USE OF PARTIAL LEAST SQUARE STRUCTURAL EQUATION MODELING (PLS-SEM) IN CUSTOMER INTENTION TO REUSE INNOVATIVE ELECTRONIC PAYMENT

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Abstract

The purpose of this study is to create a new research instrument for "Innovative Electronic Payment (e-payment)" to fit with Chinese culture through the "Diffusion of Innovation Theory" using Exploratory Factor Analysis (EFA) and to continue the study by testing the impact of four sub factors of innovative e-payment on customers' intentions to reuse e-payment. Data were collected from 350 respondents, who were working people with experience using e-payment. A survey method was applied via a self-administration technique, to collect the data in Nanning, Guangxi, China, from working people at popular office buildings. In order to test all hypotheses, the Statistical Package of PLS-SEM was applied to test model fit based on convergent and discriminant validity, and to further test all hypotheses. The results showed that trialability, compatibility, complexity, and comfortability of the innovative electronic payment model were found to have a statistically significant impact on customers' intentions to reuse e-payment.

Keywords: Innovative Electronic Payment, Reuse Intention, Innovation Diffusion

INTRODUCTION

Due to the rapid growth of online shopping in China, e-commerce significantly influences people's lives, providing greater opportunities to buy and sell products. However, online transactions to transfer money through electronic payment is the most important issue relating to the growth of e-commerce business from both buyer and seller perspectives. The online website must build up the confidence to customers in order to provide a convenient process leading to the adoption of online shopping. Many researchers have attempted to find the major factors impacting customer intentions to reuse e-payment. Venkatesh, et al. (2003) and Keramati et al. (2008) implied that innovation attributes were related to customers' intentions to reuse an e-payment system. Importantly, Rogers (1995) concluded that attributes of innovation theory comprise of five sub-variables which influence customers' intentions to reuse e-payment, namely relative advantage, compatibility, complexity, trialability, and observability. Moreover,

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Mostafa et al. (2018) and Chang et al. (2008) found that the behavioral intention to use e-payment was statistically impacted by compatibility, with a positive and direct effect. Complexity or ease of use was the major factor effecting customer intentions to adopt e-payment (Chau et al., 2003). To reduce customers' fears and discomfort in adopting e-payment, trialability and observability were the most important factors impacting the early use of customers adopting new electronic payment technologies (Henrichs, 1995). In addition, Lee (2007) confirmed that relative advantage positively influenced customers' intentions to use new technology systems.

LITERATURE REVIEW

Due to the increasing popularity of e-commerce, many different e-payment systems have been created, making it easier for the buyer and seller to complete the process of transferring money. Electronic payment systems (EPS) are defined as facilitating secure electronic commerce transactions between individuals or organizations (Benjamin et al., 2007). The diffusion of innovation theory (DOI) or innovation diffusion theory (IDT) was established in 1962 by Rogers. The diffusion of innovation theory relates to the interpretation of ideas or practices perceived as new technologies in various fields, while there should also be a relative advantage to the adoption of the technology, allowing the spread of the innovation or modifying existing technologies to solve problems. However, Rogers (1962) emphasized that the adoption and diffusion of an innovation may be influenced by various factors. Rogers (1962) proposed five stages of the diffusion process, namely knowledge, persuasion, decision, implementation, and confirmation. Various further studies from researchers, adopters, and innovators, who have proposed or applied this theory in different categories and in different geographic areas have helped to improve understanding of how new technologies spread and become adopted by the majority (Rogers, 1995, 2003). Additionally, Rogers (1995) implied that the "Diffusion of Innovation Theory" or "IDT" explains a process of innovation in communication among the members of a social system. Rogers (1995) also implied that innovation characteristics can be classified according to individuals' perception under five sub-variables. Firstly, relative advantage, which refers to the degree of the perceived relative advantage of the innovation; the greater the customers' perception of the innovation's relative advantage, the more rapid its rate of adoption. This can also be considered as the amount that customers perceive the innovation to be better than its precursor. The attribute of trialability is viewed as the ability to access the internet and trial the websites services offered by the innovation, or to experiment with it on a limited basis. This reduces fears about using and adopting online shopping, including the use of new ideas or innovative products, as it allows them to be tried by customers. Thirdly, compatibility refers to customers' perception of the degree to which the innovation matches with the existing values, needs, capacities, and past experiences, of the potential adopters, including perceived innovation consistently. The next sub-variable is complexity. This relates to the ease of understanding and using the new innovative technology or how fast the new skills and knowledge required to use the innovation can be developed. Innovations with greater complexity have a reduced rate of adoption. The last sub-variable is observability. This refers to the degree to which individuals see the results of an innovation or the innovation's visibility to others.

