

Analysis on the Influencing Factors of Users' Willingness to Use of Third-Party Mobile Payment across the Straits

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Abstract

In recent years, with the continuous development of the Internet and the popularity of smart mobile devices, people's living and entertainment habits have changed greatly. The emergence and development of third-party mobile payment is one of the influencing factors. With the development of third-party mobile payment, the factors affecting the willingness to use third-party mobile payment will be constantly updated. This paper combines perceived value theory model and technology acceptance model, and selects perceived usefulness, perceived ease of use, perceived risk, social impact, personal innovation and perceived value as influencing factors to establish third-party mobile payment users' use of a model of willingness. An effective scale was designed to analyze the data collected by descriptive analysis, reliability analysis, validity analysis and regression analysis. The effects of perceived usefulness, perceived ease of use and perceived risk on perceived value and the relationship between all factors and intention to use were analyzed. The final results show that perceived usefulness and perceived ease of use have significant positive effects on perceived value, while perceived risk has significant negative effects on Taiwan data, while perceived risk has no significant negative impact on perceived value in Chinese Mainland data. Perceived usefulness, perceived ease of use, social impact and personal innovation have significant positive effects on willingness to use. Perceived risk has no significant negative impact on willingness to use in Chinese Mainland data, but has a significant negative impact on willingness to use in Taiwan data. The article is organized as follows introduction, literature review, research design, empirical research results, analysis and summary. Finally, through the analysis of the willingness to use third-party mobile payment and its influencing factors and municipal research, this paper puts forward some personal suggestions to

promote the development of third-party mobile payment.

Keywords

Third-Party Mobile Payment, Willingness to Use, Perceived Value Theory, Technology Acceptance Mod

1. Introduction

1.1. Background of Topic Selection

With the continuous development of e-commerce, third-party mobile payment in Chinese Mainland started late, but it has developed rapidly. According to the 42nd “China Internet Road Development Status Report” released by China Internet Information Center, as of June 2018, the number of Internet users in China reached 802 million, and the number of online shoppers continued to rise. In 2018, online users exceeded the scale of shopping 600 million, and online shopping has developed rapidly. In 2018, Tmall’s double eleven sales exceeded 200 billion yuan.

After the loosening of third-party payment regulations in 2015, the mobile payment market has blossomed everywhere, but consumers’ deep-rooted consumption habits have been difficult to shake over the years, and the cash ratio is still as high as 70%, according to the Taiwan Financial Management Association’s 2016 Financial Technology White Paper. According to the report, Taiwan’s electronic payment ratio is 26%, which is much lower than 77% in South Korea, 55% in Hong Kong, China, 56% in Chinese Mainland and 53% in Singapore. Taiwan’s mobile payment consists of two major systems: HCE technology and TSM technology; electronic ticket includes: leisure card, card, iCash and Happy Cash; electronic payment is: Ou Fubao, Orange Branch, International Company, Zhifubao, Taiwan Pay and Street Mouth payment, etc.

1.2. Research Purposes and Significance

This paper will focus on the cross-strait third-party mobile payment market, combined with the research results of scholars, in the mobile Internet environment, through the use of perceived usefulness, perceived ease of use, perceived risk, personal innovation, social impact and perceived value as the influencing factors, through the questionnaire collects data, analyzes the sample data by statistical analysis, studies the influence of different factors on the user’s willingness to use, and the similarities and differences between the two sides on the influencing factors, and provides rationalization suggestions for the development of third-party mobile payment in the cross-strait region based on the conclusions.

According to iResearch’s “2017 China Third-Party Payment Annual Data Release Research Report”, in the scale of mobile payment transactions in Chinese

Mainland in 2017, the proportion of personal accounts is mainly based on transfer and credit card repayment was the highest. However, from the structural changes of 2017Q1 to Q4, the proportion of mobile consumption dominated by online shopping and offline code-based payment is gradually increasing, from 9.1% in the first quarter of 2017 to 13% in the fourth quarter. There are still a large number of payment scenarios under the data display line to be developed: only the retail stores such as grocery stores, convenience stores, and smoke hotels have 6.6 million in China, with sales of 2.3 trillion yuan in 2016. With the gradual development of mobile payment habits and the continuous connection between online and offline consumption scenarios and mobile payment, the proportion of mobile consumption in the future will continue to expand, becoming the main driving force for the rapid growth of mobile payment in Chinese Mainland.

In the third-party online payment tools in Chinese Mainland, Alipay and WeChat account for almost 94% of the market, and the number of users is large. It is representative of the development in the third-party online payment market. This study affects the adoption of Alipay and WeChat users. The various factors have been described and analyzed, and the user's adoption behavior has been reasonably explained, which is useful for the development of other third-party online payment tools, and also has reference for the development of third-party online payment tools.

According to the Taiwan Institute of Industrial Intelligence (MIC)'s implementation of the Action Payment Survey in the fourth quarter of 2017, Taiwan found that users' awareness of mobile payments increased from 84% last year to 91%. The ratio is also 40%. Among the market payment ratios, the action payment ratio increased from 4.8% in 2016 to 13.7%, and the usage rate of mobile payment has a large room for growth.

According to the survey data of the Institute, the top three most commonly used actions in Taiwan in 2017 were Line Pay (25.2%), Apple Pay (17.9%), and Street Payment (10.4%). Among them, Apple Pay can only be used with a credit card, so many people think that its market share in Taiwan may decline year by year. LINE Pay and Street Payment accounted for 35.6% of the Taiwan mobile payment market. In 2017, LINE Pay used more than 50,000 merchants, more than 2.6 million members, and used street outlets to pay more than 65,000, thanks to the convenience of Taiwan Pay. The characteristics of the bindable financial card also attracted many users. Due to a large number of mobile payments in Taiwan, there is no excessive concentration of mobile payments in a certain software. Therefore, this article will take a multi-payment option in the questionnaire to allow users to fill in the used payment software and usage experience. The behavior has made a reasonable explanation, which is useful for the development of other third-party online payment tools, and also has a reference for the development of third-party online payment tools.

In terms of academic significance, this paper is a study on the willingness to

use third-party payments across the Taiwan Strait. By reading the literature, we have learned that there is certain research on third-party mobile payment in Chinese Mainland, but it is still relatively rare to write about third-party mobile payment across the Taiwan Strait. The predecessors of this study on third-party online payment, consumer behavior, online banking willingness and network new technology acceptance factors establish a factor model that affects the willingness of third-party mobile payment, compare the data of the two sides of the strait, and aim to discover Whether these factors continue to affect consumers' willingness to use and the factors affecting cross-strait factors for third-party payments.

