce. The consumer today has the option of purchasing products and services from multiple channels. However, he refuses to stick to a particular channel and has become an ‘omni’ channel customer. In response to this evolving customer behaviour, businesses are rebalancing their presence in the offline and the online world. This shift in consumer behaviour has also exerted a significant impact on the traditional stores as many of them are being shut down. The online sales commands around 10% of total retail sales in the USA and this momentum continues to grow with no signs of decline. A good section of scholars and market analysts argue that the experience and the unique benefits of the physical retail store are hard to substitute in the online context (Havir, 2017). This explains why companies like Amazon.com or Flipkart.com are using latest augmented and interactive technologies, VR and many more to enhance the online customer experience (OCE).

With this backdrop, this study aims to analyse CE’s components elicited by a stimulus – virtual tour and its influence on outcomes: customer’s satisfaction and WTP post the virtual tour. While there are ample studies on virtual environments creation of ‘telepresence’ (for example, Debbabi et al., 2010; Spielmann and Mantonakis, 2018; Orth et al., 2019) and its impact on the consumer mind set and attitude, comprehensive studies combining different models of CE and integrating it with the marketing outcomes of satisfaction and subsequent purchase behaviour are still in nascent stage. This gap identified in the literature served as a trigger to conduct this study and get greater insights of experience of the online customer.

2.1 Customer experience

The uniqueness of CE can create an altogether new platform for differentiation. Last decade has seen some significant research in this area but still a lack of definite consensus exists on the different dimensions of CE and its possible outcomes. CE is “the internal and subjective response that a customer develops to any form of direct or indirect contact with a company” (Meyer and Schwager, 2007). Theoretically, it is a construct with roots in psychology which gives a complete idiosyncratic response arising from the interaction of the customer with the retailer (Gentile et al., 2007). When managed properly, CE enhances trust, satisfaction and loyalty of the customer and influences firm’s financial performance (Klaus and Maklan, 2012). Past studies confirm that OCE causes three behavioural variables: satisfaction, trust, and repurchase intention (Ranaweera et al., 2008).

2.2 Dimensions of CE

While studying CE it is essential to segregate offline and an OCE. Both of them share certain dimensions, however it would be unfair to treat them similarly. For example, in contrast to the physical interaction at brick-and-mortar outlets, customers in online channels assess products through a combination of visual and verbal stimuli installed on the product web pages. Past studies theorise offline experience as a set of multiple, separate but linked dimensions like, cognitive, sensory, affective, physical and social

(Brakus et al., 2009; Verhoef et al., 2009). This was extended to OCE with new models of Gentile et al. (2007) that showed evidence of six components of OCE; EM, cognitive, sensorial, pragmatic, relational and lifestyle-based. Bleier et al. (2018) also conceived OCE with four dimensions of informativeness (INF), social presence, entertainment and sensory appeal in addition to the four basic established dimensions of cognition, relationships, affect and sensation. A study of Van et al. (2020) on sustainable tourism for the post COVID world recently established that tourists use human-machine-interactive (HMI) devices due to technology acceptance factors, reliable information-sharing mechanisms and as a qualitative value-enhancing service.

Cognition and affect are regarded as important drivers of customer behaviour and experience. They are integrated in the models of CE like that of Verhoef et al. (2009). After analysing all these models the important dimensions are incorporated in this study. The same are sensory experience (SE), perceived enjoyment (PE), INF, EM, peace of mind (PM), information security concerns and intellectual (INT) dimensions of CE. Past studies confirm that CE determines customer satisfaction, this implies that the dimensions of OCE will also influence the same. Thus these dimensions are integrated with customer satisfaction and WTP. All these significant dimensions in context of virtual tours are discussed individually in the following section and hypotheses are accordingly developed.

2.3 Sensory experience

SE is the bodily sensation due to the five sensory modalities, i.e., auditory, visual, olfactory, tactile and gustatory. Schmitt (1999) proposed the sense experience contains aesthetics and sensory qualities. CEs develop from the combination of all of the sensory inputs which finally affects their decision and behaviour (Krishna, 2012). Also, the more the experience in the store is multi-sensorially congruent, the greater the chances of them being evaluated as pleasant and interesting (Spence et al., 2014). The same applies to the online environments (Spence et al., 2017; Liu et al., 2018). Technologies like VR are immersive in nature and extend a sense of embodiment to the users who start viewing themselves in the virtual environment (Flavián et al., 2018). Past studies have also pointed out that integration at a multi-sensory level greatly enhances the probability of the brain detecting a stimulus and initiating a response to the same (here WTP). Thus with this we develop the Hypothesis H₁:

H₁ SE of the virtual tour significantly and positively influences customer satisfaction.

2.4 Perceived enjoyment

Enjoyment happens when users get a holistic sensation and becomes fully involved in a particular activity. This aspect was analysed in the flow theory. Enjoyment in online shopping is equally important the way it is in the offline scenario and has immense impact on customer intent and behaviour (Koufaris, 2002) while shopping at an e-commerce website customers initially search information on products and do transactions later by using information systems. The phase of pre-purchase has a customer who is majorly concerned about the privacy maintenance, security convenience and ease of operation. Customer enjoyment is more important in the purchase phase and stimulates purchase decisions. Thus, online retailers may lose customers if customers do

not enjoy the overall shopping experience (Wen et al., 2011). VR and AR-based technologies provide customers with innovative and memorable experiences that generate feelings like enjoyment (Tussyadiah et al., 2018) with this we develop the Hypothesis H₂:

H₂ PE in virtual tour positively and significantly influences customer satisfaction.

2.5 Informativeness

The extent of resourceful and useful information offered to customers by a website is referred to as INF. It is one of the major dimensions of cognition in the OCE (Bleier et al., 2018). INF majorly revolves around the functional aspects and value attached by the customer to the experience (Verhoef et al., 2009). It is outcome-based, objective and impersonal in nature (Schlosser et al., 2006). It is based on facts and the information which persists after the interaction with a particular web page that potentially improves attitude toward the website (Hausman and Siekpe, 2009). Thus with this we develop the Hypothesis H₃:

H₃ INF gained through virtual tour significantly and positively influences customer satisfaction.

2.6 Emotional

Often customer exchanges with online offerings evokes sentimental responses overlooking functional considerations. EM experiences are sentiments and the emotions induced by the stimulus of a brand. For example, customers sense interest, surprise, joy, anger, sadness and disgust as emotions. Positive emotions from customers enhances promotion through the word of mouth, allures customers for greater payment and increases chances of repeat purchase (Barsky, 2002). Hollebeek et al. (2020) suggested that consumers' EM VR engagement directly impacts the affective commitment, intimacy, self-connection and love/passion facets in context of brand relationship quality. With this we develop the Hypothesis H₄:

H₄ Emotions aroused through virtual tour significantly and positively influences customer satisfaction.

