



A Structural Equation Model of Consumer Engagement in Online Retail Businesses Employing Augmented Reality Applications

Thadathibesra Phuthong^a, ^aFaculty of Management Science, Silpakorn University, Thailand, 76120, Email: thadathibes@ms.su.ac.th

Nowadays technological changes and the adoption of digital technologies are transforming retail businesses and shopping experience. Augmented reality is a type of digital technology useful in developing a new concept of retail stores wherein traditional and digital store elements synchronise. This research examines a model of consumer engagement in the context of online retail business with augmented reality applications. The sample comprises 400 consumers who have experience using augmented reality for online retail business. The data was derived via a questionnaire. The descriptive statistics were analysed in terms of frequency and percentage. Furthermore, structural equation model analysis was performed using the Partial Least Squares technique. The results show that consumer engagement was influenced by the digital service experience through hedonic value and utilitarian value due to perceived ease of use, social influence and personal innovativeness, which were all causal factors. Moreover, results indicated that perceived risk does not affect the hedonic or utilitarian value, and personal innovativeness does not affect utilitarian value. This study reveals the importance of understanding the factors that affect consumer engagement with online retailers in augmented reality applications. The study recommends that online retail business entrepreneurs use augmented reality applications to enhance consumer engagement.

Key words: *Online Retail Business, Augmented Reality, Consumer Engagement.*



INTRODUCTION

Owing to advances in technology and innovations that facilitate daily activities, our world is fully entering the digital age. This has resulted in revolutionary changes in consumer behaviour and business operations. For instance, an enormous consumer base now opts for online purchases instead of more traditional shopping methods, thus generating exponential growth in the e-commerce industry. According to 2019 statistics kept by the United Nations Conference on Trade and Development (UNCTAD), the global value of business-to-consumer (B2C) and retail transactions through e-commerce channels stood at 80 trillion baht (\$2.57 trillion) (UNCTAD, 2019). To put it another way, this high potential development is creating countless opportunities for consumers and enterprises alike.

In Thailand, a similar scenario is evident. With technological and digital breakthroughs, consumer behaviour is changing considerably. The corresponding increase in online business transactions is transforming the economic and social outlook of the country. A survey by the Electronic Transactions Development Agency (2020) revealed that on average, Thai people spent 10 hours 22 minutes on the internet, a significant increase over past years. During this period of internet use, the purchase of products and services through online channels was one of the five most common activities for two consecutive years (Ibid, 2020). Consequently, e-commerce transactions saw a growth of 3.15 trillion baht, or 8% – 10%, per annum (Ibid, 2020). From this, the value of B2B transactions ranked first, totalling 1.5 trillion baht, or 54.49% of total growth, followed by that of B2C transactions at 0.758 trillion baht, or 27.47% (Ibid, 2020).

Such developments in the context of business are opening up opportunities for commerce, especially retailers wishing to make a move towards online platforms. To achieve their business goals, they often attempt to establish long-term relationships with their target market through consumer engagement. This marketing strategy has been examined in various respects. To illustrate, Hu & Chaudhry (2020) discovered that e-commerce retailers employing live broadcasts on social media platforms were able to foster relationships with their customers and thus establish customer loyalty. Blasco-Arcas et al., (2016) revealed that one factor having a considerable impact on the relationship between online retailers and consumers was the incorporation of interactive features into online platforms (cf. Lin et al., 2018 for a similar proposition).

However, studies focusing on the creation of consumer engagement by online retail businesses employing augmented reality (AR) applications are still lacking. Among these, very few have taken a comprehensive approach to investigating the issue from all related perspectives. Therefore, the objective of this research was to develop a model for examining consumer engagement in online retail businesses employing AR applications. The framework drew on an extensive list of related concepts, namely Chiu et al., (2014) and Xiang et al.,

(2015) for perceived risk; Chun et al., (2012), Ozturk et al., (2016) and Yang (2010) for perceived ease of use; Ajzen (1991), Bhattacharjee & Lin (2015) and Jackson et al., (2013) for social influence; Hartman et al., (2006) and Noh et al., (2014) for personal innovativeness; Chang (2013), Chiu et al., (2014) and Kim et al., (2013) for hedonic and utilitarian value; Pullman & Gross (2004) and Lusch et al., (2008) for digital service experience; and Chang (2013) and Chiu et al., (2014) for consumer engagement. The findings of this study will be beneficial for online retailers employing AR applications, as well as to relevant authorities in enhancing consumer engagement, thus creating a sustainable competitive advantage for businesses running on digital platforms.

RESEARCH OBJECTIVE

To develop and evaluate a model for examining consumer engagement in online retail businesses employing AR applications.

LITERATURE REVIEW

PERCEIVED RISK

Perceived risk refers to a consumer's beliefs relating to the benefit or cost associated with his or her adoption of certain technology. The degree of perceived risk is a direct determinant of the decision to adopt that technology. Specifically, Wang & Wang (2010) found that perceived risk entailed the estimation of sacrifice of privacy for the use of a given piece of technology, thus triggering a negative effect on perceived hedonic and utilitarian value. Based on this, the first two hypotheses were proposed as follows:

H1: Perceived risk will have a negative effect on hedonic value.