2. Literature Review

2.1. Definition and Development of Mobile Payment

2.1.1. Third-Party Mobile Payment

Different scholars have different definitions of third-party mobile payments. In Chinese Mainland, Xu (2012) believes that third-party mobile payment is a payment platform, which refers to a third-party payment institution with sufficient credit line and fund guarantee, independent of banks and mobile operators, through signing cooperation with major banks to move the Internet. In order to support the platform, the use of mobile terminals to promote the two sides to achieve trading activities, to achieve near-field and remote payment functions (Xu, 2012). Near-field payment is also called offline payment, which refers to the way of instant transfer by mobile device when the user consumes offline; remote payment is also called online payment, and refers to the use of mobile communication network when the user consumes online. Distance transfer of funds.

2.1.2. Action Payment

Third-party payment is called mobile payment in Taiwan. Weng and Tian (2014) believe that Mobile Payment is a kind of electronic payment, covering a wide range Lin & Wu, 2015 all refer to 2012. The Bank for International Settlements (Innovations in retail payments) provides a broad definition of mobile payments: no matter what method, such as voice, SMS or Near Field Communication (NFC), can be acted upon by the access behavior of the access device through the wireless network can be called (Lin & Wu, 2015). Weng and Tian (2014) believe that mobile payment services belong to a multi-industry platform and diversified system services. To be able to operate effectively, multiple participants (such as financial institutions, mobile operators, third-party payment institutions, merchants, customers, etc.) need to be connected.). The typical mobile payment services mainly have three types of ecosystems: the financial ecosystem, the mobile phone ecosystem of consumer mobile devices and communications, and the retail ecosystem that provides vending services (Figure 1).

Mobile payment ecosystem

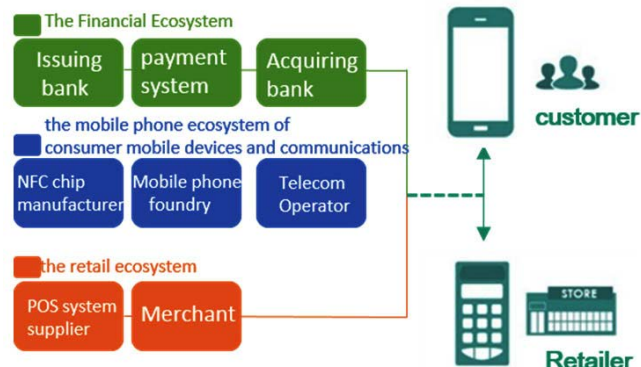


Figure 1. Action payment ecosystem (Weng Shiji, Tian Yuren).

2.1.3. The Development of Third-Party Mobile Payment in China

Liu (2018) combined with the development of third-party mobile payment in China can be roughly divided into three stages: the first stage before 2012, the development of modern technology and the popularization of mobile phones promote the development of e-commerce, and mobile e-commerce as an infrastructure. The unprecedented development, with Alipay as a typical representative, presents the evolution trend of the mobile terminal from the PC.

In the second stage, in 2013-2016, there were two ways of payment, sonic payment, etc., and the means of payment were more diversified and convenient. At the same time, WeChat Pay is a third-party mobile payment platform that is second only to Alipay with a wide range of users and with the help of TenPay;

The third stage is 2016-present, and the online and offline are closely integrated. The offline merchants use Alipay and WeChat payment. The third-party mobile payment is gradually transformed into an important link between online and offline, and the richness of offline payment scenarios. Extension has gradually become an important direction for the recent development of Alipay and WeChat payment (Liu, 2018).

2.1.4. Taiwan's Mobile Payment Development Process

Taiwan scholar Zheng (2015) believes that Taiwan's third-party payment can be traced back to the Green, Hongyang and Lanxin technologies that were established in the late 1990s. The three Internet Golden Stream companies initially provided services for the collection of Internet Payment Service Provider (IPSP) services, providing credit card information to the online payment service, and there is no guarantee of transactions or a mechanism for resolving transaction disputes (Zheng, 2015). In 2007, the FSC required the acquiring bank not to provide credit card and other services without signing the contract. This requirement severely created the network collection and payment service at that time, until the "credit card business organization management method" passed the network collection and payment in 2011 began to be protected by law. With

the vigorous development of the third-party payment industry in the world, the Financial Management Association will be loosened. In May 2015, the “Regulations on the Management of Electronic Payment Institutions” was officially implemented. It is clear that the electronic payment institution refers to the intermediary of the Internet or electronic payment platform, accepting user registration to transfer funds between accounts and accepting the stored value. Provide services such as a depository mechanism.

2.2. Theoretical Model Overview

2.2.1. Technology Acceptance Model

In 1989, the Technology Acceptance Model (TAM) was Davis use Rational behavior theory Research user pair Information system The initial purpose of a model proposed at the time of acceptance was to explain the determinants of the widely accepted computer (Davis, 1989). The technology acceptance model proposes two main determinants: perceived usefulness, reflecting the extent to which a person thinks that using a particular system improves his job performance; perceived ease of use reflects the extent to which one considers it easy to use a specific system.

The technology acceptance model considers that system use is determined by behavioral intention, and behavioral intention is determined by the attitude toward using and the usefulness of perception. The attitude to be used is useful and easy to use.

The common decision of sex is that the usefulness of perception is determined by the ease of use of perception and external variables. The ease of use of perception is determined by external variables. External variables include system design features, user characteristics (including perceptual forms and other personality traits), task characteristics, nature of development or execution processes, policy implications, organizational structure, etc., internal beliefs, attitudes, and intentions in the technology acceptance model. Establish a link between differences between individuals, environmental constraints, and controllable interference factors, as shown in **Figure 2**.

2.2.2. Perceived Value Theory

In today’s Internet era, users have diversified needs and role orientations for Internet products and services. They are not only consumers of products and services, users of technology, but also producers of media content. In the current mobile Internet environment, the original technology acceptance model and rational behavior theory are based on users. With the development of the times and the diversification of needs, these can no longer explain the user’s willingness to use and Use behavior. Scholars Kim, Chan and Gupta (2007) propose a Value-based Adoption Model (VAM) based on the user’s perspective, and believe that users’ perception of mobile Internet is more influential than its own use value. Force, can affect the user’s willingness to use the mobile Internet service or product (Kim, Chan, & Gupta, 2007).

