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Study on Mobile Commerce Customer Based on Value Adoption

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Abstract: The core of the mobile-commerce value chain is the users, their perceived value decide the development and evolution of Mobile-commerce industrial. The study analyzes customer's value of M-commerce, proposes an adoption model for Mobile-commerce users and which is verified by the questionnaire data and (structural equation model) SEM method. The results show that perceived usefulness has more direct effect on user's perceived value and free connects influences user's trust and perceived value positively. The findings also demonstrate that consumers' perception of the value of Mobile-ecommerce is a principal determinant of adoption intention. As the mobile commerce industry is getting closer to the users and model innovation combined together will be full of vitality, users choose Mobile-commerce not only because of its function, but also the enjoyment experience. Service providers and location-based information and service will be the hot topic in the development of mobile commerce.

Key words: Mobile-commerce, perceived value, (structural equation model) SEM, adoption model

INTRODUCTION

The core of the Mobile-commerce value chain is users, users is the ultimate perceiver of the value chain, their perceived value decide the development and evolution of Mobile-commerce industrial chain. During Mobile-commerce value creation and delivery process, rich content services can attract users and users can improve their recognition and perceived value by their service experiences, thus, more users prefer to use mobile device to do business which can promote the development of mobile commerce. The study extents and improves the study and understanding of the value chain of mobile commerce by theoretical model and empirical analysis of the mobile business customer value perception and adoption (Kim *et al.*, 2007).

In the field of mobile commerce, mobile customers are the ultimate recipients of the products and services, enterprise's mission and goals in the mobile value chain is to create value for mobile customers. The fundamental problem of long-term survival for enterprises depends on the ability of creating continually value for customers (Lee *et al.*, 2011) value is generally a trade-off or ratio between quality and price for a product or service, it is a index of perceived benefits and cost. Now from the research results, it can be found that the customer value is the value which is identified by customer based on the value of their own evaluation criteria, namely the delivered value or customer recognition value, in this view, customer value is provided by enterprises (Yee and San, 2011). From the present results of research, the comprehension of customer value includes two

perspectives: The first is the value provided for customers by the enterprises. Researchers reckons that the customer value is the value identified by customers' own value evaluation criteria on the products or service offered by enterprises, namely the delivered value or customer recognition value, which means to perceive the value of the products or service offered by the enterprises from the customers' aspect. In other words, customer value is the value provided by enterprises (Yee and San, 2011). The other understanding believes that customer value is the value which customers provide to a enterprise (Turel *et al.*, 2010). Scholars such as Berger studied customer value from enterprise's perspective; they think customers create value for enterprise which can be measured according user's consuming characteristics and behavior variables. For the relationship between customers and enterprise, customer is the reason why enterprise can exist; customer also is the ultimate source of enterprise's competitive advantage. With the structure of the market transforming from seller's market to buyer's, the focus of marketing has changed from product-centric 4p to customer-centric 4C or 4R, consequently, it studies mobile-commerce customer value from customer's perspective, especially, customer value mentioned in the study is the perceived value of the personal users.

Value can be divided into external perceived value and intrinsic value in nature, according to Zeithaml's definition, perceived value refers to "a consumer's perceptions of what is received and what is given determine the consumer's overall assessment of the utility of a product". Value represents the trade-off between the utility benefits and costs, it varies from person to person,

customer value is decided by the consumer rather than the provided enterprise, customer value actually means the customer perceived value (Customer Perceived Value, CPV) which is the overall evaluation of the utility of a product or service after weighing their perceived benefits and cost when obtaining a product or service. According to the definition, perceived value can at least be divided into two dimensions: Perceived benefits and perceived sacrifice (Junglas and Watson, 2006). Price is an important factor of perceived value, early interpretation of the benefit and sacrifice components includes perceived quality and monetary price. But the research of consumer choice behavior shows that consumer adoption and selection are based on multi-value functions, namely the functional value, social value, emotional value, epistemic value and conditional value, etc. Research on customer value should be measured from multiple-dimensionality or single-latitude multiple dictators (Rogers, 1995; Venkatesh *et al.*, 2003; Van der Heijden, 2004). Mark Parry thinks that consumers realized their personal value depends on whether the marketer can provide corresponding benefits, but how much interests are determined by various attributes of a product. Mark Parry takes consumer's behavior as the process of achieving personal value. Therefore, the consumer's purchase behavior is the trade-off between internal value and external interest, or customer value is the critical basis of consumer purchase decision.