Based on the "Diffusion of Innovation Theory" by Rogers (1962), the results in Table 1 show the five factors or sub-variables of the original theory of innovation attributes represented by Rogers's model in 1983. These are relative advantage (6 questions), compatibility (5 questions), complexity (4 questions), trialability (3 questions) and observability (4 questions). The total of 22 questions were analyzed by Factor Analysis,

grouping the sub-variables based on content validity and structural validity.

In 1995, Rogers studied the rate at which customers adopted electronic payment and concluded that relative advantage, compatibility, trialability, and observability, had positive statistically significant influences on the rate of adoption of electronic payment systems, with complexity having a statistically significant negative impact.

In 2006, He, Duan, Fu, and Li applied the innovation diffusion theory developed by Rogers (1983, 1995) to study "An Innovation Adoption Study of Online E-Payment in Chinese Companies." The objective of the study was to find the influential factors for the adoption of IS (information system) and IT (information technology) in an innovation. The examination of the adoption of online e-payment using Rogers' model is shown in Table 1. The questions were adjusted based on the research method and focused to collect data by online questionnaire (see Table 2). A confirmatory factory analysis (CFA), and exploratory factor analysis (EFA) were applied to test the construct validity, leading to a refined scale of factor loading as shown in Table 3.

Table 1: Factor Loading of the Original Scale

Item	Relative Advantage	Compatibility	Complexity	Triability	Observability
ADV 1	0.900				
ADV 2	0.608				
ADV 3	0.777				
ADV 4	0.911				
ADV 5	0.898				
ADV 6	0.714				
COMP 1		0.904			
COMP 2		0.818			
COMP 3		0.795			
COMP 4		0.934			
COMP 5		0.893			
CLEX 1			0.781		
CLEX 2			0.699		
CLEX 3			0.672		
CLEX 4			0.791		
TRIL 1				0.953	
TRIL 2				0.970	
TRIL 3				0.933	
OBSR 1					0.846
OBSR 2					0.686
OBSR 3					0.853
OBSR 4					0.856

Notes: ADV=Relative advantage, COMP=Compatibility, CLEX=Complexity, TRIL=Trialability, PBSR=Observability
Model fit $\chi 2$=313.087, *df*=199, $\chi 2ldf$=1.573, CFI=0.894, NNFI=0.877, RMSR=0.069
All factor loadings are significant at p=0.001 level.

Source: Roger, E. M. (1983). *Diffusion of innovations*. 3rd edition. New York: Free Press, USA.

Table 2: Original Constructs and Items

Construct	Dimensions	Items
Perceived Relative Advantage	ADV 1: Operational cost	E-payment system is relatively cheaper to use compare to the traditional payment methods
	ADV 2: Relative security	E-payment is more secure than traditional payment methods
	ADV 3: Profitability	E-payment system will strengthen your company's profitability
	ADV 4: Competitiveness	E-payment system will strengthen your company's competitive power
	ADV5: Efficiency	E-payment system will increase the efficiency of your company
	ADV 6 Prestige	Utilization of e-payment will enhance your company's prestige
Perceived Compatibility	COMP 1: Fit needs	E-payment fits your company's needs
	COMP 2: Complement	E-payment is a good complement to the traditional payment methods
	COMP 3: Conflict	E-payment does not conflict with the traditional payment methods
	COMP 4: Fit style	E-payment fits well with the operation style of your company
	COMP 5 Overall compatibility	E-payment system is compatible with the overall operation of your company
Perceived Complexity	CLEX 1: Setup difficulty	E-payment is difficult to set up compared to traditional payment methods
	CLEX 2: Maintenance difficulty	E-payment system is difficult to maintain compared to traditional payment methods
	CLEX 3: Operation difficulty	E-payment system is difficult to operate compare to traditional payment methods
	CLEX 4: Overall effort	It takes your company a lot of efforts to get e-payment system to work
Perceived Trialability	TRIL 1: Technology access	Your company has proper access to the technology related to e-payment system before application
	TRIL 2: Service access	Your company has proper access to the services related to e-payment system before application
	TRIL 3: Try out opportunities	Your company has opportunities to try out the e-payment system before application
Perceived Observability	OBSR 1: Benefit information	Your company has proper information on the benefits of the e-payment system
	OBSR 2: Usage by others	There are lots of e-payment systems being used by other companies
	OBSR 3: Result apparentness	The result of applying e-payment would be apparent to you
	OBSR 4: Benefit understanding	Benefits of e-payment application are easy to understand