2.7 Peace of mind

PM is one of the recent addition as a dimension of CE (Klaus and Maklan, 2013) and strongly affects satisfaction of the customer and his loyalty. It also adds to the promotion through word of mouth. It implies overall assessment by the customer of all the exchanges he has had from the beginning to the final purchase of the service. PM dimension should be clearly incorporated for the creation and calculation of CE metric. Customer has PM if he is confident of the service provider's expertise and is sure that the service provider tries to make things comfortable and easier for him. The same also has the potential to convert non-customers into customers. Thus PM, represents customer's EM evaluation of his overall customer journey. With this we develop the next Hypothesis H₅:

H₅ PM attained post virtual tour significantly and positively influences customer satisfaction.

2.8 Information privacy concern

Information privacy concern (IPC) refers to the individuals' ability to control their personal information as AR and interactive technology that enables virtual tours, carries the potential to collect and personalise customer's information. For, e.g., a tourist perceives secure guarantee as a complete form of trust on which they can rely or depend and the same is one of the most crucial aspect of tourist hospitality service (Van et al., 2020). Customers are possessive and sensitive about their privacy and desire only those applications which do not require them to share personal information. In the study of mobile AR customer's experience and expectations by Olsson and Salo (2011); the need for privacy, user control and the mental security of personal information being kept confidential were greatly stressed. The customer's do not appreciate when devices automatically learns about them and perceive risk that their personal information can spread in public. Apparently, this concern is common in the design of almost any information systems. This is further confirmed by the recent study of Van et al. (2020) on the use of HMI devices for a sustainable tourism, that trustworthy and secure services are important to tourists from the perspective of technology acceptance factors. This leads us to the Hypothesis H₆:

H₆ Customer's IPC in virtual tours significantly and positively influences customer satisfaction.

2.9 Intellectual

INT experience is basically an experience which provokes thought and stimulates ideas. It is derived from the cognitive view of experience as knowledge. This knowledge helps one to classify, analyse and reason about things. The cognitive dimension's purpose is to make customers think and engage their imagination by surprising, provoking and intriguing them (Fornerino et al., 2005). Enriching experiences enhances learning and discovery and hones customer skills. In certain cases, cognitive experiences enable customers to solve problems (Gentile et al., 2007). Cognitive VR engagement impacts customer commitment as well (Hollebeek et al., 2020). This leads us to the Hypothesis H₇:

H₇ INT experience gained in virtual tours significantly and positively influences customer satisfaction.

2.10 Willingness to purchase

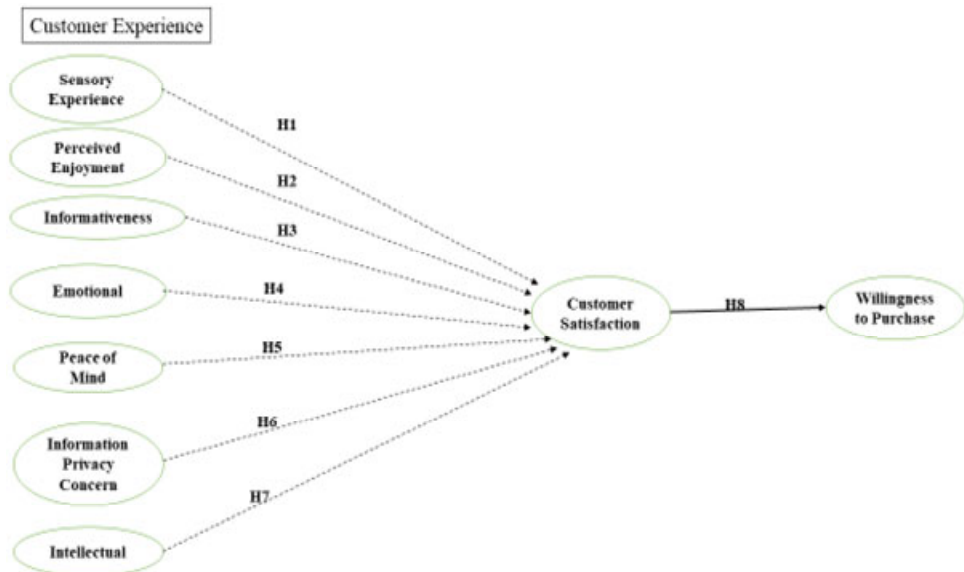
Customer's WTP refers to consumers' inclination to purchase the targeted products in the future and predicts actual buying behaviour. One of the theories which are applicable to virtual tours, is the media richness theory. According to this theory, a medium is rich if it has the ability to create as well as deliver various sensory stimulations and multiple cues. Virtual tours that offer environmental simulation delivers media rich experience. This enhances both task fulfilment and strengthens the experiences and feelings of customers (Pollach, 2008). Such technology enhances customer's enjoyment and mental imagery

(Schlosser, 2003), which can stimulate customer’s WTP (Kim and Forsythe, 2008; Flavián et al., 2018). Virtual tours enable an object simulation which takes products directly into the active lives of customer, enables him to use and experience the product and finally evaluate how these products influence their lives (Fogg, 2002). Thus, the online shopping experience with media richness through various sensory stimulations and cues persuades customers to purchase products (Mathwick et al., 2001). It increases reliability of products or services, decreases perceived risks and persuade consumers to buy services or products. With this we develop our last Hypothesis H₈:

H₈ Customer satisfaction post the virtual tour significantly and positively influences WTP.

Thus the research framework conceived for this study by integrating all these dimensions is developed into a comprehensive framework and depicted in Figure 1.

Figure 1 Research framework of the study (see online version for colours)



3 Methodology

3.1 Participants

The survey was conducted among the university students and professionals working in National Capital Region (NCR) of Delhi. Delhi NCR, the national capital of India, draws students and professionals across the country and thus is more cosmopolitan in nature (Yadav et al., 2016). Also, this demographic cohort predominantly consists of young population which is more technology savvy (Madan and Yadav, 2019). Hence the chosen sample is an ideal representative of the population and the research area under study. In order to attract genuine respondents on volunteer basis, no monetary/non-monetary incentive was offered towards participation in the survey.