According to the research above, in the study, customer perceived value is defined as the overall assessment of the utility of a product or service after weighing their perceived benefits and cost when the customer gets a product or service. Mobile users' perceived value is related to their perceived benefit and cost when mobile terminal customers purchase information, service or products. Compared to the objective value of products and services, customer perceived value reflects the customer's value perception of a products or service provided by enterprises.

ADOPTION MODEL OF MOBILE COMMERCE USERS BASED ON PERCEIVED VALUE

At present, most of mobile commerce model in China are being innovative and transplantation, the adoption and application of the Mobile-innovation business has just been provided for Mobile-users. There are some core theories or model of user innovation adoption in the study, such as the mainly theory of reasoned action proposed by Fishbein and Ajzen (1975), technology adoption model proposed by Davis (1989), theory of planned behavior proposed by Ajzen (1991), task

technology matching model, etc. In addition, based on TRA, TAM or TPB model, some researchers obtain some new adoption model for special studies, such as UTAUT, TAM2. So far there are not enough studies about the core theory and model of user innovation adoption at abroad and domestic. The researches mainly include Theory of Reasoned Action proposed by Fishbein and Ajzen (1975), Technology Adoption Model proposed by Davis (1989), Theory of Planned Behavior proposed by Ajzen (1991), Task Technology Matching Model. In addition, based on TRA, TAM or TPB model, aiming at special study objectives, some researchers developed some new adoption models, such as UTAUT, TAM2. Kim *et al.* (2007) developed the value-based user adoption model based on value theory and did an empirical study on M-internet business user acceptance in 2007, but it can not theoretically be popularized and promoted because of its particular research situations and objects.

Normally, users voluntary participate in Mobile-commerce by considering benefit and cost involved in the mobile business as well as evaluating their gained value. Mobile-commerce users play the dual roles of technology users and Mobile-commerce participants, the cost of voluntary acceptance of mobile-commerce service is borne by the individuals, the purposes of user participating in M-commerce include gaining value and improving work efficiency and gaining entertainment. Therefore, the existing TAM model and theories based on TAM model can not explain the user acceptance behavior of Mobile-commerce.

From consumer's perspective, consumer always want to reduce their costs of monetary, time, risk and make efforts to minimum and gain more actual utility at the same time, as a result, they can maximize their perceived value and get the highest level of satisfaction. Thus, whether Mobile-commerce users accept and participate in mobile business depends on their perceived value and perceived cost, Mobile-users' perceived value is related to their perceived profits and perceived costs which is calculated when they purchase information contents and service. At the same time, in mobile-commerce environment, there are many features such as shortcut to send and receive information and characteristics of the parties to the transaction is not directly, personalized service means more personal information is collected, furthermore, the security system of mobile-commerce is still in the process of continuous improvement, trust becomes an important factor of influencing consumer behaviors. High degree of consumer trust can increase their perceived benefits, in contrast, low degree of consumer trust even distrust will increase perceived cost, thus trust can affect consumer perceived value. Based on customer value theory, the

study integrates social cognitive theory and the theory of consumer behavior and proposes the parameters such as perceived benefit and perceived cost and user's trust influence user's value perception, the perceived value of customer influences the user's adoption of intentions and behavior. The study model is shown as the Fig. 1.

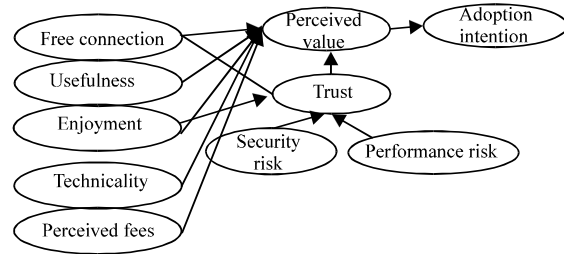


Fig. 1: Study model of the customer behaviour

Perceived benefit: Assessment of the users for products and services include cognitive and emotional factors, purchase of product includes utility value and entertainment value and psychological satisfaction. For these reasons, in the study, it defines perceived benefits including Free Connection (FC), Usefulness (Usef) and Enjoyment (ENJ).