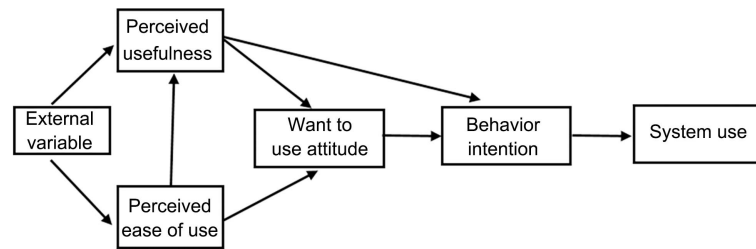


Figure 2. Technology acceptance model (Davis).

Perceived gains and perceived gains and losses are the two main influencing factors of the perceived value model. Perceived profit refers to the value-added value embodied in the process of receiving services and using products, such as entertainment value, use value, etc.; perceived loss refers to the loss that may occur in the process of accepting products and using products. Such as the loss of money, the waste of time, etc.; perceived value refers to the choice of whether to accept and use the product and service for the maximization of the interests in the face of the balance between perceived profit and perceived profit and loss. The theoretical model of perceived value is shown in **Figure 3**.

2.3. Introduction to Relevant Theories

2.3.1. Perceived Risk Theory

Perceived risk theory, Bauer first proposed in 1960, he believes that in the process of consumption, users will produce different results than expected, and thus need to bear certain risks (Bauer, 1960). Based on the technology acceptance model, Featherman & Pavlou (2010) divides consumers' perceived risks into performance risk, psychological risk, time risk, financial risk, social risk and privacy risk from the perspective of perceived risk. Privacy risk and financial risk are the most significant impact on consumers' willingness to accept e-services (Davis, 1989).

Based on the research of scholars, this paper believes that the perceived risk factors refer to the personal information that the user perceives during the process of use, such as address contacts, etc., and the risk of security is not guaranteed, such as the password is leaked, and the perceived risk factors of different dimensions. It will have different effects on the user's willingness to use.

3.3.2. Innovation Diffusion Theory

Roger (1983) proposed five major characteristics of innovation diffusion: comparative advantage, complexity, compatibility, experimentability, and observability (Roger, 1983). Relative Advantage refers to the superiority brought to consumers by using innovation, which is generally reflected in improving efficiency, saving time and bringing economic benefits. Rakhi and Srivastavamala (2014) added individual innovation based on the theory of innovation diffusion, and verified that individual innovation has a positive impact on the willingness to adopt mobile payment services (Rakhi & Srivastavamala, 2014).

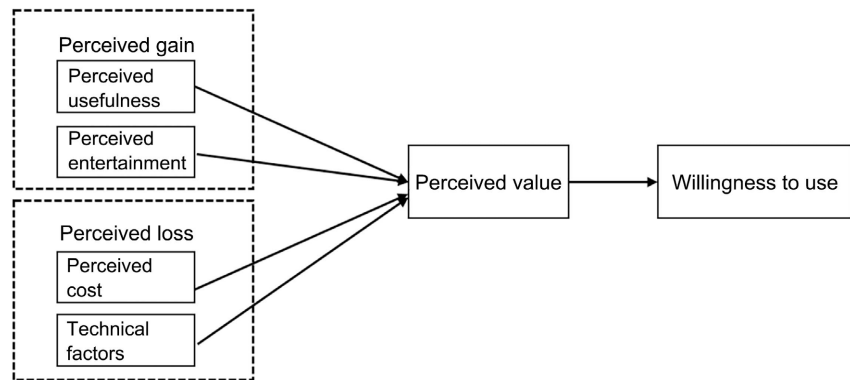


Figure 3. Perceptual value theory (Kim, Hee-Woong, Hock Chuan).

Based on the research of scholars, this paper believes that under the continuous development of modern technology and the Internet, individual innovation has an important impact on users' use of the product and service. Therefore, the influencing factors of individual innovation are added in this paper.

2.3.3. Social Influence Theory

The theory of social influence refers to the theory that examines the impact of the team on individual behavior. The social impact is due to the existence of a certain relationship between the two parties, and one party intentionally or unintentionally affects the behavior of the other party. On the basis of David's theory, scholars have been improving and perfecting. Venkatesh & David's (2000) added factors such as social influence and perceived website operation efficiency to the technology acceptance model in order to make the model closer to its research (Venkatesh & Davis, 2000).

Based on scholars' research, social influence exists in everyone's daily life, which we cannot avoid. Therefore, this paper adds social influence factors to model research.

3. Research Design

3.1. Research Methods

After reading and collating a large number of documents on the willingness to use third-party payment, this paper decided to use the Technology Acceptance Model (TAM) and Perceptual Value Theory to construct a model to analyze the influencing factors of consumers' use of third-party mobile payment behavior. Referring to the previous papers, the perceived usefulness, perceived ease of use, perceived risk, social impact, personal innovation and perceived value are the main influencing factors added to the model.

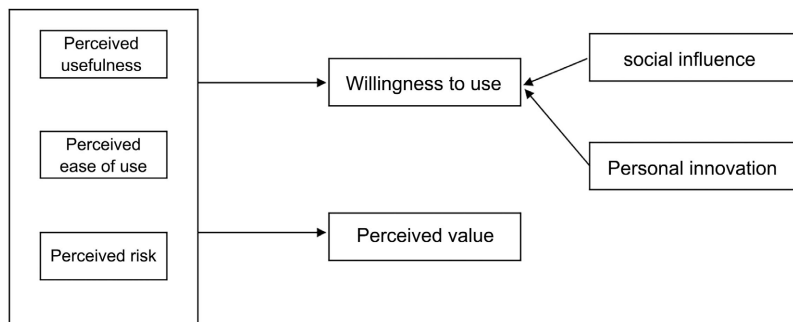
3.2. Research Objects

This article mainly selects third-party mobile payment people with certain experience, including 18 - 25 years old, 26 - 35 years old, 35 - 45 years old, and users of different ages over 45 years old. In general, the test subjects cover different age

groups and different Internet experience groups, making the research of this paper more universal.

3.3. Research Hypothesis Framework

Following is Research Hypothesis Framework.