3.2 Pre-screening questions and procedure

Respondents were pre-screened to participate in the survey. They were informed in the beginning about the purpose and nature of the survey. The survey instrument consisted of questions on internet self-efficacy, virtual retail technology and the extent to which a respondent prefers to buy from online sources. The mean of such pre-qualifiers was calculated and respondents with very low mean were dropped from the survey.

3.3 Stimuli

Unlike the experimental research, survey-based research studies have limitations in ensuring that respondents are sufficiently exposed to the stimuli and has requisite experience, knowledge and ability to elicit genuine response (Shim et al., 2015). Moreover, the respondent's memory may also fade due to temporal effects. In order to minimise such errors, the present study provided the link of a popular eyeglass/sunglass brand store which provides VR-based CE as a stimulus in the study. The purpose of the use of stimuli was mainly to expose the respondents to the concept of virtual tours on real-time basis thus minimising errors on account of temporal and memory dimensions.

3.4 Data collection and sampling

A Google survey form was created to record the responses of the respondents in the survey. The pre-test of the survey form was conducted over 12 professionals and academicians working in the domain of VR. This process improved the sequencing and logical consistency. Several statements were rephrased to make it easier from respondents' perspective. The survey form was shared with the respondents through Facebook, e-mail and WhatsApp. The questionnaire contained three important sections. The first section captured information on demographic and socio-cultural dimensions of the participants. The demographic table for the respondents is mentioned in Table 1. The second section dealt with questions linked to pre-screening. The third section obtained information on the research framework of the study. The statements of the items were modified according to the nature of the survey wherever required. The items of the scale used in the study are mentioned in Table 2. In absence of sampling frame in such kind of studies, present study used non-probability sampling technique which is in coherence with similar other studies conducted in recent past (Tiruwa et al., 2016; Yadav et al., 2016; Madan and Yadav, 2019). The survey obtained 240 filled in responses and constituted the sample of the study.

3.5 Period of survey

The data collection process was done in a period of three months starting from January to March 2020.

Table 1 Respondents demographic details

| <i>Gender</i> | |
|--------------------------------------|--------|
| Male | 52.03% |
| Female | 47.97% |
| <i>Age</i> | |
| Below 18 yrs. | 1.86% |
| 19–30 yrs. | 56.69% |
| 31–45 yrs. | 34.26% |
| Above 45 yrs. | 7.19% |
| <i>Occupation</i> | |
| Student | 43.33% |
| Self-occupied professionals/business | 9.34% |
| Government/private job | 39.56% |
| Housewife | 2.17% |
| Any other | 5.60% |
| <i>Annual family income</i> | |
| Below 5 lakhs | 22.43% |
| 6 to 10 lakhs | 30.21% |
| 11–15 lakhs | 17.44% |
| 16–20 lakhs | 8.43% |
| Above 20 lakhs | 21.49% |
| <i>Education</i> | |
| Below 12th std. | 0.93% |
| Graduation or equivalent | 18.06% |
| Post-graduate or equivalent | 54.84% |
| Professionals | 19.05% |
| Any other | 7.12% |

3.6 *Constructs measurement*

Drawn from the models of CE, the study tested the proposed hypothetical relationships among seven independent variables of CE and two dependent variables, i.e., CS and WTP. A five-point Likert scale having anchors of 1 as strongly disagree and 5 as strongly agree was used for measuring all the items of the constructs. A summary of the constructs, number of items in them and their sources has been listed in Table 3.

Table 2 Scales used in questionnaire

| <i>Constructs</i> | <i>Items</i> |
|---------------------------------|---|
| Sensory experience | The virtual tour of a retail store makes a strong impression on my visual senses |
| | The virtual tour of retail store is interesting in sensory way |
| | The virtual tour of retail store is appealing to my senses |
| | The sensory experience of virtual tour is holistic in terms of the visuals and the audio messages it provides |
| Information privacy concern | I was informed about the personal information collected about me during my interaction with my store visit |
| | The store website explained the reasons why my personal information is being collected |
| | The store website informed the way my personal information may be used |
| | The store website gave me a clear choice before using my personal information |
| Informativeness | My virtual tour to the store is very informative and enriching |
| | I learned a lot from making a virtual tour to the retail store |
| | I think the information obtained during my virtual tour of the store is very helpful |
| | I can find all information on virtual tour easily |
| Peace of mind | The store website gave me a clear choice before using my personal information |
| | I am confident in the store's expertise and offerings |
| | The whole process of this virtual tour was simple and easy to navigate |
| | This store will look after my needs for a long time |
| Emotional | This store gives independent and reliable advice |
| | Virtual tour to the store induced feelings and sentiments |
| | I have strong emotions for this store experience |
| | This store experience is emotional |
| Intellectual | I liked the virtual experience of the store |
| | I engage in a lot of thinking after taking a virtual tour of this store |
| | This store experience makes me think of the offerings |
| | The virtual store visit experience stimulates my curiosity and solves my problem |
| Perceived enjoyment/playfulness | I think the virtual tour of this store is interesting |
| | I think the virtual tour of this store is enjoyable |
| | I think the virtual tour of this store is exciting |
| | I think taking a virtual tour of this store is fun |
| Willingness to purchase | The virtual tour makes me feel like buying the product |
| | I intend to purchase from this store |
| | I would be willing to purchase from this store |
| | In future, I would purchase from this store |
| | The virtual tour makes me feel like buying the product |

Table 2 Scales used in questionnaire (continued)

| <i>Constructs</i> | <i>Items</i> |
|-----------------------|---|
| Customer satisfaction | My feeling about this store is very positive |
| | I feel good about visiting this store virtually |
| | Overall, I am satisfied with the virtual tour of this store |
| | I feel satisfied with the results I obtained after visiting this store virtually |
| | The store produced satisfying results and I am overall impressed by the virtual tour experience |

Table 3 Summary of constructs, number of items and sources

| <i>Constructs</i> | <i>No. of items</i> | <i>Sources</i> |
|-----------------------------------|---------------------|-------------------------------------|
| Sensory experience (SE) | 4 | Baek et al. (2020) |
| Perceived enjoyment (PE) | 4 | Hsu and Chiu (2004) |
| Informativeness (INF) | 5 | Bleier et al. (2018) |
| Emotional (EM) | 4 | Baek et al. (2020) |
| Peace of mind (PM) | 4 | Klaus and Maklan (2013) |
| Information privacy concern (IPC) | 4 | Poushneh and Vasquez-Parraga (2017) |
| Intellectual (INT) | 3 | Baek et al. (2020) |
| Customer satisfaction (CS) | 5 | Klaus and Maklan (2013) |
| Willingness to purchase (WTP) | 4 | Poushneh and Vasquez-Parraga (2017) |

4 Analysis and results

A two-staged approach was chosen for this study to analyse the customer satisfaction with regards to the dimensions of CE of virtual tours. The hybrid technique of structural equation modelling (SEM) and neural networks (NNs) approach is extremely beneficial in understanding the association of constructs in a much comprehensive manner. SEM enables to test the hypothesis for the causal structures whereas NNs helps us in analysing the factors in order of their relative importance.