H2: Perceived risk will have a negative effect on utilitarian value.

PERCEIVED EASE OF USE

Perceived ease of use refers to a consumer's expectation that the use of an AR application will be simple and thus require minimal training (Davis, 1989). From this definition, perceived ease of use will have a direct effect on hedonic and utilitarian value. This proved to be true in Chun et al., (2012) and Yang (2010), which revealed that perceived ease of use was a causal factor affecting the utilitarian value of online applications perceived by customers. Accordingly, the next two hypotheses were put forward as follows:

H3: Perceived ease of use will have a positive effect on hedonic value.

H4: Perceived ease of use will have a positive effect on utilitarian value.

SOCIAL INFLUENCE

Social influence refers to an external force that engenders a change in the attitude of a consumer (Ajzen, 1991). Jackson et al., (2013) found that individuals who recognised the use of a new technology by their social influencers or close friends would soon be persuaded to have a positive attitude toward the technology. Chun et al., (2012) went a step further, demonstrating that social influence was an important factor that exerts a direct effect on the hedonic and utilitarian value perceived by consumers. Based on this, the next two hypotheses were formulated as follows:

H5: Social influence will have a positive effect on hedonic value.

H6: Social influence will have a positive effect on utilitarian value.

PERSONAL INNOVATIVENESS

Personal innovativeness refers to the tendency of a consumer to quickly adopt a new technology despite the associated risks relative to other methods (Slade et al., 2015). Such a trait is believed to be an important determinant of the hedonic and utilitarian value associated with a given technology (Noh et al., 2014). This claim was supported by Hartman et al., (2006), who concluded from their research that increases in perceived hedonic and utilitarian value were positively correlated with personal innovativeness. Accordingly, the next two hypotheses were constructed as follows:

H7: Personal innovativeness will have a positive effect on hedonic value.

H8: Personal innovativeness will have a positive effect on utilitarian value.

HEDONIC VALUE

Hedonic value refers to the tendency of a consumer to choose an AR application based on the state of emotion that he or she experiences by using it, including the level of enjoyment, usefulness and stress relief. With regard to hedonic value, Avcilar & Özsoy (2015) found that perceived hedonic value was positively correlated with satisfaction from online purchases. Mouakket & Al-hawari (2012) also discovered a positive correlation between hedonic value and digital service satisfaction. Based on this, the next hypothesis was formed as follows:

H9: Hedonic value will have a positive effect on digital service experience.

UTILITARIAN VALUE

Utilitarian value refers to the value of an AR application perceived by a consumer in relation to its ability to satisfy his or her needs or help solve a problem. As determined in the studies

conducted by Avcilar & Özsoy (2015) and Mouakket & Al-hawari (2012), perceived utilitarian value is positively correlated with digital service experience. Accordingly, the next hypothesis was established as follows:

H10: Utilitarian value will have a positive effect on digital service experience.

DIGITAL SERVICE EXPERIENCE

Digital service experience refers to the quality and form of interaction that a given digital technology creates between a consumer and an online entrepreneur, such as real-time contact between two parties regardless of time and space constraints. Tseng & Chiang (2013) pointed out that this service factor was crucial for building and enhancing consumer engagement. Further, Quester & Lim (2003) specifically demonstrated that the satisfaction from digital service determines the quality of consumer engagement reflected by positive service ratings and a high frequency of service utilisation.