3.4. Proposing Hypotheses

3.4.1. Perceived Usefulness

In this paper, perceived usefulness refers to whether consumers think that using third-party mobile payment is convenient and will improve work efficiency and quality of life. In the original TAM model, perceived usefulness is a fundamental part of the model and is closely related to the use of attitudes and behaviors. A large body of literature also confirms that perceived usefulness has a positive impact on willingness to use. For example, [Chen and Qiu \(2017\)](#) have confirmed that the perceived usefulness in the user acceptance model of third-party mobile payment has a positive impact on the willingness to use ([Chen & Qiu, 2017](#)). [Abrazhevich \(2002\)](#) found in the study whether the payment system is convenient or not, whether the funds are flexible, payment security, trust has a significant impact on consumers' choice of online payment system ([Abrazhevich, 2002](#)); for users, using third-party mobile payment for payment Trading can save time and improve efficiency. Online payment can quickly avoid location constraints. Offline can avoid forgetting trivial problems such as wallet going out and changing, and can solve life trivial problems online, such as recharge, credit card repayment, Pay the utility bill, etc. This paper speculates that consumers will have higher perceived usefulness when faced with such a series of convenient and efficient functions provided by third-party mobile payment, and then generate a strong willingness to use. Based on the above discussion, this paper proposes the following assumptions:

Hypothesis H1: Perceived usefulness positively affects consumers' perceived value for third-party mobile payments.

Assume that H2: perceived usefulness positively affects consumers' willingness to use third-party mobile payment payments.

3.4.2. Perceived Ease of Use

With regard to cognitive ease of use and cognitive usefulness, David proposed a

technology acceptance model in 1989. He believes that there are two main determinants in the model: perceived usefulness, perceived ease of use, and perceived usefulness. A system can improve the level of performance of its own work; perceived ease of use is the user's perception of whether a system is easy to use (Davis, 1989). Perceived ease of use in this article refers to whether consumers feel that third-party mobile payment is easy to use, and the operation process is simple and uncomplicated. Based on the above argument, this paper proposes the following hypothesis:

Hypothesis H3: Perceived usability is positively affecting consumers' perceived value for third-party mobile payments.

Hypothesis H4: Perceived usability is positively affecting consumers' willingness to use third-party mobile payments.

3.4.3. Perceived Risk

Regarding the issue of risk and trust, Wang et al. (2003) puts the perceived risk into the technology acceptance model (Wang et al., 2003). Kong et al (2011) in the measurement of the user's willingness to use the Internet to study the privacy risk, service risk, body Risk and psychological risk are summarized into four dimensions of perceived risk, and further demonstrates that the means of third-party payment affects the four dimensions of perceived risk (Kong, Chen, & Yan, 2011). In this paper, perceived risk refers to privacy risk and security risk. The real information provided by the consumer to the third-party mobile payment platform belongs to personal privacy information. If the information is not protected, it will bring privacy risks to the consumer and cause trouble. Security risk refers to the risk that the bank card is bound to a third-party mobile payment wallet, whether the payment password will be leaked, and whether the funds will be stolen. Therefore, based on the above discussion, the following assumptions are made:

Hypothesis H5: Perceived risk negatively affects the perceived value of consumers for third-party mobile payments.

Hypothesis H6: Perceived risk negatively affects consumers' willingness to use third-party mobile payments.

3.4.4. Social Impact

Regarding social impact, Ye and Hou (2011) adopts the integrated information receiving model (LTAUT) to obtain performance expectation, hard work expectation and social impact, and trust has a positive correlation with the user's willingness to adopt: the perceived trust in trust is positively related to trust. Perceived payment security importance has a regulatory effect on its relationship. Perceived privacy protection has no significant positive correlation with trust. The perceived importance of privacy has no adjustment effect on its relationship (Ye & Hou, 2011). On the basis of Davids' theory, scholars have been improving and perfecting. Venkatesh & Davids (2000) added the influence factors such as social influence and perceived website operation efficiency to the technology ac-

ceptance model (Venkatesh & Davis, 2000) in order to make the model closer to its research. In this article, social impact means that when people around you are using third-party mobile payments, it will have a subtle influence on you, and you will want to try it. Based on the above argument, the following assumptions are made:

Hypothesis H7: Social impact positively affects consumers' willingness to use third-party mobile payments.

3.4.5. Individual Innovation

Regarding innovation, Rakhi and Srivastavamala (2014) added individual innovation based on the theory of innovation diffusion, and verified that individual innovation has a positive impact on the willingness to adopt mobile payment services (Rakhi & Srivastavamala, 2014); Qiu & Li (2008) considers consumption. The original model is improved on the basis of credit and perceived entertainment (Qiu & Li, 2018). In this paper, personal innovation refers to whether it is easy to accept the emergence of a new thing, whether it is curious about new things. Based on the above argument, the following assumptions are made:

Hypothesis H8: Individual innovation positively affects consumers' willingness to use third-party mobile payments.

3.4.6. Perceived Value

Perceived value refers to the user's choice of whether to accept and use the product and service for the most profit-seeking after weighing the perceived profit and perceived profit and loss. The greater the perceived value of a user when facing a product or receiving a service, the greater the probability that the user will accept the product and service. Research by Flint, Blocker & Boutin Jr. (2011) shows that perceived value has a positive impact on users' willingness to use (Flint et al., 2011). Therefore, this study proposes the following assumptions regarding the relationship between perceived value and willingness to use: Assume H9: The perceived value of the user's third-party mobile payment significantly positively affects the user's willingness to use.

3.5. Definition and Measurement of Each Variable

Definition of Variables

This paper summarizes the research results of scholars, and considers the purpose and research object of this study comprehensively. The following variables are defined as shown in Table 1. (Source: This study)

3.6. Proposing and Recycling of the Questionnaire

3.6.1. Research Form

In this paper, Chinese Mainland region selects Alipay payment and WeChat payment as the influencing factors of research users' willingness to use mobile payment for third parties. In Taiwan, due to the large number of payment software

Table 1. Definition of variables.

variable	Variable definition	source
Perceived usefulness	Users perceive the convenience of third-party mobile payment, meet personal use requirements, improve work efficiency and quality of life	Chen and Qiu (2017), Abrazhevich (2002)
Perceived ease of use	The user feels that it is easy to use and the operation process is simple and uncomplicated.	David (1989)
Social influence	People around the user are using third-party mobile payments to have a subtle influence on him, and the user wants to try it.	Ye & Hou (2011), Venkatesh and David (2000)
Personal innovation	Users are easy to accept the emergence of a new thing, curious about new things.	Rakhi & Srivastavamala (2014), Qiu and Li (2008)
Perceived value	After weighing the perceived gains and perceived gains and losses, the user chooses whether to accept and use the product and service for the maximum benefit.	Flint, Blocker, & Boutin Jr. (2011)

and user dispersion, the overall action payment is selected as the research, so the respondents need have a certain experience in mobile Internet use, therefore, the form of the questionnaire is mainly carried out through the mobile Internet. The pipeline of the survey selected the current and more professional "Questionnaire Star" questionnaires and the Google form to publish questionnaires in two regions, and distributed and collected data through Internet social media such as WeChat and line. At the same time, use the school's students and classrooms to conduct offline research to ensure the validity and accuracy of the sample data.

