



Research on the Impact of Digital Payment Product Usage on Continued Usage Intention Based on SEM Model Technology

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Abstract. With the rapid development of the digital economy, the penetration rate of digital payments in my country has increased significantly. This study conducted the following research based on the actual situation and drew the following conclusions.

The research confirms that system convenience, cost-effectiveness, and social influence are key factors affecting users' continuous usage intention of digital payment products. To explore these factors, a questionnaire was distributed to users of WeChat Pay, a widely used digital payment platform in China, and a dataset of 390 valid responses was collected and analyzed using the Smart-PLS structural equation modeling method.

From a technological standpoint, the study also acknowledges that the design and operation of digital payment systems are deeply rooted in computer science and information technologies. These systems rely on real-time data processing, secure encryption algorithms, cloud-based computing infrastructure, and machine learning models for fraud detection and credit scoring. Such technological underpinnings contribute to the overall convenience and security perceived by users. According to the analysis results: (1) convenience, economy, and social influence all significantly impact users' willingness to continue using digital payment products; (2) among these, technological convenience is the most influential factor ($\beta = 0.366$, $T = 2.170$), followed by social influence ($\beta = 0.298$, $T = 3.305$), and economy ($\beta = 0.177$, $T = 32.170$). These findings underscore the essential role of computer technology in shaping digital financial behavior in modern society.

To provide a holistic understanding, this paper also delves into the core computer technologies underpinning digital payment systems—covering distributed service architectures, real-time transaction processing engines, cryptographic algorithms, and machine learning-driven risk-control models—to analyze their influence on perceived convenience and security.

Keywords: digital payments; convenience; economics; continuance intention to use

1 Introduction

With the rapid development of the digital economy, the penetration rate of digital payment in China has increased dramatically. Some people have negative and some have positive attitudes towards the changes brought by digital payment products. Those with negative views worry that digital payment products will lead to blind overspending and exacerbate individuals' financial woes. On the other hand, those with a positive view support the idea that the more one uses payment services like digital payment products, the more one will instead improve credit management skills and thus economic wealth. However, to date, there has been no research to show how these digital payment products affect users, and in particular, how the use of these services affects credit management ability. Therefore, this study is based on this need as follows.

First: digital payment products continued use of digital payment products positively and positively affects the relationship on credit management ability.

Second: Digital payment products verified the impact of credit social system building, and explored which digital payment products' characteristics better serve to positively influence the ability of credit management.

Now, with the advancement of core technologies for social credit system construction in China, such as AI, face recognition, and big data, concerns about the proliferation of social credit systems are growing. Representative ICT companies include Alibaba, Tencent, Baidu, and Jingdong.

Modern digital payment platforms rely on a microservices-based, distributed architecture that ensures scalability and fault tolerance. Transactions are processed through a low-latency event-driven pipeline, secured by AES/RSA encryption and SSL/TLS protocols, while machine learning models continuously monitor transaction patterns to detect fraud in real time.

1.1 Theoretical Significance

Like Alibaba, Sesame Credit, for example, collects customer information from subsidiaries such as e-commerce information using Alibaba, Alipay's payment history, and loan-related governments, and conducts credit scoring on customers.

1.2 Practical Significance

Fintech payment services mainly include offline services and online services. Online services are services where goods purchased through smartphones and the internet are settled online, such as WeChat Pay, Alipay, Kakao Pay, etc. Offline services are essentially playing a debit card when buying something in a shop or using a mobile device instead of cash. Depending on the method of payment, there are NFC, magnetic stripe method, QR code scanning method, barcode scanning method, and payment board touching method, with NFC and barcode scanning methods being the most widely used methods. The most widely used methods are NFC and barcode scanning. Digital payment products are easy to use and the handling fee is low, and the trend of users is growing.

1.3 Research Methods

1. Literature Review Method

To explore the factors influencing payment services, a large number of relevant literature were reviewed, and the necessary theories and research models were organized. The literature review method lays a solid theoretical foundation for the thesis, and this paper establishes the overall research framework through the literature review method.

This study used the Smart-PLS 2.0 statistical software package to verify the reliability, central feasibility, and discriminant feasibility of the measurement issues and component concepts because PLS is suitable for small samples or exploratory studies and can effectively verify the adaptability of the model.

2. Empirical Research Method

The empirical research method is a research approach aimed at understanding objective phenomena, providing people with real, useful, certain, and precise knowledge. Its focus is on addressing the question of “what” the phenomenon itself is. The empirical research method seeks to transcend or exclude value judgments, revealing only the intrinsic constituent factors of objective phenomena and their universal connections, and summarizing the essence and operational laws of phenomena.

3. Questionnaire Survey Method

After determining the research subjects, this study conducted a questionnaire survey to carefully analyze which payment services among the characteristics of digital payment products have a greater influence on users' intentions for continued use.