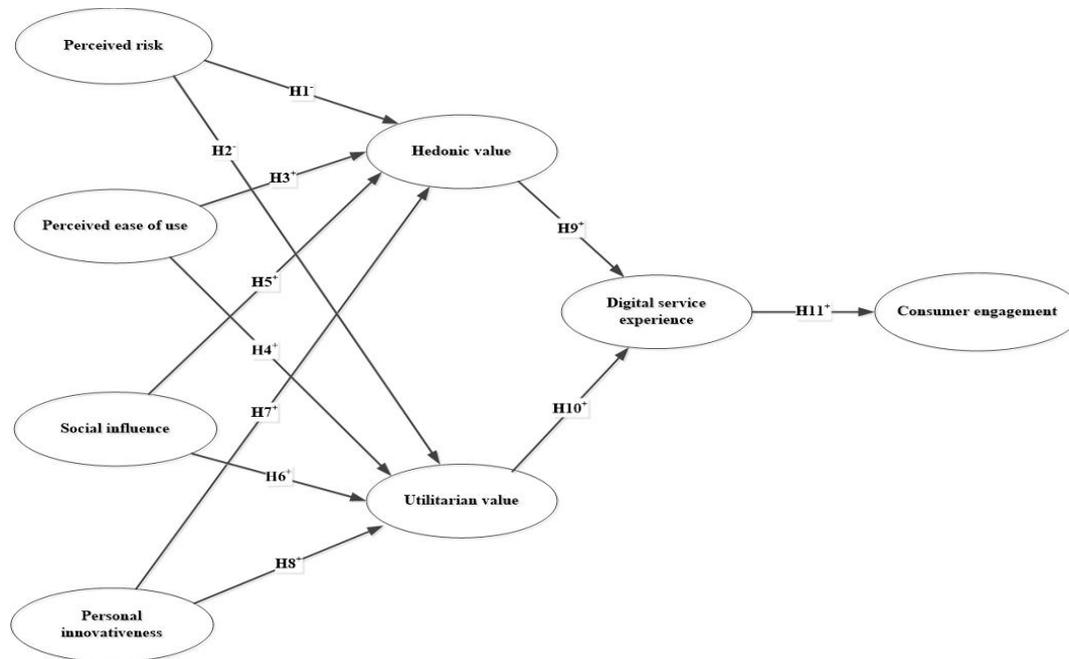
CONSUMER ENGAGEMENT

Consumer engagement refers to the extent to which product or service providers succeed in gaining and retaining loyal customers who buy from and interact with them through online platforms on a regular basis. Such interactions should come as a result of the usefulness and emotional connection that a product or service provides, as well as the perceived bond that such online communities generate (Brodie et al., 2011; Lim et al., 2019). Based on this, the final hypothesis was formulated as follows:

H11: Digital service experience will have a positive effect on consumer engagement.

From the literature review, the conceptual framework underlying the present study can be summarised as seen in Figure 1.

Figure 1: Conceptual framework of the study



RESEARCH PROCEDURES

This research was a quantitative study examining the population of consumers having prior experience with AR applications employed by online retail businesses. The calculation of the sample size was based on Hair et al.'s (2017) stipulation that the number be at least five to ten times greater than the number of indices to be measured. As the questionnaire used to collect the data comprised 23 questions, the smallest acceptable sample size would be 230. However, to prevent obstacles to statistical calculation caused by sample size determination (cf. Henseler et al., 2016), the final figure was set higher than the smallest acceptable sample at 400. The sample selection employed a purposive sampling method.

RESEARCH INSTRUMENT

The instrument for data collection was a questionnaire made up of two parts. 1) Demographic information comprised of eight questions. 2) Consumer engagement in online retail businesses employing AR applications consisting of: three questions assessing perceived risk adapted from Chiu et al., (2014) and Xiang et al., (2015); three questions assessing perceived ease of use adapted from Chun et al., (2012), Ozturk et al., (2016) and Yang (2010); three questions assessing social influence adapted from Ajzen (1991), Bhattacharjee & Lin (2015) and Jackson et al., (2013); two questions assessing personal innovativeness adapted from Hartman et al., (2006) and Noh et al., (2014); three questions assessing hedonic value and two questions assessing utilitarian value adapted from Chang (2013), Chiu et al., (2014) and Kim et al., (2013); five questions assessing digital service experience adapted from Pullman

& Gross (2004) and Lusch et al., (2008); and two questions assessing consumer engagement adapted from Chang (2013) and Chiu et al., (2014). The format for all the questions was a five-point Likert-scale.

VALIDATION OF THE RESEARCH INSTRUMENT

To validate the research instrument, the content validity of the questionnaire was evaluated by three experts using an item-objective congruence method. In accordance with Rovinelli & Hambleton (1977), the minimum acceptable score demonstrating the congruence between the questions in the questionnaire and the research objective was determined at 0.50. An analysis of the results indicated that all the questions met the criterion since the scores ranged between 0.67 and 1.00. The next step involved trialling the questionnaire on 30 subjects and determining its Cronbach's alpha coefficient. In line with Hair et al., (2017), the minimum acceptable coefficient demonstrating reliability was set at 0.70. An analysis of the findings indicated that eight of the variables met the criterion with the scores ranging from 0.732 to 0.902, whereas one failed and was thus excluded. After the final revision, the questionnaire was administered to 400 subjects.

DATA COLLECTION

To collect the data, a link to the questionnaire was created on social media websites, such as WeLoveShopping, Pantip and the IKEA fan page. The link was made to remain active for responses from the period comprising 16 September 2020 to 5 October 2020. To ensure inclusion of only the subjects that satisfied the research objective, the first demographic information question enquired about the respondents' prior experience with AR applications, i.e. applications combining real and virtual world environments that project interactive 3D images on consumers' devices, such as smart phones and tablets, for real-time online purchase transactions. Those giving a negative response to the question were excluded from the study.

To further ensure no missing data or outliers, normal distribution of the data and no issues regarding linearity, multicollinearity and singularity, the returned questionnaires went through a preliminary statistical assumption test. An analysis of the results showed that the data met these criteria with a left-skewed distribution within the range of +3 to -3. Then the data were further analysed using descriptive statistics to identify the demographic characteristics of the subjects and a Partial Least Squares Structural Equation Modelling (PLS-SEM) method to determine the causal relationships between the variables. The PLS-SEM method is suitable for the determination of paths, factor loading and path coefficients in models with complex relationships between independent and dependent variables (Sarstedt et al., 2017). The consistency between the structural equation obtained and the empirical evidence was tested using SmartPLS 3.0 software.