3.6.2. Research Objects

This paper mainly selects third-party mobile payment people with certain experience, including 18 - 25 years old, 26 - 35 years old, 35 - 45 years old, and people of different ages over 45 years old. In general, the test subjects cover different age groups and different Internet experience groups, making the research of this paper more universal.

3.6.3. Research Area

The questionnaire area mainly includes Dongguan and Taipei and New Taipei.

3.6.4. Data Size

According to the requirements of statistical analysis, in order to ensure the rationality and effectiveness of the data, each questionnaire has one question; it

needs 5 - 10 sample data for statistical analysis. The questionnaire in this paper has a total of 26 items, so the minimum sample size needs to have 130 samples. The correctness (error) of the probability sample can be calculated by simply. To get the sample error map, the formula is: positive or negative ratio of sample error

$$\text{MOE} = 1.96 \sqrt{\frac{\pi(1-\pi)}{N}}$$

4. Empirical Research Results and Analysis

Based on the sample data collected from the questionnaire, this article uses statistical analysis methods to conduct empirical analysis to study the relationship between the user's willingness to use and various factors.

4.1. Sample Descriptive Analysis

4.1.1. Taiwan Area Data

As can be seen from **Table 2**, the ratio of male to female in the sample of this survey is 76.43% and 23.57%, respectively. The proportion of males and females is not coordinated, and the number of female students is large. The age of the samples is mainly concentrated in 18 - 25 years old and under 18 years old. The age group, the proportion of the total number of people is 75.80% and 17.83%, respectively, a total of 93.53%; the education level of the sample is distributed in universities, colleges and high schools, of which 48.41% are university-based, followed by 39.13%. In summary, the main characteristics of the survey sample are summarized as: younger, female majority, students and academics.

Table 2. Sample basic data and statistical results (n = 157).

Demographic characteristics	classification	Number of people	Proportion of total population
gender	Female	120	76.43%
	male	37	23.57%
age	18 - 25 years old	119	75.80%
	Under 18 years old	28	17.83%
	26 - 35 years old	4	2.55%
	36 - 45 years old	2	1.27%
	Over 45 years old	4	2.55%
education level	the University	76	48.41%
	High school	21	13.38%
	Specialist	60	38.22%

(Source: This study).

4.1.2. Chinese Mainland Area Data

As can be seen from **Table 3**, the ratio of male to female in the sample of this survey is 32.94% and 67.06%, respectively, and the number of females is mostly; the age of the sample is mainly concentrated at 18 - 25 years old, accounting for 91.76% of the total number; the education level is distributed in the university, accounting for 83.53% of the total number. In summary, the main characteristics of the survey sample are summarized as: younger, more female, and undergraduate.

4.2. Sample Population Using the Internet and Third-Party Mobile Payment Statistics

4.2.1. Taiwan Area Data

1) Internet usage

This paper mainly investigates the average traffic of users' monthly Internet access. The survey results are shown in the following **Table 4**:

Table 3. Sample basic data and statistical results (n = 170).

Demographic characteristics	classification	Number of people	Proportion of total population
gender	Female	56	32.94%
	male	114	67.06%
age	Under 18 years old	5	2.94%
	18 - 25 years old	156	91.76%
	26 - 35 years old	2	1.18%
	36 - 45 years old	1	.59%
	Over 45 years old	6	3.53%
education level	Junior high school and below	2	1.18%
	High school	10	5.88%
	College	14	8.24%
	Bachelor	142	83.53%
	Master's degree and above	2	1.18%

(Source: This study).

Table 4. Average monthly Internet usage traffic (n = 157).

Average monthly flow	Number of people	Proportion of total population
500 M	6	3.82%
500 M - 1 G	5	3.18%
1 G - 3 G	33	21.02%
5 g or more and eat full flow	113	71.97%

(Source: This study).

Among them, users with a monthly traffic of 5 g and above accounted for the most, accounting for 71.97% of the total number of users, followed by users of 1 g - 3 g, accounting for 21.02% of the total number, and less than 500 m and below, accounting for 3.82% of the total number. Overall, the users in the sample spend more time on the Internet and have a certain understanding of the Internet.

2) Third-party mobile payment usage

According to the fund policy survey, the top three mobile payment services in the Taiwan market are Line pay, Apple pay and street payment. In this survey of third-party mobile payment tools, Line pay was the most used, accounting for 37.89% of the total number of people, which is basically consistent with the survey by the Institute showing in **Table 5**. The number of other payment instruments is small, and the sample of cash payment accounts for 19.25% of the total number. This shows that the penetration rate of third-party mobile payment is not high. From the use frequency of **Table 6**, the sample size of 5.10% of the total number is used every day, and basically does not need to account for 56.69%. It can be seen that cash payment is still the choice of most people, and the development space of third-party mobile payment is huge.

4.2.2. Chinese Mainland Area Data

1) Internet usage

This paper mainly investigates the average traffic of users' monthly Internet access. The survey results are shown in **Table 7**.

Among them, users with a flow rate of 5 g or more per month accounted for 57.08% of the total number, followed by 1 g - 3 g, accounting for 19.41% of the total number, and less than 500 m and below, accounting for 2.94% of the total number. Overall, users spend more time on the Internet in the sample and have a certain understanding of the Internet.

Table 5. Use of third-party mobile payment tools (n = 157).

payment method	Number of people	Proportion of total population
Line Pay	61	37.89%
Street payment	25	15.53%
Apple pay	27	16.77%
Taiwan Pay	13	8.07%
Ou Fubao	5	3.11%
Zhifubao	5	3.11%
Orange payment	2	1.24%
International company	2	1.24%
Not used	31	19.25%
Alipay	2	1.24%

(Source: This study).

2) The use of Alipay/WeChat payment

According to **Table 8**, the number of people who use Alipay/WeChat to pay almost every day is the highest, accounting for 82.94% of the total number, and the basic number of people who do not use is 1.18%.

4.3. Analysis of the Reliability and Validity of the Questionnaire

Reliability is reliability. It refers to the degree of consistency of results obtained by repeating measurements on the same object in the same way. Reliability analysis is used to evaluate the stability or reliability of the questionnaire. The method of reliability analysis mainly includes Cronbach α coefficient, test-retest reliability method, copy the reliability method and the semi-trust method.

Table 6. Frequency of third-party mobile payment (n = 157).