Source: He, Q., Duan, Y., Fu, Z., and Li, D. (2006). An Innovation Adoption Study of Online E-Payment in Chinese Companies. Journal of Electronic Commerce in Organizations, 4(1), 48

Table 3: Factor Loading of the Refined Scale

Item	Relative Advantage	Compatibility	Complexity	Triability	Observability
ADV 1	0.895				
ADV 3	0.785				
ADV 4	0.924				
ADV 5	0.898				
ADV 6	0.711				
COMP 1		0.907			
COMP 2		0.816			
COMP 3		0.793			
COMP 4		0.938			
COMP 5		0.889			
CLEX 1			0.761		
CLEX 4			0.851		
TRIL 1				0.953	
TRIL 2				0.970	
TRIL 3				0.933	
OBSR 1					0.842
OBSR 3					0.841
OBSR 4					0.876

Source: ADV=Relative advantage, COMP=Compatibility, CLEX=Complexity, TRIL=Trialability, OBSR=Observability
Model fit $\chi 2$=197.709, *df*=125, $\chi 2ldf$=1.582, CFI=0.924, NNFI=0.907, RMSR=0.054
All factor loadings are significant at p=0.001 level.

Its results show the factor loadings of the refined scale; it was found that all factor loadings were above 0.7. However, the numbers of questions were changed in each construct. Based on the results, five sub-variables were found, which were the same as in Rogers' original model. The names of all five sub-variables were kept the same as in Rogers' original research. These are relative advantage (5 questions), compatibility (5 questions), complexity (2 questions), trialability (3 questions) and observability (3 questions). In total, 18 questions were used, which were different from the 22 questions of the original Rogers' model. In this study, the hypotheses between adopters and non-adopters of e-payments were tested, finding that both groups had significantly different perceptions regarding the innovation attributes of e-payment, but with only compatibility having a significant impact on online e-payment adoption.

Similarly, Mostafa et al. (2018) and Ramos-de-luna et al. (2016) found that compatibility had a positive significant influence on intentions to adopt e-payment as was found in the results of previous research by Chang et al. (2008). In addition, Lee (2007) indicated that complexity and trialability had a significant negative effect on the intention to use, which was supported by Chau and Lai (2003), and Venkatesh and Davis (2000). Also, Lee et al. (2011) confirmed that perceived relative advantage and trialability had statistically significant influences on employees' behavioral intentions for using e-learning systems. Based on observability or comfortability, Dariyoush

et al. (2015) and Lee (2007) implied that these variables had a positive impact on the user's intention to use the system, which was similar to the results of Chang and Tung's (2008) study. According to Chang et al. (2008), compatibility has a statistically significant positive effect on behavioral intentions.

In this research paper, the researchers applied the constructs & items, and refined scale shown in Table 2, and 3, respectively (He et al., 2006). In order to study "customer intention to reuse innovative electronic payment using Partial Least Square Structural Equation Modeling (PLS-EM)", the research was designed to use Exploratory Factor Analysis (EFA) to test the construct validity, which is the same statistical treatment used by Rogers (1983) and He et al. (2006), as shown in Table 1 and 3. The results showed in Appendix A with the Kaiser-Meyer-Olkin Measurement of Sampling Adequacy at .873, which was above the standard cut-off of 0.5, and the Bartlett's Test of Sphericity of Approx. Chi-Square = 2555.233, df. = 91, and significance level .000. However, the factor loadings were grouped to be four sub-variables, namely compatibility (4 questions), complexity (3 questions), trialability (4 questions), and comfortability or observability (3 questions). Totally, there were 14 questions, which is different from the 22 questions of the original model (Rogers, 1983), and 18 questions used by He et al. (2006). For the factor loading, Hair, Black, Barry, Anderson, and Tatham (2006) implied that if factor loading is greater than .50, it is considered to be of practical significance. Therefore, only factor loadings above .50 were utilized in this study.