4.1 Preliminary analysis

Before the empirical analysis the reliability of the questionnaire was assessed. Reliability indicates the ability of the survey instrument to give constant and accurate results (Joshi and Yadav, 2017). The same was analysed by using Cronbach’s α . Value of 0.7 or greater suggests a reliable scale (Hair et al., 2013). All the constructs had α greater than 0.8 indicating that our measurement instrument was acceptable. The empirical analysis for this study was done through SEM using SPSS AMOS 22 and NNs.

4.2 Validity analysis

After the reliability of the scales the validity of the construct needs to be checked. Construct validity indicates whether the scores of the instrument measure the distinct

dimension (construct) it was intended to measure. This is done by analysing the values for convergent and discriminant validity. The plug-ins proposed by Gaskin and Lim (2016) were used to come up with the estimates. The average variance extracted (AVE) scores was greater than 0.50; thus establishing convergent validity (Hair et al., 2013) indicating that the items used in the construct converge to the proposed factor only. We derive discriminant validity by the values of AVE, maximum shared variance (MSV) and average shared variance (ASV). Since the values of AVE are greater than MSV and ASV, it suggests the presence of discriminant validity, i.e., the constructs do not relate with each other and are distinct. Table 4 illustrates the composite reliability and validity values of the constructs used in this study.

Table 4 Reliability values and validity values of constructs

| | <i>CR</i> | <i>AVE</i> | <i>MSV</i> | <i>ASV</i> | <i>CS</i> | <i>SE</i> | <i>IPC</i> | <i>PM</i> | <i>EM</i> | <i>INF</i> | <i>PE</i> | <i>INT</i> | <i>WTP</i> |
|-----|-----------|------------|------------|------------|-----------|-----------|------------|-----------|-----------|------------|-----------|------------|------------|
| CS | 0.85 | 0.53 | 0.47 | 0.34 | 0.73 | | | | | | | | |
| SE | 0.83 | 0.56 | 0.41 | 0.28 | 0.64 | 0.75 | | | | | | | |
| IPC | 0.87 | 0.62 | 0.47 | 0.29 | 0.68 | 0.58 | 0.79 | | | | | | |
| PM | 0.81 | 0.51 | 0.44 | 0.27 | 0.58 | 0.51 | 0.52 | 0.72 | | | | | |
| EM | 0.85 | 0.59 | 0.36 | 0.29 | 0.56 | 0.55 | 0.52 | 0.60 | 0.77 | | | | |
| INF | 0.84 | 0.51 | 0.44 | 0.30 | 0.55 | 0.58 | 0.55 | 0.66 | 0.56 | 0.71 | | | |
| PE | 0.86 | 0.61 | 0.39 | 0.25 | 0.62 | 0.53 | 0.43 | 0.46 | 0.58 | 0.63 | 0.78 | | |
| INT | 0.81 | 0.59 | 0.33 | 0.24 | 0.58 | 0.47 | 0.52 | 0.46 | 0.55 | 0.46 | 0.46 | 0.77 | |
| WTP | 0.83 | 0.56 | 0.22 | 0.13 | 0.39 | 0.35 | 0.47 | 0.33 | 0.38 | 0.33 | 0.16 | 0.42 | 0.75 |

4.3 Measurement model

A confirmatory factor analysis (CFA) was done in AMOS 22.0. The model fit estimates of the measurement model are depicted in Table 5. The chi-square/df (X^2/df) for the measurement model was 1.68, a value of <3 is considered good (Hu and Bentler, 1999). The goodness of fit is analysed by the values of goodness fit index (GFI), comparative fit index (CFI) and Tucker Lewis index (TLI). The more these values are closer to 1 the better the fit is (Hair et al., 2013). A value greater than 0.90 for the CFI indicates a good fit (Hair et al., 2013). The GFI, CFI and TLI for the measurement model was 0.83, 0.91 and 0.90 respectively. The badness of fit is assessed by the value of root mean square error of approximation (RMSEA), which in our study was 0.05; the threshold value for RMSEA should be between 0.03 and 0.08 (Hair et al., 2013).

Table 5 Measurement model fit estimates

| <i>CMIN/DF</i> | <i>GFI</i> | <i>CFI</i> | <i>TLI</i> | <i>RMSEA</i> |
|----------------|------------|------------|------------|--------------|
| 1.68 | 0.83 | 0.91 | 0.90 | 0.05 |

4.4 Structural model

Post the CFA, the estimates for the structural model was checked for hypotheses testing as proposed in the research framework. The CMIN/df for the structural model was 1.71, the GFI, CFI and TLI; 0.82, 0.91 and 0.90 respectively and the RMSEA was 0.05 and

thus indicate an acceptable fit. An examination of the p values (depicted in Table 6) indicates that out of the eight hypotheses proposed in the research framework six are significant. SE has a positive and significant impact on customer satisfaction since $p < 0.05$, IPC also emerged to be a significant driver for customer satisfaction with $p < 0.01$ and 0.05 ; PM and INT had a significant and positive influence on customer satisfaction with $p < 0.05$, PE again had a significant and positive influence with $p < 0.01$ and 0.05 . The results of EM and INF did not support the hypothesis as the value of $p > 0.05$. Finally, our study established that CS has a direct influence on WTP with $p < 0.01$ and 0.05 .