2 Literature Review and Research Assumptions

2.1 Literature Review

Convenience refers to the degree to which a user feels that the process of using a service or product is simple and easy to use. Venkatesh and Davis (1996)^[1], Davis (1989). Convenience refers to how easy it is to use an object (tool) or service for a specific purpose. Focusing on mobile banking users and observing the influence of continuance intention^[2], it is found that mobile banking attributes such as convenience, complexity, and security have an influence on continuance, and in terms of the attributes and continuance intention of mobile quick payment, convenience, security of payment, and trust in mobile quick payment have a positive influence on continuance intention.

Affordability refers to the cost-effectiveness of using the payment service. Higher satisfaction and higher value can be felt if it is recognised that the use of settlement services is more economical than the use of other products or services in terms of cost, effort, etc., and affordability is defined as the experience of purchasing at a lower price in the mobile mall as influenced by discount coupons or price discounts.

(Venkatesh et al.,2003). Social influence is defined as the degree of perception of individuals who think that they should take advantage of the new technology through the favourable image and friendly evaluation of people around them^[3], etc. Rogers (2003) and Venkatesh et al. (2000). Information gained through relationships with people around them has a great impact on people's decision making^[4].

Cabanillas, F.L. et al. (2014) verified the availability and usefulness of the perception of social influence as an important factor of influence in the study of intention to use payment applications based on mobile social networks^[5].

According to the cost of creating new customers and the cost of maintaining existing customers and maintaining ongoing relationships, existing customers emphasise the continued use Birelen et al., (1997)^[6].

Continuance intention is a core concept in the ongoing relationship between users and companies, and in the formation of continuance intention, satisfaction and expected benefits based on past experiences play an important role.(2000) Continuance intention refers to the decision to use a service at a future point in time based on the consumer's evaluation of the service at the current point in time Bolton and Levesque (2000). Continuance is the degree to which a person who has used a product or service in the past is willing to continue to use it in the future^[7].

Research hypothesis

Venkatesh and Davis (1996), Davis (1989) Convenience is the extent to which users feel that the process of using a service or product is simple and easy to use. In this study, convenience is defined as the ease with which users can understand the service, the simplicity of input methods, the ease of use, and the speed of processing time in mobile payment services^[8].

"Economy" refers to the degree of feeling economical in terms of costs through the use of settlement services.

Venkatesh et al. (2003) Social influence is defined as the degree to which users perceive that other influencers believe that users should use the new technology^[9].

Hypothesis 1: The convenience of the digital payment product will have a positive (+) impact on the willingness to continue using it.

Hypothesis 2: The economic benefits of the digital payment product will have a positive (+) impact on the willingness to continue using it.

Hypothesis 3: The social impact of digital payment products will have a positive (+) impact on the willingness to continue using.

3 Research Design

The purpose of this study is the convenience, economic and social impact of the characteristics of digital payment products on the intention to continue to use the use of this study constructed a theoretical model of digital payment products affecting the intention to continue to use. the fig.1 shows that Research Model contains three types of independent variables: convenience, economy, and social influence, and the dependent variable is intention to continue using.

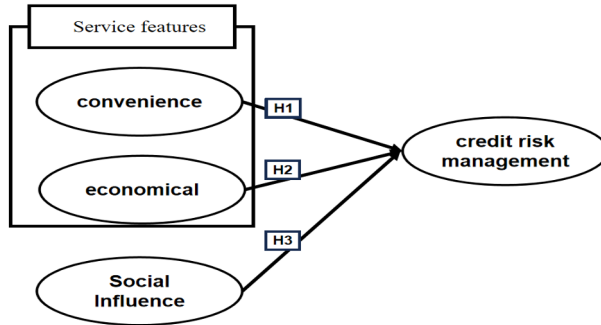


Fig. 1. Research Model

4 Empirical Analysis

The characteristics of the sample who responded to the questionnaire are shown in Table 1 Sample Data. In terms of gender, males accounted for 43.59% and females for 62.61%. The highest age group was 18-25 years old, accounting for 42.31%.

Table 1. Sample Data

variable	districtpoint	Respondentnumber	percentage(%)
gender	man	170	43.59%
	Female people	230	62.61%
Yearage	18-25 years old	165	42.31%
	26-30age	119	30.51%
	31-35 years old	35	8.97%
	36-40 years old	12	3.08%
	41 year old or older	59	15.13%
OccupationIndustry	student	179	45.90%
	Civil servants	48	12.31%
	maleDepartment staff	64	16.41%
	Individual Businessoperators andsinceBy professionals	44	11.28%
	Thatthe	55	14.10%
Education	Smallstudy	2	0.51%
	middlestudy	10	2.56%
	highmiddle	52	13.33%
	University	276	70.77%
	postgraduatehospital	50	12.82%

Before validating this research model, the measurement questions and component concepts were verified for reliability, central feasibility, and discriminant feasibility using the Smart-PLS 2.0 statistical software package. As shown in Table 2 shows that Sample Data, the Cronbach's Alpha values for each configuration concept were all greater than 0.7, indicating reliability. The composite confidence interval (CR) for each construct was above 0.7, and the average variance extracted (AVE) was above 0.5, indicating central feasibility.