	Number of people	Proportion of total population
Basically not used	89	56.69%
Used almost daily	8	5.10%
1 - 3 times a week	25	15.92%
4 - 6 times a week	4	2.55%
Used before	31	19.75%

Table 7. Average monthly Internet usage traffic (n = 170).

Average monthly flow	Number of people	Proportion of total population
Below 500 M	5	2.94%
500 M - 1 G	14	8.24%
1 G - 3 G	33	19.41%
3 G - 5 G	21	12.35%
5 g or more	97	57.06%

(Source: This study).

Table 8. Alipay/WeChat payment frequency (n = 170).

	Number of people	Proportion of total population
Used almost daily	141	82.94%
4 - 6 times a week	16	9.41%
1 - 3 times a week	11	6.47%
Basically not used	2	1.18%

(Source: This study).

In this paper, the first method, the Cronbach α coefficient method, is used to analyze the reliability of the questionnaire. In general, the Cronbach α coefficient is above .90, indicating that the reliability of the study scale is very reliable; at .80 - .90, the study scale is very reliable; at .70 - .80, the study scale is The reliability is better; at .65 - .70, the reliability of the research scale is in the lowest acceptable range; below .65, the scale should be revised, that is, the reliability is low.

Validity is the degree of validity. It refers to the degree to which a measurement tool or means can accurately measure the things to be measured. The more consistent the measurement results are with the content to be examined, the higher the validity; otherwise, the more effective low. Validity analysis is mainly divided into three types: content validity, criterion validity and structural validity.

In this paper, Bartlet sphere test and KMO sample measure will be performed on the scale to test the correlation between the questions. The correlation between the questions is high, which is suitable for factor analysis. On this basis, this paper uses factor analysis to verify the structural validity of the scale.

The Bartlet sphere test judges whether the corresponding p value is less than .05. When the p value is lower than .05, it indicates that it is suitable for exploratory factor analysis by Bartlet sphere test.

4.3.1. Reliability Analysis

1) Taiwan area data

In this paper, the reliability analysis of each research variable is carried out first. The analysis results are shown in **Table 9**.

As can be seen from **Table 9**, the Cronbach α coefficient of each variable is greater than .7, and the overall reliability is .943, and the reliability is very high. It is concluded that the indicators, dimensions and overalls of this paper show a high degree of consistency. This questionnaire has stability and reliability, so the next step can be studied.

2) Chinese Mainland area data

It can be seen from **Table 10** that the Cronbach α coefficient of each variable is greater than .7, and the overall reliability is .937, and the reliability is very high. It is concluded that the indicators, dimensions and overalls of this paper show a high degree of consistency. This questionnaire has stability and reliability, so the next step can be studied.

4.3.2. Validity Analysis

This paper then performs a KMO test and a Bartlet sphere test on the collected sample data. The test results are shown in **Table 11**.

It can be seen from **Table 11** and **Table 12** that the KMO values in Taiwan and Chinese Mainland are .913 and .916 respectively, which is higher than the evaluation standard of .6. The Bartlet sphere test has a significance of .000 and less than .05. It has passed the Bartlet sphere test and is very suitable for factor analysis. .

Table 9. Taiwan area data variables and overall reliability test (n = 157).

Research variable	Number of indicators	Cronbach α
Perceived usefulness	4	.903
Perceived ease of use	3	.939
Perceived risk	4	.936
Social influence	3	.897
Personal innovation	2	.896
Perceived value	3	.914
Overall reliability	19	.943

(Source: This study).

Table 10. Sample data of Chinese Mainland area and the overall reliability test (n = 170).

Research variable	Number of indicators	Cronbach α
Perceived usefulness	4	.963
Perceived ease of use	3	.952
Perceived risk	4	.853
Social influence	3	.910
Personal innovation	2	.891
Perceived value	3	.896
Overall reliability	19	.937

(Source: This study).

Table 11. Sample data of Taiwan KMO and Bartlett sphere test (n = 157).

	index	result
Sampling enough Kaiser-Meyer-Olkin metrics		.913
	Approximate chi square	2847.897
Bartlett's sphericity test	df	171
	Sig.	.000

Table 12. Sample data of Chinese Mainland area KMO and Bartlett sphere test (n = 170).

	index	result
Sampling enough Kaiser-Meyer-Olkin metrics		.916
Bartlett's sphericity test	Approximate chi square	3319.985
	df	171
	Sig.	.000

(Source: This study).

After the KMO and Bartlett sphere test, the principal component analysis method is used to perform factor rotation analysis on the questions in the questionnaire, and the factor load of each variable is obtained, as shown in **Table 13** and **Table 14**. It can be seen from the table that the factor load value of each item is greater than .6, which meets the requirement of factor load. In addition, the overall interpretation variance of sample data in Taiwan and sample data in Chinese Mainland is 75.76% and 76.238%, which is greater than 60%. It can be concluded that each item of the questionnaire better represents the variables involved in the study, has a high structural validity, and can be used for subsequent analysis of the sample.

Based on the appeal analysis, the sample data in this paper can be considered to meet the reliability and validity index requirements, and subsequent analysis can be performed through reliability and validity.

Reliability analysis is to evaluate whether the questionnaire is consistent and stable. In order to make the questionnaire reliable and stable, this study uses Cronbach's Alpha value for analysis to test the internal consistency and the reliability of the understanding scale.

Table 13. Factor load of each measurement item in Taiwan sample data (n = 157).

Factor	index	Factor load
Perceived usefulness	1	.783
	2	.753
	3	.819
	4	.801
Perceived ease of use	1	.759
	2	.715
	3	.748
Perceived risk	1	.906
	2	.905
	3	.904
	4	.905
Social influence	1	.707
	2	.743
	3	.853
Personal innovation	1	.826
	2	.787
Perceived value	1	.763
	2	.786
Willing to use	1	.744

Table 14. Factor load of each measurement item in the sample data of Chinese Mainland area (n = 170).

Factor	index	Factor load
Perceived usefulness	1	.856
	2	.856
	3	.872
	4	.888
Perceived ease of use	1	.746
	2	.727
	3	.747
Perceived risk	1	.845
	2	.879
	3	.856
	4	.733
Social influence	1	.695
	2	.757
	3	.775
Personal innovation	1	.842
	2	.794
Perceived value	1	.748
	2	.718
Willing to use	1	.760

(Source: This study).

4.4. Relevant Analysis

This section will use SPSS 17.0 to analyze the correlation between perceived usefulness, perceived ease of use, perceived risk, social impact, individual innovation, perceived value, and willingness to use. In this paper, the Pearson correlation coefficient is used to measure the correlation between them, reflecting the degree of linear correlation between the two variables. The larger the r value, the stronger the correlation.