Figure 2 Measurement model of the study (see online version for colours)

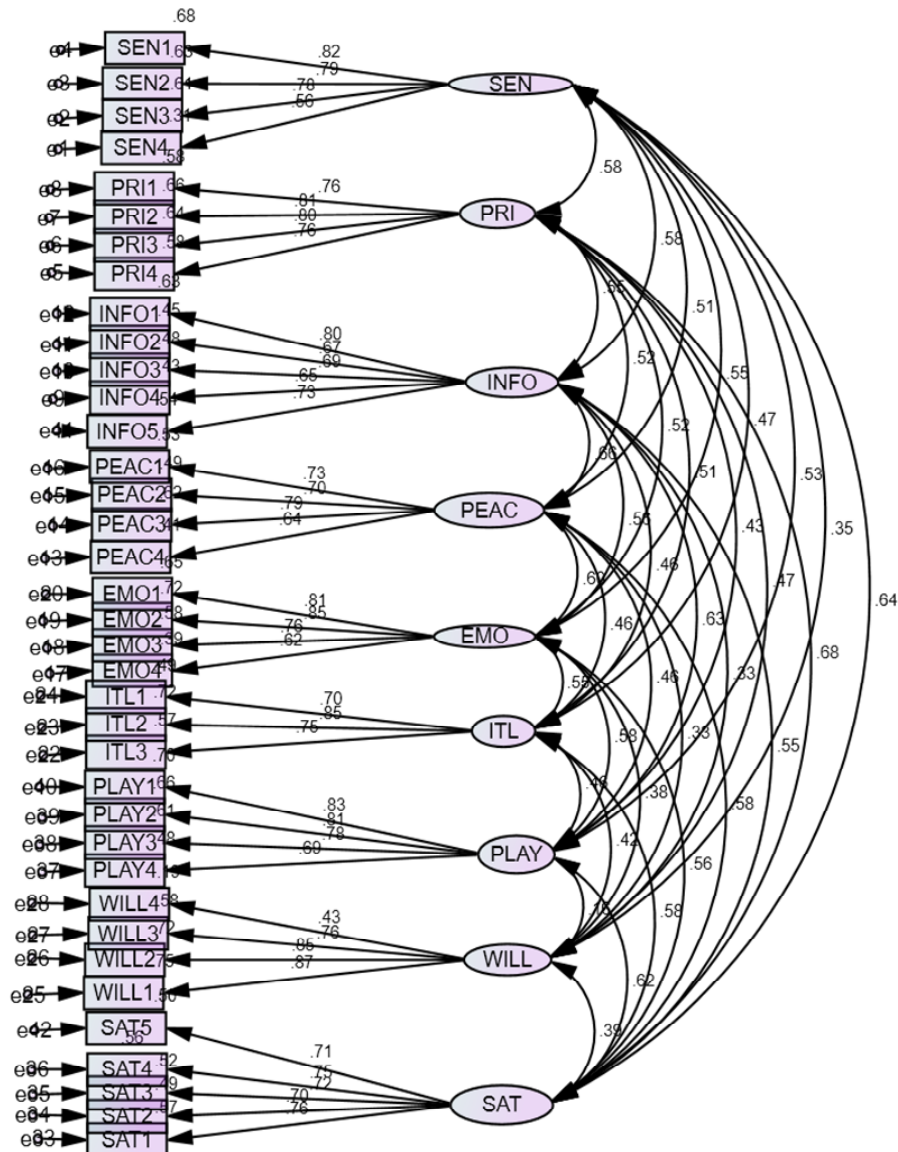


Table 6 Structural results

| <i>Hypotheses</i> | <i>P</i> | <i>Result</i> |
|-------------------|----------|---------------|
| CS ← SE | 0.013 | Accepted |
| CS ← IPC | 0.000 | Accepted |
| CS ← PM | 0.041 | Accepted |
| CS ← EM | 0.731 | Not supported |
| CS ← INF | 0.238 | Not supported |
| CS ← PE | 0.000 | Accepted |
| CS ← INT | 0.026 | Accepted |
| WTP ← CS | 0.000 | Accepted |

4.5 NN results

The NNs are superior in comparison to the traditional methods of regression (Chong, 2013) as it enables to investigate the contribution of different independent constructs on a single dependent construct. Traditional regression analysis functions by assuming linearity. However, to capture the intricacies linked with the psychological emotion like satisfaction, artificial intelligence (AI) is a better technique since it generates nonlinear models with much greater precision (Wong et al., 2011). The multi-layer perceptron training algorithm is used in this analysis. The network model's precision is checked by values of root mean square error (RMSE) values. The hidden layer uses a hyperbolic tangent as the activation function.

Table 7 RMSE values for NNs

| <i>Network</i> | <i>Testing</i> | <i>Training</i> |
|----------------|----------------|-----------------|
| ANN 1 | 0.420 | 0.531 |
| ANN 2 | 0.546 | 0.464 |
| ANN 3 | 0.455 | 0.509 |
| ANN 4 | 0.762 | 0.397 |
| ANN 5 | 0.542 | 0.465 |
| ANN 6 | 0.438 | 0.513 |
| ANN 7 | 0.584 | 0.498 |
| ANN 8 | 0.466 | 0.462 |
| ANN 9 | 0.520 | 0.499 |
| ANN 10 | 0.709 | 0.712 |
| Average | 0.544 | 0.505 |

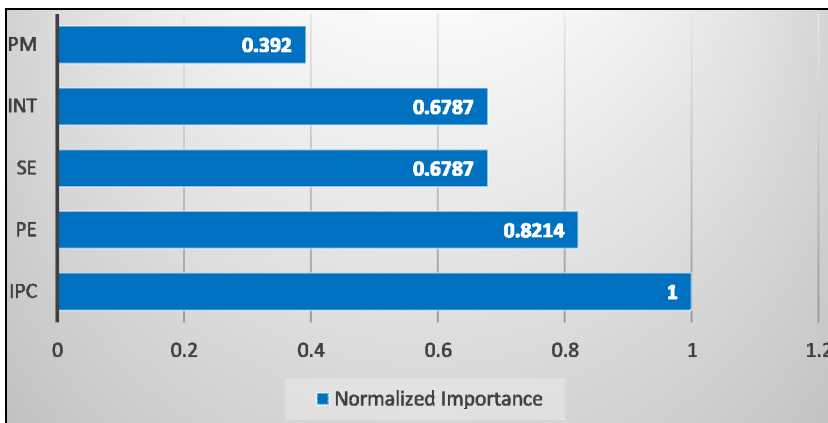
70% of data was used for training the model and 30% for testing the model. NNs should be evaluated by changing the count of hidden nodes from one to ten (Wang and Elhag, 2007); thus ten cross-validations were conducted in the analysis. The exogenous variables which were significant in the SEM analysis are taken as covariates in the NN model. Five covariates, sensory (SE), IPC, PM, PE and INT were considered for the input layer of the network model. The output layer of the model had customer satisfaction as the dependent variable. Table 7 displays the results of RMSE of the ten validations. The average value

of the RMSE of the training model was 0.505 and that of the testing model was 0.544. This indicates that the model fit is consistent in demonstrating the relationship between the independent and the dependent variable. Table 8 depicts the sensitivity analysis results in the NN model. The same is graphically represented in order of the relative importance of variables in Figure 3. IPC came out to be the most important determinant of satisfaction of the customer, followed by PE. SE and INT had similar contribution and the least important was PM.

