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Jhong-Min Yang

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The impact of perceived value and trust on mobile payment reuse intention: the mediating role of user satisfaction

Jhong-Min Yang

International Business Management,
Tainan University of Technology,
No.529, Zhongzheng Rd.,
Yongkang District, Tainan City 710302, Taiwan
Email: a845461@gmail.com

Abstract: Although m-payment usage in Taiwan has expanded year after year, research on reuse intention appears to be limited. According to this study, perceived convenience, perceived benefit, and perceived mobility will continue to produce perceived value, affecting user satisfaction and eventually the decision to continue using. Online, 326 valid samples were obtained. According to the findings of the measurement model analysis and structural model analysis of structural equation modelling, user satisfaction has a full mediation impact between perceived value and intention to reuse, as well as between trust and intention to reuse MP. The comprehensive findings and academic and practical consequences are reported at the end of this work.

Keywords: mobile payment; user satisfaction; perceived value; trust; social influence.

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Biographical notes: Jhong-Min Yang is an Assistant Professor at the Department of International Business Management, Tainan University of Technology. He received his PhD degree in the Institute of Technology Management at Taiwan's National Chung Hsing University. His current research interests include e-commerce, m-commerce, service management, IT management, and consumer behaviour.

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1 Introduction

A 2016 assessment by the Financial Supervisory Commission (2016) highlighted that mobile payments (MPs) accounted for barely 26% of Taiwan's consumption expenditure, significantly less than other Asian countries. Because few people were willing to try MP

at the time, studies mainly focused on consumer adoption. According to eMarketer (2016), 73.4% of Taiwan's population had smartphones in 2016. In contrast, 71.8% of Singapore's population, 70.4% of South Korea's population, 63.9% of the US population and 43.8% of China's population had smartphones, making Taiwan one of the world's most mobile countries. Since then, several retailers, financial institutions, telecommunications companies and e-commerce sites have adopted the service, accelerating customer acceptance of MP. As a result, according to the Market Intelligence and Consulting Institute's (MIC) 2020 investigative report, 60% of Taiwan's population used MPs in the second half of 2019. At this point, research must move beyond the topic of initial consumer adoption, as similar findings contribute little to new knowledge.

Drawing on innovation diffusion theory (IDT), Rogers (1995) posited that the acceptance of an innovation is divided into two stages: individual adoption and widespread adoption. Individual adoption is further subdivided into four stages: awareness, decision to adopt, initial use and continued use whereas mass adoption is subdivided into five adopter groups: innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%). Based on its MP usage rate of 60% (MIC, 2020), Taiwan is most likely in the initial phase of the late majority stage of mass adoption. However, determining the degree of individual adoption is challenging.

According to IDT, the individual adoption stages are awareness (knowledge), decision to adopt (evaluation), initial use (trial) and continued use (confirmation). When an individual is aware that a new technology can meet specific needs, the individual will seek information about the latest technology. Through learning, an individual begins to evaluate whether the new technology meets one's demands and is beneficial. The new technology will then be trialled (initial use) on a small scale and observed to make future decisions. Finally, the individual will decide whether to continue using the new technology.

Even though MP usage increases yearly, there is little research on reuse intentions. Based on IDT, this study contends that reuse intention is the endpoint of the individual adoption process. Previous research has found that user satisfaction strongly predicts the intention to reuse (Choi and Sun, 2016; Park, 2019). Satisfaction is defined as 'ultimately a state experienced inside the user's head' [Tessier et al., (1997), p.383] and can be considered a user's evaluative response after a trial, influenced by the confirmation of pre-use expectations and trial performance (Oliver, 1980).

In this study, pre-use expectations refer to the features that an individual perceives will be linked with using MP. Previously, studies focused on perceived characteristics for the initial use of MP, such as perceived relative benefit, usefulness, security, mobility, ease of use, trust, and convenience (Kim et al., 2010; Liébana-Cabanillas et al., 2014; Schierz et al., 2010; Yang et al., 2012; Zmijewska et al., 2004). After eliminating perceived usefulness, security and ease of use that sparked users' interest and assessed whether MP corresponded to their needs and triggered the initial trial, this study selects perceived convenience, benefit and mobility, anticipating they will reflect users' perceived value, affect user satisfaction and the decision to continue to use a new technology.

Perceived value is 'the evaluation of the users regarding the utility of the product based on the user perception of what is received in exchange for what is given' [Zeithaml, 1988, p.4]. According to Xu et al. (2006), perceived value influences consumer satisfaction in financial services. According to TVBS News (2018), an essential driver of the expansion of MP services is convenience, while perceived benefit

is also a key element for engaged consumers. Furthermore, MP has higher mobility requirements than other technological applications and perceived mobility is a key factor influencing MP utilisation (Schierz et al., 2010). In this study, users' perceptions of convenience, benefits and mobility reflect consumers' perceived value of MPs.

However, because the risk of MP use has influenced many individuals who have concerns about MP, user-perceived value alone may not fully account for user satisfaction with the use of MP. As a result, while assessing the impact of perceived value on user satisfaction for MP use, consumers' trust must also be considered.

