INFLUENCES OF INNOVATION ATTRIBUTES ON VALUE PERCEPTIONS AND USAGE INTENTIONS OF MOBILE PAYMENT

Edward Shih-Tse Wang
Graduate Institute of Bio-Industry Management
National Chung Hsing University, Taiwan
250, Kuo Kuang Rd., Taichung 402, Taiwan R.O.C
shihtse.wang@msa.hinet.net

ABSTRACT

Although previous studies have indicated that innovation attributes and the perceived utilitarian and hedonic value of mobile payment (m-payment) influence its adoption, few have examined the predictive relationships between innovation attributes and perceived utilitarian and hedonic value. Therefore, how innovation attributes affect perceived hedonic and utilitarian value and how these types of value mediate the relationships between the attributes and continuance intention require further clarification. Drawing upon Rogers's diffusion of innovation theory and customer value (hedonic and utilitarian) theory, this study investigated the five innovation attributes (i.e., compatibility, relative advantage, observability, complexity, and trialability) of m-payment and their effects on customers' perceived utilitarian and hedonic value of m-payment and m-payment continuance intention. In total, 416 volunteers participated in this study. Structural equation modeling was used to test a conceptual model. The results revealed that compatibility and relative advantage positively influenced perceived utilitarian and hedonic value, whereas complexity negatively and significantly influenced customer-perceived utilitarian and hedonic value. Observability and trialability positively influenced utilitarian value but did not significantly influence hedonic value. A mediating analysis further revealed that both utilitarian and hedonic value mediated the effects of compatibility, relative advantage, and complexity (but not observability or trialability) on continuance intention. In addition, utilitarian value mediated the effects of observability and trialability on continuance intention, whereas hedonic value had no such effect. Both theoretical and practical implications are presented for m-payment marketers to develop effective systems, customer segmentation, and communication strategies for promoting the use of m-payment systems.

Keywords: Mobile payment; Diffusion of innovation theory; Innovation attributes; Utilitarian and hedonic value; Continuance intention

1. Introduction

Providing more convenient and faster payment services to customers is a critical success factor for retailer competitiveness. As an alternative to cash, checks, or credit cards, customers can use their mobile phones to pay for a wide range of services as well as digital and physical goods. Using mobile payment (m-payment), also known as using mobile money or a mobile wallet, refers to economic transactions of individuals or businesses conducted through mobile phones (Liébana-cabanillas et al., 2014). These transactions are authorized and conform to legal policy (Apanasevic et al., 2016). As a service, m-payment allows customers to make payments and transfer funds conveniently and easily using their mobile phones (Phonthanukitithaworn et al., 2015). Using smartphones to pay for goods in stores is growing in popularity, and such transactions may become more frequent over the next few years (Hillman & Neustaedter, 2016). M-payment is rapidly growing in numerous markets (Merritt, 2011), and it has become a key driver of socioeconomic development in emerging markets (Kshetri & Acharya, 2012). At present, the most popular established m-payment platforms are Apple Pay, PayPal, Alipay, and M-Pesa (Lupo-Pasini, 2021).

Because product performance substantially influences the future decisions of customers (Mahapatra et al., 2010), many m-payment researchers have focused on its role in assessment of product performance, as measured by usefulness (Hossain et al., 2018; Koenig-Lewis et al., 2015; Liébana-Cabanillas et al., 2014; Padashetty and Kishore, 2013; Upadhyay and Chattopadhyay, 2015; Wu et al., 2017), ease of use (Arvidsson, 2014; Hossain et al., 2018; Liébana-Cabanillas et al., 2014; Padashetty & Kishore, 2013; Upadhyay & Chattopadhyay, 2015), convenience (Ozturk et al., 2017; Teo et al., 2015), system quality (Upadhyay & Chattopadhyay, 2015), and utilitarian value (Koenig-Lewis et al., 2015; Ozturk et al., 2017).

According to diffusion of innovation (DOI) theory, five attributes of an innovation (i.e., compatibility, relative advantage, observability, complexity, and trialability) influence its adoption (Rogers, 2003). M-payment is a

technological innovation in mobile financial services (Mustafa, 2015); thus, the tenets of DOI theory have been used to identify the characteristics of m-payment (Arvidsson, 2014). M-payment researchers have discovered that five innovation attributes influence m-payment adoption (Peng et al., 2012; Arvidsson, 2014; Kapoor et al., 2015; Oliveira et al., 2016). By contrast, according to customer value theory, value reflects the entire consumption experience (Blázquez, 2014; Cheng et al., 2017), and a customer's choice is a function of multiple value dimensions (Chow & Shi, 2015). M-payment studies have revealed that customer perceptions of utilitarian and hedonic value directly influence their likelihood of m-payment adoption (Chen et al., 2019). Although m-payment researchers have discovered that innovation attributes (Peng et al., 2012; Arvidsson, 2014; Kapoor et al., 2015; Oliveira et al., 2016) and perceived utilitarian and hedonic value (Chen et al., 2019) directly affect the adoption of m-payment systems, few studies have examined the effects of innovation attributes on the perceived utilitarian and hedonic value of m-payment.

Yuen et al. (2020) proposed that customers' perceived value of a product is derived from their evaluation of the product's characteristics; the researchers discovered that influence of the innovation attributes of autonomous vehicles on public acceptance is mediated by the public's perceived value of autonomous vehicles. Specifically, Yuen et al. (2020) adopted a single construct to evaluate the perceived value of autonomous vehicles and therefore could not clarify the causality in the relationship between innovations attributes and dimensions of perceived value (i.e., utilitarian and hedonic value). Research has demonstrated that service compatibility has a significant and indirect effect on the adoption of mobile social networking sites mediated by hedonic and utilitarian value (Lin & Lu, 2015), but the nature of the other innovation attributes of m-payment (relative advantage, observability, complexity, and trialability) and their effects on perceived utilitarian and hedonic value remain unclear. Research has demonstrated that businesses can deliver products with an appropriate mix of product attributes only when they understand the value that customers place on these attributes (Lenk et al., 1996). Thus, marketers must enhance their understanding of the predictive relationship between innovation attributes and perceived value (utilitarian and hedonic value). This study attempted to clarify the effects of the innovation attributes of m-payment on customers' hedonic and utilitarian value perceptions as well as their continuance intention to use, specifically within the context of m-payment.

2. Theoretical Development

Drawing upon Rogers's DOI theory, customer value theory (hedonic and utilitarian value), and previous studies (Lin & Lu, 2015; Yuen et al., 2020), the present study established a research model that focused on the five innovation attributes of m-payment that contribute to customers' perceived hedonic and utilitarian value and their intention to continue using m-payment. Figure 1 provides an overview of the research model.
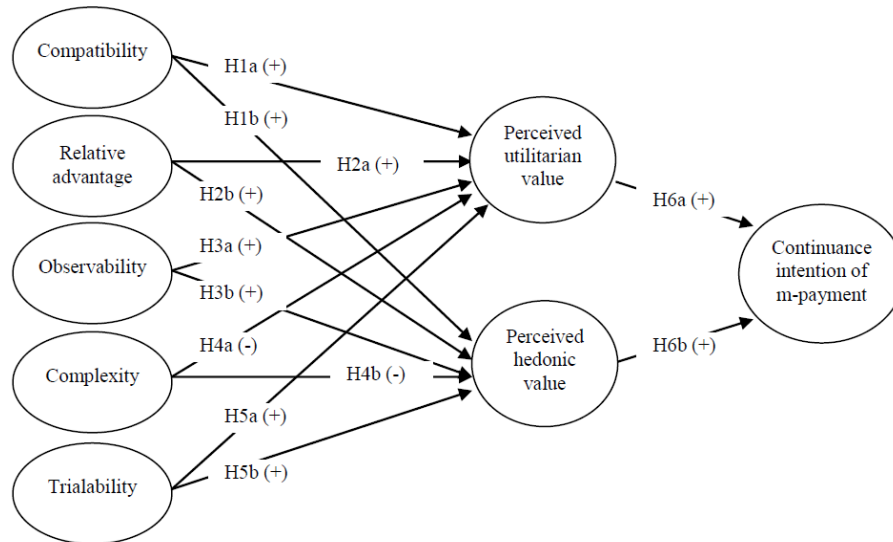