In general, traditional business restricts by spacetime, but in e-commerce environment, users have to sit in front of computer to get information or service by connecting with internet, thus, e-commerce is limited by their geographical location. Comparing to traditional business and e-commerce, the mobile-commerce breaks the limits of time-space, users can freely and easily get information or service at any time and place through mobile terminals such as mobile phones and PDA, the advantage of free connection or ubiquity can improve greatly efficiency of work and life and the freedom value of customer. Free connection also means freedom of the business relationship and mobile business knowledge acquisition. Unrestricted choice and trading can happen between customers, merchants and customers, merchants and their business partner, which implies the freedom of business procedure and enhances user's trust of M-commerce. It is assumed that:

H1: Free connection has a positive effect on user's perceived value

H2: Free connection has a positive effect on user's trust

Usefulness is defined as the value which is perceived by users when using a new technique (Van der Heijden, 2004), users evaluate their behavior results according to their perceived usefulness and behavioral choice of usefulness demand. Usefulness of perception is focused on the completion of the task. According to Pedersen's study, usefulness of mobile internet service is a key factor of m-commerce and m-internet, assume that:

H3: Usefulness has positive effect on user's perceived value

Comparing to external motives such as function value, the sense of enjoyment emphasizes internal emotional motives; this is consistent with emotional value

which is widely applied in the study. Heijden's study suggests usefulness is a key factor of user acceptance in work-related environments but emotional value may be more explanatory power on reflecting willingness to accept in the consumer market. User's perceived benefits contain spiritual pleasure and meet, for mobile-commerce users, they believe that participating in mobile-commerce is a wonderful experience and will give them spiritual pleasure and meet, that is an important factor of their choosing mobile-business. Therefore, the study makes the assumption that the enjoyment has positive effects on user's perceived value.

Perceived cost: User's perceived sacrifices contain monetary and non-monetary components. Monetary cost is visible, for example, the actual price of a product can be measured by user's actual payment; Non-monetary component usually is invisible such as the spending of time and energy or unpleasant buying experience and related to consumer's personal values, needs, preferences and context of users. Several exploratory surveys indicate that, technology factor and price are the most important cost for users in participating and accepting mobile-commerce (Suoranta *et al.*, 2005).

Reference to DeLone and McLean's research, technicality defines as the perceived mobile-internet's technical complexity in the process of providing products and service including perceived easy of use and system reliability and connectivity and efficiency. Easy of use is a key factor for new users to accept or not, complexity of innovation to the adoption of new applications has significant negative effects, for instance, consumers always puzzle about what specific steps should be performed to complete the transaction when using m-finance services (Suoranta *et al.*, 2005; Zhu, 2009). Because there is no complete and comprehensive model on mobile-internet features in existing information systems research, other technical elements as the overall experience is used to measure technicality by users such as time-cost and vigor input and information search cost and cost of convenience. In mobile-ecommerce context,

load and response time are regarded as time cost, easy of use is considered as cost of effort, connectivity is regarded as cost of convenience, negative psychological factors contain internal conflicts, depression and negative, nervous, anxiety and mental fatigue, etc. (Gefen, 2002). Thus, system technicality is combined with all non-monetary cost, suppose that:

H4a: Technicality (technical complexity) has negative effect on perceived value

H4b: Technicality (technical complexity) has positive effect on user's trust

Cost is the user's focus of accepting Mobile-commerce (Voss *et al.*, 1998; Kim *et al.*, 2007), perceived price symbolize and internalize sale price of a product or service. Mobile-commerce users pay communication fee and service fee and other expense. For inexperienced mobile-internet users, they are unable to judge the level of offers. According to adaptation-level theory, due to asymmetric information, users usually compare internal reference price with offers, for example, users may compare mobile-service fees with the cost of using internet, then they form the perception of cost. Perception of cost affect perceived value, moreover, good perceived cost always link with the perception of low price. Thus, suppose that:

H5: The perception of cost has negative effect on perceived value

Trust: With the development of information technology, building trust relationship between customer and business is increasingly important (Gefen *et al.*, 2003). Due to the division of responsibilities of failure or loss is not always very clear, in mobile-commerce environment, consumers feel particularly vulnerable to risk (Bahli and Benslimane, 2004). In mobile commerce, businesses collect customer's location information by using GPS, cellular technology or other location technology to provide personalized customer service based on location, merchants also provide personalized service for users through rich customer personal information access and data mining, but personalized service also means more customer's information will be collected, this will cause customers seriously concerns about the security and individual privacy (misuse and leakage) and in mobile-commerce environment, the shortcut characteristics of sending and receiving information and the feature of trading partners not obtained directly, etc., users is very sensitive to transaction and payment risk, this risk perception affects user's trust in mobile e-commerce. Due to mobile-ecommerce special

circumstances, the recognition of trust about mobile commerce can increase the user's perception of the profits, but also may increase the perceived cost. Current studies found that, factors which influencing trust includes usefulness, technicality, security risk, performance risk and privacy risk. Therefore, in the study, it is assumed that:

H6: User's trust has positive effect on perceived value

H7: Security risk has negative effect on user's trust

H8: Performance risk has negative effect on user's trust

According to the economic theory of utility, given the limited resources condition, user always pursue maximum of the utility or satisfaction. User's choice is a combination of economic rationality and psychological cognition. Use makes an overall evaluation of a products or service and then decides whether to accept or not according to perceived benefits and perceived sacrifices. Due to the special situation of mobile commerce, whether mobile commerce trust recognition may increase user's perceived benefits or perceived sacrifices are related to individual character, mobile technology and mobile business, these factors will affect directly user's value perception. For mobile-commerce value chain, the meaningful value creation is the value creation which can be accepted by customer and promote the adoption intention of Mobile-commerce. According to value theory, assume that:

H9: User's perceived value has positive effect on user adoption intention

MATERIALS AND METHODS

This study test above theoretical model and hypotheses by using questionnaire data and Structural Equation Model (SEM). The variables in the model and measurement indicators are adopted and adapted from the existing research literatures home and abroad, in order to improve the content validity and reliability of the scale, the respondents were requested to grade items on five points scale. The final list of items for each construction is provided as in Table 1.

In order to guarantee the quality of questionnaire, the instrument was sent to mobile commerce scholars and psychological experts, according to their suggestions, Variable settings, semantic understanding, format descriptions, etc., are amended. After the first revision, the questionnaire was pre-tested in 20 graduate students and undergraduates, in the light of the pre-test results and student's advice; it modified the question and tried to make the text to be more concise and easy to be understood.