Table 8 Results of sensitivity analysis

| | <i>Importance</i> | <i>Normalised importance</i> |
|-----|-------------------|------------------------------|
| IPC | 0.280 | 100% |
| PE | 0.230 | 82.14% |
| SE | 0.190 | 67.87% |
| INT | 0.190 | 67.87% |
| PM | 0.110 | 39.20% |

Figure 3 Importance of independent variables (see online version for colours)



5 Discussion

Just like the experience of a physical visit to a store elicits satisfaction or dissatisfaction, virtual tours to a retail store also elicits same. This premise set the ground for this study where an attempt has been made to integrate all the prominent CE models of Fornerino et al. (2006), Gentile et al. (2007), Verhoef et al. (2009) and that of Klaus and Maklan (2012) to conceptualise CE of virtual tour as a multi-dimensional construct. The impact of this virtual tour CE was investigated on CS and WTP. Virtual tours surely offer an enriching experience and augments reality by providing 3D images of products to customers and aids in their perception of reality.

The results of the study establish that the VR and AR aided virtual tours definitely impact customer satisfaction as it helps them to evaluate the product better along with a sense of excitement due to ‘telepresence’ and access to a great amount of virtual

information. Out of the seven important dimensions of CE identified five had a positive and significant influence on customer satisfaction, they were SE (H_1), PE (H_2), PM (H_5), IPC (H_6) and INT (H_7). Thus, these dimensions must be meaningfully embedded in the virtual tours to lead to a productive CE. The empirical results also establish that the satisfaction arising from this virtual tour further leads to WTP (H_8) as customers can actually view the products on themselves and make a much more informed purchase.

Enriched with AR virtual tour adds immensely to the SE at the same time stimulating the INT aspect of CE. They also enjoy the experience and find it entertaining and exciting as it enables them to have endless interaction with the virtual information (Poushneh and Vasquez-Parraga, 2017). Thus, PE as an aspect of OCE significantly and positively influences online CS. Past studies (Poushneh and Vasquez-Parraga, 2017) did not confirm the impact of customer's IPC on customer satisfaction. However, the results of current study clearly confirm that Indian customers highly value personal information privacy; thus IPC as a feature which impacts OCE positively and significantly impacts CS. In the NN analysis too, IPC ranked highest in contribution to the customer satisfaction. INT and INF is the cognitive aspect of OCE. The results of our study could confirm the impact of INT on CS but not INF. This suggests that mere provision or overload of information may not necessarily imply customer satisfaction, it needs to stimulate the thinking and the problem solving curiosity to actually satisfy the customer. After all, a picture speaks a thousand words! The audio visual effects transcend much higher than an overload of information supply. PM and EM dimension are both drawn from the affective component of CE. Also PM is more important affective component as compared to pure EM feelings, EM. This reflects that confidence in the retailer is more crucial for customer satisfaction. Virtual image technology provides simulated experience to customers and encourages them to buy the product (Huang and Liu, 2014). This study supported this relation in context of Indian customers who are increasingly getting driven to the virtual world and increasing their purchases post virtual tours. Thus CS significantly and positively influences WTP.

6 Conclusions

Virtual tours are relatively new addition to the shopping experience and have the potential to play a key role in the online environment. These digital interactive technologies like virtual tours not only enhances customers' experience but also makes them more confident in their purchase decision. Not all products need to be touched and smelt, some properties of the products can be imagined through digital interfaces as well like virtual tours. Forward looking marketers would do well by building new spaces of experiential consumption (Petit et al., 2018). Virtual tours offer one such medium to engage with customers in a much innovative manner. Businesses should embrace these technological developments to enhance the CE in online environments as it increases their likelihood of purchase.

7 Managerial implications, limitations and scope for future research

The study offers substantial implications to the online marketers. Retailers all over the world are increasingly being expected to exhibit responsiveness to the ever evolving

customer preferences (Rana, 2020). As India gets more and more digitised the electronic commerce firms will continue to witness a surge in online sales. Prior to the pandemic COVID-19, online sales were essentially an urban phenomenon but now the pandemic has deeply impacted customer's perception towards online shopping in the positive sense as online sales has doubled in this pandemic time (Economic Times, 2020). Thus, in order to maintain this trend, online marketers will have to incorporate more experiential-oriented content not just to their regular customers but to a significant chunk of first time visitors too. The results of this study are helpful to the online marketers as it has not only established the causal effect of the factors impacting virtual tour experience through SEM but also ranked the same through NN technique which can be incorporated while designing virtual tours in online retail.

Although this study attempts to integrate various offline CE models and study it in context of virtual tours, it is still inclusive of certain limitations. First, virtual tours only offer visual and auditory information, whereas in the real world, retail stores incorporate multi-sensory aspects such as fragrance, touch and feel. This study did not incorporate multi-sensory contexts. Also, this study did not consider the impact of other variables like ethnicity and culture in CE.

Future studies should further build upon multi-sensory information to determine the overall enhancement of OCE. Scholars may also investigate how virtual store experience can reinforce the brand image and its relationship with the consumer and give an edge to the online retailers in the era of omni-channel retailing. Future studies can also investigate the extent of difference that exists between virtual experience compared to the experience of an actual visit to a store.

References

- Back, E., Choo, H.J., Wei, X. and Yoon, S-Y. (2020) 'Understanding the virtual tours of retail stores: how can store brand experience promote visit intentions?', *International Journal of Retail & Distribution Management*, Vol. 48, No. 7, pp.649–666.
- Barsky, J. (2002) 'Evoking emotion: affective keys to hotel loyalty', *The Cornell Hotel and Restaurant Administration Quarterly*, Vol. 43, No. 1, pp.39–46.
- Bleier, A., Harmeling, C.M. and Palmatier, R.W. (2018) 'Creating effective online customer experiences', *Journal of Marketing*, DOI: 10.1177/0022242918809930.
- Bogicevic, V., Seo, S., Kandampully, J.A., Liu, S.Q. and Rudd, N.A. (2019) 'Virtual reality presence as a preamble of tourism experience: the role of mental imagery', *Tourism Management*, Vol. 74, pp.55–64.
- Brakus, J.J., Schmitt, B.H. and Zarantonello, L. (2009) 'Brand experience: what is it? How is it measured? Does it affect loyalty?', *Journal of Marketing*, Vol. 73, No. 3, pp.52–68.
- Chong, A.Y-L. (2013) 'A two-staged SEM-neural network approach for understanding and predicting the determinants of m-commerce adoption', *Expert Systems with Applications*, Vol. 40, No. 4, pp.1240–1247.
- Cipresso, P., Giglioli, I.A.C., Raya, M.A. and Riva, G. (2018) 'The past, present, and future of virtual and augmented reality research: a network and cluster analysis of the literature', *Front. Psychol.*, Vol. 9, p.2086, DOI: 10.3389/fpsyg.2018.02086.
- Cognizant (2020) [online] <https://www.cognizant.com/whitepapers/the-2020-customer-experience-codex2426.pdf> (accessed 8 May 2020).
- Debbabi, S., Daassi, M. and Baile, S. (2010) 'Effect of online 3D advertising on consumer responses: the mediating role of telepresence', *Journal of Marketing Management*, Vol. 26, Nos. 9–10, pp.967–992.