Figure 1: Research Framework

2.1. Diffusion of Innovation (DOI) Theory and Customer Value (Hedonic and Utilitarian) Theory

Rogers' innovation attribute framework indicates that if potential adopters have a positive view of the collective innovation attributes of an innovation, it is more likely that they will adopt the innovation (Rogers, 2003). DOI theory uses five variables to interpret the five main properties that individuals perceive when making decisions (Zolait and

Mattila, 2009): compatibility, relative advantage, observability, complexity, and trialability. Compatibility is the extent to which an innovation is perceived to be consistent with a potential adopter's lifestyle (Dzogbenuku, 2013). Relative advantage is the extent to which an innovation is perceived to be more advanced than its forerunner (Christian & Carter, 2005; Carter & Campbell, 2011). Observability is the extent to which the results of an innovation's usage is visible to the customer and to others (Liang & Lu, 2013). Complexity is how difficult an innovation is to implement and operate (Cheung et al., 2000; Moons & Pelsmacker, 2015). Trialability is the extent to which people try an innovation for the sake of understanding it better (Phonthanukitithaworn et al., 2015). In general, these variables greatly affect individuals' adoption decisions (Roach, 2009). DOI theory is the most accepted and frequently used theory within innovation research (Al-Jabri & Sohail, 2012; Kapoor et al., 2015; Liang & Lu, 2013; Tan & Teo, 2000; Zhang et al., 2017a). This could be because the perceived innovation attributes explain 49%–87% of the variance in the rate of the adoption of an innovation (Rogers, 2003). The five variables of DOI theory therefore provide crucial functional significance and analytical orientations for research on the adoption of innovations.

DOI theory has been used to explain the adoption or adoption intention of numerous innovations, including those in mobile banking (Al-Jabri & Sohail, 2012), online health service (Zhang et al., 2017b), online tax filing services (Liang & Lu, 2013), e-learning (Hafizah & Kamil, 2009), e-commerce (Seyal & Rahman, 2003), accounting and auditing organization (Sarea & Hanefah, 2013), human resource information systems (Obeidat, 2013), and taxi-hailing apps (Bai et al., 2021). Many studies have investigated the direct effects of perceptions of the five innovation attributes on adoption (Abdullah, 2011; Al-Jabri & Sohail, 2012; Hafizah & Kamil, 2009; Sarea & Hanefah, 2013; Seyal & Rahman, 2003). In addition to the direct influences of innovation attributes on adoption, several studies have focused on the factors that may mediate the innovation attributes–adoption relationships, such as attitude (Chen, 2013; Ha and Im, 2014), perceived ease of use, usefulness (Ha & Im, 2014; Mohammadi, 2015), and perceived value (Yuen et al., 2020).

From the perspective of customer value theory, perceived value is a multifaceted concept, and hedonic and utilitarian values have been frequently examined to understand the consumption process more fully (Lee and Kim, 2018). Utilitarian value is the extent to which the customer perceives the product or service to be an effective means to some end, whereas hedonic value is the extent to which the customer perceives the use of a product or service to be a fun and emotionally stimulating experience (Leftheriotis & Giannakos, 2014). Many studies have investigated the effect of hedonic and utilitarian value in e-commerce (Li et al., 2020), mobile service (Park et al., 2017), and mobile banking (Malaquias & Hwang, 2017). M-payment technologies were driven by customers' desire for greater hedonic value and convenience in shopping (Taylor, 2016). Studies have identified utilitarian value and hedonic value as key drivers of m-payment adoption (De Kerviler & Demoulin, 2017; Chen et al., 2019).

2.2. Effect of Compatibility on the Utilitarian and Hedonic Value of M-Payment

Utilitarian value focuses on the efficiency of completing a task (Etemad-Sajadi, 2014). Studies have revealed that compatibility affects a customer's evaluation of an outcome value such as an innovation's performance (Lee et al., 2011). Lin and Lu (2015) discovered that service compatibility affects customer perceived utilitarian value. In this study, compatibility was considered to be the degree to which an innovation is consistent with customers' lifestyle (Dzogbenuku, 2013). A study suggested that companies should position their products to focus on how to fit them into potential customers' lifestyles, because customers use products to express their identities and lifestyles (Zhang & Liu, 2018). The correspondence between lifestyle and product consumption leads to favorable evaluations of that product (Yap & Lee, 2014). A customer's assessment of a product's utilitarian value may be based on how compatible the product is with their lifestyle. Thus, if customers believe that m-payment usage fit their lifestyle, they will report higher utilitarian values of m-payment.

H1a. Compatibility has a positive effect on the perceived utilitarian value of m-payment.

Hedonic value focuses on fun, playfulness, and emotional worth (Etemad-Sajadi, 2014). In the context of innovative products, a customer's lifestyle has been theorized as a set of factors affecting the emotions that are derived from their experience of a product (Mishra et al., 2014). Researchers have suggested that compatibility affects a customer's emotional response toward an innovation (Moons & Pelsmacker, 2015). Customers search for congruence between the symbolic meaning of a product and their perspective on life (Mishra et al., 2014). The greater the identify their lifestyle with a particular brand, the more positive feelings of affinity towards the brand (Ekinci et al., 2013). Thus, it is expected that congruence between a product and a customer's lifestyle leads to a more positive emotional response.

H1b. Compatibility has a positive effect on the perceived hedonic value of m-payment.

2.3. Effect of Relative Advantage on the Perceived Utilitarian and Hedonic Value of M-Payment

Relative advantage is defined as how advanced an innovation is perceived compared with the idea it supersedes (Carter & Campbell, 2011; Christian & Carter, 2005). Relative advantage represents the perception that a particular innovation performs a certain function better than either its predecessor or its alternative (Msaed et al., 2017).

Utilitarian value is delineated as the function and quality elements from a task-oriented perspective (Prebensen & Rosengren, 2016). Researchers have suggested that the primary relative advantage of using mobile services is convenience (Lin & Lu, 2015) and that the benefits of m-payments are convenience, efficiency, and speed (Nel & Heyns, 2017). Previous research suggested that the efficient and timely delivery of a service determine its utilitarian value (Lin & Lu, 2015; Ozturk et al., 2017). Because m-payment is more convenient than its predecessors (Trütsch, 2016), the current study proposed the following hypothesis:

H2a. Relative advantage has a positive effect on the perceived utilitarian value of m-payment.