Furthermore, social influence is crucial in the early phases of technological experience, but it fades over time (Venkatesh et al., 2003). Although social influence is a key factor in new technology adoption (Hoque and Sorwar, 2017; Madigan et al., 2016), few studies have focused on the moderating effects of social influence on MP reuse. The primary goals of this study are to

1 identify the inflective factors influencing user perceived value of MP use
2 empirically depict and examine the relationships between perceived value, trust and user satisfaction
3 confirm the causal links between user satisfaction and reuse intention
4 reveal the moderating role of social influence on the effects of value, trust and satisfaction on the intention to reuse MP.

2 Theoretical background

2.1 Innovation diffusion theory

Rogers (1995) defines innovation diffusion as the process by which an innovation spreads across members of a social system through specified channels over time. According to the IDT, the progression of an invention diffusion process is determined by the qualities of the innovation, which include relative advantage, simplicity, compatibility, trialability and observability. Simplicity was crucial in the early days of the growth of MPs in Taiwan. Simplicity is defined as the degree to which MPs are considered easy to understand and utilise. However, the adoption rate of MP in Taiwan reached 60% in 2019 (MIC, 2020). The preference rate reached 50% in 2021 (MIC, 2022), indicating that the diffusion rate of MP in Taiwan has reached the initial phase of late adopter majority. Most users have some degree of awareness of and experience with MP. As a result, simplicity is an insufficient explanation of user intention to reuse. In contrast, the four remaining innovative features are still essential for explaining reuse:

Relative advantage refers to the extent to which an innovation is a better substitute for the original product or service (Rogers, 1995, 2002). Relative advantage is determined by adopters' subjective views, reflecting users' perceived value (Ho et al., 2013). The relative advantage that reflects the perceived value of MP use is the user's subjective perception, such as perceived convenience, perceived benefit, and perceived mobility.

Compatibility refers to the degree to which users believe an innovation is consistent with their value beliefs, experiences and existing demands (Roger, 1995, 2002). According to Oliver (Expectation Confirmation Theory, ECT, 1980), the degree of consistency confirmation influences user satisfaction. In utilising MP, the relative

advantage is the user's expectation of MP use and the degree of confirmation is the development of perceived value. The consistency of confirmation influences user satisfaction.

Trialability refers to the degree to which an innovation may be tried out. Adoption will be sped up if an invention may be tried out (Roger, 1995, 2002). IDT splits the individual adoption process into four stages, with the trial stage implying that an invention will be trailed on a modest scale. Engel et al. (EKB model, 1995) identified five steps in the consumer decision-making process: demand recognition, information collection, programme evaluation, purchase and outcome. According to Kotler et al. (1996), the consumer decision-making process is separated into the following steps: identifying needs, searching for information, evaluating options, purchasing, and post-purchase behaviour. They all assume buyers will have subsequent behavioural intentions based on their purchase results. This study argues that MP trialability relates to the use experience in specific consuming settings and reuse intention refers to the post-use behaviour following initial use.

An observational innovation can be observed and described to others as having the benefits of adoption (Rogers, 1995, 2002). This study contends that innovation diffusion occurs frequently inside users' social systems. As a result, while discussing the elements influencing users' usage intention, the 'social influence' is sometimes overlooked. Although previous studies believed that social influence did not affect use intention at the late majority stage (Venkatesh et al., 2003; Ho et al., 2017), this study did not believe that. As a result, the discussion of social influence in this study will concentrate on the moderating effect.

2.2 User satisfaction

Oliver (1980) suggested satisfaction as a critical predictor of long-term customer behaviour. According to Al-Maskari and Sanderson (2010, p.2), 'user satisfaction is a subjective variable' and is widely regarded as a measure of system success (Opoku, 2020; Pham and Dau 2022). This study investigates customer satisfaction in MP use and indicates that user satisfaction is equivalent to customer satisfaction.

According to Hossain and Quaddus (2012), the higher the level of satisfaction perceived by customers, the more likely they are to purchase conveniently. ECT has been widely employed in studies analysing the relationship between consumer contentment and repurchase intention to quantify the influence of customer satisfaction (e.g., Dabholkar et al., 2000). However, Hossain and Quaddus (2012) pointed out ECT largely deals with perceptions and attitudes regarding the attributes/performance of products/services, cannot capture quality characteristics and thus cannot fully explain user satisfaction in an IS use. Later, it was replaced by Bhattacherjee's Expectation Confirmation Model (ECM, 2001), which focused on 'post-usage expectation' rather than 'pre-use expectations' (Hossain and Quaddus, 2012). The current study focuses on reuse intention, which relates to post-use behaviour and assumes that users would have expectations for the initial MP trial (post-usage expectations relating to usage characteristics/performance). Following the encounter, customers will compare their post-usage expectations with post-usage performance, resulting in user satisfaction.

2.3 Perceived value

Value is an individual's impression of product qualities, performance and use outcomes. In strategic management, perceived value is crucial (Sánchez-Fernández and Iniesta-Bonillo, 2007; Ulaga and Chacour, 2001). According to Flint et al. (1997), perceived value is determined by the balance between the customer's advantage and the cost of certain use scenarios. According to IDT, ECT, and ECM, the user's subjective viewpoint, the user's post-usage expectation for the ongoing usage of MP, determines the relative advantage. Many studies have been conducted to investigate the impact of various perceived beliefs on customer satisfaction in various IT contexts, including perceived usefulness and risk in online shopping (Tandon et al., 2017, 2018), perceived usefulness and enjoyment in mobile commerce (Marinkovic and Kalinic, 2017) and perceived reliability in self-service technology (Barua et al., 2018). This study proposes that users' post-usage expectation for reusing MP is driven by convenience, benefit and mobility as the three relative advantages reflecting the perceived value. If perceived value is confirmed, user satisfaction will be affected.