- Deloitte (2015) [online] <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/consumer-business/deloitte-uk-consumer-review-customer-experience.pdf> (accessed 9 July 2020).
- Economic Times (2020) [online] <https://economictimes.indiatimes.com/industry/cons-products/fmcg/online-sales-doubles-for-top-consumer-brands-in-india-due-to-covid19/articleshow/76533563.cms?from=mdr> (accessed 18 July 2020).
- EY (2015) [online] [https://www.ey.com/Publication/vwLUAssets/EY-now-that-india-shops-online-how-do-you-turn-growth-into-profit/\\$File/EY-now-that-india-shops-online-how-do-you-turn-growth-into-profit.pdf](https://www.ey.com/Publication/vwLUAssets/EY-now-that-india-shops-online-how-do-you-turn-growth-into-profit/$File/EY-now-that-india-shops-online-how-do-you-turn-growth-into-profit.pdf) (accessed 8 July 2020).
- Flavián, C., Ibáñez-Sánchez, S. and Orús, C. (2018) 'The impact of virtual, augmented and mixed reality technologies on the customer experience', *Journal of Business Research*, Vol. 100, pp.547–560.
- Fogg, B.J. (2002) 'Persuasive technology', *Ubiquity*, Vol. 2.
- Fornerino, M., Helme-Guizon, A. and De Gaudemaris, C. (2005) 'L'immersion dans une expérience de consommation: vers une échelle de mesure', *Actes des 10 es Journées de Bourgogne de Recherche en Marketing*.
- Fornerino, M., Helme-Guizon, A. and de Gaudemaris, C. (2006) 'Mesurer L'immersion dans une expérience de consommation: premiers développements', *Proceedings of the XXIIth Congress de l'AFM, France* [online] <http://www.afm-marketing.com>.
- Gaskin, J. and Lim, J. (2016) 'Model fit measures', *AMOS Plugin*, Gaskination's StatWiki.
- Gentile, C., Spiller, N. and Noci, C. (2007) 'How to sustain the customer experience: an overview of experience components that co-create value with the customer', *European Management Journal*, Vol. 25, No. 5, pp.395–410.
- Hair, J.F., Anderson, R.E., Tatham, R.L. and Balck, W.C. (2013) *Multivariate Data Analysis*, 9th ed., Prentice-Hall, Englewood Cliffs, NJ.
- Hausman, A.V. and Siekpe, J.S. (2009) 'The effect of web interface features on consumer online purchase intentions', *Journal of Business Research*, Vol. 62, No. 1, pp.5–13.
- Havir, D. (2017) 'A comparison of the approaches to customer experience analysis', *Economics and Business*, Vol. 31, DOI: 10.1515/eb-2017-0020.
- Hollebeck, L.D., Clark, M.K., Andreassen, T.W., Sigurdsson, V. and Smith, D. (2020) 'Virtual reality through the customer journey: framework and propositions', *Journal of Retailing and Consumer Services*, Vol. 55, p.102056.
- Hsu, M-H. and Chiu, C-M. (2004) 'Internet self-efficacy and electronic service acceptance', *Decision Support Systems*, Vol. 38, pp.369–381, DOI: 10.1016/j.dss.2003.08.001.
- Hu, L.T. and Bentler, P.M. (1999) 'Cut off criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives', *Structural Equation Modelling*, Vol. 6, No. 1, pp.1–55.
- Huang, T.L. and Liu, F.H. (2014) 'Formation of augmented-reality interactive technology's persuasive effects from the perspective of experiential value', *Internet Research*.
- Joshi, R. and Yadav, R. (2017) 'Evaluating the feedback effects of brand extension on parent brand equity: a study on Indian FMCG industry', *Vision: The Journal of Business Perspective*, Vol. 21, No. 3, pp.305–313.
- Kim, J. and Forsythe, S. (2008) 'Sensory enabling technology acceptance model (SE-TAM): a multiple-group structural model comparison', *Psychol. Mark.*, Vol. 25, No. 9, pp.901–922.
- Klaus, P. and Maklan, S. (2012) 'EXQ: a multiple-item scale for assessing service experience', *Journal of Service Management*, Vol. 23, No. 1, pp.5–33.
- Klaus, P.P. and Maklan, S. (2013) 'Towards a better measure of customer experience', *International Journal of Market Research*, Vol. 55, No. 2, pp.227–246.
- Koufaris, M. (2002) 'Applying the technology acceptance model and flow theory to online consumer behavior', *Information Systems Research*, Vol. 13, No. 2, pp.205–223.