Soo, Sheau, and Christina (2015) studied external networks and how the perceived innovation characteristics influenced intentions to use mobile banking. Three sub-variables of innovation characteristics were found in this study, namely perceived relative advantage, perceived complexity, and perceived compatibility. The results showed that perceived relative advantage and perceived compatibility had a statistically significant positive impact on customer intentions to use mobile banking, with perceived compatibility having a negative impact on the intention to use mobile banking.

Several prior research have considered an examination of the innovation characteristics, with results indicating that the components of the innovation characteristics in the innovation diffusion theory tend to vary with different numbers of sub-variables and set into different names of sub-variables, likely to be caused by the collection of data in different cultures, geographic areas, countries, and also different periods of time (Lewis, Palmer, and Moll, 2010; Adams, Nelson, and Todd, 1992). Therefore, it is unreasonable to delete some components or questions for each of the sub-variables of the innovation model that were used in previous studies, as the results may have lower or higher significance levels.

Nevertheless, most empirical research has aimed to test the innovation characteristics as independent variables and consumer behaviors (use, reuse, purchase, repurchase, visit, revisit, buy, rebuy, and so forth) as dependent variables. Similarly, this study is focused on testing all four sub-variables of the innovation characteristics which may influence customer intentions to reuse e-payment as supported by the results of Table 1, 2, and 3 and the four sub-variables of the innovation characteristics in Appendix A, and included in various previous research. The hypotheses are set accordingly, as follows:

H1a: Trialability impacts customer intentions to reuse e-payment

H1b: Compatibility impacts customer intentions to reuse e-payment

H1c: Complexity impacts customer intentions to reuse e-payment

H1d: Comfortability impacts customer intentions to reuse e-payment

Comfortability was developed based on the Factor Analysis in this study and was renamed from observability.

RESEARCH METHODOLOGY

Development of the Conceptual Research Model

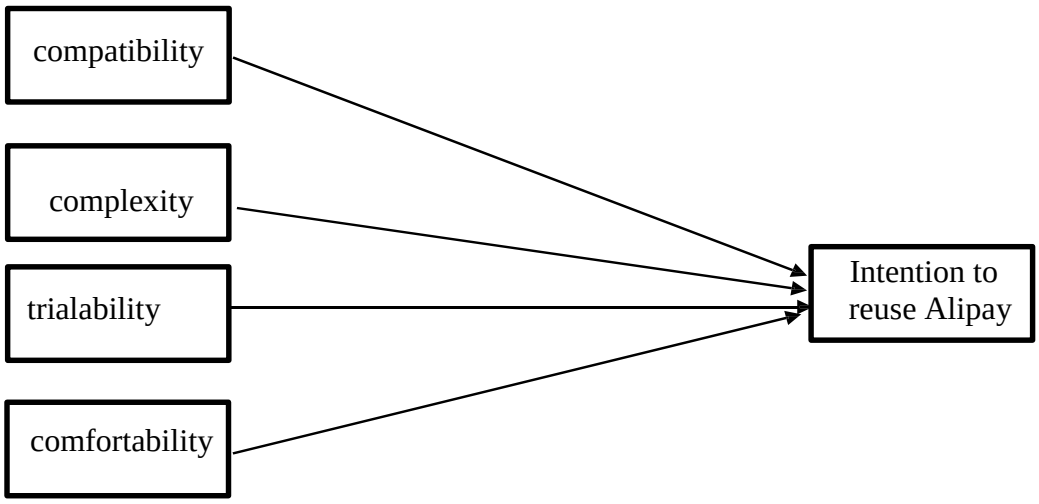

Figure 1 The Proposed Conceptual Research Model

The conceptual framework of this study was developed based on the "Diffusion of Innovation Theory" or "IDT" applied from Rogers (1995), who stated that the characteristics of Innovation Theory are comprised of five sub-variables, namely relative advantage, compatibility, complexity, trialability, and observability. Data were collected from working people with experience using e-payment in Alipay.com. The sample size was 350 respondents. Data were collected from May to November 2019. The sampling procedure to collect data in this study applied non-probability sampling, utilizing convenience sampling techniques to identify respondents in Qingxiu district as this district is the business area and has many high- class office buildings, department stores, and major transport connections such as the main railway and bus stations. Based on primary data, Exploratory Factor Analysis (EFA) was applied, revealing four factors namely compatibility, complexity, trialability, and comfortability (observability), under the name of "Innovative Electronic Payment" research model. Finally, all hypotheses were tested using a Partial Least Squares Structural Equation Modeling (PLS-SEM) approach.

