

Online Usage of Electronic Payment Investigation and Problem Analysis*

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Abstract - This paper aims at studying and analyzing China's existing e-payment usage by setting up an online survey according to its development trends.

Index Terms - Electronic money, Online payment, Alipay

1. Introductions

The appearance and growth of cyberspace have brought profound changes in financial activity space and payment. The electronic data exists as electronic money become very popular. A large number of physical currency transforming into electronic money flow on a high-speed on the network. Internet-based electronic money freely flows in the global in digital form, broking the limit of national boundaries, and its ability to cross-border flows beyond the gold and silver currency and banknotes and other forms of physical movement, but also a substantial increase in flow velocity. In China, nowadays, the largest online payment platform is "Alipay"[1], in the United States, the largest online payment platform is "Paypal". Electronic money has become the main form of online payment and mobile payment and other areas, the whole field of online payment is explosive growing[2].

National security includes political security and economic security. Information cyberspace electronic payment system security is directly related to a country's economic lifeline and political stability, and should become an important strategic consideration. Electronic payment increases the vulnerability of the financial system, reducing the financial system's ability to resist risks. Network has no borders, the network power can attack the enemy's electronic payment information systems via a network connection no matter where it is. Criminal groups, hackers, terrorists can also initiate electronic payment systems on the network attacks. One node on the network is destroyed, could trigger a domino effect, resulting in the paralysis of the financial system, causing huge economic turmoil, triggering the collapse of national confidence, and even threatening the country's political stability.

This paper aims at studying and analyzing China's existing e-payment usage by setting up an online survey according to its development trends

2. Online Usage of Electronic Payment Investigation

In view of the field of electronic money in the payment

of the importance, in order to more intuitive understanding of the use of electronic payments online status and existing problems, the author carried out for more than 500 users to "e-money online payment use surveys "as the theme of the questionnaire survey in March 2013 on the Internet.

A. Survey sample's selection

This study selected a thousand Internet users for the survey, the questionnaire survey was conducted in March 2013, the online survey ranking of 1927, a total of 529 questionnaires to fill a completion rate of 27.45%, excluding the 21 invalid questionnaires, 508 valid questionnaires were obtained. Limited to the writer's working condition; the sample of the questionnaire mainly includes government agencies / organizations / institutions of staff, the court / Procurator ate / police / military personnel, students, business leaders and other staff.

B. The basic structure of the questionnaire

According to electronic money using online payment status and related issues, in close connection with research needs, and carefully prepared questionnaire. Questionnaire is consisted of the basic situation of the person under investigation, using a variety of online payment platform in the frequency and amount, the amount paid to overseas, the temporary amount of online payment platform and other components, the matrix contains 10 questions and eight single-dimension problem, and two open questions. Through investigation, the preliminary results of the use of online electronic payment status, problems and related measures proposed for the research findings provide strong empirical evidence.

C. Technical methods used in the investigation

The survey uses the network self-administered questionnaire, we can expand the scope of data collection, and in order to prevent the emergence of more than one person fill out the questionnaire happens, technically from the network is limited to one computer only fill once a questionnaire design of a large matrix problem, a problem is equivalent to multiple single-dimensional matrix problem can be more detailed and accurate access to various types of data, the survey results with high uniformity, and relatively objective and easy to analyze.

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D. Investigation of use online electronic payment

1) *Percentage of the use of electronic money online payment the last five years.* From the research point of view, the survey sample did not use electronic money online payment users, there are 48.12% in 2008, then declined rapidly to 2012 when only 4.75% of the members have not used the online electronic payment, and there are already 95.25% of the members to use an online electronic payment, accounting for the vast majority of the survey sample (Fig. 1).