Hedonic value refers to emotional elements from experiential aspects (Prebensen & Rosengren, 2016). Moons & Pelsmacker (2015) discovered that the perceived relative advantage of an innovation induces positive emotions toward the innovation. Studies have suggested that the main relative advantage of m-payment is the fact that it is faster than other payment methods (Nel & Heyns, 2017). Customers generally prefer to accomplish a task as quickly as possible (Hansen, 2005). Thus, when a customer's time and effort are saved, their positive emotions, such as pleasure, increase (Li et al., 2012). Researchers have also discovered that technological convenience influences hedonic value perceptions (Lin & Lu, 2015). Thus,

H2b. Relative advantage has a positive effect on the perceived hedonic value of m-payment.

2.4. Effect of Observability as Result Demonstrability on the Utilitarian and Hedonic Value of M-Payment

Observability refers to the degree to which customers perceive an innovation as easy to demonstrate to others the results of using the innovation (Gounaris & Koritos, 2008). Research has suggested that if the observability of a product is low, customers may not be aware of the product's advantages after using it (Hsin et al., 2017). Thus, if the effects of an innovation are easily visible, it will be viewed more favorably (Marak et al., 2019). Therefore, the greater the customer's awareness of product performance, the higher the utilitarian value is.

H3a. Observability has a positive effect on the perceived utilitarian value of m-payment.

Observability reflects the degree to which the results of an innovation are demonstrable, and the benefit of high observability is that an innovation can be recognized and its results communicated easily (Al-Jabri & Sohail, 2012). Innovation is regarded as the solution to most of the problems encountered by humankind (Soleas, 2020). Furthermore, the visibility of innovation encourages its discussion (Waheed et al., 2015) and provides opportunities to connect with other people, thereby increasing the hedonic value perceived of it. Therefore, the following hypothesis was proposed.

H3b. Observability has a positive effect on the perceived hedonic value of m-payment.

2.5. Effect of Complexity on the Perceived Utilitarian and Hedonic Value of M-Payment

Complexity has been defined as the degree to which an innovation is seen as difficult to realize or operate (Cheung et al., 2000; Moons & Pelsmacker, 2015). In other words, complexity reflects the degree to which an innovation is perceived as difficult to understand and use. The utilitarian value of a product is its practical effectiveness for solving problems or achieving goals (Pihlström, 2007). A more complex product poses a greater challenge to users; thus, customers are more likely to feel to incapable of making full use of the product (Guo & Poole, 2009). Research has found that complexity negatively affects learning outcomes (Spencer et al., 2019) and productivity (Tóth & Hartványi, 2015). Therefore, the following hypothesis was proposed.

H4a. Complexity has a negative effect on the perceived utilitarian value of m-payment.

Hedonic value highlights the importance of the fun and enjoyment derived from using certain technology (Pihlström, 2007). Research has demonstrated that complexity induces negative emotions toward an innovation (Moons & Pelsmacker, 2015). Guo & Poole (2009) indicated that complexity increases the challenges that users encounter in identifying methods for achieving their desired goals, which leads to the development of negative emotions such as the feeling of being overwhelmed. A previous study discovered that greater difficulty and perceived complexity are related to increased anxiety and more negative emotions (Bobek et al., 2016). Therefore, the following hypotheses were proposed:

H4b. Complexity has a negative effect on the perceived hedonic value of m-payment.

2.6. Effect of Trialability on the Perceived Utilitarian and Hedonic Value of M-Payment

Trialability represents the degree to which an innovation is used in small-scale testing before adoption (Valier et al., 2008). Thus, trialability can be viewed as the degree to which an innovation can be experimented with on a limited basis. Utilitarian value is considered task-oriented and rational, and it focuses on product performance factors such as convenience, effectiveness, and efficiency (Chang et al., 2016). Previous research has discovered that trialability has a significant influence on the evaluation of an innovation's performance (Lee et al., 2011). Thus,

H5a. Trialability has a positive effect on the perceived utilitarian value of m-payment.

Hedonic value is subjective and derived from feelings, such as those of fun and entertainment (Chang et al., 2016). Customers can also experience technostress, or the physical and emotional burnout caused by an inability to adapt to a new technology (Hafizah & Kamil, 2009); therefore, if customers can try an innovation first, they can become

comfortable with it and calm their fears about using it (Nelson & Sinti, 2006). The current study therefore proposed the following hypothesis:

H5b. Trialability has a positive effect on the perceived hedonic value of m-payment.

2.7. Effects of Perceived Utilitarian and Hedonic Value on the Continuance Intention

Continuance intention is a measure of one's possible action or intention; it can be used to determine the likelihood an individual decides to continue using m-payment services (Dlodlo, 2015). Utilitarian and hedonic motivation theory was used to explain why people tend to buy a particular product (Mikalef et al., 2013). Relatedly, the utilitarian and hedonic components of a product have been examined as a research theme to understand customers' product experiences and behavioral decisions (Herrando et al., 2019). Researchers have suggested that customers evaluate products by using hedonic and utilitarian criteria (Sharma, 2018). A previous study revealed that customers' perceived utilitarian and hedonic value positively affected their adoption of m-payment (Chen et al., 2019). Thus, the current study proposed the following hypotheses:

H6a. Perceived utilitarian value has a positive effect on the continuance intention of m-payment.

H6b. Perceived hedonic value has a positive effect on the continuance intention of m-payment.

3. Research Method

3.1. Sample and Data Collection

Official statistics regarding the population and distribution of m-payment customers in Taiwan are unavailable; hence, random and quota sampling cannot be performed. Instead, convenience sampling and the intercept survey technique were utilized to collect sample data. Questionnaires were administered to collect data from experienced m-payment customers residing in Taiwan. Data were gathered at train stations because they are the most crucial community areas in a city and are accessible to all residents. Passersby at the stations were approached individually and asked to participate in a survey. Participants were informed of the research purpose and the anonymous nature of the questionnaires. One item was used to identify m-payment customers (i.e., "Have you ever used m-payment?") to exclude invalid samples. All participants were queried concerning their perceptions of the research constructs based on their m-payment usage experience. Respondents' demographic information (including gender, age, and education level) was also collected. All participants participated voluntarily and received no monetary compensation. In total, 535 questionnaires were returned. After incomplete questionnaires were excluded, the 416 remaining questionnaires were considered valid. Regarding the sample profile, 56.5% of respondents were aged between 20 and 29 years, 20.9% were aged 30–39 years, and 13.0% were aged 40–49 years; 57.5% of the participants were female, and 42.5% were male. In terms of education, 71.6% of participants stated that they possess a university education, and 24.5% stated that they have a graduate education.

3.2. Measurement

All research constructs were measured using multiple-item scales that had been validated in previous studies. Four four-item scales developed by Makanyeza (2017) were adopted to measure the compatibility, relative advantage, complexity, and trialability constructs separately. Observability was measured with a four-item scale (Wang et al., 2018). Utilitarian value and hedonic value, respectively, were measured with three-item and four-item scales adapted from Song et al. (2012). Finally, continuance intention was measured with a three-item scale adapted from Tsiotsou and Alexandris (2009). All responses were made on a seven-point Likert-type anchoring that ranged from "strongly disagree'' (1) to "strongly agree'' (7). The measurements from previous studies were written in English; therefore, back-translation was performed to increase instrumentation equivalence. In addition, before formal research, a pilot study was performed to verify the absence of ambiguously or unclearly phrased items from the questionnaire.