FINDINGS

DEMOGRAPHIC INFORMATION

A majority of the subjects were female (83.60%) in the age range of 18 – 25 (99.60%). Over three-fourths held a bachelor's degree (75.60%). Almost all earned an income of 5,000 – 10,000 baht per month (94.70%). Over one-third had three years of experience in purchasing products or services online (39.40%) and rated IKEA Place as their AR retail application of choice (40.20%). Slightly under half of the subjects reported average spending of 501 – 1,000 baht for each online purchase (47.10%).

ANALYSIS OF THE CAUSAL RELATIONSHIPS USING THE PLS-SEM

ASSESSMENT OF THE MEASUREMENT MODEL

An analysis of internal consistency reliability indicated a composite reliability value higher than 0.708 and a Cronbach's alpha coefficient of over 0.70 for all the latent variables, demonstrating their reliability (Hair et al., 2017). An analysis of convergent validity showed an Average Variance Extracted (AVE) value of higher than 0.50 for all the latent variables, revealing the convergent validity between the manifest variables under the same latent variables for all the latent variables in the model (Hair et al., 2017). An analysis of indicator reliability indicated an outer loading coefficient of over 0.70 for all the manifest variables, suggesting that all the manifest variables in the model were reliable (Hair et al., 2017). The results are illustrated in Table 1.

Table 1: Cronbach's alpha, composite reliability, AVE and VIF values of the latent variables

Constructs	Items	Factor Loading > 0.70	Cronbach's Alpha > 0.70	CR > 0.70	AVE > 0.50
Digital service experience (DE)	DE1	0.787	0.897	0.924	0.709
	DE2	0.861			
	DE3	0.878			
	DE4	0.831			
	DE5	0.851			
Consumer engagement (CE)	CE1	0.937	0.840	0.926	0.862
	CE2	0.919			

Perceived ease of use (EU)	EU1	0.837	0.785	0.874	0.699
	EU2	0.819			
	EU3	0.851			
Hedonic value (HV)	HV1	0.798	0.778	0.871	0.693
	HV2	0.812			
	HV3	0.885			
Personal innovativeness (PI)	PI1	0.902	0.733	0.882	0.789
	PI2	0.874			
Perceived risk (PR)	PR1	0.772	0.776	0.862	0.677
	PR2	0.890			
	PR3	0.802			
Social influence (SN)	SN1	0.831	0.841	0.904	0.759
	SN2	0.898			
	SN3	0.883			
Utilitarian value (UV)	UV1	0.917	0.818	0.916	0.846
	UV2	0.922			

An analysis of discriminant validity showed a greater AVE square root for each latent variable than the correlation coefficients between that latent variable and the other variables in the model; and a higher cross-loading correlation between each manifest variable and the corresponding latent variable than the cross-loading correlation between that manifest variable and the other latent variables in the model. This pointed to satisfactory discriminant validity for all the latent variables in the model and their measurement using valid manifest variables (Fornell & Larcker, 1981). The results are presented in Table 2.

Table 2: Square roots of the latent variables' AVE values and the correlation coefficients of the latent variables

Constru ct	VIF	Correlation Matrix							
		DE	CE	EU	HV	PI	PR	SN	UV
DE	2.445	0.842							
CE	2.102	0.757	0.928						
EU	1.641	0.681	0.694	0.836					
HV	1.709	0.651	0.616	0.678	0.833				
PI	1.502	0.631	0.654	0.603	0.525	0.888			
PR	1.644	0.145	-0.016	0.043	0.118	0.124	0.823		
SN	2.064	0.666	0.694	0.674	0.607	0.618	0.059	0.871	
UV	1.916	0.538	0.607	0.623	0.600	0.505	0.003	0.560	0.920

Note: The square roots of the AVE values are presented in bold type along the diagonal cells.

ASSESSMENT OF THE STRUCTURAL MODEL

The process of assessing a structural model requires multicollinearity testing, no statistically significant relationships between the predicted variables, and a variance inflation factor (VIF) value not higher than 3.30 (Hair et al., 2017). As shown in Table 2, the VIF values of the predicted variables were consistent with the specified criteria, thus fulfilling the requirements.

HYPOTHESIS TESTING

To evaluate the structural model obtained from the PLS-SEM method from the statistical significance of the parameters involved, a two-tailed hypothesis test was conducted using a bootstrapping method (Hair et al., 2017) and repeated sampling of 5,000 sets of data (Hair et al., 2017). The significance level indicating confirmation of the hypotheses was determined at 0.05 or $p < 0.05$ and the t-value of higher than or equal to 1.96 or $t \geq 1.96$. A summary of the hypothesis testing results is provided in Table 3 and Fig. 2.