In the MP scenario, perceived value is examined in relation to user satisfaction and reuse intention, while perceived convenience, perceived benefit and perceived mobility are included as the reflective indicators in this study.

2.3.1 Perceived convenience

Berry et al. (2002, p.12) defined service convenience as "the perception of the time and effort that customers spend for using/purchasing services." Yoon and Kim (2007) referred service convenience as 'a degree of convenience perception towards time, place and execution when users use technology'. This study defines perceived convenience in MP use as the degree of convenience that users experience throughout a transaction. Recent studies have confirmed the link between consumer satisfaction and service convenience. (e.g., Mehmood and Najmi, 2017; Duarte et al., 2018). Accordingly, this study contends that perceived convenience is a crucial reflective indicator of perceived value.

2.3.2 Perceived benefit

Financial, telecommunications and retail sectors have implemented incentives to draw customers, such as points and discounts, to increase consumer desire to use MPs. These incentives are extra rewards received for using MPs. Accordingly, the degree of additional benefits gained from MP use is defined in this study as perceived benefit. According to De Oña et al. (2016), customer satisfaction is influenced by perceived advantages, while experienced benefits are positively connected with satisfaction, according to Hallmann and Zehrer (2016). We anticipate increased satisfaction from utilising MPs will increase users' intention to reuse. As a result, one of the crucial reflective indicators of users' perceived value that influences user satisfaction should be perceived benefit.

2.3.3 Perceived mobility

Mobility refers to the ability to access services ubiquitously, on the move, via wireless networks and a variety of mobile devices (Kim et al., 2010; Au and Kauffman, 2008).

Mobility can help customers in mobile situations whenever and wherever it is needed and perceived mobility was defined as the extent of user awareness of the mobility value of mobile services and systems (Huang et al., 2007). Previous research has demonstrated that perceived mobility affects usability and attitudes towards mobile services (Park and Kim, 2013); however, research on the impact of perceived mobility on satisfaction is sparse. According to the findings of Schierz et al. (2010), persons' mobility strongly influences their views about MP use; we argue that perceived mobility is also a primary reflective indicator that reflects user perceived value, influencing user satisfaction.

In conclusion, we argue that these perceived beliefs are reflective indicators of perceived value in MP reuse. It is more likely to perceive a good value when a user sensed convenience, mobility value and benefits from using MP. As a result, through perceived value, which is reflected by perceived convenience, perceived mobility and perceived benefits, we hypothesise that

H1 Perceived value positively affects user satisfaction.

2.4 Reuse intention

According to Li et al. (2012), in the context of MP use, reuse intention is defined as the degree to which consumers intend to use the service continuously or enhance their use in future transactions. Previous research has primarily focused on the direct relationship between perceived beliefs and intention to use/reuse. For instance, Choi and Sun (2016) found that perceived convenience directly influences users' intention to reuse online payment. According to Lee (2009) and Wang et al. (2014), perceived benefits significantly affect users' intentions to utilise internet banking, while perceived mobility affects users' intentions to use mobile data services constantly.

This study considers that developing perceived beliefs will lead users to believe that using MP is worthwhile, reflecting their perceived value. Recent studies have shown that consumer reuse intentions for e-commerce and mobile purchasing applications are strongly impacted by perceived value (e.g., Anshori et al., 2022; Tseng et al., 2021). Accordingly, through perceived value, reflected by perceived convenience, perceived mobility and perceived benefits, we hypothesise that

H2 Perceived value positively affects users' intentions to reuse MPs.

2.5 Trust, user satisfaction and reuse intention

Based on a platform's trustworthiness, competence and benevolence, trust is the extent to which customers favour online purchasing (Wang et al., 2016). According to Sirdeshmukh et al. (2002), trust in MP is defined as users' perception of dependability and reliability when utilising MP as a payment mechanism. Customers indicate their willingness or desire to follow a specific pattern of behaviour through trust. According to Lu et al. (2012), in customer-to-customer transactions, trust has a positive impact on consumer satisfaction. Additionally, Kim et al. (2009) found that e-trust significantly impacted e-satisfaction. This study, therefore, assumes that users will be satisfied if the MP service is dependable and can be trusted to pay for a transaction. As a result, we hypothesise that

H3 User trust positively affects user satisfaction.

A long-lasting client relationship is mostly based on trust (Lee et al., 2015). Saleem et al. (2017) reported that trust directly influences repurchase intention in the airline business, and studies have shown that website trust influences reuse intention (Lim, 2011). This study assumes that reuse intention will rise when the MP transaction is dependable and can be trusted to pay for a transaction. Thus, the following hypothesis is put forth:

H4 Trust positively affects the intention to reuse MPs.