Data Analysis

The popularity and importance of PLS-SEM has been increasingly recognized in recent years (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). A series of prior research has proven its credibility in assessing the quality of causal-predictive models (e.g. Hulland, 1999; Peng & Lai, 2012; Ringle, Sarstedt, & Zimmerman, 2011; Tehseen, Sajilan, Gadar, & Ramayah, 2017), especially in studies where a non-normality issue occurrs (Hair, Risher, Sarstedt, & Ringle, 2018; Ramayah, Cheah, Chuah, Ting, & Memon, 2018). Additionally, PLS-SEM is the proper tool for studies with a small sample size (Hair et al., 2018; Hair et al., 2014; Ramayah et al., 2018); however, the minimum sample size is not static. Hair, Hult, Ringle, and Sarstedt (2017) identified that the minimum sample size can be obtained through a G*Power analytical approach (see also Tehseen et al., 2017). Thus, the minimum sample size was initially calculated based on G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007), which indicated that the minimum sample size of the study should be

at least 85. This allows for a statistical power of 0.8 for the proposed research model with a medium effect size of 0.15 (Hair et al., 2017; Hair et al., 2014; Tehseen et al., 2017). In this context, with data collection from 350 respondents, it can be said that the statistical power and medium effect size in this study are assured.

RESULTS AND DISCUSSION

Demographic Profile

The majority of respondents were female (59.4 per cent), and aged between 21 and 25 years (56.9 per cent). Most possessed a bachelor's degree (79.7 percent) and were employed by the private sector (67.7 percent) with a monthly income between 2001 CNY and 3000 CNY. More importantly, many of them use Alipay 1 to 2 times per month (47.7 percent). The main problem, encountered most frequently by the respondents while using Alipay was system error (19.4 percent), which impeded transactions to a certain extent.

PLS-SEM Analysis

1) Evaluation of Measurement

Convergent Validity Test: The results of the convergent validity testing are presented in Table 4, with an emphasis on Cronbach's Alpha, rho_A, Composite Reliability and Average Variance Extracted (EVA). Cronbach's Alpha values varied from .749 to .861, which fulfills the threshold of 0.7 recommended by Nunnally and Bernstein (1994). For the roh_A, Dijkstra and Henseler (2015) stated that the report of roh_A coefficient is essential to verify the reliability of PLS-SEM constructs, while values should be above the cut-off value of 0.7 (Wong, 2019; Zhu, 2021). In terms of AVE, each construct should possess an AVE value greater than 0.5 (Fornell & Larcker, 1981; Hair et al., 2017, Chaipoopirutana, 2018). For composite reliability, all values met the recommended cut-off point of 0.7 (Bagozzi & Yi, 1988, Chaipoopirutana, 2018). In summary, the convergent validity of the measurement items in this study was confirmed.

Discriminant Validity Test: Hair et al. (2017) suggested the Fornell-Larcker criterion (Table 5), Cross-loading (Table 6), and Heterotrait-Monotrait Ratio of Correlation (Table 7). Tables 5, 6, and 7 report the values important for proving discriminant validity (Ramayah et al., 2018). The Fornell-Larcker criterion results in Table 5 show that "the square roots of each construct's AVE is greater than" the inter-construct correlation (Hair et al., 2017, Chaipoopirutana, 2018). Regarding cross-loadings, "the loadings of indicators on the assigned latent variable should be higher than the loadings on all other latent variables" (Ramayah et al., 2018, p. 84). The Heterotrait-Monotrait Ratio of Correlation indicates "the ratio of correlations within the constructs to correlations between construct" (Ramayah et al., 2018, p. 85). In this study, the rule of HTMT.85 of Kline (2015) was followed, whereby any values greater than 0.85 indicate a failure of the discriminant validity test (Zhu, 2019). Consequently, the results of Table 5, Table 6 and Table 7 indicate that the study met the requirements; thus, discriminant validity is assured.