Table 1: Operationalization of the model variables

Variables	Item	Description	Reference
Free connection	Fr1	I can get information and service at any time through the m-Internet	Lee (2005) Zhou <i>et al.</i> (2009)
	Fr2	I can get information and service at any place through the m-Internet	
	Fr3	I can get information and service through the m- Internet without the time and place restrictions	
Usefulness	Use1	Using M-Internet enables me to accomplish tasks	Kim <i>et al.</i> (2007), Yen <i>et al.</i> (2010), Davis (1989)
	Use2	Using M-Internet enhances my task effectiveness	
	Use3	Using M-Internet makes it easier to do my task	
	Use4	Using M-Internet improves my work performance	
	Use5	M-Internet is useful in performing my task	
Enjoyment	Enjo1	I have fun participating in M-Commerce	Agarwal and Karahanna (2000)
	Enjo2	M-Commerce provides me with a lot of enjoyment	
	Enjo3	I enjoy using M-Internet	
Technicality	Tech1	It is easy to use M-Internet	Davis (1989) and DeLone and McLean (1992)
	Tech2	M-Internet can be connected instantly	
	Tech3	M-Internet takes a short time to respond	
	Tech4	it is easy to get M-Internet to do what I want it to do	
Perceived fee	Fee1	The fee that I have to pay for using M-Internet is too high	Voss <i>et al.</i> (1998) and Kim <i>et al.</i> (2007)
	Fee2	The fee that I have to pay for using M-Internet is reasonable	
	Fee3	I satisfy with the fee that I have to pay for using M-Internet (Reversed)	
Trust	Trus1	The products and services provided by M-Internet are trustful	Lee (2005) Zhou <i>et al.</i> (2009)
	Trus2	Transactions on M-Internet can be trusted	
	Trus3	The M-internet can be trusted	
Perceived value	Val1	Compared to the effect I need to put in the use of M-Internet is beneficial to me	Kim <i>et al.</i> (2007) and Sirdeshmukh <i>et al.</i> (2002)
	Val2	Compared to the effect I need to spend, Using M-Internet is worthwhile to me	
	Val3	Overall ,the user of M-Internet delivers me good value	
Adoption intention	Int1	I plan to use M-Internet in the future	Zhu (2009) and Davis <i>et al.</i> (1989)
	Int2	I get information and service by using M-Internet	
	Int3	Overall, I intend to use M-Internet in the future	
Security risk	Secu1	I feel uncomfortable when using Mobile payments	Zhou <i>et al.</i> (2009) and Kleijnen <i>et al.</i> (2007)
	Secu2	In my view, mobile data transmission is unsafe	
	Secu3	In my view, mobile transitions is not secure	
	Secu4	My personal information is used for other purposes	
Performance risk	Per1	when doing mobile transactions, I'm worried about whether the service is provided as promised	Stone and Gronhaug (1993) and Kleijnen <i>et al.</i> (2007)
	Per2	The idea of mobile transactions make me to concern about the reliability of the service	
	Per3	When doing mobile business, I am concerned about the level of service which cannot provides the benefits I expected	

Empirical data for this study was collected via an internet survey and supplemented by paper-based questionnaire. The statistic found, most of the respondents' age range is between 19 and 35. As the mobile business in China is still in the rise phase and is something new, in line with diffusion of innovations, early innovation users have the demographic characteristics of young and high education level, the ratio of active users reached nearly 59%, this shows that mobile commerce for innovative groups of young people is gradually accepted and adopted.

RESULTS AND DISCUSSION

In the assessment of reliability and validity, first, the validity and reliability of the questionnaire measuring instrument and the reliability of individual project were tested. The SPSS17.0 software package was used for an exploratory factor analysis on sample data, by calculation

of effective sample data, the results showed the value of KMO was 0.840 and Bartlett test of sphericity value is significant at the 0.001 level, so using collected data is feasible for EFA. After the varimax rotation, factor loading matrix is shown in Table 2, each indicator in the corresponding factor loading is far higher than other cross-load factor's and factor loading value is between 0.5-0.95, which shows a well discriminate validity and convergent validity and measurement group items meet study design goal. Extracted 10 factors explain about 71.1% of the total variance.

Reliability analysis for the scales was tested with Cranach's alpha by using Spss17.0 program. The value of Cranach's alpha was 0.751, which is more than referenced 0.7 and shows good reliability of the scales.

Amos 17.0 and Spss 17.0 program were used for Confirmatory Factor Analysis (CFA). Table 3 shows output results for standardized loadings of all indicators, composite reliability of latent variables, Average Variance Extracted (AVE) and Cronbach's Alpha.