Although it has been demonstrated in other mobile contexts, there is little research on the relationship between satisfaction and intention to reuse. Alalwan (2020), for instance, produced findings that demonstrate the importance of e-satisfaction in determining the likelihood that users will reuse mobile food delivery apps. Wu et al. (2016) found that when user satisfaction is developed, which results in an intention to continuously use the mobile value-added service. According to Li and Shang (2020), satisfaction impacts users' intention to reuse mobile government services. Thus, this study hypothesises that when a user is satisfied with the MP service, their intention to reuse MP will increase:

H5 User satisfaction positively affects the intention to reuse MPs.

2.6 Mediating role of user satisfaction

Contrary to the aforementioned hypotheses, numerous studies have suggested the importance of the mediating role of satisfaction. For instance, Caruana (2002) discovered that the relationship between service quality and service loyalty is mediated by customer satisfaction. Cole and Illum (2006) indicated that the relationship between service quality and behavioural intention is mediated by satisfaction. Vesel and Zabkar (2009) also found that the relationship between program quality and customer loyalty is mediated by satisfaction. This study argues that it is essential to investigate how user satisfaction mediates in this situation. As a result, the causalities of perceived value → user satisfaction → reuse intention and trust → user satisfaction → reuse intention are both pursued, and the following hypotheses regarding the mediating influence of user satisfaction are presented:

As a result, the paths of perceived value, user satisfaction and reuse intention are both pursued and the following hypotheses regarding the mediating influence of satisfaction are presented:

H6a User satisfaction mediates the relationship between perceived value and the intention to reuse.

H6b User satisfaction mediates the relationship between trust and the intention to reuse.

2.7 Moderating effect of social influence

Social influence is defined as 'the degree to which an individual perceives that importance of other's belief that he or she should use the technology' [Musa et al., (2015), p.675]. This variable is crucial in the early phases of technology experience (Ho et al., 2017). In this study, social influence is defined as the degree to which significant others who support MP reuse impact a customer's intention to do so.

Sawang et al. (2014) discovered that subjective norms had a moderating effect on the relationship between technological attitude and adoption intention and between perceived

control and adoption intention, in contrast to previous research that mostly considered attitude, perceived control and subjective norms as being in parallel relationships. The moderating impact of social influence on the relationship between expectations and confirmation was also examined by Sedera et al. (2017). According to Povey et al. (2000), the relationship between behavioural control and intention and between attitude and intention are both moderated by social influence. Thus, the following hypotheses are proposed about the moderating role of social influence:

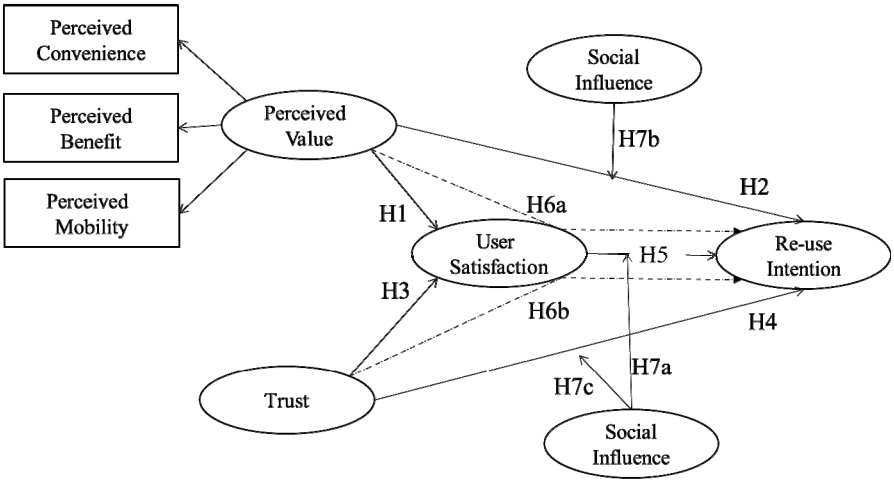
H7a Social influence moderates the effect of user satisfaction on the intention to reuse MPs.

H7b Social influence moderates the effect of perceived value on the intention to reuse MPs.

H7c Social influence moderates the effect of trust on the intention to reuse MPs.

In summary, this research proposes a second-order model including formative indicators and the relationships among customer perceived value, trust, user satisfaction, social influence and the intention to reuse, as shown in Figure 1.

Figure 1 Research model



Note: The dotted paths represent the hypotheses of the mediation effect

3 Research methodology

3.1 Questionnaire development

Rarely has MP research examined the relationship between perceived value and reuse intention. Therefore, the purpose of this study is to fill this research gap. To reflect general customer dispositions regarding MP reuse intention, a multi-item scale was developed based on the literature on trust, satisfaction and reuse intention (e.g., Zmijewska et al., 2004; Lin and Wang, 2006; Forsythe et al., 2006; Mimouni-Chaabane

and Volle, 2010; Kim et al., 2010; Sena Abraho et al., 2016). Finally, a Likert-type scale with a 5-point scale was created, with strongly disagree = 1 and strongly agree = 5.

To ensure that the respondents completely grasped the semantics of the questionnaire, three academics and three industry specialists reviewed the generated multi-item scale. Finally, utilising Google Forms, a formal online questionnaire was created utilising the definitions.