3.3. Data Analysis

Because the exogenous and endogenous constructs were measured using a single questionnaire, the relationships in the present study were exposed to common method variance (CMV) bias. Therefore, Harman's single-factor test and confirmatory factor analysis (CFA) were conducted to ensure that the results were not affected by CMV. Structural equation modeling (SEM) was conducted using LISREL 8.7 software to test the single-factor model. The criteria for the proposed index included the following: chi-square (χ^2)/degrees of freedom (d.f.) of <5 (Hair et al., 2006), root-mean-square error of approximation (RMSEA) of <0.08 (Byrne, 1998), comparative fit index (CFI) and nonnormed fit index (NNFI) of >0.9 (Hu and Bentler, 1999), goodness-of-fit index (GFI) of >0.8 (DeConinck and Johnson, 2009), and adjusted goodness-of-fit index (AGFI) of >0.8 (Segars and Grover, 1993). The fit of the single-factor model was highly unsatisfactory (χ^2 = 9532.36/d.f. = 405; RMSEA = 0.233; CFI = 0.81; NNFI = 0.79; GFI = 0.58; AGFI = 0.31), indicating that CMV was not a concern in the current study. Next, the study employed SEM to validate the measurement model. A confirmatory test of the measurement model was conducted using CFA, which assessed construct reliability and validity using composite reliability (CR) and average variance explained (AVE). The measurement model fit indices were within the accepted thresholds (χ^2 = 972.24/d.f. = 377; RMSEA = 0.062; CFI =

0.98; NNFI = 0.98; GFI = 0.86; AGFI = 0.83). The CR and AVE should be greater than 0.60 and 0.5, respectively (Fornell & Larcker, 1981). Table 1 reveals that the CR values were between 0.79 and 0.96, and the AVE values were between 0.57 and 0.90. These results indicate that the measurement items had high reliability and convergent validity. Further, to fully satisfy the requirements for discriminant validity, the square root of AVE should be larger than the correlation of that construct's measure with all measures of other constructs in the model. Table 2 demonstrates that the correlations between the constructs were less than the square root of AVE of their respective constructs and suggests good discriminate validity of the constructs.

Table 1: Accuracy Analysis Statistics

Research constructs	Measurement items	Factor loading	CR	AVE
Compatibility	M-payment is compatible with my lifestyle.	0.82		
	Using m-payment fits into my lifestyle.	0.85	0.93	0.77
	M-payment is completely compatible with my lifestyle.	0.92		
	Using m-payment helps me maintain my lifestyle.	0.91		
Relative advantage	M-payment gives me greater control over my moneys transfer than traditional forms.	0.37		
	M-payment allows me to manage my moneys transfer more efficiently than traditional forms	0.87	0.86	0.63
	M-payment is more convenient to transfer moneys than traditional forms	0.93		
	M-payment allows me to manage my moneys transfer more effectively than traditional forms of banking.	0.89		
Observability	I would have no difficulty telling others about the results of using m-payment.	0.75		
	I could communicate to others the consequences/outcomes of using m-payment.	0.86	0.89	0.67
	The results of using m-payment are apparent to me.	0.84		
	I would have no difficulty explaining why m-payment may/not be beneficial.	0.81		
Complexity	Using m-payment requires a lot of mental effort	0.82		
	Using m-payment can be frustrating	0.89	0.79	0.57
	Using m-payment requires knowledge and learning	0.49		
	I believe that m-payment is cumbersome to use	0.88		
Trialability	M-payment provide me a trial basis first to see what it can offer	0.83		
	M-payment provide me to see a trial demo about using it	0.79	0.92	0.74
	Before using m-payment, I could try it	0.93		
	M-payment offer me a trial basis to see what it can	0.89		
Utilitarian value	All things considered, m-payment would provide very good value	0.83	0.90	0.76
	Using m-payment would be worth my time and effort.	0.84		
	It would be of value for me to use m-payment	0.93		
Hedonic vale	Using m-payment t is fun	0.88		
	Using m-payment is a joy to me	0.94	0.96	0.87
	Using m-payment is enjoyable	0.97		
	Using m-payment is very entertaining	0.93		
Continuous intention	I will consider continuous using m-payment in the future	0.96		
	I will try to continuous use m-payment in the future	0.92	0.96	0.90
	I will continuous use m-payment in the future	0.95		

The results presented in Table 2 and the descriptive characteristics of the collected data reveal that the observed mean scores for complexity and trialability were 3.31 and 3.59, respectively. This implies that experienced customers perceived m-payment as not frustrating or cumbersome to use. They also perceived m-payment to lack a trial scenario to see what it can offer them before they use it. Table 2 shows that the observed mean scores for compatibility, relative advantage, and observability of m-payment usage were 5.15, 5.52, and 5.10, respectively, implying that although customers believed m-payment did not offer them trialability, the experience was positive afterward. Customers nevertheless believed they could easily use m-payment systems.

Table 2: Correlations between Research Constructs

Research constructs	Mean	S.D.	Correlation							
			CP	RA	OB	CPX	TRA	UV	HV	CI
Compatibility (CP)	5.15	1.18	0.87							
Relative advantage (RA)	5.52	0.99	0.59	0.80						
Observability (OB)	5.10	1.11	0.74	0.53	0.82					
Complexity (CPX)	3.31	1.28	-0.16	-0.30	-0.07	0.75				
Trialability (TRA)	3.59	1.67	0.29	0.06	0.33	0.33	0.86			
Utilitarian value (UV)	5.31	1.07	0.70	0.60	0.62	-0.26	0.24	0.87		
Hedonic vale (HV)	5.37	1.18	0.64	0.55	0.53	-0.27	0.15	0.76	0.93	
Continuous intention (CI)	5.95	1.06	0.58	0.60	0.47	-0.39	-0.00	0.71	0.75	0.95

Note: Square root of average variance extracted for each construct (on the diagonal)
Scores: 1 – *Strongly disagree*; 4 – *Neutral*; 7 – *Strongly agree*

The present study also employed SEM to test the hypotheses with the structural model. The structural model fitted the data well (χ^2/d.f. = 2.82, RMSEA = 0.066, CFI = 0.98, NNFI = 0.97, GFI = 0.86, and AGFI = 0.83). Standardized path coefficients and t values were used in the SEM analysis to identify the effects of the five innovation attributes (compatibility, relative advantage, observability, complexity, and trialability) on perceived utilitarian and hedonic value and the effects of utilitarian and hedonic value on continuance intention. Hypotheses 1 to 5 predicted the effects of the five innovation attributes on utilitarian and hedonic value. H1a and H1b predict that compatibility will have positive effects on utilitarian and hedonic value. The results support these predictions, indicating that compatibility is positively related to utilitarian (H1a: β =0.39, $p < 0.001$) and hedonic value (H1b: β = 0.44, $p < 0.001$). Hypotheses 2a and 2b predicted that the relative advantage of m-payment would have positive effects on utilitarian and hedonic value. The results support these predictions, indicating that relative advantage is related to utilitarian (H2a: β = 0.24, $p < 0.001$) and hedonic value (H2b: β = 0.21, $p < 0.001$). Hypotheses 3a and 3b predicted the effect of observability on utilitarian and hedonic value. The results support H3a but not H3b, indicating the positive influence of observability on utilitarian value (H3a: β = 0.17, $p < 0.01$). However, observability was unrelated to hedonic value (H3b: β =0.07, $p > 0.05$). H4a and H4b predicted that complexity will have a negative effect on utilitarian and hedonic value. Results indicate the negative effect of complexity on utilitarian (H4a: β = –0.16, $p < 0.001$) and hedonic values (H4b: β = –0.15, $p < 0.001$), confirming H4a and H4B. Hypotheses 5a and 5b predicted that trialability will have a positive effect on utilitarian and hedonic value. Results indicate a positive association between trialability and utilitarian value (β =0.10, $p < 0.05$) but not between trialability and hedonic value (β = 0.04, $p > 0.05$), thus H5a is supported but H5b is not supported.