Table 3: Summary of the effects of the variables and hypothesis testing

Hypotheses	Paths	β	t-values	Results
H1	Perceived risk --> Hedonic value	0.072	1.749	Rejected
H2	Perceived risk--> Utilitarian value	-0.044	1.147	Rejected
H3	Perceived ease of use --> Hedonic value	0.460	8.717***	Confirmed
H4	Perceived ease of use --> Utilitarian value	0.402	7.929***	Confirmed
H5	Social influence --> Hedonic value	0.234	4.228***	Confirmed
H6	Social influence --> Utilitarian value	0.203	3.710***	Confirmed
H7	Personal innovativeness --> Hedonic value	0.095	1.941	Rejected
H8	Personal innovativeness --> Utilitarian value	0.142	3.064**	Confirmed
H9	Hedonic value --> Digital service experience	0.512	10.596***	Confirmed
H10	Utilitarian value --> Digital service experience	0.231	4.140***	Confirmed
H11	Digital service experience --> Consumer engagement	0.757	31.349***	Confirmed

Notes:

** indicates statistical significance at $p < 0.01$ ($t\text{-value} \geq 2.576$).

*** indicates statistical significance at $p < 0.001$ ($t\text{-value} \geq 3.291$).

Figure 2: Path coefficients of the structural model

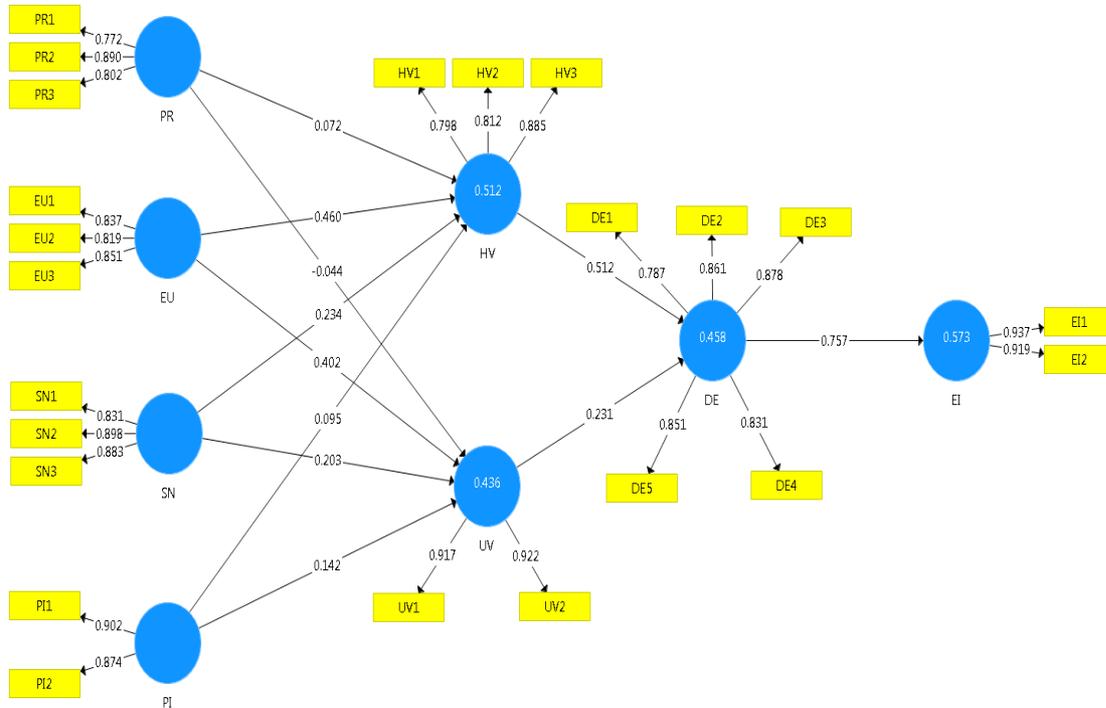


Table 4: Analysis of the path coefficients of the independent and the dependent variables

Latent Variables	Q ²	R ²	Effects	Antecedents						
				PR	EU	SN	PI	HV	UV	DE
HV	0.329	0.512	DE	0.072	0.460	0.234	0.095	0.000	0.000	0.000
			IE	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			TE	0.072	0.460	0.234	0.095	0.000	0.000	0.000
UV	0.349	0.436	DE	-0.044	0.402	0.203	0.142	0.000	0.000	0.000
			IE	0.000	0.000	0.000	0.000	0.000	0.000	0.000
			TE	-0.044	0.402	0.203	0.142	0.000	0.000	0.000
DE	0.303	0.458	DE	0.000	0.000	0.000	0.000	0.512	0.231	0.000
			IE	0.027	0.328	0.167	0.081	0.000	0.000	0.000
			TE	0.027	0.328	0.167	0.081	0.512	0.231	0.000
CE	0.469	0.573	DE	0.000	0.000	0.000	0.000	0.000	0.000	0.757

			IE	0.020	0.249	0.126	0.062	0.388	0.175	0.000
			TE	0.020	0.249	0.126	0.062	0.388	0.175	0.757

Notes:

1. *DE = direct effect, IE = indirect effect, TE = total effect*
2. *$R^2 \geq 0.25$ demonstrates a low level of predictive power, $R^2 \geq 0.50$ demonstrates a moderate level of predictive power and $R^2 \geq 0.75$ demonstrates a high level of predictive power (Hair, Hult, Ringle & Sarstedt, 2017).*
3. *$Q^2 \geq 0.02$ demonstrates a low degree of correlation, $Q^2 \geq 0.15$ demonstrates a moderate degree of correlation and $Q^2 \geq 0.35$ demonstrates a high degree of correlation (Hair, Hult, Ringle & Sarstedt 2017).*

As shown in Table 4, the factor with the greatest total effect (TE) on consumer engagement was digital service experience (TE = 0.757), followed by hedonic value (TE = 0.388), perceived ease of use (TE = 0.249), utilitarian value (TE = 0.175), social influence (TE = 0.126), personal innovativeness (TE = 0.062) and perceived risk (TE = 0.020). Additionally, the power of all the factors combined (R^2) in predicting consumer engagement in online retail businesses employing AR applications stood at 0.573% or 57.30%, and the correlation between the factors (Q^2) was relatively high at 0.469.

DISCUSSION

The findings presented herein first demonstrate that with regard to consumer engagement in online retail businesses employing AR applications, perceived ease of use is the most likely causal factor to contribute to hedonic value. This psychological tendency is supported by a great deal of past research. For instance, Avcilar & Özsoy (2015) demonstrate a direct correlation between perceived ease of use and consumers' perception of hedonic value. Ozturk et al., (2016) draw the more specific conclusion that perceived ease of use and social influence are probably the most influential factors determining the hedonic value consumers perceive while using online shopping applications on mobile devices. In comparison, Yu et al., (2018), Luo & Ye (2019) and Altalhi (2020) also acknowledge the importance to perceived ease of use and social influence; however, their findings differ slightly, indicating not only these two factors but also personal innovativeness as major determinants of consumers' perception of hedonic value and utilitarian value (cf. Al-Jundi et al., 2019 for corroborative evidence of the effect of personal innovativeness).

Apart from perceived ease of use, the findings also point to the likelihood that perceived hedonic value may be the most powerful precursor to the creation of digital service experience. In this regard, Chiu & Cho (2019) contend that consumers who have a pleasant experience with an e-commerce service are likely to express satisfaction with the service quality and express their intention to repurchase. Papagiannidis et al., (2017); Yu et al.,

(2018) and Vijay et al., (2019) further explain that in addition to hedonic value, the utilitarian value perceived by consumers is also a possible contributor to the unique digital service experience they receive from online retail businesses and social media platforms for commercial purposes.

Finally, the findings of this research suggest that digital service experience correlates with the creation of consumer engagement in online retail businesses adopting AR applications. This is in line with Wu & Stilwell (2018), who indicate that satisfactory digital service experience seems to have a positive effect on the attempt to earn and retain brand loyalty. Likewise, Ngo et al., (2019) reveal a possible direct correlation between positive experience with the service received through a certain technology and consumer engagement with the technology, which likely contributes to regular repurchases (Lim et al., 2019).

However, some surprising findings were obtained from this study. First, perceived risk may have little, if any, effect on hedonic and utilitarian value. Second, a correlation between personal innovativeness and hedonic value seems to be non-existent. In fact, such phenomena are not uncommon in the current research environment. Among others, Chakraborty & Soodan (2019) illustrate that the consumer's perceived risk regarding a technology is not a likely determinant of their perception of its hedonic value, while Riek et al., (2016) indicate no connection between perceived risk and utilitarian value or between personal innovativeness and hedonic value. The latter is also evidenced in Krey et al., (2019) study on smart watch consumers.

RECOMMENDATIONS

APPLICATION OF THE FINDINGS

The findings of this research confirm that perceived ease of use and social influence should have a positive effect on hedonic value; and this mechanism further works in tandem with personal innovativeness in determining the digital service experience received from the use of an online shopping application through a mobile device. Accordingly, it is advisable that online retailers and those involved develop a simple application that enables consumers to speedily browse product or service information and select items all on their own. Also, the application may be promoted through advertising or celebrity endorsement.

Since the findings also demonstrate the combined effect of hedonic value and utilitarian value on the digital service experience perceived by consumers, online retailers and those involved are offered the following recommendations. First, the presentation of product or service information on an application should incorporate an element of surprise and be subject to close scrutiny in terms of design. To further enhance its hedonic value, the application may apply a gamification strategy, making available games that consumers can either enjoy while



shopping or win prizes from. As regards utilitarian value, the application should offer a multitude of functions, such as real-time order processing notification and interactive messaging, to ensure that consumers get instant updates on their orders. All this will help distinguish virtual shopping from the traditional forms and pave the way for success for online retail businesses employing AR technology.

Finally, the results of this study illustrate a positive correlation between digital service experience and consumer engagement. Thus, online retailers and those involved are advised to gain a competitive edge by tapping into the strengths of AR technology in their service design. An example of this is the incorporation of real-time order processing notification and interactive messaging functions as mentioned above. However, one issue to bear in mind is that regardless of how advanced an AR application is, it must be user-friendly and accommodating to consumers with varied degrees of technological savvy. Such prerequisites are essential for achieving consumer engagement and thus, brand loyalty.