3.2 Data collection

This study primarily examines individuals' intentions to reuse MP. The questionnaire poll only includes respondents who have used MPs before. Therefore, as a first step in the questionnaire's sample screening process, we ask the respondents if they have had such an experience. Usage scenarios and purposes are not included because they are outside the scope of this study. Five hundred eighty-five potential respondents received the questionnaire link via email, Facebook fan group and Line group. The online survey received responses from 471 people in total. Three hundred twenty-six valid samples were left after the inexperienced and invalid samples were eliminated, resulting in a valid response rate of 69.21%.

Reviewing the respondent profile reveals that nearly 66% of respondents completed college, 78.5% of the samples are male and 54% are between the ages of 21 and 50. More than 60% of Taiwanese citizens now use MPs, according to the MIC (2020) report. There are 326 valid samples among the 585 potential respondents who received the questionnaire link and the effective recovery rate is 55.7%, close to the 60% of the MIC survey. We feel that the recovered samples were typical because all the valid samples are experienced MP users.

4 Analysis and results

First, this study applied Harman's one-factor test, as recommended by Podsakoff and Organ (1986), in the data analysis to determine whether the common method variance among the research variables would significantly impact the research results. Then, confirmatory factor analysis and structural equation modelling (SEM) were carried out using AMOS statistical software with maximum likelihood to evaluate both measurement and structural models for testing the goodness-of-fit, reliability and validity of constructs and hypotheses.

4.1 Common method variance

According to the results of the analysis, of the six extracted components, the first unrotated factor explains 37.015% of the variance, which is less than 40% (Podsakoff and Organ, 1986). Therefore, it can be said that this scale has no significant common method bias (see Table 1).

Table 1 Total variance explained

Component	*Initial Eigenvalues*			*Extraction sums of squared loadings*			*Rotation sums of squared loadings*		
	Total	*% of variance*	*Cumulative %*	*Total*	*% of variance*	*Cumulative %*	*Total*	*% of variance*	*Cumulative %*
1	9.991	35.681	35.681	9.991	35.681	35.681	5.628	20.099	20.099
2	2.640	9.429	45.110	2.640	9.429	45.110	3.287	11.739	31.837
3	1.923	6.866	51.976	1.923	6.866	51.976	3.068	10.958	42.796
4	1.694	6.051	58.028	1.694	6.051	58.028	3.007	10.739	53.535
5	1.248	4.458	62.486	1.248	4.458	62.486	1.761	6.288	59.823
6	1.012	3.614	66.099	1.012	3.614	66.099	1.757	6.277	66.099
7	.913	3.262	69.362						
8	.835	2.984	72.345						
9	.718	2.563	74.908						
10	.694	2.480	77.389						
11	.655	2.341	79.730						
12	.543	1.940	81.669						
13	.506	1.806	83.475						
14	.476	1.699	85.173						
15	.447	1.595	86.768						
16	.430	1.535	88.303						
17	.411	1.469	89.773						
18	.384	1.372	91.144						
19	.347	1.238	92.382						
20	.314	1.122	93.504						
21	.301	1.076	94.581						
22	.262	.937	95.518						
23	.244	.873	96.391						
24	.238	.849	97.240						
25	.229	.819	98.059						
26	.213	.761	98.820						
27	.175	.625	99.445						
28	.155	.555	100.000						

Note: Extraction method: principal component analysis.

4.2 Analysis of measurement model

4.2.1 Goodness-of-fit

In the measurement of goodness-of-fit, six items were eliminated because of the low factor loadings (λ) (i.e., PB3, PB4, PM2, PM3 and PM6 < 0.5) and a high modification index (MI) (i.e., PC4 > 3.84), as recommended by Jöreskog and Sörbom, 1993).

The reserved items yielded a CMIN value of 371.282 and 188 degrees of freedom (df) with a p-value < 0.001. Using CMIN/df = 1.975 as an alternative, less than the recommended value of 5 (Hair et al., 2006), provided evidence of good model fit. Other indices (RMSEA = 0.055, GFI = 0.908, AGFI = 0.879, NFI = 0.916, IFI = 0.957, TLI = 0.946, CFI = 0.956) provided significant evidence of good model fit.

4.2.2 Reliability and convergent validity

For the reliability test, SPSS 12.0 was applied. The Cronbach's alpha scores of all constructs were greater than 0.7 (0.76–0.90), which indicates each construct exhibits good reliability.

For the convergent validity test, results from AMOS analyses showed that all the indicator factor loadings (λ) are significant (***) and exceed the 0.5 (0.59–0.93) threshold and the composite reliability (CR) scores of all constructs exceed 0.7 (0.78–0.90), while the average variance extracted (AVE) by each construct is higher than the 0.5 (0.51–0.76) threshold, showing adequate convergent validity. Table 2 presents the details of both the reliability and convergent validity tests.