Table 4 Construct Validity and Reliability

Cronbach's Alpha		rho_A	Composite Reliability	Average Variance Extracted (AVE)
Comfortability	0.777	0.812	0.868	0.688
Compatibility	0.854	0.865	0.901	0.695
Complexity	0.760	0.763	0.862	0.677
Reuse Intention	0.749	0.777	0.856	0.665
Trial	0.861	0.866	0.906	0.707

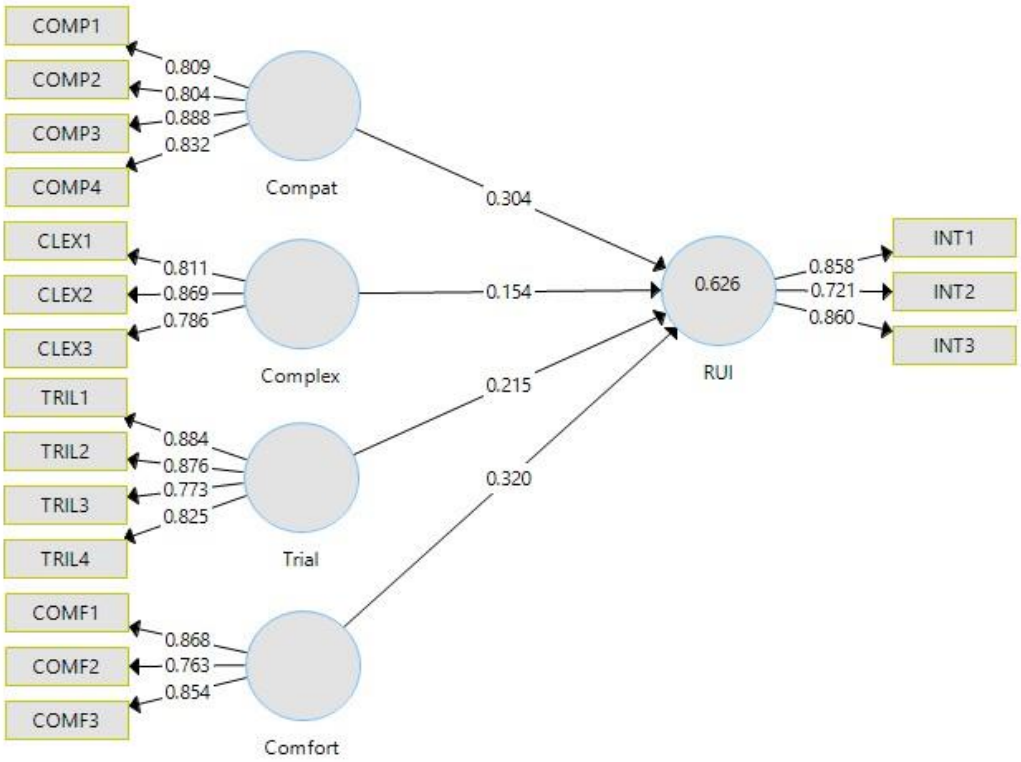

Figure 2: Path Analysis showing path coefficients and T-values

Table 5 Fornell-Larcker Criterion

Comfort		Compat	Complex	RUI	Trial
Comfort	***0.830***				
Compat	0.558	***0.834***			
Complex	0.304	0.472	***0.823***		
RUI	0.645	0.694	0.472	***0.816***	
Trial	0.503	0.646	0.360	0.628	***0.841***

Table 6 Cross-loadings

	Comfort	**Compat**	**Complex**	**RUI**	**Trial**
CLEX1	0.122	0.336	**0.811**	0.354	0.223
CLEX2	0.173	0.474	**0.869**	0.398	0.340
CLEX3	0.436	0.350	**0.786**	0.409	0.317
COMF1	**0.868**	0.471	0.316	0.636	0.479
COMF2	**0.763**	0.498	0.173	0.399	0.395
COMF3	**0.854**	0.437	0.242	0.529	0.371
COMP1	0.421	**0.809**	0.361	0.490	0.504
COMP2	0.456	**0.804**	0.310	0.549	0.427
COMP3	0.487	**0.888**	0.482	0.661	0.570
COMP4	0.490	**0.832**	0.405	0.596	0.644
INT1	0.540	0.543	0.445	**0.858**	0.553
INT2	0.491	0.425	0.236	**0.721**	0.346
INT3	0.549	0.696	0.442	**0.860**	0.601
TRIL1	0.398	0.559	0.279	0.533	**0.884**
TRIL2	0.425	0.524	0.223	0.513	**0.876**
TRIL3	0.383	0.437	0.291	0.470	**0.773**
TRIL4	0.478	0.633	0.404	0.585	**0.825**

2) Evaluation of the Structural Model

Figure 2 presents the final PLS-SEM path model. The value of R^2 is 0.626 for reuse intentions for Alipay, indicating that compatibility, complexity, trialability, and comfortability together explain 62.6% of the variance in reuse intentions.