Table 2: Results of factor loading matrix after varimax rotation

Items	Component									
	1	2	3	4	5	6	7	8	9	10
Fr1	0.158	-0.075	-0.059	0.831	-0.056	0.060	0.001	0.137	0.155	0.055
Fr2	0.151	-0.038	-0.067	0.868	0.008	0.111	-0.006	0.060	0.125	0.165
Fr3	0.100	-0.046	-0.016	0.836	-0.121	0.051	-0.019	0.048	0.118	0.094
Use1	0.756	-0.066	-0.033	0.053	0.019	0.086	0.038	0.098	0.268	0.011
Use2	0.744	-0.054	0.044	0.009	-0.041	0.132	0.081	0.158	0.170	0.092
Use3	0.814	0.029	-0.048	0.074	-0.041	0.110	0.022	0.132	0.103	0.021
Use4	0.770	-0.024	0.002	0.154	0.056	0.098	0.027	0.080	0.034	0.089
Use5	0.757	-0.008	-0.021	0.145	-0.080	0.150	0.018	0.097	0.066	-0.007
Per1	0.071	0.207	-0.010	-0.055	0.030	0.007	0.803	-0.061	-0.068	-0.136
Per2	-0.038	0.055	0.119	0.043	0.133	-0.007	0.804	0.040	0.091	-0.109
Per3	0.127	0.021	-0.030	-0.012	0.045	0.017	0.812	0.019	-0.127	-0.087
Trus1	0.152	-0.250	-0.088	0.177	-0.072	0.136	-0.147	0.066	-0.033	0.735
Trus2	-0.004	-0.029	-0.133	0.061	-0.045	-0.012	-0.072	0.080	0.273	0.750
Trus3	0.070	-0.166	-0.049	0.124	-0.153	0.097	-0.194	0.076	0.110	0.795
Fee1	0.030	0.163	0.048	-0.043	0.793	-0.083	0.181	-0.092	-0.119	0.054
fee2	-0.106	0.023	0.003	-0.094	0.811	-0.020	0.008	-0.115	-0.060	-0.161
Fee3	0.011	0.070	0.001	-0.030	0.832	-0.066	0.041	-0.143	-0.031	-0.114
Val1	0.246	-0.062	-0.154	0.197	-0.106	0.188	-0.073	0.105	0.718	0.143
Val2	0.288	-0.081	-0.109	0.181	-0.027	0.100	-0.007	0.170	0.747	0.140
Val3	0.246	0.040	-0.062	0.160	-0.165	0.209	-0.075	0.199	0.712	0.137
Tech1	-0.072	0.034	0.788	-0.043	-0.027	0.013	0.044	0.009	-0.099	-0.070
Tech2	-0.040	-0.044	0.823	-0.023	0.038	-0.076	0.082	0.007	-0.090	-0.017
Tech3	0.029	0.030	0.768	-0.050	0.001	-0.019	0.013	-0.171	-0.060	-0.040
Tech4	0.033	0.048	0.848	-0.013	0.039	0.006	-0.063	0.040	0.022	-0.096
Secu1	-0.080	0.824	0.027	-0.034	0.053	-0.003	0.123	-0.023	-0.018	-0.108
Secu2	0.008	0.846	0.024	-0.087	0.032	-0.018	0.069	-0.022	-0.082	-0.072
Secu3	-0.016	0.843	0.064	-0.084	0.065	-0.014	0.057	-0.006	-0.057	-0.068
Secu4	-0.014	0.784	-0.044	0.051	0.087	-0.043	0.023	0.054	0.068	-0.090
Enjo1	0.150	-0.010	0.027	0.117	-0.105	0.784	0.093	0.085	0.079	0.129
Enjo2	0.178	-0.036	-0.024	0.085	-0.052	0.836	-0.068	0.144	0.114	0.029
Enjo3	0.198	-0.037	-0.077	0.015	-0.016	0.760	-0.008	0.099	0.158	0.023
Int1	0.173	0.021	-0.048	0.110	-0.164	0.158	0.002	0.728	0.168	0.060
Int2	0.162	0.013	-0.041	0.021	-0.146	0.110	0.034	0.792	0.104	0.056
Int3	0.191	-0.023	-0.027	0.115	-0.068	0.074	-0.036	0.806	0.088	0.084
Cumulative variance (%)	10.236	18.850	26.869	34.020	40.455	46.805	53.048	59.265	65.191	71.094

Table 3 shows all standardized factor loadings exceed the recommended value of 0.5, the scale show good reliability of the measurement indicators in the study. The composite reliability value ranged from 0.772 to 0.866 indicating a high internal consistency of the data existed, the result is consistent with Cronbach's reliability test, all Average Variance Extracted (AVE) value is greater than the generally recognized 0.5 cut-off indicating convergent validity.