Table 2 Reliability and convergent validity

Constructs	*Items*		*λ*	*CR*	*AVE*	*α*
PC	PC1	MP is convenient because the phone is usually with me.	.75	.78	.55	.76
	PC2	MP is convenient because I can use it anytime.	.83			
	PC3	MP is convenient because I can use it in any transaction situation.	.63			
PB	PB1	Using MP would enable me to get more points back.	.79	.81	.68	.81
	PB2	Using MP would enable me to get a higher discount.	.86			
PM	PM1	My network roaming services are adequate for using the MP.	.59	.82	.61	.79
	PM4	I can get sufficient mobile internet flow support anytime.	.93			
	PM5	I can get sufficient mobile internet flow support anywhere.	.78			
SI	SI1	People who influence my behaviour think I should reuse MPs.	.86	.90	.70	.90
	SI2	People who are important to me think that I should reuse MPs.	.90			

Notes: PC=perceived convenience; PB=perceived benefit; PM=perceived mobility; SI=social influence; TRU=trust; US=user satisfaction; IRU=intention to reuse.

Table 2 Reliability and convergent validity (continued)

Constructs	*Items*		*λ*	*CR*	*AVE*	*α*
	SI3	People who are important to me could assist me in MP reuse.	.84			
	SI4	In the future, organisations that offer MP services will guarantee that I adopt MP.	.75			
TRU	TRU1	Using MP is trustworthy.	.73	.80	.51	.80
	TRU2	Transactions using MPs can be easily refunded.	.62			
	TRU3	I believe that the transmission of information in using MP is confidential.	.83			
	TRU4	Errors in MP use can be easily reversed.	.66			
US	US1	The MP used in transactions is successful.	.75	.85	.65	.84
	US2	I am satisfied with MP usage.	.83			
	US3	MP usage has met my expectations.	.83			
IRU	IRU1	If I had access to MP services, I would intend to use them again.	.89	.90	.76	.90
	IRU2	If I had access to MP services, I would use them again.	.87			
	IRU3	I think it would be worth it for me to continue to use MP when it is available.	.85			

Notes: PC=perceived convenience; PB=perceived benefit; PM=perceived mobility; SI=social influence; TRU=trust; US=user satisfaction; IRU=intention to reuse.

4.2.3 Discriminant validity

In this step, the criteria recommended by Fornell and Larcker (1981) were used to test discriminant validity. Table 3 lists the correlations between constructs with the square root of the AVE on the diagonal, which shows that the square root values of AVE exceed the inter-construct correlations; therefore, discriminant validity is confirmed.

Table 3 Discriminant validity

	PC	*PB*	*PM*	*SI*	*TRU*	*US*	*IRU*
Perceived convenience (PC)	.742						
Perceived benefit (PB)	.495	.825					
Perceived mobility (PM)	.418	.159	.781				
Social influence (SI)	.332	.421	.242	.837			
Trust (TRU)	.403	.359	.390	.508	.714		
User satisfaction (US)	.609	.485	.470	.475	.710	.806	
Intention to reuse (IRU)	.627	.484	.459	.439	.682	.801	.872

Note: Figures on diagonal are square roots of average variance extracted.

4.2.4 One-sample test

This study used a single-sample t-test with a median of 3 of a 5-point Likert scale as the test value to determine whether the phenomena represented by each variable exist. The test findings demonstrate that the means of all variables are significantly higher than the median of 3, indicating that the samples gathered in this study agree with the cognition of each construct mentioned in the item (see Table 4 and 5).

Table 4 One-sample statistics

	N	*Mean*	*Std. deviation*	*Std. error mean*
Perceived convenience	326	4.4703	0.57317	0.03174
Perceived benefit	326	4.2362	0.79868	0.04423
Perceived mobility	326	4.4274	0.68289	0.03782
Social influence	326	3.8374	0.87312	0.04836
Trust	326	336672	0.71012	0.03933
User satisfaction	326	4.2751	0.61130	0.03386
Intention to reuse	326	4.4254	0.63439	0.03514

Table 5 One-Sample test

	Test value = 3					
	t	*df*	*Sig. (2-tailed)*	*Mean difference*	*95% confidence interval of the difference*	
					Lower	*Upper*
Perceived convenience	46.318	325	.000	1.47035	1.4079	1.5328
Perceived benefit	27.946	325	.000	1.23620	1.1492	1.3232
Perceived mobility	37.740	325	.000	1.42740	1.3530	1.5018
Social influence	17.317	325	.000	0.83742	0.7423	0.9326
Trust	16.964	325	.000	0.66718	0.5898	0.7446
User satisfaction	37.660	325	.000	1.27505	1.2084	1.3417
Intention to reuse	40.568	325	.000	1.42536	1.3562	1.4945

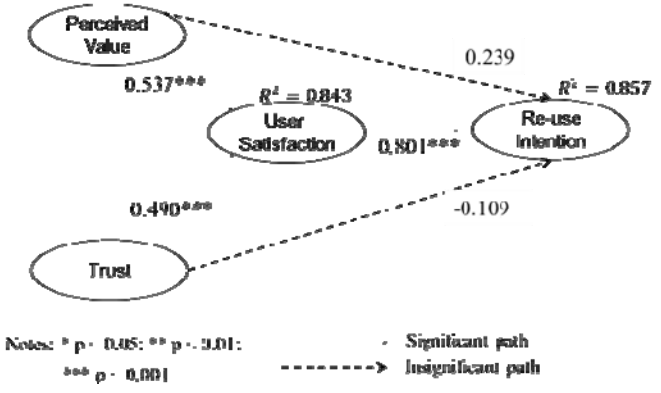
4.3 Analysis of structure model

Goodness-of-fit. The analysis results show that the structure model yields a CMIN value of 279.945 and 126 df with $p < 0.001$. Using CMIN/df as an alternative, which showed a value of 2.222 along with other indices (RMSEA = 0.061, GFI = 0.914, AGFI = 0.884, NFI = 0.917, IFI = 0.953, TLI = 0.942, CFI = 0.952), provided significant evidence of good model fit.