The results of the structural model are shown in Table 5, which was analyzed by using T-Statistics through bootstrapping. First, the multicollinearity issue was. evaluated (Shanmugapriya & Subramanian, 2015), with all VIF values being smaller than 5 (Hair, Ringle, & Sarstedt, 2011), indicating that there is no collinearity issue in the data of this study. Secondly, all paths from independent variables to dependent variable were significant; hence, all hypotheses were supported.

Regarding the outer weights, the values were obtained via bootstrapping and

Table 7 Heterotrait-Monotrait Ratio (HTMT)

Comfort		Compat	Complex	RUI	Trial
Comfort					
Compat	0.690				
Complex	0.384	0.577			
RUI	0.824	0.842	0.605		
Trial	0.607	0.743	0.436	0.759	

Table 8 Structural Path Analysis After Bootstrapping

Hypothesis	Path	VIF	Original Sample (O)	T Statistics (|O/STDEV|)	P Values	Results
H1	Compat -> RUI	2,163	0.304	4,013	***	Accepted
H2	Complex -> RUI	1,298	0.154	3,427	**	Accepted
H3	Trial -> RUI	1,819	0.215	3,476	**	Accepted
H4	Comfort -> RUI	1,532	0.320	4,204	***	Accepted

*** P< .01 **P<. 05

Table 9. Outer Weights

Original Sample (O)		T Statistics (|O/STDEV|)	P Values
CLEX1 <- Complex	0.371	9,309	0.000
CLEX2 <- Complex	0.417	12,079	0.000
CLEX3 <- Complex	0.428	8,707	0.000
COMF1 <- Comfort	0.486	17,100	0.000
COMF2 <- Comfort	0.305	11,140	0.000
COMF3 <- Comfort	0.404	20,822	0.000
COMP1 <- Compat	0.255	14,894	0.000
COMP2 <- Compat	0.286	15,557	0.000
COMP3 <- Compat	0.344	19,535	0.000
COMP4 <- Compat	0.311	20,117	0.000
INT1 <- RUI	0.424	22,761	0.000
INT2 <- RUI	0.320	13,914	0.000
INT3 <- RUI	0.471	21,576	0.000
TRIL1 <- Trial	0.302	20,711	0.000
TRIL2 <- Trial	0.290	17,422	0.000
TRIL3 <- Trial	0.266	16,803	0.000
TRIL4 <- Trial	0.331	20,780	0.000

explained each indicator's importance to formulate the construct (Ramayah et al., 2018). All p values shown in Table 6 are significant; thus, it can be said that the indicators possess a positive linkage with their respective constructs.

The computation of Q^2 statistics was done through a blindfolding technique in order to assess the quality of the proposed model (Hair et al., 2017; Wong, 2019). As addressed by Hair et al. (2017, p. 208), "values of 0.02, 0.15, and 0.35 indicate a small, medium or large predictive relevance" (see also Tehseen et al., 2017; Zhu, 2019a). Table 10 shows a Q^2 value of 0.376 for reuse intentions; this represents a large predictive relevance.

CONCLUSIONS

Originally, this study was inspired by the five innovation attributes proposed by Rogers (2003), while finally four attributes were found to be more suitable with the e-commerce milieu in China, namely comfortability, compatibility, complexity and trialability. Among these four attributes, comfortability plays the most influential role in fostering consumers intentions to reuse e-payment with a t-statistic of 4.204, and significance level of .001(99.99% confidence interval), which was the highest among all the sub-variables, in reference to Alipay in this study. This finding is in line with the tendency of e-payment use among young consumers. In this study compatibility was found to be the second most influential factor on customers' intentions to reuse e-payment with a T-statistic of 4.013, and significance level of .001. This indicates that a positive change in compatibility has a positive effect on customer intentions to reuse e-payment, implying that the new technology is compatible with a customer exiting situation through 'a wise step forward'. Actually, when considering the fast growth of online internet and e-commerce within the nature of the new generation and the nature of innovation, e-payment becomes almost necessary to businesses in order to survive in the severe market competition and to satisfy customers.