Discriminate validity indicates the extent to which a given concept is different from other constructs. The calculation results in Table 4 shows the square root of the AVE in the diagonal are greater than the off-diagonal elements in the corresponding rows and columns, demonstrating discriminate validity. To sum up, the above analysis testifies to the reliability and validity of the survey instrument for further study.

Analysis of the structural path model includes measurement model and structural model. The structural path model of the proposed research model was tested by using AMOS17.0 tools, the objective was to test ten

hypotheses and research model fit. Structural Equation Modeling (SEM) was built by AMOS17.0 tools according Fig. 1 in current study.

In the research model in this study, the relationship between latent variable and observed variable reach a significant level. The signs of causal path coefficients are consistent well with the theoretical hypotheses.

CONCLUSION

Support structural model of customer value perception based on the value theory are presented in this study.

Calculation result of structural model shows that the research model explains 55.3% of the variances in user's perceived value and perceived value has significant, direct effect on user's adoption intention. The regression coefficients (β) is 0.605 ($p < 0.001$). The regression coefficients (β) are 0.231 ($P < 0.001$) for FC→Pv and 0.413 ($p < 0.001$) for UF→Pv and 0.211 ($p < 0.05$) for ENJ→Pv

Table 3: Results of factor standard loadings, composite reliability, AVE, cronbach's alpha

Variables	Indicators	Standard loading	CR	AVE	Cronbach's alpha
Free connection	Fr3	0.771	0.866	0.684	0.863
	Fr2	0.890			
	Fr1	0.816			
Usefulness	Use3	0.797	0.865	0.561	0.864
	Use2	0.739			
	Use1	0.768			
	Use4	0.714			
	Use5	0.725			
Enjoyment	Enjo3	0.690	0.795	0.566	0.789
	Enjo2	0.840			
	Enjo1	0.718			
Technicality	Tech4	0.784	0.832	0.553	0.830
	Tech3	0.696			
	Tech2	0.763			
	Tech1	0.729			
Perceived fees	Fee3	0.768	0.795	0.564	0.794
	fee2	0.748			
	Fee1	0.736			
Security risk	Secu4	0.681	0.859	0.605	0.858
	Secu3	0.822			
	Secu2	0.792			
	Secu1	0.808			
Performance risk	Per3	0.708	0.772	0.532	0.772
	Per2	0.681			
	Per1	0.794			
Trust	Trus1	0.744	0.784	0.552	0.772
	Trus2	0.607			
	Trus3	0.856			
Perceived value	Val1	0.783	0.826	0.613	0.825
	Val2	0.784			
	Val3	0.781			
Adoption intention	Int1	0.752	0.778	0.539	0.778
	Int2	0.722			
	Int3	0.728			

Table 4: Testing the square root of the AVE and correlations of constructs

Items	FC	Usefulness	Enj	Tech	PF	Trust	PV	AI	SR	PR
Free connection	0.827									
Usefulness	0.354	0.749								
Enjoyment	0.294	0.458	0.752							
Technicality	-0.141	-0.066	-0.090	0.744						
Perceived fees	-0.190	-0.121	-0.228	0.075	0.751					
Trust	0.382	0.232	0.281	-0.212	-0.348	0.743				
Perceived value	0.509	0.594	0.509	-0.257	-0.322	0.463	0.783			
Adoption intention	0.320	0.478	0.430	-0.118	-0.400	0.297	0.550	0.734		
Security risk	-0.163	-0.089	-0.100	0.076	0.227	-0.379	-0.153	-0.052	0.778	
Performance risk	-0.066	0.102	-0.025	0.075	0.241	-0.410	-0.151	-0.032	0.282	0.729

FC: Free connection, Enj: Enjoyment, Tech: Technicality, PF: Perceived fees, PV: Perceived value, AI: Adoption intention, SR: Security risk PR: Performance risk

respectively. Moreover, perceived cost, technicality, trust has significant direct effect on perceived value and their regression coefficient (β) are -0.186 ($p < 0.05$), -0.145 ($p < 0.05$) and 0.189 ($p < 0.05$) respectively, among them, usefulness has positive effect on perceived value and its regression coefficient (β) is greater. Among influencing trust factors, the regression coefficients (β) are -0.238 ($p < 0.001$) for Sr→Tru and -0.322 ($p < 0.001$) for Pr→Tru and 0.329 ($p < 0.001$) for Fc→Tru and -0.155 ($p < 0.05$) for Tech→Tru, respectively, obviously, free connection and performance risk have greater effect on trust.