4.4.1. Taiwan Data

As can be seen from **Table 15**, all variables have a positive correlation at the .01 level.

4.4.2. Chinese Mainland Data

It can be seen from **Table 16** that there is a significant correlation between social impact and perceived value, and the correlation between perceived risk and perceived value and willingness to use. All other variables have a positive correlation at .01 level. Based on this paper, a regression model can be run for causality testing.

Table 15. Table of correlations between variables.

variable	Perceived usefulness	Perceived ease of use	Perceived risk	Social influence	Personal innovation	Perceived value	Willing to use
Perceived usefulness	1						
Perceived ease of use	.790 ^{**}	1					
Perceived risk	.261 ^{**}	.164 [*]	1				
Social influence	.603 ^{**}	.668 ^{**}	.188 [*]	1			
Personal innovation	.587 ^{**}	.670 ^{**}	.251 ^{**}	.720 ^{**}	1		
Perceived value	.649 ^{**}	.702 ^{**}	.256 ^{**}	.725 ^{**}	.824 ^{**}	1	
Willing to use	.664 ^{**}	.645 ^{**}	.209 ^{**}	.692 ^{**}	.732 ^{**}	.845 ^{**}	1

(Source: This study). Note: ** indicates significant at .01 level.

Table 16. Table of correlations between variables.

variable	Perceived usefulness	Perceived ease of use	Perceived risk	social influence	Personal innovation	Perceived value	Willing to use
Perceived usefulness	1						
Perceived ease of use	.825 ^{**}	1					
Perceived risk	.136	.178 [*]	1				
Social influence	.666 ^{**}	.743 ^{**}	.140	1			
Personal innovation	.559 ^{**}	.666 ^{**}	.159 [*]	.733 ^{**}	1		
Perceived value	.690 ^{**}	.690 ^{**}	.091	.754 ^{**}	.721 ^{**}	1	
Willing to use	.654 ^{**}	.689 ^{**}	.076	.723 ^{**}	.698 ^{**}	.832 ^{**}	1

(Source: This study).

4.5. Regression Analysis

The data analysis results in the previous section show that there is a significant correlation between the variables, but it does not indicate that there is a causal relationship between them. In this section, we use the linear regression model to perform regression analysis on the data using the mandatory entry method and conduct hypothesis testing.

4.5.1. Influence Variables and Perceived Value

In order to avoid the influence of the interaction between various factors on the research results, the three factors affecting the perceived value of the third-party mobile payment in the two regions—perceive usefulness, perceived ease of use, and perceived risk are linear. Regression, the results are summarized as shown in **Table 17** and **Table 18**.

Table 17. Regression effects of various factors in Taiwan on perceived value (n = 157).

model	Non-standardized regression b	Standardized regression coefficient β	f value	Judgment coefficient r	Adjusted coefficient r square after adjustment
Constant term	1.338				
Perceived usefulness	.651	.649	152.573	.421	.417
Constant term	1.501				
Perceived ease of use	.641	.702	150.806	.493	.490
Constant term	2.880				
Perceived risk	.250	.258	10.960	.066	.060

(Source: This study).

Table 18. Regression effects of various factors on perceived value in Chinese Mainland (n = 170).

model	Non-standardized regression b	Standardized regression coefficient β	f value	Judgment coefficient r	Adjusted coefficient r square after adjustment
Constant term	1.561				
Perceived usefulness	.590	.69	152.573	.476	.473
Constant term	1.450				
Perceived ease of use	.617	.69	152.578	.476	.473
Constant term	3.920				
Perceived risk	.079	.091	1.409	.008	.002

(Source: This study).

1) The perceived usefulness of data in Taiwan explains 41.7% of the use attitude and has a good explanatory power; the perceived usefulness of data in Chinese Mainland region explains 47.3% of the use attitude and has a good explanatory power. The f values of the two regional data models are sig = .000, less than .05, so the null hypothesis is rejected. The regression effect of the model is significant, and the perceived usefulness has a significant positive effect on the perceived value. Therefore, it is assumed that H1 is established;

2) Data perceived ease of use in Taiwan explained 49% of the attitude of use and has a good explanatory power; the perceived usefulness of data in Chinese Mainland explained 47.3% of the attitude of use, which has a good explanatory power. The f values of the two regional data models are sig = .000, less than .05, so rejecting the null hypothesis, the regression effect of the model is significant,

and the perceived ease of use has a significant positive effect on the perceived value, so it is assumed that H2 is established;

3) In the regression analysis of the perceptual value of data perception risk in Taiwan, the adjusted judgment coefficient is .060, and the explanatory power is poor; the judgment coefficient of the data perceived usefulness in Chinese Mainland is .002, and the explanatory power is poor. The sig = .001 of the Taiwan model is less than .05, so the null hypothesis is rejected. The regression effect of the model is significant, and the perceived risk has a significant negative impact on the perceived value. Therefore, the Taiwan region data assumes that H5 is established; The sig = .237 of the f value of the regional model is greater than .05, so the effect of the model is not significant. Perceived risk does not have a significant negative impact on perceived value, so Chinese Mainland region data assumes that H5 does not hold.

4.5.2. Influence Variables and Willingness to Use

Then, the six factors that influence the willingness to use third-party mobile payment-perceive usefulness, perceived ease of use, perceived risk, social impact, individual innovation and perceived value are analyzed by using a linear regression analysis. The results are shown in **Table 19** and **Table 20**.

Table 19. Regression effects of various factors on the willingness to use in Taiwan.

model	Non-standardized regression b	Standardized regression coefficient β	f value	Judgment coefficient r	Adjusted coefficient r square after adjustment
Constant term	1.035				
Perceived usefulness	.711	.664	122.274	.441	.437
Constant term	1.476				
Perceived ease of use	.628	.645	110.692	.417	.413
Constant term	2.966				
Perceived risk	.210	.203	6.603	.041	.035
Constant term	1.361				
Social influence	.654	.692	142.707	.479	.476
Constant term	.669				
Personal innovation	.803	.732	179.191	.536	.533
Constant term	.308				
Perceived value	.902	.845	387.928	.715	.713

(Source: This study).

Table 20. The regression effect of each factor on the data of Chinese Mainland.

model	Non-standardized regression b	Standardized regression coefficient β	f value	Judgment coefficient r	Adjusted coefficient r square after adjustment
Constant term	1.719				
Perceived usefulness	.570	.654	125.389	.427	.424
Constant term	1.467				
Perceived ease of use	.629	.689	152.203	.475	.472
Constant term	4.031				
Perceived risk	.067	.076	.966	.006	0
Constant term	1.230				
Social influence	.718	.723	184.358	.523	.520
Constant term	1.488				
Personal innovation	.670	.698	159.807	.488	.484
Constant term	.708				
Perceived value	.848	.832	377.149	.692	.690

(Source: This study).