Alipay has become the main e-payment tool for both online and offline consumption in China. Consumers receive a variety of rewards when using Alipay to pay online. Additionally, paying online can not only receive free insurance, bonus, mobile internet package and other benefits, but also allows customers to participate in CSR projects led by Alipay such as planting trees and making donations. More importantly, Alipay circumvents the risk of counterfeit banknotes and reduces the risk of property loss. In addition, with Alipay, payment becomes more efficient than the traditional cashier change method. As a consumer, waiting at the checkout counter is inevitably irritating. The truth is that time matters for businesses and consumers alike in the contemporary environment. Thus, the combination of security, speed, and convenience, in Alipay's traditional consumption scene is undoubtedly a time-saving tool. This has made consumers comfortable with using it.

	SSO	SSE	Q^2 (=1-SSE/SSO)

Table 10: Predictive Relevance of The Model Using Cross-Validated Redundancy Analysis

	SSO	SSE	Q^2 (=1-SSE/SSO)
Comfort	1.050,000	1.050,000	
Compat	1.400,000	1.400,000	
Complex	1.050,000	1.050,000	
RUI	1.050,000	655,710	0.376
Trial	1.400,000	1.400,000	

IMPLICATIONS

Theoretical Implications:

In the scope of the innovation diffusion theory, four new innovative elements were found. This confirms that the extent to which consumers accept and recognize innovation varies in different social and cultural environments. Additionally, novelty is a major part in an innovation context as it relates to a level of newness, which reflects to various standpoints in developing higher quality that feeds into a fast and effective innovation opportunity**.** Therefore, the major contribution of this paper is to form a relatively novel innovative theory **-** Innovative Electronic Payment **(**e**-**payment**)**; it can be said that this study is somewhat compatible with the market environment of electronic payment in China**.**

Practical Implications:

Regarding the complexity issue, the inherent physiological characteristics of the human body such as fingerprints, face, and iris, are recommended for integration with the payment system as they are unique and non-replicable. Therefore, the biometric-based identity authentication method is more secure and convenient than the traditional identity authentication method based on ID, password, and SMS dynamic code. This will also attract more laggards (e.g. senior citizens) to use Alipay who are generally conservative or even reject novel practice in their lives. In terms of trialability, any new features or functions associated with e-payment should be widely advocated, as this will stimulate consumers curiosity to try. Regarding compatibility, the features, appearance, or functions, should meet the need of consumers. The demand of senior users should not be neglected, aiming for simplified systems. Unlike senior users, young users prefer systems with multiple features, such as games, investment, community sharing, CSR, recommendations, and reviews. In this context, perhaps Alipay could come up with a dual system, which consists of a simple system for senior users and a multi-function system for ordinary users. Finally, for comfortability, Alipay might try to improve the user experience by organizing a small seminar for senior users in order to involve more users in the Alipay system. Additionally, the fluency of the payment system should be enhanced especially during online shopping festivals.

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Appendix A. Factor analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.873
Bartlett's Test of Sphericity	Approx. Chi-Square	2555.233
	df	91
	Sig.	.000

Factor		1	2	3	4
Compatibility	E-payment is compatible with my transaction's preference		.788		
	E-payment complement the traditional payment methods perfectly		.749		
	E-payment fits my needs		.730		
	Utilization of E-payment will enhance my transaction		.625		
Complexity	It does not take a lot of my efforts to get E-payment system to work				.855
	E-payment is not difficult to use compared to traditional payment methods				.813
	E-payment is not difficult to set up compared to traditional payment methods				.662
Trialability	I have proper access to the technology related to E-payment system before real using it	.840			
	I have proper access to the services related to E-payment system before real using it	.838			
	I have opportunities to try out the E-payment system before real using it	.766			
	E-payment is more secure than traditional payment methods	.650			
Comfortability	There are lots of people around me using E-payment			.731	
	The result of applying E-payment would be apparent to me			.690	
	Benefit of E-payment application are easy to understand			.822	