Research results show that perceived value has a significant effect on the adoption intention, which coincides with value-based behavioral model proposed by Kleijnen *et al.* (2007). The direct effect of perceived value on the adoption intention is 0.605, which is very approximate with the result of VAM model, it is really surprised. Compared to other factors, it shows that during the development of mobile commerce, integration of industry chain resources, the technology and business model can meet user's need embodied in service and practicality, the rapid development of mobile group purchase and mobile micro-blog have verified this

problem. Compared to other factors, usefulness has the greatest effect on perceived value, this shows that, during the development of mobile commerce, integration of resources on industry chain, technology and business model close to users, reflecting service and utility functions, the rapid development of mobile group-buying and mobile micro-blogging have proved this. For mobile commerce industry, it is getting closer to the users and model innovation combined together will be full of vitality. Combined with the characteristics of user's demand and mobility of mobile-commerce, how to provide location-based information and service will be a hot topic in the development of mobile commerce. A prominent feature of the mobile internet is the value of freedom everywhere, for all significant factors that affect perceived value; the free connection has greater effect on perceived value than technicality and perceived cost and significantly affects the trust. under some circumstances (such as in course of moving), users can select using mobile internet because of its convenience and there are no other better choices, on the other hand, service providers and operators in the mobile commerce value chain can enhance the speed of mobile net and provide users with reliable, fast, uninterrupted connection and optimized process service, which will significantly promote customer value perception. On the one hand, the reason why the users select using mobile Internet under some circumstances (such as in course of moving) is that it is convenient and they have no option; on the other hand, it means that the service providers and operators on the mobile commerce value chain enhance the speed of mobile net and provide users with reliable, fast, uninterrupted connection and optimized process service, which will remarkably promote the customer value perception. In addition, enjoyment emotion value is also an affective factors should be taken serious consideration in the development of mobile commerce and will have a profound effect on the mobile internet value chain, Apple Inc led the negotiation with China Mobile company and China Unicom by means of I-phone's advantage prove this point, users choose I-phone not only because of its function, but also the enjoyment experience.

In the study, trust has positive effect on perceived value but the regression coefficient value is not great. One possible reason is that users used to do business on the stationary internet and know well about the network economy after the traditional e-commerce era, the development of mobile commerce has a considerable base of users and at a certain level, users trust Mobile-commerce, this can explain why trust has positive effect on perceived value; on the other hand, because the

SIM card has the function of identity authentication, the mobile terminal has the feature of exclusivity, It greatly helps to improve the distrust problem in the era of e-commerce especially the electronic payment problems; thirdly, network payment and data security which restrict the development of mobile commerce are still a concern topic for users and merchants provide personalized service for users through rich customer personal information access and data mining, but personalized service means more customer's information will be collected, this brings users serious concerns on the security and privacy, due to these factors, the perceived value influenced by user's trust to mobile business is not improved obviously. In addition, the results that technicality has a negative effect on trust and customer value perception, all these are coincided with the research results of in the Venkatesh *et al.* (2003).

In the effecting factors of the trust, performance risk has more negative effects on it, which indicates the quality service offered by the mobile-internet is far from the customer's expectation. Because of the virtual features of mobile business, the users only can read the words and pictures to judge the quality of product and its service which can increase the misunderstanding between users and the service providers, hence, "genuine goods and the fair price" will be an important factor to enhance the customers' trust. The service providers should show their genuine goods to customers, offer good service, fulfill their duties loyally as well. These will help to reduce the judgment on the risk of performance guarantee, thus improve the users' trust on mobile business.

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