Path analysis. We used the path analysis method to examine the hypotheses. The findings reveal that the three hypothesised paths are supported by the significant value of the path coefficient, including the paths from perceived value, reflected by three reflective indicators (i.e. perceived benefit, perceived mobility and perceived convenience) to user satisfaction ($\beta = 0.537$, $t = 5.381$, $p < 0.001$); from trust to user satisfaction ($\beta = 0.490$, $t = 6.213$, $p < 0.001$); and from user satisfaction to the intention to reuse ($\beta = 0.801$, $t = 4.339$, $p < 0.001$). However, the paths from perceived value to the

intention to reuse ($\beta = 0.239$, $t = 1.773$, $p = 0.076$) and from trust to the intention to reuse ($\beta = -0.109$, $t = -1.092$, $p = 0.275$) are not supported significantly. The details of the path analysis are shown in Figure 2.

Figure 2 Path analysis



4.4 Mediation effect

We employed AMOS statistical software with Bootstrap method in the mediation effect test. Table 6 shows that the path PV→US→IRU shows a significant indirect effect (0.431*) with the confidence interval (0.102–1.137) not containing 0. The path TRU→US→IRU shows a significant indirect effect (0.392*) with a confidence interval (0.005 ~ 0.833) that does not include 0, indicating that customer satisfaction has a mediation effect. In the direct effect, both paths of PV→IRU and TRU→IRU show that the confidence intervals (−0.187–0.865 and −0.577 ~ 0.180, respectively) include 0 with an insignificant p-value, while the total effect shows a significant value (0.67 and 0.284) with confidence intervals (0.475–0.915 and 0.008–0.915) not including 0. This shows that customer satisfaction fully mediates between customer perception and intention to reuse and between trust and the intention to reuse.

Table 6 The summary of mediation effect

	Estimate	*95% confidence interval*	
		p-value	*Bias-corrected percentile method*
Indirect effect			
PV → US → IRU	0.431	0.025* < 0.05	0.102 ~ 1.137
TRU → US → IRU	0.392	0.048* < 0.05	0.005 ~ 0.833
Direct effect			
PV → IRU	0.239	0.198 > 0.05	−0.187 ~ 0.865
TRU → IRU	−0.109	0.347 > 0.05	−0.577 ~ 0.180
Total effect			
PV → IRU	0.670	0.003** < 0.05	0.475 ~ 0.915
TRU → IRU	0.284	0.045* < 0.05	0.008 ~ 0.915

Note: TRU = trust; CS = customer satisfaction; IRU = intention to reuse.

4.5 Moderation effect

To test the moderation effect, SPSS and AMOS were used to perform the k-means clustering method, discriminant analysis, independent sample t-test and multi-group analysis.

In k-means clustering analysis, samples were divided into the low-SI group (mean = 2.90; 120 samples) and high-SI group (mean = 4.39; 206 samples). Then, we used the discriminant analysis method to test the effectiveness of grouping. The results show that the hit rate of the grouping is 100%, meaning that the use of the k-means clustering method is effective. Moreover, in the independent sample *t*-test, the Levene test showed a significant value of 0.013 and the t-test provided the *t*-value = −24.005 and *p*-value < 0.001, indicating a significant difference between the low-SI and high-SI groups.

Finally, in the multi-group analysis, the results indicate that social influence does not significantly affect each path, whether from perceived value to reuse intention trust to reuse intention ($\Delta\chi^2$ = 1.061, p = 0.303). Table 7 shows the detailed results of the moderator model.

Table 7 Results of moderation effect analysis

Model	*Estimate*	χ^2	*df*	$\Delta\chi^2$	*P-value*
PV→IRU					
Default model	Low-SI: 0.197	468.804	252		
Moderator model	High-SI: 0.183	472.363	253	3.559	0.059
US→IRU					
Default model	Low-SI: 0.811	468.804	252	2.224	0.136
Moderator model	High-SI: 0.987	471.028	253		
TRU→IRU					
Default model	Low-SI: 0/197	468.804	252	1.061	0.303
Moderator model	High-SI: 0.183	469.865	253		

5 Discussion and conclusions

5.1 Discussion

Despite several studies having confirmed the link between perceived value and user happiness in various contexts, only a handful have specifically addressed the MP scenario. We hypothesised that perceived convenience, perceived benefit and perceived mobility are the critical reflective factors of perceived value, which positively affects user satisfaction relative to MP reuse. We employed the SEM statistical method to depict and empirically examine the relationship among perceived value, trust and satisfaction,

Results show that three first-order reflective constructs, including perceived convenience, perceived benefit and perceived mobility, reflect a second-order formative dimension: perceived value, which positively and significantly affects user satisfaction. Second, trust also significantly influences user satisfaction, as hypothesised. However, although previous studies have indicated that individual perceived value (e.g., Prodanova

et al., 2019; Li and Shang, 2020) and trust (Lim, 2011; Saleem et al., 2017) affect reuse intention in different settings, we found the influence of perceived value and trust on MP reuse intention to be insignificant.