FURTHER RESEARCH

A mixed method supplementing a quantitative approach with a qualitative one should be employed to yield more extensive results that cast new light on how the psychological make-up of consumers determines their engagement with online retail businesses offering products and services through AR applications. The qualitative approach may adopt a focus group interview or other methods as appropriate.

Further research should take into account other factors that are likely to exert an influence on consumer engagement, such as purchasing power, quality expectations, brand loyalty and the parity between self-image and brand identity.



REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Altalhi, M.M. (2020). Social co-creation acceptance among females in Saudi Arabia. *Cogent Business & Management*, 7(1), 1-17.
- Al-Jundi, S.A., Shuhaiber, A., & Augustine, R. (2019). Effect of consumer innovativeness on new product purchase intentions through learning process and perceived value. *Cogent Business & Management*, 6(1), 2-21.
- Avclar, M.Y., & Özsoy, T. (2015). Determining the Effects of Perceived Utilitarian and Hedonic Value on Online Shopping Intentions. *International Journal of Marketing Studies*; 7(6), 27-49.
- Bhattacharjee, A., & Lin, C.P. (2015). A unified model of IT continuance: Three complementary perspectives and crossover effects. *European Journal of Information Systems*, 24(5), 364-373.
- Blasco-Arcas, L., Hernandez-Ortega, B.I., & Jimenez-Martinez, J. (2016). Engagement platforms: The role of emotions in fostering customer engagement and brand image in interactive media. *Journal of Service Theory and Practice*, 26(5), 559-589
- Brodie, R.J., Hollebeek, L.D., Juric, B., & Ilic, A. (2011). Customer Engagement: Conceptual Domain, Fundamental Propositions, and Implications for Research. *Journal of Service Research*, 14(3), 252-271.
- Chakraborty, S., & Soodan, V. (2019). Examining Utilitarian and Hedonic Motivations in Online Shopping in India: Moderating Effect of Product Browsing Behavior. *International Journal of Recent Technology and Engineering*, 8(1C2), 117-125.
- Chang, K.C. (2013). How reputation creates loyalty in the restaurant sector. *International Journal of Contemporary Hospitality Management*, 25(4), 536–557.
- Chiu, C., Wang, E.T.G., Fang, Y., & Huang, H. (2014). Understanding customers' repeat purchase intentions in B2C e-commerce: the roles of utilitarian value, hedonic value and perceived risk. *Information Systems Journal*, 24(1), 85–114.
- Chiu, W., & Cho, H. (2019). E-commerce brand: The effect of perceived brand leadership on consumers' satisfaction and repurchase intention on e-commerce websites. *Asia Pacific Journal of Marketing and Logistics*, 10(5), 439-450.
- Chun, H., Lee, H., & Kim, D. (2012). The integrated model of smartphone adoption: hedonic and utilitarian value perceptions of smartphones among Korean college students. *Cyberpsychology, Behavior, and Social Networking*, 15(9), 473–479.
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*. 13(3), 319–339.
- Electronic Transactions Development Agency. (2020). *Thailand Internet User Behavior 2019*, Retrieved April 5, 2020, from <https://www.etcha.or.th/publishing-detail/thailand-internet-user-behavior-2019.html>



- Electronic Transactions Development Agency. (2020). *ETDA Annual Report 2019*, Retrieved April 5, 2020, from <https://www.etda.or.th/publishing-detail/etda-annual-report-2019.html>
- Fornell, C., & Larcker, D.F. (1981). Evaluating structural equations with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39– 50.
- Hair, J., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 2nd ed. Thousand Oaks, CA: Sage.
- Hartman, J.B., Shim, S., & Barber, B. (2006). Adolescents' utilitarian and hedonic Web consumption behavior: hierarchical influence of personal values and innovativeness. *Psychology Marketing*, 23(10), 813–839.
- Henseler, J., Hubona, G., & Ray, P.A. (2016). Using PLS Path Modeling in New Technology Research: updated guidelines. *Industrial Management & Data Systems*, 116(1), 2–20.
- Hu, M.Y., & Chaudhry, S.S. (2020). Enhancing consumer engagement in e-commerce live streaming via relational bonds. *Internet Research*, 30(3), 1019-1041.
- Jackson, J.D., Yi, M.Y., & Park, J.S. (2013). An empirical test of three mediation models for the relationship between personal innovativeness and user acceptance of technology. *Information Management*, 50(4), 154–161.
- Kim, Y.H., Kim, D.J., & Wachter, K. (2013). A study of mobile user engagement (MoEN): engagement motivations, perceived value, satisfaction, and continued engagement intention. *Decision Support Systems*, 56(1), 361–370.
- Krey, N., Chuah, S.H.-W., Ramayah, T., & Rauschnabel, P.A. (2019). How functional and emotional ads drive smartwatch adoption: The moderating role of consumer innovativeness and extraversion. *Internet Research*, 29(3), 578-602.
- Lim, X.J., Cheah, J.H., Waller, D.S., Ting, H., & Ng, S.I. (2019). What s-commerce implies? Repurchase intention and its antecedents. *Marketing Intelligence & Planning*. <https://doi.org/10.1108/MIP-03-2019-0145>. In press.
- Lin, J., Li, L., Yan, Y., & Turel, O. (2018). Understanding Chinese consumer engagement in social commerce: The roles of social support and swift guanxi. *Internet Research*, 28(1), 2-22.
- Luo, Y., & Ye, Q (2019). Understanding Consumers' Loyalty to an Online Outshopping Platform: The Role of Social Capital and Perceived Value. *Sustainability*, 11(19), 1-18.
- Lusch, R., Vargo, S.L., & Wessels, G. (2008). Toward a conceptual foundation for service science: contributions from service-dominant logic. *IBM Systems Journal*, 47(1), 5–14.
- Mouakket, S., & Al-hawari, M.A. (2012). Examining the antecedents of e-loyalty intention in an online reservation environment. *The Journal of High Technology Management Research*, 23(1), 46-57.