Table 2. Intensive Feasibility Test

	Original-Sampe (O)	T Statistics (O/STERR)	AVE	Composite Reliability	Cronbachs Alpha
convenience	0.788	13.875	0.600	0.857	0.782
convenience	0.745	12.535			
convenience	0.748	11.109			
convenience	0.816	15.171			
economical	0.885	39.050	0.787	0.917	0.865
economical	0.867	28.979			
economical	0.909	53.560			
social influence	0.811	19.469	0.636	0.875	0.810
social influence	0.762	14.119			
social influence	0.846	27.413			
social influence	0.768	14.983			
Continuance intention	0.828	16.397	0.714	0.882	0.800
Continuance intention	0.861	33.391			
Continuance intention	0.845	28.693			

Table 3. Confirmatory Factors Analysis

	convenience	economical	Social influence	Continuance intention
V2 1 1	0.7876	0.2866	0.3788	0.3877
V2 1 2	0.7449	0.2556	0.3574	0.3598
V2 1 3	0.7478	0.4922	0.4733	0.5514
V2 1 4	0.8159	0.4039	0.4844	0.4929
V2 2 1	0.3913	0.8848	0.5425	0.4667
V2 2 2	0.4863	0.867	0.5225	0.4372
V2 2 3	0.4185	0.9093	0.6283	0.4754
V3 2 1	0.3538	0.1062	0.2503	0.3247
V3 2 2	0.3378	0.2678	0.3506	0.2323
v3 2 3	0.2068	0.044	0.1913	0.1309
v5 1	0.4531	0.4894	0.8112	0.5485
v5 2	0.3546	0.3575	0.7624	0.4279
v5 3	0.4988	0.5648	0.8461	0.5603
v5 4	0.4627	0.608	0.7684	0.4716

At the same time, the results of the deterministic factor analysis of the entire sample showed that the factor values were all greater than 0.5, which was higher than the other factor values.

Table 3 shows that Confirmatory Factors Analysis PLS analysis requires a goodness of fit test (GoF) of the path model. The model goodness of fit is judged as small, medium, and large based on 10%, 25%, and 36%, respectively (Wetzels, 2009). The GoF calculation result of the research model using all 390 data from WeChat Pay and Ant Check Later is 46%, which is highly consistent.

5 Conclusion

This study examines the impact of digital payment products on users' continued usage behavior from three perspectives: convenience, economic feasibility, and social impact. It analyzes how the convenience, economic feasibility, and social impact of the digital payment product Ant Bill Follow-up influence users' willingness to continue using credit loan payment services. Empirical analysis results indicate that convenience, economic feasibility, and social impact significantly influence users' willingness to continue using payment services. Based on path coefficient significance tests, the influence of convenience, economic feasibility, and continued usage willingness on the continued use of payment services is more significant than that of WeChat Pay itself.

The results of this study offer the following insights.

Hypothesis 1: The convenience of mobile payment methods affects the willingness to continue using them ($\beta = 0.366$, $T = 3.145$)

Hypothesis 2: The economic feasibility of mobile payment methods will affect the willingness of users to continue to use ($\beta = 0.177$, $T = 2.170$)

Hypothesis 3: The social impact of mobile payment methods will affect the willingness to continue using them ($\beta=0.298$, $T=3.305$)

Hypothesis 4: The willingness to continue using mobile payment methods will affect credit management ability ($\beta=0.403$, $T=5.792$)

This study argues, firstly, that people who use mobile payment services in China are generally young people, with the majority in their 20s, but not many in their 30s and above, making generalisations a bit far-fetched.

Depending on the age group, the intention to continue using mobile payment services may vary. Therefore, this can be remedied in the future to ensure that a rich sample of age groups is surveyed to produce rich findings.

Second, the questionnaire survey in this study focused on people living in urban areas, but did not survey people living in rural areas or countryside, which is a limitation of this study.

In the future, we could survey not only urban residents in China, but also residents in rural and rural areas of China, which would make the study plausible and lead to rich findings on the ability to manage credit by continuing to use mobile payment services in various regions of China.

The future scenario for this study is to continue to use mobile payment services to discover ideal spending patterns and learn better ways of spending by understanding,

regulating and managing their spending details. Therefore, it would be impactful to include in the thesis that users are highly concerned about unreasonable spending and their ability to pay back, and that self-control, such as impulse buying and overspending, can be achieved if self-control is increased through credit education.

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