Finally, H6a and H6b predicted the effect of utilitarian and hedonic value on continuance intention. Results indicate the positive effects of utilitarian (H6a: β = .35, $p < 0.001$) and hedonic value (H6b: β = 0.53, $p < 0.001$) on continuance intention. Table 3 details the path coefficient and relationship between the research variables. The results demonstrate that the innovation attribute that most affected utilitarian value was compatibility (path coefficient: 0.39), followed by relative advantage (0.24), observability (0.17), complexity (-0.16), and trialability (0.10). The innovation attribute that most affected hedonic value was compatibility (path coefficient: 0.44), followed by relative advantage (0.21) and complexity (-0.15). The results reveal that compatibility was the most influential factor affecting utilitarian and hedonic value. Finally, compared with utilitarian value (path coefficient: 0.35), hedonic value (path coefficient: 0.53) had a larger influence on continuance intention. The variance explained by the constructs was 60% for utilitarian value, 49% for hedonic value, and 60% for m-payment continuance intention.

Table 3: Testing of the Proposed Hypotheses H1-H6 (Direct Effect)

Hypotheses	Path between	Path coefficients	t values
H_{1a}	Compatibility →Utilitarian value	0.39***	5.91
H_{1b}	Compatibility →Hedonic value	0.44***	6.31
H_{2a}	Relative advantage →Utilitarian value	0.24***	4.78
H_{2b}	Relative advantage →Hedonic value	0.21***	4.03
H_{3a}	Observability →Utilitarian value	0.17**	2.61
H_{3b}	Observability →Hedonic value	0.07 ns	1.13
H_{4a}	Complexity →Utilitarian value	-0.16***	-3.77
H_{4b}	Complexity →Hedonic value	-0.15***	-3.42
H_{5a}	Trialability→ Utilitarian value	0.10*	2.19
H_{5b}	Trialability →Hedonic value	0.04 ns	0.78
H_{6a}	Utilitarian value →Continuous intention	0.35***	8.01
H_{6b}	Hedonic vale →Continuous intention	0.53***	12.01

***: $p < 0.001$; **:$p < 0.01$;*:$p < 0.05$; ns: not significant

3.4. Mediation Analysis

This study constructed a mediated model to uncover the mechanism (involving utilitarian and hedonic value) that underlies the effects of the five innovation attributes on continuance intention. Bootstrapping is used as an analytical tool to test for indirect effects in mediation models (Koopman et al., 2015). Bootstrapping was conducted using AMOS 22 and 5000 bootstrap samples with a 95% confidence interval. An indirect effect was considered significant when the 95% confidence interval did not include 0. Table 4 indicates that only the indirect effects of observability and trialability being mediated by hedonic value included 0 in the 95% confidence intervals at p > 0.05, indicating that no significant mediating role of hedonic value in the associations of observability and trialability with continuance intention. By contrast, utilitarian value had a significant mediating effect on the associations of observability and trialability with continuance intention. Furthermore, both hedonic and utilitarian value had mediating effects on the associations of compatibility, relative advantage, and complexity with continuance intention.

Table 4: Testing of the Mediating Effect (Bootstrapping Approach)

Indirect effect	Estimate	P value	Confidence interval
Compatibility → Utilitarian value →Continuous intention	0.138	0.001	0.066~0.239
Compatibility →Hedonic value→ Continuous intention	0.231	0.001	0.121~0.358
Relative advantage →Utilitarian value →Continuous intention	0.085	0.001	0.042~0.155
Relative advantage→ Hedonic value →Continuous intention	0.111	0.001	0.047~0.190
Observability →Utilitarian value →Continuous intention	0.058	0.040	0.003~0.141
Observability →Hedonic value →Continuous intention	0.039	0.378	-0.050~0.148
Complexity →Utilitarian value →Continuous intention	-0.057	0.001	-0.106~-0.025
Complexity →Hedonic value→ Continuous intention	-0.081	0.001	-0.152~-0.028
Trialability →Utilitarian value →Continuous intention	0.033	0.029	0.004~0.074
Trialability→ Hedonic value →Continuous intention	0.019	0.432	-0.032~0.072

4. Conclusion and Discussion

This study explored the effects of five innovation attributes (compatibility, relative advantage, observability, complexity, and trialability) on utilitarian and hedonic value perceptions. The effects of customer-perceived utilitarian and hedonic value on m-payment continuance intention were also investigated. The results revealed that compatibility and relative advantage positively affected both utilitarian and hedonic value, whereas complexity had a negative influence on utilitarian and hedonic value. Furthermore, observability and trialability positively influenced only utilitarian value. These findings indicate that neither observability nor trialability significantly influenced on hedonic value perceptions.

4.1. Theoretical and Practical Implication

This study revealed that customers' utilitarian and hedonic value perceptions positively affect their m-payment continuance intention. The results are consistent with those of a previous study (Chen et al., 2019), which reported that customers' perceptions of utilitarian and hedonic value positively influence their adoption of m-payment. The present study contributes to academic research by clarifying the relationships between innovation attributes and

multiple types of customer value perceptions. Yuen et al. (2020) reported that the construct of perceived value mediates the effects of the five innovation attributes of autonomous vehicles on public acceptance; however, few studies have investigated how the five innovation attributes affect types of perceived value. The present study investigated the five innovation attributes in explaining perceived utilitarian and hedonic value. The results indicated that compatibility and relative advantage have significant positive effects on perceived utilitarian and hedonic value, whereas complexity has a significant negative effect on perceived utilitarian and hedonic value. Observability and trialability positively influence perceived utilitarian value but do not influence perceived hedonic value. Building on the research conducted by Yuen et al. (2020), the present study contributes to the literature by identifying the five innovation attributes that influence multiple types of perceived value (i.e., utilitarian and hedonic value). Furthermore, the bootstrapping results and mediating effects of utilitarian and hedonic value (Table 4) revealed by the present study further the understanding of the mechanism (involving utilitarian and hedonic value) that underlies the effects of the five innovation attributes on continuance intention. Perceived utilitarian value and hedonic value mediate the effects of compatibility, relative advantage, and complexity on continuance intention. Notably, the relationships of observability and trialability with continuance intention are not mediated by perceived utilitarian value, and neither observability nor trialability significantly influences perceived hedonic value (which is unexpected). However, observability ($r = 0.53$, $p < 0.001$) and trialability ($r = 0.15$, $p < 0.01$) are significantly and positively related to perceived utilitarian value (Table 2); these unexpected results may be attributed to the interaction effects of these innovation attributes on perceived hedonic value. In summary, these findings enhance the understanding of the relationships among the five innovation attributes, utilitarian and hedonic value, and continuance intention.