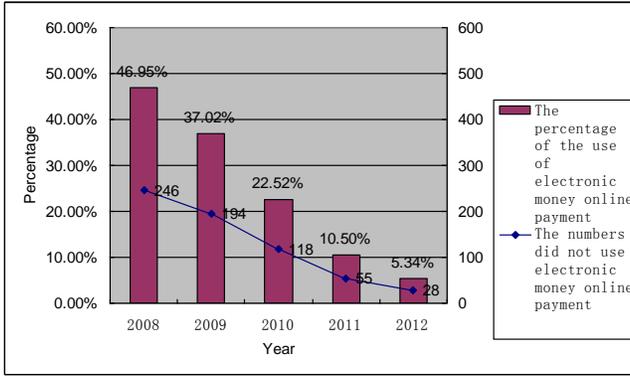


Fig. 1 2008-2012 Internet users do not use electronic payments

2) *Variety preferences of electronic money payment instruments.* Groups surveyed more than 4 times the average monthly use of electronic money payment instruments are the top two online banking, Paypal, while China UnionPay and TenPay less than a third of any former two. Show in Fig. 2.

3) *Concerns of the use of electronic payment order.* Surveyed groups in the use of electronic payment, great concerning whether the sort is easily stolen account password, disclosure of personal information, whether the victim of fraud can recover funds, the temporary account in the payment of funds will be misappropriated. Most respondents do not care whether the payment of funds to overseas, and can endure the tedious process of registration and opening, but paying more concerned about the slow tedious process and the payment process prone to failure. Show in Fig. 3.

4) *The use of electronic money payment for online authentication mode selection situation.* Cipher SMS authentication methods selected by the majority of respondents, followed by the password plus U shield plus mobile phone text messages. Show in Fig. 4.