The result is different from previous research; we believe that this may be due to the mediating effect of user satisfaction. In other words, researchers believe that customer perception/trust affects reuse intentions based on their inner satisfaction with a service after use. Previous research did not include the satisfaction dimension in the research model, leading to the illusion that individual customer perception/trust directly affects reuse intention. Therefore, this study further implements an analysis of the mediation effect. The results show that user satisfaction fully mediates between perceived value and the intention to reuse and between trust and the intention to reuse. This confirms our theory that user satisfaction must first be improved to improve users' reuse intention and that user-perceived value and trust impact user satisfaction.

Finally, the results show that social influence does not have a significant moderating effect on each examined path. Previous studies have found a moderating role of subjective norms, social influence and social support on the relationship between attitude and adoption intention (e.g., Povey et al., 2000; Sawang et al., 2014; Sedera et al., 2017). Our findings differ from previous studies, which might be due to our collected samples: all respondents were required to have MP experience, as reuse intention was the dependent variable. Previous studies have indicated that social influence is important in the early stages of technological experience (Venkatesh et al., 2003; Ho et al., 2017). When customers become experienced users, they develop individual ideas about MP and no longer rely on the opinions of others. The moderation effect analysis of this study once again demonstrates that social influence does not moderate the influence on reuse intentions.

5.1.1 Contribution

Many industry reports have pointed out that MP drives sales performance growth. For example, the number of LINE Pay users reached 8.4 million in September 2020, creating more than 85.1 million transactions in the first three quarters, driving the total transaction amount to exceed NT$35.6 billion (TechNews, 2020). PX Mart also announced that the launch of the MP service 'PX Pay' has become one of its major growth drivers, resulting in its 2020 performance exceeding NT$140 billion (BUSINESS NEXT, 2020). Currently, the contribution to industry is no greater than assisting them in stimulating reuse. This study contributes to this subject by showing the significant full mediation effect of user satisfaction on reuse intention and confirming that the moderation effect of social influence is insignificant. The present research offers the following recommendations.

First, we suggest that, if the application of MP has reached the stage of encouraging reuse, the marketing strategy should focus on improving user satisfaction. Second, overall perceived value, rather than individual perceptions, could be a better point of focus for improving overall user satisfaction. Third, with user-perceived value, trust can impact satisfaction. Thus, increasing user trust will improve user satisfaction. Finally, social influence for marketing can only be used in the initial stages of technology introduction because the moderation effect of social influence is not significant for experienced users. Therefore, at this stage, MP marketers should pay greater attention to user satisfaction than the impact of social influence.

Previous studies have verified that perceived convenience (e.g., Choi and Sun, 2016), perceived benefit (e.g., Lee, 2009) and perceived mobility (e.g., Wang et al., 2014) have a direct and positive influence on behavioural intention in the context of online payments, banking and mobile data services. However, this study finds the direct effect of overall perceived value on reuse intention to be insignificant (p = 0.198). Similarly. the relationship between trust and the intention to reuse was found to be insignificant (p = 0.347), which is inconsistent with previous research (e.g., Lim, 2011; Saleem et al., 2017). Based on these discrepancies, this study provides discussion points for academics, such as whether the mediating variable of user satisfaction causes the direct effects of user perception (overall value) and trust to be insignificant or whether it is due to the different results produced by different technology applications further empirical research is required to answer these questions.

Additionally, the findings of the full mediation effect of user satisfaction highlights the dominant role of user satisfaction on the intention to reuse MP. This indicates the positive user perception (overall value) and trust that must be achieved to improve user satisfaction and stimulate users' reuse intention. We believe this result will lead to a new direction for future research on MP. Researchers can determine the individual perceived value based on technological characteristics for different applications, use our research model to measure the overall user perceived value and empirically demonstrate the model applicability on reuse intention for specific technology products.

Finally, although this research found an insignificant moderating effect of social influence for experienced users, we still recommend continuous empirical research for further theory development.

5.1.2 Limitations and future research

The study is not without its limitations. Due to restrictions of the research scope, we selected only three technological characteristics that are most used as constructs in previous MP research as individual customer perceptions. It is possible that other customer perceptions have been ignored. It is recommended that future researchers improve on this research limitation.

Second, this research mainly focuses on the reuse intention of MP. Future research should study loyalty to specific MP brands to assist service providers in marketing strategy planning.

Finally, a reviewer felt that trust was more acceptable as a moderator than as an independent variable in their comments. However, due to time limits, this essay cannot thoroughly examine the subject. As a result, it was identified as one of the study's research limitations. Future research should focus on this assumption to launch a fresh investigation.

5.2 Conclusions

The current study shows that

1 perceived value, formed by perceived convenience, value and mobility, positively affects user satisfaction

2 trust positively affects user satisfaction

3 user satisfaction positively affects the intention to reuse MP.

These relationships are found to be significant through the analysis. In addition, user satisfaction has a full mediation effect between perceived value and the intention to reuse and between trust and the intention to reuse. Finally, the moderation effects of social influence on the paths from perceived value to reuse intention, user satisfaction to reuse intention and trust to reuse intention are insignificant.

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