4) Perceived usefulness in Taiwan explained 43.7% of the attitude of use. The perceived usefulness of Chinese Mainland explained 42.4% of the use attitude and had good explanatory power. The f values of the data models in both regions were sig = .000 and less than .05. Therefore, rejecting the null hypothesis, the regression effect of the model is significant, and the perceived usefulness has a significant positive effect on the willingness to use, so it is assumed that H2 is established;

5) Data perceived ease of use in Taiwan explained 41.3% of the attitude of use. The perceived usefulness of data in Chinese Mainland explained 47.2% of the attitude of use, which has a good explanatory power. The f values of the two regional data models are sig = .000, less than .05, so the null hypothesis is rejected. The regression effect of the model is significant, and the perceived ease of use has a significant positive effect on the willingness to use. Therefore, it is assumed that H4 is established;

6) The data perceived risk in Taiwan explained 3.8% of the attitude of use, and the explanatory power was poor; the adjusted coefficient in Chinese Mainland was 0, and there was no explanatory power. Taiwan's model f value is sig = .009, less than .05, so the null hypothesis is rejected. The regression effect of the model is significant, and the perceived risk has a significant positive effect on the willingness to use. Therefore, the Taiwan region data hypothesis H6 is established; the continental region model. The sig = .327 of the f value is greater than .05.

The effect of the model is not significant, and the perceived risk does not have a significant negative impact on the willingness to use. Therefore, it is assumed that H6 does not hold for the data of Chinese Mainland region.

7) The data social impact in Taiwan explained 47.6% of the attitude of use. The social impact of data in Chinese Mainland explained 52% of the attitude of use and has a good explanatory power. The f values of both models are $\text{sig} = .000$, less than $.05$, so rejecting the null hypothesis, the regression effect of the model is significant, and the social impact has a significant positive effect on the willingness to use, so it is assumed that H7 is established;

8) The personal innovation of Taiwan data explained 53.3% of the attitude of use. The data of Chinese Mainland personally explained 48.4% of the attitude of use, which has a good explanatory power. The f values of both models are $\text{sig} = .000$, less than $.05$, so the null hypothesis is rejected, the regression effect of the model is significant, and the individual innovation has a significant positive effect on the willingness to use, so it is assumed that H8 is established;

9) The perceived value of data in Taiwan explains 71.3% of the attitude of use. The perceived value of data in Chinese Mainland region explains 69% of the attitude of use and has a good explanatory power. The f values of both models are $\text{sig} = .000$, less than $.05$, so the null hypothesis is rejected, the regression effect of the model is significant, and the perceived value has a significant positive effect on the willingness to use, so it is assumed that H9 is established;

5. Summary

5.1. Research Conclusions

In recent years, third-party mobile payment has developed rapidly in Chinese Mainland. Alipay payment and WeChat payment account for 94% of the market's third-party mobile payment, but there is still a large market to be developed. Since the third-party payment regulations have been loosened in Taiwan, third-party mobile payment tools have emerged everywhere, but consumer spending habits of using cash payments over the years are still difficult to shake.

Therefore, this paper uses the results-perceived value model and the content of the technology acceptance model to make adjustments and improvements, including the factors of perceived usefulness, perceived ease of use, social influence, individual innovation and perceived value. The three-way mobile payment willingness model theoretically analyzes the main influencing factors and the degree of influence.

The data in Chinese Mainland is mainly based on Alipay and WeChat payments, and the number of users in Taiwan is distributed among various payment instruments. Therefore, multiple payment instruments are selected to verify the validity of the model from an empirical perspective. Through empirical analysis, this paper draws the following conclusions:

1) In the data of the two places, perceived usefulness and perceived ease of use have a significant positive impact on perceived value, while perceived risk has a

significant negative impact on perceived value, due to the current third-party mobile payment in Taiwan. At the initial stage, there are many payment instruments in the market, and consumers are skeptical about these payment instruments. However, the negative impact of perceived risk on perceived value in Chinese Mainland data is not significant. This may be due to the continuous development of Alipay and WeChat payment in the past few years, and consumers have already generated a trustworthy attitude.

2) In the data of the two places, perceived usefulness, perceived ease of use, perceived value, social impact and individual innovation have a significant positive impact on the willingness to use. In Taiwan data, perceived risk is willing to use. There is a significant negative impact. However, the perceived risk in the data of Chinese Mainland does not have a significant positive impact on the willingness to use. Due to the different degrees of development of third-party mobile payments in the two places, people have different willingness and attitude towards it. As Taiwan is in its infancy, third-party mobile payment tools are on the market, and the public has a certain degree of doubt about its security and risk. The payment of Alipay and WeChat in Chinese Mainland has been relied on in recent years. Degree and trust are rising, and its convenience and value in consumer perception have exceeded their risk.

3) Advice on the development of third-party mobile payment: improve product services, optimize product functions and systems, meet the needs of diverse customers, and develop into diversified financial services, not only for mobile payment, but also to meet the financial needs of customer service. At present, Alipay and WeChat payment increase the wealth management products and online payment to different extents, so that customers can further enhance the perceived usefulness, perceived ease of use and perceived value of the products; the dissemination of social software has been positively evaluated, improved user coverage, gained good reputation among customer groups, promoted the spread of third-party mobile payment users, improved system stability and security, and protected users' funds and customers. Privacy and security of information, etc., to enhance customer trust and establish a good corporate image.

5.2. Development of the Thesis

Due to some objective factors and other limitations, this paper may have a certain degree of limitations, mainly:

The sample investigators in this article are mainly concentrated on college students. Although college students are the main force of third-party mobile payment, their economic strength is insufficient. The data obtained can only represent this group, can not represent all groups, and has certain restrictions. Sex, so future developments can be investigated and popularized by different groups of people.

This paper combines the research results of scholars and the development status of third-party mobile payment, and puts forward the influence of perceived

usefulness, perceived ease of use, perceived risk, social influence, individual innovation and perceived value on the willingness to use. But beyond that, there may be other influencing factors. In the future, with the development of third-party mobile payment, more influencing factors will be added to make up for the shortcomings.

This paper proposes research and discussion on third-party payment in Chinese Mainland and Taiwan, which is very innovative. In the future, it is necessary to strengthen the discussion of literature, including mobile payment and fintech-related literature. And the validity is richer.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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