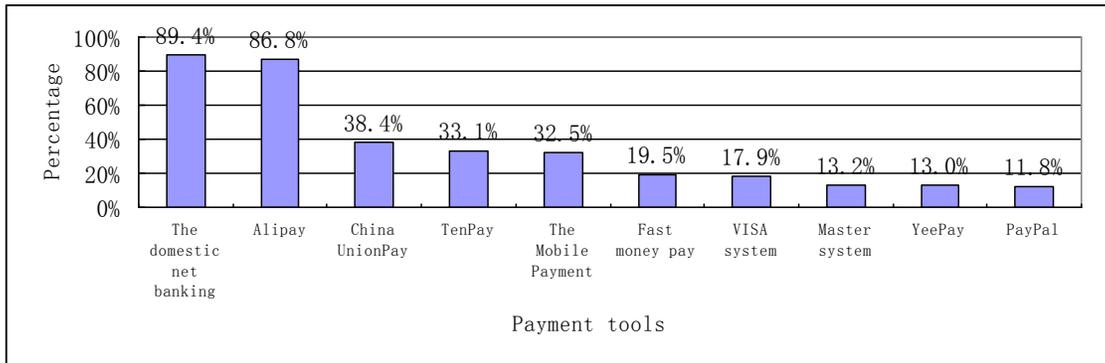


Fig.2 Situations of using payment tools

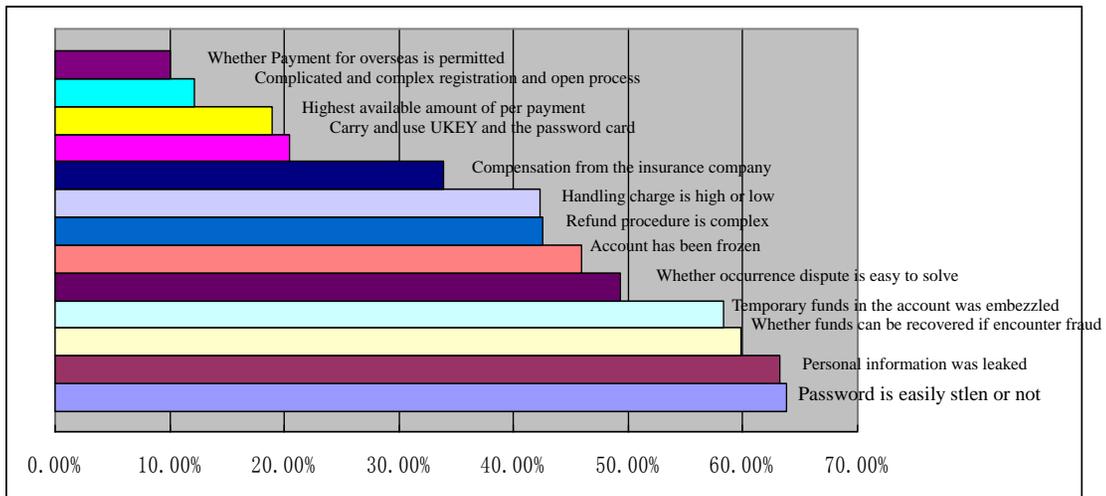


Fig. 3 Sorting the use of electronic payment concerns

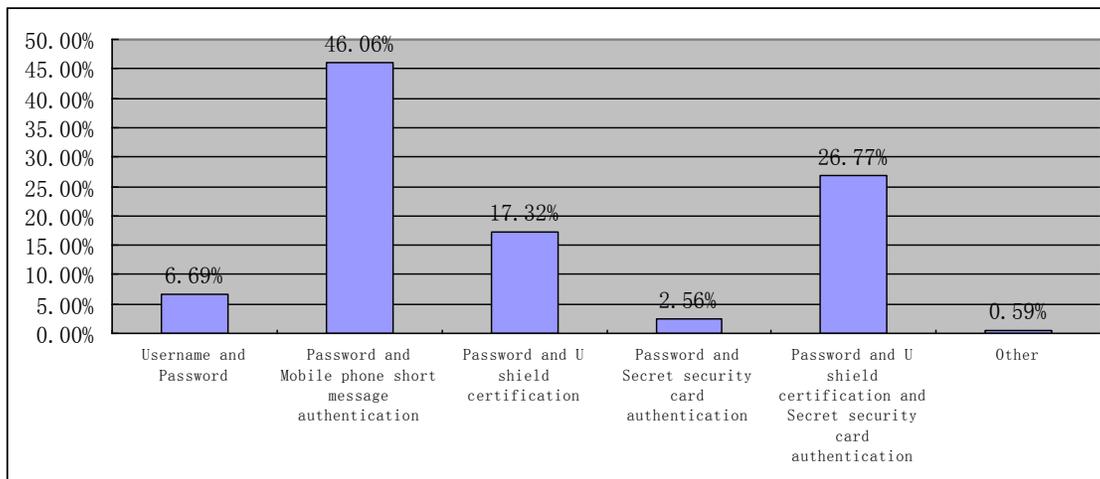


Fig. 4 Selection of authentication mode

3. Problem Analysis of Investigation

According to the survey analysis, from 2008 to 2012 in five years time, the rapid development of online electronic payment, electronic payments have not used the online users rapidly reduced to 2012 when only 4.75% of the sample members had not used online electronic payment. While single-use frequency rising rapidly, more than 4 times per month of Internet users from 2008 to 10.69% up to 34.85% in 2012, up more than threefold. From the data we can see online electronic payment status in reality rising year by year, and its importance can not be ignored.

A. Questions reflected from the Survey

Investigated groups prefer payment tools like Online banking and Paypal, mobile payment and other payment tools have yet to continue to develop.

The vast majority of respondents (90%) are more concerned about the problem of stolen electronic money online account, only a handful of respondents less concerned about theft problem. Because once stolen by the consumer to bear the loss, so investigators this concern is inevitable.

The vast majority of respondents (89%) are more concerned about their own temporary staff in the electronic money payment funds in the account will be misappropriated. Electronic money to put money into a number, but consumers can not control where the real money is, which also makes consumers are very concern.

The vast majority of respondents are more concerned about whether the use of electronic money payment will encounter fraud, for fraud aversion is high, reflecting the presence of the current credit environment more serious problem.

Personal privacy are disclosed. Most of the respondents (80 percent) are very concerned about the use of electronic currency online payment whether disclosure of personal information and privacy. As the need for online transactions, the user's personal information in the network, a lot of circulation, but also makes personal information and privacy is the possibility of exposure increases.

Insurance protection and relief. 63% of respondents who are very concerned about the loss occurred when using online payment can get the amount of insurance compensation. The truth is in many cases consumers are in a vulnerable position, most of the loss should an accident consumer unilaterally to bear.

Double or even triple certification authentication method is an urgent need, 72% of the surveyed population in the electronic money payment people more receptive to mobile phone text messages and U Shield verification of just by a user name and password authentication is not assured. This exposed the domestic online electronic payment transactions serious lack of security, and electronic money issuers and operators will be passed on to the various responsibilities of the user's head, users can only expect from a technically to avoid personal losses.