From a practical perspective, m-payment managers can reference these findings to understand how the five innovation attributes of m-payment affect customers' continuance intention through perceived utilitarian and hedonic value. In the model of m-payment continuance intention, utilitarian ($\beta = 0.35$, $p < 0.001$) and hedonic ($\beta = 0.53$, $p < 0.001$) value explained 60% of the variance, and customers' m-payment continuance intention was more strongly influenced by hedonic value. The managerial implication is that increasing both the utilitarian and hedonic value of m-payment is necessary to increased continuance intention. The findings indicate that m-payment system developers should focus on value creation when they market their m-payment system. To increase customers' continuance intention, communication strategies can focus on increasing not just the perceived utilitarian value but also the perceived hedonic value of m-payments. M-payment marketers can emphasize hedonic value because it is essential in encouraging consumers to continue using m-payments. In summary, traditional marketing communication strategies are too narrow in scope because they focus only on system performance factors such as convenience and effectiveness. M-payment marketers should promote both utilitarian and hedonic value through marketing and appeal to their customers' desire to have fun, joyful, and entertaining user experiences.

The findings also help m-payment managers to understand how the innovation attributes of m-payment influence customers' perceived utilitarian and hedonic value. The SEM analysis revealed that the variance in perceived utilitarian (60%) and hedonic (49%) value is associated with the innovation attributes. Per the findings, m-payment managers can enhance perceived utilitarian and hedonic value by developing and designing their m-payment system with a focus on innovation attributes. Furthermore, managers' understanding of the varying influences of these attributes on customers' perceived utilitarian and hedonic value of m-payment is crucial in determining the appropriate allocation of resources. In other words, understanding how consumer perceptions of utilitarian and hedonic value are affected by innovation attributes can help m-payment marketers to effectively design and manage their products' attributes. For example, the results showed that compatibility has the strongest influence on customers' perceived utilitarian ($\beta = 0.39$, $p < 0.001$) and hedonic ($\beta = 0.44$, $p < 0.001$) value. Therefore, m-payment system developers should work to increase the compatibility of their system with their target customers' lifestyles. The present study also suggests that m-payment marketers focus their efforts on potential m-payment customers who fit their target customer profiles. Furthermore, relative advantage is the second most influential factor affecting customers' perceived utilitarian ($\beta = 0.24$, $p < 0.001$) and hedonic ($\beta = 0.21$, $p < 0.001$) value. Developers of m-payment systems should communicate to their customers the advantages (e.g., greater convenience and effectiveness) of m-payment relative to traditional money transfer services. By contrast, the results indicated that complexity negatively affects both utilitarian ($\beta = -0.16$, $p < 0.001$) and hedonic ($\beta = -0.15$, $p < 0.001$) value. Thus, m-payment system developers should design their system to be simple to learn and use. Finally, although observability ($\beta = 0.07$, $p > 0.05$) and trialability ($\beta = 0.04$, $p > 0.05$) do not significantly influence perceived hedonic value, they do significantly influence perceived utilitarian value (observability, $\beta = 0.17$, $p < 0.01$; trialability, $\beta = 0.10$, $p < 0.05$). Therefore, to enhance consumers' perceptions of the utilitarian value of m-payment, system developers should allow m-payment customers to clearly experience the benefits of m-payment, enabling customers to easily communicate their experiences to other people; in addition, customers could also be given trial versions or demos of m-payment products or services.

4.2. Limitations and Future Research

As with most studies, this study has limitations. First, because convenience sampling was used for data collection and 416 m-payment customers participated in this survey, the generalizability of the results is limited. Further studies must conduct more extensive or even nationwide sampling to increase the representativeness and generalizability of the findings. Second, this research examined compatibility from the lifestyle-fit perspective and revealed it to be the most influential factor in the formation of customers' perceived utilitarian and hedonic value. Previous studies have suggested that compatibility is formulated through an innovation's perceived fit with the potential adopter's habits and experiences (Dzogbenuku, 2013; Rogers, 2003). Future research can investigate the different concepts of compatibility, such as fits with habits and experiences, to understand the effects of compatibility more thoroughly. Third, observability can be divided into two connotations: visibility and result demonstrability (Dzogbenuku, 2013). Because this study focused on result demonstrability, future research should investigate the effects of visibility. Fourth, previous studies have suggested that privacy risk has a negative relationship with attitudes toward the use of m-payment systems (Meharia, 2012). Further research may address privacy risk and its effect on continued use. Integrating privacy risk factors into the model may lead to an improved understanding of m-payment usage behaviors. Fifth, this study focused on innovation attributes, but further research may address the influences of social factors (e.g., social norms) and customer demographics (e.g., gender). An understanding of the factors affecting the adoption behavior of m-payment from a variety of perspectives can help m-payment administrators attract new customers or retain experienced customers, and marketers can increase m-payment use through effective product development, customer segmentation, and communication programs.

Acknowledgement

REFERENCES

Al-Jabri, I. M., & Sohail, M. S. (2012). Mobile banking adoption: Application of diffusion of innovation theory. *Journal of Electronic Commerce Research*, *13*(4), 379-391.

Apanasevic, T., Markendahl, J., & Arvidsson, N. (2016). Stakeholders' expectations of mobile payment in retail: Lessons from Sweden. *International Journal of Bank Marketing, 34*(1), 37-61.

Arvidsson, N. (2014). Consumer attitudes on mobile payment services–results from a proof of concept test. *International Journal of Bank Marketing, 32*(2), 150-170.

Bai, H., Xu, B., & Zhang, W. (2021). Can money buy continuous use? An exploration with taxi-hailing apps. *Journal of Electronic Commerce Research*, *22*(2), 110-127.

Blázquez, M. (2014). Fashion shopping in multichannel retail: The role of technology in enhancing the customer experience. *International Journal of Electronic Commerce*, *18*(4), 97-116.

Bobek, D. D., Chen, J. C., Hageman, A. M., & Tian, Y. (2016). Are more choices better? An experimental investigation of the effects of multiple tax incentives. *The Journal of the American Taxation Association*, *38*(2), 111-128.

Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. Lawrence Erlbaum Associates.

Cai, S., & Xu, Y. (2011). Designing not just for pleasure: Effects of web site aesthetics on consumer shopping value. *International Journal of Electronic Commerce*, *15*(4), 159-188.

Carter, L., & Campbell, R. (2011). The impact of trust and relative advantage on internet voting diffusion. *Journal of Theoretical and Applied Electronic Commerce Research*, *6*(3), 28-42.

Chang, S. H., Chih, W. H., Liou, D. K., & Yang, Y. T. (2016). The mediation of cognitive attitude for online shopping. *Information Technology & People, 29*(3), 618-646.

Chen, C. (2013). Perceived risk, usage frequency of mobile banking services. *Managing Service Quality, 23*(5), 410-436.

Chen, S. C., Chung, K. C., & Tsai, M. Y. (2019). How to achieve sustainable development of mobile payment through customer satisfaction—the SOR model. *Sustainability*, *11*(22), 6314.

Cheng, X., Fu, S., & Yin, G. (2016). Does subsidy work? An investigation of post-adoption switching on car-hailing apps. *Journal of Electronic Commerce Research,18*(4), 317-329.

Cheung, W., Chang, M. K., & Lai, V. S. (2000). Prediction of Internet and World Wide Web usage at work: A test of an extended Triandis model. *Decision Support Systems*, *30*(1), 83-100.

Chow, W. S., & Shi, S. (2015). Investigating customers' satisfaction with brand pages in social networking sites. *Journal of Computer Information Systems*, *55*(2), 48-58.

Christian, S., L., & Carter, L. (2005). E-voting: From apathy to adoption. *Journal of Enterprise Information Management, 18*(5), 586-601.