- Krishna, A. (2012) 'An integrative review of sensory marketing: engaging the senses to affect perception, judgment and behavior', *Journal of Consumer Psychology*, Vol. 22, No. 3, pp.332–351.
- Lee, H. and Leonas, K. (2018) 'Consumer experiences, the key to surviving in an omni-channel environment: use of virtual technology', *Journal of Textile and Apparel, Technology and Management*, Vol. 10, No. 3, pp.1–23.
- Lee, M., Lee, S.A., Jeong, M. and Oh, H. (2020) 'Quality of virtual reality and its impacts on behavioral intention', *International Journal of Hospitality Management*, Vol. 90, p.102595.
- Liu, R., Hannum, M. and Simons, C.T. (2018) *Using Immersive Technologies to Explore the Effects of Congruent and Incongruent Contextual Cues on Context Recall, Product Evaluation Time, and Preference and Liking During Consumer Hedonic Testing*, Food Research International.
- Madan, K. and Yadav, R. (2019) 'A two-stage SEM-neural network analysis to predict drivers of m-commerce in India', *International Journal of Electronic Marketing and Retailing*, Vol. 10, No. 2, pp.130–149.
- Mathwick, C., Malhotra, N. and Rigdon, E. (2001) 'Experiential value: conceptualization, measurement and application in the catalog and Internet shopping environment', *Journal of Retailing*, Vol. 77, No. 1, pp.39–56.
- Meyer, C. and Schwager, A. (2007) 'Understanding customer experience', *Harvard Business Review*, Vol. 85, No. 2, pp.116–126.
- Olsson, T. and Salo, M. (2011) 'Online user survey on current mobile augmented reality applications', in *Proceedings of ISMAR 2011*, IEEE, Basel.
- Orth, U.R., Lockshin, L., Spielmann, N. and Holm, M. (2019) 'Design antecedents of telepresence in virtual service environments', *Journal of Service Research*, Vol. 22, No. 2, pp.202–218.
- Park, M., Im, H. and Kim, D.Y. (2018) 'Feasibility and user experience of virtual reality fashion stores', *Fashion and Textiles*, Vol. 5, No. 32, pp.1–17.
- Petit, O., Velasco, C. and Spence, C. (2018) in Velasco, C. and Charles, S. (Eds.): *Multisensory Consumer Packaging Interaction (CPI): The Role of New Technologies in Multisensory Packaging: Designing New Product Experiences*, Palgrave MacMillan, New York, NY.
- Pizzi, G., Scarpi, D., Pichierri, M. and Vannucci, V. (2019) 'Virtual reality, real reactions?: comparing consumers' perceptions and shopping orientation across physical and virtual-reality retail stores', *Computers in Human Behavior*, Vol. 96, pp.1–12.
- Pollach, I. (2008) 'Media richness in online consumer interactions: an exploratory study of consumer-opinion', *IRMJ*, Vol. 21, No. 4, pp.49–65.
- Poushneh, A. and Vasquez-Parraga, A. (2017) 'Discernible impact of augmented reality on retail customer's experience, satisfaction, and willingness to buy', *Journal of Retailing and Consumer Services*, Vol. 34 No.10.
- Rana, S.M.S. (2020) 'Supply chain drivers and retail supply chain responsiveness: strategy as moderator', *International Journal of Management Practice*, Vol. 13, No. 1, p.1.
- Ranaweera, C., Bansal, H. and McDougall, G. (2008) 'Web site satisfaction and purchase intentions', *Managing Service Quality*, Vol. 18, No. 4, pp.329–348.
- Schlosser, A.E. (2003) 'Experiencing products in the virtual world: the role of goal and imagery in influencing attitudes versus purchase intentions', *J. Consum. Res.*, Vol. 30, No. 2, pp.184–198.
- Schlosser, A.E., White, T.B. and Lloyd, S.M. (2006) 'Converting web site visitors into buyers: how web site investment increases consumer trusting beliefs and online purchase intentions', *Journal of Marketing*, Vol. 70, No. 2, pp.133–148.
- Schmitt, B. (1999) 'Experiential marketing', *Journal of Marketing Management*, Vol. 15, No. 1, pp.53–67.
- Shim, S., Forsythe, S. and Kwon, W-S. (2015) 'Impact of online flow on brand experience and loyalty', *Journal of Electronic Commerce Research*, Vol. 16, No. 1, pp.56–71.

- Spence, C., Obrist, M., Velasco, C. and Ranasinghe, N. (2017) 'Digitizing the chemical senses: possibilities & pitfalls', *International Journal of Human-Computer Studies*, Vol. 107, pp.62–74.
- Spence, C., Puccinelli, N.M., Grewal, D. and Roggeveen, A.L. (2014) 'Store atmospherics: a multisensory perspective', *Psychology & Marketing*, Vol. 31, No. 7, pp.472–488.
- Spielmann, N. and Mantonakis, A. (2018) 'In virtuo: how user-driven interactivity in virtual tours leads to attitude change', *Journal of Business Research*, Vol. 88, pp.255–264.
- Tiruwa, A., Yadav, R. and Suri, P.K. (2016) 'An exploration of online brand community (OBC) engagement and customer's intention to purchase', *Journal of Indian Business Research*, Vol. 8, No. 4, pp.295–314.
- Tussyadiah, I.P., Wang, D., Jung, T.H. and Tom Dieck, M.C. (2018) 'Virtual reality, presence, and attitude change: empirical evidence from tourism', *Tourism Management*, Vol. 66, pp.140–154.
- Van, K.H., Malaika, B. and Kim, W. (2017) 'Escaping the crowd: an experimental study on the impact of a virtual reality experience in a shopping mall', *Computers in Human Behavior*, DOI: 10.1016/j.chb.2017.07.019.
- Van, N.T.T., Vrana, V., Duy, N.T., Minh, D.X.H., Dzung, P.T., Mondal, S.R. and Das, S. (2020) 'The role of human-machine interactive devices for post-COVID-19 innovative sustainable tourism in Ho Chi Minh City, Vietnam', *Sustainability*, Vol. 12, No. 22, p.9523.
- Verhoef, P.C., Lemon, K.N., Parasuraman, A., Roggeveen, A., Tsiros, M. and Schlesinger, L.A. (2009) 'Customer experience creation: determinants, dynamics and management strategies', *Journal of Retailing*, Vol. 85, No. 1, pp.31–41.
- Walsh, K.R. and Pawlowski, S.D. (2002) 'Virtual reality: a technology in need of IS research', *Communications of the Association for Information Systems*, Vol. 8, No. 1, p.20.
- Wang, K. and Goldfarb, A. (2017) 'Can offline stores drive online sales?', *Journal of Marketing Research*, Vol. 54, No. 5, pp.706–719.
- Wang, Y.M. and Elhag, T. (2007) 'A comparison of the neural network, evidential reasoning and multiple regression analysis in modeling bridge risks', *Expert Systems with Applications*, Vol. 32, No. 2, pp.336–348.
- Wen, C., Prybutok, V.R. and Xu, C. (2011) 'An integrated model for customer online repurchase intention', *Journal of Computer Information Systems*, Vol. 52, No. 1, pp.14–23.
- Wong, T.C., Kris, M.Y.L., Hon, K.Y. and Ngan, S.C. (2011) 'Analyzing supply chain operation models with the PC-algorithm and the neural network', *Expert Systems with Applications*, Vol. 38, No. 6, pp.7526–7534.
- Yadav, R., Sharma, S.K. and Tarhini, A. (2016) 'A multi-analytical approach to understand and predict the mobile commerce adoption', *Journal of Enterprise Information Management*, Vol. 29, No. 2, pp.222–237.