- Ngo, H.Q., Nguyen, T.H., & Kang, G.D. (2019). The Effect of Perceived Value on Customer Engagement with the Moderating Role of Brand Image: A Study Case in Vietnamese Restaurants. *International Journal of Innovative Technology and Exploring Engineering*, 8(7C2), 451-461.
- Noh, M., Runyan, R., & Mosier, J. (2014). Young consumers' innovativeness and hedonic/utilitarian cool attitudes. *International Journal of Retail & Distribution Management*, 42(4), 267–280.
- Ozturk, A.B., Bilgihan, A., Nusair, K., & Okumus, F. (2016). What keeps the mobile hotel booking users loyal? Investigating the roles of self-efficacy, compatibility, perceived ease of use, and perceived convenience. *International Journal of Information Management*, 36(6), 1350-1359.
- Papagiannidis, S., Pantano, E., See-To, E.W.K., Dennis, C., & Bourlakis, M. (2017). To immerse or not? Experimenting with two virtual retail environments. *Information Technology & People*, 30(1), 163-188.
- Pullman, M.E., & Gross, M.A. (2004). Ability of experience design elements to elicit emotions and loyalty behaviors. *Decision Sciences*, 35(3), 551–578.
- Quester, P., & Lim, A. (2003). Product involvement/brand loyalty: is there a link?. *Journal of Product & Brand Management*, 12(1), 22-38.
- Riek, M, Bohme, R., & Moore, T. (2016). Measuring the Influence of Perceived Cybercrime Risk on Online Service Avoidance. *IEEE TRANSACTIONS ON DEPENDABLE AND SECURE COMPUTING*, 3(2), 261-273.
- Rovinelli, R.J., & Hambleton, R.K. (1977). On the use of content specialists in the assessment of criterion-referenced test item validity. *Dutch Journal of Educational Research*, 2, 49-60.
- Sarstedt, M., Ringle, C.M., & Hair, J.F. (2017). *Partial least squares structural equation modeling*. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), *Handbook of market research*. Heidelberg: Springer.
- Slade, E.L., Dwivendi, Y.K., Piercy, N.C., & Williams, M.D. (2015). Modeling consumers' adoption intentions of remote mobile payments in the United Kingdom: extending UTAUT with innovativeness, risk, and trust. *Psychology & Marketing*, 32(8), 860–873.
- Tseng, F.M., & Chiang, H.Y. (2013). Exploring consumers to buy innovative products: Mobile phone upgrading intention. *The Journal of High Technology Management Research*, 24(2), 77-87.
- UNCTAD. (2019). *UNCTAD B2C E-COMMERCE INDEX 2019*. Retrieved April 5, 2020, from https://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d14_en.pdf
- Vijay, T.S., Prashar, S., & Sahay, V. (2019). The Influence of Online Shopping Values and Web Atmospheric Cues on E-Loyalty: Mediating Role of E-Satisfaction. *Journal of Theoretical and Applied Electronic Commerce Research*, 14(1), 1-15.



- Wang, H-Y., & Wang, S-H. (2010). Predicting mobile hotel reservation adoption: Insight from a perceived value standpoint. *International Journal of Hospitality Management*, 29(1), 598-608.
- Wu, L., & Stilwell, M.A. (2018). Exploring the marketing potential of location-based mobile games. *Journal of Research in Interactive Marketing*, 12(1), 22-44.
- Xiang, J.Y., Jing, L.B., Lee, H.S., & Choi, Y.I. (2015). A comparative analysis on the effects of perceived enjoyment and perceived risk on hedonic/utilitarian smartphone applications. *International Journal of Networking and Virtual Organisations*, 15(2-3), 120–135.
- Yang, K. (2010). Determinants of US consumer mobile shopping services adoption: implications for designing mobile shopping services. *Journal of Consumer Marketing*, 27(3), 262–270.
- Yu, H., Zhang R., & Liu, B. (2018). Analysis on Consumers' Purchase and Shopping Well-Being in Online Shopping Carnivals with Two Motivational Dimensions. *Sustainability*, 10(12), 1-18.