DeConinck, J. B., & Johnson, J. T. (2009). The effects of perceived supervisor support, perceived organizational support, and organizational justice on turnover among salespeople. *Journal of Personal Selling & Sales Management*, *29*(4), 333-350.

De Kerviler, G., & Demoulin, N. T. (2017). Making in-store payment enjoyable by adopting mobile payment. In *Annales des Mines-Réalités industrielles* (No. 4, pp. 64-68). FFE.

Dlodlo, N. (2015). The use of M-payment services in South Africa: A value-based perceptions approach. *International Business & Economics Research Journal*, *14*(1), 159-178.

Dzogbenuku, R. K. (2013). Banking innovation in Ghana: Insight of students-adoption and diffusion. *Journal of Internet Banking and Commerce*, *18*(3), 1-20.

Ekinci, Y., Sirakaya-Turk, E., & Preciado, S. (2013). Symbolic consumption of tourism destination brands. *Journal of Business Research*, *66*(6), 711-718.

Etemad-Sajadi, R. (2014). The influence of a virtual agent on web-users' desire to visit the company: The case of restaurant's web site. *International Journal of Quality & Reliability Management, 31*(4), 419-434.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50.

Gounaris, S., & Koritos, C. (2008). Investigating the drivers of internet banking adoption decision: A comparison of three alternative frameworks. *International Journal of Bank Marketing, 26*(5), 282-304.

Guo, Y. M., & Poole, M. S. (2009). Antecedents of flow in online shopping: A test of alternative models. *Information Systems Journal*, *19*(4), 369-390.

Ha, Y., & Im, H. (2014). Determinants of mobile coupon service adoption: Assessment of gender difference. *International Journal of Retail & Distribution Management, 42*(5), 441-459.

Hafizah, M. H., & Kamil, M. I. (2009). E-learning adoption: The role of relative advantages, trialability and academic specialisation. *Campus-Wide Information Systems, 26*(1), 54-70.

Hair, J. F., Anderson, R. E., Tatham, R., & Black, W. C. (2006). *Multivariate data analysis.* Pearson Prentice Hall.

Hansen, T. (2005). Consumer adoption of online grocery buying: A discriminant analysis. *International Journal of Retail & Distribution Management, 33*(2), 101-122.

Herrando, C., Jiménez-Martínez, J., & Hoyos, M. D. (2019). *Social commerce users' optimal experience: Stimuli, response and culture*. *Journal of Electronic Commerce Research*, *20*(4), 199-218.

Hillman, S., & Neustaedter, C. (2017). Trust and mobile commerce in North America. *Computers in Human Behavior*, *70*, 10-21.

Hossain, M. A., Hossain, M. S., & Jahan, N. (2018). Predicting continuance usage intention of mobile payment: An experimental study of Bangladeshi customers. *Asian Economic and Financial Review*, *8*(4), 487-498.

Hsin, H. C., Huang, C. Y., Chen, S. F. & Ming, T. H. (2017). The effects of innovative, consumer and social characteristics on willingness to try nano-foods. *Information Technology & People,30*(3), 653-690.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55.

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2015). Examining the role of three sets of innovation attributes for determining adoption of the interbank mobile payment service. *Information Systems Frontiers*, *17*(5), 1039-1056.

Koenig-Lewis, N., Marquet, M., Palmer, A., & Zhao, A. L. (2015). Enjoyment and social influence: Predicting mobile payment adoption. *The Service Industries Journal*, *35*(10), 537-554.

Koopman, J., Howe, M., Hollenbeck, J. R., & Sin, H. P. (2015). Small sample mediation testing: Misplaced confidence in bootstrapped confidence intervals. *Journal of Applied Psychology*, *100*(1), 194-202.

Kshetri, N., & Acharya, S. (2012). Mobile payments in emerging markets. *IT Professional*, *14*(4), 9-13.

Lee, S., & Kim, D. Y. (2018). The effect of hedonic and utilitarian values on satisfaction and loyalty of Airbnb users. *International Journal of Contemporary Hospitality Management, 30*(3), 1332-1351.

Lee, Y. H., Hsieh, Y. C., & Hsu, C. N. (2011). Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems. *Journal of Educational Technology & Society*, *14*(4), 124-137.

Leftheriotis, I., & Giannakos, M. N. (2014). Using social media for work: Losing your time or improving your work? *Computers in Human Behavior*, *31*(2), 134-142.

Lenk, P. J., DeSarbo, W. S., Green, P. E., & Young, M. R. (1996). Hierarchical Bayes conjoint analysis: Recovery of partworth heterogeneity from reduced experimental designs. *Marketing Science*, *15*(2), 173-191.

Li, X., Liao, Q., Luo, X., & Wang, Y. (2020). Juxtaposing impacts of social media interaction experiences on e-commerce reputation. *Journal of Electronic Commerce Research*, *21*(2), 75-95.

Liang, S. W., & Lu, H. P. (2013). Adoption of e-government services: An empirical study of the online tax filing system in Taiwan. *Online Information Review, 37*(3), 424-442.

Liébana-Cabanillas, F. J., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014). Role of gender on acceptance of mobile payment. *Industrial Management & Data Systems, 114*(2), 220-240.

Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014). Antecedents of the adoption of the new mobile payment systems: The moderating effect of age. *Computers in Human Behavior*, *35*, 464-478.

Lin, K. Y., & Lu, H. P. (2015). Predicting mobile social network acceptance based on mobile value and social influence. *Internet Research, 25*(1), 107-130.

Lupo-Pasini, F. (2021). Monetary transitions and property rights: Lessons from India's 2016 demonetization. *Banking & Finance Law Review*, *36*(2), 209-236.

Mahapatra, S. N., Kumar, J., & Chauhan, A. (2010). Consumer satisfaction, dissatisfaction and post-purchase evaluation: An empirical study on small size passenger cars in India. *International Journal of Business & Society*, *11*(2), 97-108.

Makanyeza, C. (2017). Determinants of consumers' intention to adopt mobile banking services in Zimbabwe. *International Journal of Bank Marketing, 35*(6), 997-1017.

Malaquias, R. F., & Hwang, Y. (2017). Mixing business and pleasure: Empirical implications for trust in mobile banking. *Journal of Electronic Commerce Research*, *18*(3), 212-224.

Marak, Z. R., Tiwari, A., & Tiwari, S. (2019). Adoption of 3D printing technology: An innovation diffusion theory perspective. *International Journal of Innovation*, *7*(1), 87-103.

Meharia, P. (2012). Assurance on the reliability of mobile payment system and its effects on its' use: An empirical examination, *11*(1), 97-111.

Merritt, C. (2011). Mobile money transfer services: The next phase in the evolution of person-to-person payments. *Journal of Payments Strategy & Systems*, *5*(2), 143-160.

Mishra, A., Dash, S. B., & Cyr, D. (2014). Linking user experience and consumer-based brand equity: The moderating role of consumer expertise and lifestyle. *Journal of Product & Brand Management, 23*(4), 333-348.

Mohammadi, H. (2015). A study of mobile banking usage in Iran. *International Journal of Bank Marketing, 33*(6), 733-759.

Moons, I., & De Pelsmacker, P. (2015). An extended decomposed theory of planned behaviour to predict the usage intention of the electric car: A multi-group comparison. *Sustainability*, *7*(5), 6212-6245.

Mikalef, P., Giannakos, M., & Pateli, A. (2013). Shopping and word-of-mouth intentions on social media. *Journal of Theoretical and Applied Electronic Commerce Research*, *8*(1), 17-34.