B. Web-based electronic payment technology security risks

Currently there are more than 100 companies to pay to get a license plate[3], but did not form several large standard pay communities. Multi-mode and manner of payment, confusion of payment standards. Contrast US online payment (including mobile payments), the biggest difference is that online payment in China is a user must intervene in the operation of the tedious process, and pay in the United States is an invisible process, all the user needs to do is click once button only. Domestic payment platform accounts funded largely by debit card, so the domestic payment platform in the payment process and the bank must establish real-time communication direct docking, third-party payment platform on the technical architecture for security is the first one, while domestic banks use of software and system solutions for almost all Microsoft, Microsoft system is precisely the most vulnerabilities system. Including many domestic enterprises and banking system can direct docking.

1) Browser plug-in brings new risks

At present, China's online banking security technology used in common is a browser plug-in, which is a less secure techniques, using a computer when the user is on an untrusted

environment, such as the user's computer system in a Trojan horse hiding the browser plug-in user's password cannot effectively prevent the risk of theft. Also, because users are accustomed to install plug-ins, this habit will reduce the external plug-ins to other users of vigilance, the software is easy to install an alien cause the system easier the Trojans lead to new risks. Technically speaking, a browser plug-in for enhancing security and not a lot of benefits, the browser uses HTTPS encryption can be fully guaranteed during transmission of sensitive information is not being monitored, you can replace the browser plug-in. However, the domestic enterprises in order to promote their own payment security, exaggerating the browser plug-in security. Even after installing the browser plug-in, it can not prevent the client's keyboard input being monitored danger.

2) Security controls manipulate local U Shield

Depending on your browser security restrictions, the browser can not access local resources, domestic payment institutions in order to access to the U Shield, can only rely on security controls, and security controls also provide some self-protection. Security controls are mainly used to read the information in the U shield and call U Shield for cryptographic operations, primarily authentication and digital signatures to achieve two functions, and leave for the operation of electronic evidence. U shield in smart chip + COS, the chip can perform cryptographic operations, save the key, COS is an operating system to manage these resources. U shield can be generated in an asymmetric key pair (typically RSA), through third-party digital certificate issued by a CA and imported into the U Shield, the private key + certificate on behalf of the customer's identity. If you use online banking to pay for U Shield, in fact, even the passwords do not need to, because the bank will do security checks. Domestic insecure network environment, user security awareness is weak, trojans rampant, financial institutions, payment confirmation link in doing intervention with control analysis of user behavior is still the feasible solution.

3) SMS confirmation

Now it seems that in our current environment, no controls with cell phone password to confirm payment, will be a more favorable solution. But once the phone is lost, the risk borne entirely by the mobile phone users, so once the risk of loss to the user will be significant.

4. Summary

Electronic payment trend is unstoppable, level and scope

of its application more widely, more and more people use, the public demand for and use of electronic money will explosive grow[4]. How to improve and protect the online trading environment to meet the needs of this rapidly developing not only related to the interests of consumers, but also affect the national security. This author has made the following recommendations:

First, improve our third-party payment mechanism for the regulation of a regulatory legal and regulatory system. At present, China's electronic money main issue is too many, with sound regulatory legal and regulatory system, the solution circulation and electronic money transfer channel chaos, payment and settlement system is not formed, the Internet, there are many flows and cross-border flows vulnerabilities and other issues will be been effectively controlled and resolved[5].

Second, build a sound social credit system. Protect the user's personal information, reducing the incidence of online fraud, improve network environment, and gradually build social integrity, making consumers feel comfortable, safe to use online payment. It is currently China's social credit system is imperfect, resulting in some consumers use online payment concerns still exist, it will affect the development of online payment is one of the elements.

Third, address security issues from technical, simplify the transaction process. Transaction process is too cumbersome and constraints will also affect the development of an online payment feature.

Fourth, from the perspective of maintaining national financial security, it is necessary to actively support vigorously promote online electronic payments on the Internet high flow, but also effectively prevent and respond to online electronic payments in the high-speed mobile Internet risks and crises.

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