Mustafa, R. (2015). Business model innovation. *Journal of Strategy and Management, 8*(4), 342-367.

Nel, J., & Heyns, N. (2017). The in-store factors influencing the use-intention of proximity mobile-payment applications. *Management Dynamics*, *26*(2), 2-20.

Ndubisi, N. O., & Sinti, Q. (2006). Consumer attitudes, system's characteristics and internet banking adoption in Malaysia. *Management Research News, 29*(1), 16-27.

Obeidat, B. Y. (2013). The relationship between innovation diffusion and human resource information system (HRIS). *International Journal of Information, Business and Management*, *5*(1), 72-96.

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, *61*(8), 404-414.

Ozturk, A. B., Bilgihan, A., Salehi-Esfahani, S., & Hua, N. (2017). Understanding the mobile payment technology acceptance based on valence theory: A case of restaurant transactions. *International Journal of Contemporary Hospitality Management, 29*(8), 2027-2049.

Padashetty, S., & Kishore, K. S. (2013). An empirical study on consumer adoption of mobile payments in Bangalore city-A case study. *Researchers World*, *4*(1), 83-94.

Park, J., Snell, W., Ha, S., & Chung, T. L. (2011). Consumers' post-adoption of M-services: Interest in future M-services based on consumer evaluations of current M-services. *Journal of Electronic Commerce Research*, *12*(3), 165-175.

Peng, R., Xiong, L., & Yang, Z. (2012). Exploring tourist adoption of tourism mobile payment: An empirical analysis. *Journal of Theoretical and Applied Electronic Commerce Research*, *7*(1), 21-33.

Phonthanukitithaworn, C., Sellitto, C., & Fong, M. W. L. (2015). User intentions to adopt mobile payment services: A study of early adopters in Thailand. *Journal of Internet Banking and Commerce*, *20*(1), 1-29.

Pihlstrom, M. (2007). Committed to content provider or mobile channel? Determinants of continuous mobile multimedia service use. *Journal of Information Technology Theory and Application*, *9*(1), 230.

Prebensen, N. K., & Rosengren, S. (2016). Experience value as a function of hedonic and utilitarian dominant services. *International Journal of Contemporary Hospitality Management, 28*(1), 113-135.

Roach, G. (2009). Consumer perceptions of mobile phone marketing: A direct marketing innovation. *Direct Marketing, 3*(2), 124-138.

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Ryu, K., Han, H., & Jang, S. S. (2010). Relationships among hedonic and utilitarian values, satisfaction and behavioral intentions in the fast-casual restaurant industry. *International Journal of Contemporary Hospitality Management, 22*(3), 416-432.

Sarea, A. M., & Hanefah, M. M. (2013). Adoption of AAOIFI accounting standards by Islamic banks of Bahrain. *Journal of Financial Reporting & Accounting, 11*(2), 131-142.

Segars, A. H., & Grover, V. (1993). Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. *MIS Quarterly*, 517-525.

Seyal, A. H., & Rahman, M. N. A. (2003). A preliminary investigation of e-commerce adoption in small & medium enterprises in Brunei. *Journal of Global Information Technology Management*, *6*(2), 6-26.

Sharma, R. (2018). Buying behaviour of rural consumer towards purchase of mobile phones: An empirical study of Himachal Pradesh. *Prestige International Journal of Management and Research*, *10*(5), 93-99.

Sirgy, M. J. (1982). Self-concept in consumer behavior: A critical review. *Journal of Consumer Research*, *9*(3), 287-300.

Soleas, E. K. (2020). Leader strategies for motivating innovation in individuals: A systematic review. *Journal of Innovation and Entrepreneurship*, *9*, 1-28.

Song, P., Zhang, C., & Xu, H. (2012). How to exploit the user base for online products: A product integration perspective. *Journal of Electronic Commerce Research*, *13*(4), 356-372.

Spencer, M., Gilmour, A. F., Miller, A. C., Emerson, A. M., Saha, N. M., & Cutting, L. E. (2019). Understanding the influence of text complexity and question type on reading outcomes. *Reading and Writing*, *32*(3), 603-637.

Tan, M., & Teo, T. S. (2000). Factors influencing the adoption of Internet banking. *Journal of the Association for Information Systems*, *1*(5), 1-42.

Taylor, E. (2016). Mobile payment technologies in retail: A review of potential benefits and risks. *International Journal of Retail & Distribution Management, 44*(2), 159-177.

Teo, A. C., Tan, G. W. H., Ooi, K. B., Hew, T. S., & Yew, K. T. (2015). The effects of convenience and speed in m-payment. *Industrial Management & Data Systems, 115*(2), 311-331.

Tóth, F., & Hartványi, T. (2015). Operation and supply chain optimisation for small companies. *Annals of the Faculty of Engineering Hunedoara*, *13*(3), 37-44.

Trütsch, T. (2016). The impact of mobile payment on payment choice. *Financial Markets and Portfolio Management*, *30*(3), 299-336.

Tsiotsou, R., & Alexandris, K. (2009). Delineating the outcomes of sponsorship. *International Journal of Retail & Distribution Management, 37*(4), 358-369.

Upadhyay, P., & Chattopadhyay, M. (2015). Examining mobile based payment services adoption issues: A new approach using hierarchical clustering and self-organizing maps. *Journal of Enterprise Information Management, 28*(4), 490-507.

Valier, F. M., McCarthy, R. V., & Aronson, J. E. (2008). A primary study of attributes of innovations during the prediffusion stage. *Journal of International Technology and Information Management*, *17*(3), 219-234.

Waheed, M., Kaur, K., Ain, N., & Sanni, S. A. (2015). Emotional attachment and multidimensional self-efficacy: Extension of innovation diffusion theory in the context of eBook reader. *Behaviour & Information Technology*, *34*(12), 1147-1159.

Wang, X., Yuen, K. F., Wong, Y. D., & Teo, C. C. (2018). An innovation diffusion perspective of e-consumers' initial adoption of self-collection service via automated parcel station. *The International Journal of Logistics Management, 29*(1), 237-260.

Wu, J., Liu, L., & Huang, L. (2017). Consumer acceptance of mobile payment across time. *Industrial Management & Data Systems, 117*(8), 1761-1776.

Yap, S. F. C., & Lee, C. K. C. (2014). Leveraging the power of online social networks: A contingency approach. *Marketing Intelligence & Planning, 32*(3), 345-374.

Yuen, K. F., Wong, Y. D., Ma, F., & Wang, X. (2020). The determinants of public acceptance of autonomous vehicles: An innovation diffusion perspective. *Journal of Cleaner Production*, *270*, 121904.

Zhang, L., & Liu, C. (2018). Extending a mass-market functional brand into lifestyle products: The case of consumer acceptance of Ford fashion apparel. *Journal of Marketing Perspectives*, *1*, 68-88.

Zhang, T., Lu, C., & Kizildag, M. (2017a). Engaging generation Y to co-create through mobile technology. *International Journal of Electronic Commerce*, *21*(4), 489-516.

Zhang, X., Guo, X., Lai, K. H., Yin, C., & Meng, F. (2017b). From offline healthcare to online health services: The role of offline healthcare satisfaction and habits. *Journal of Electronic Commerce Research*, *18*(2), 138-154.

Zolait, A. H. S., & Mattila, M. (2009). UIBR-an approach to innovations acceptance. *The Journal of Internet Banking and Commerce*, *14*(2), 1-17.