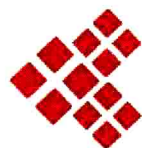


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**(NFD 2010)**

**Wuhan, China  
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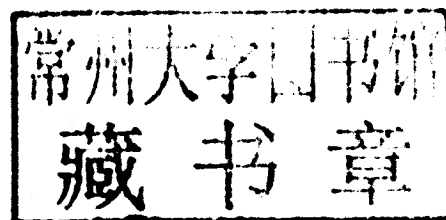


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## Preface

# 前 言

我们知道，科技与经济是始终社会发展的关键因素，随着计算机网络和信息技术的发展，互联网在经济领域中的应用越来越普遍，网络经济——这一新的经济形态在此环境中产生并蓬勃发展，对当前经济社会产生了空前的影响。在这样的时代背景下，网络与金融行业的发展都面临着新的机遇和挑战，同时也促使我们的科研工作者们在观念、理论、技术、和实践上进行积极的探索与创新。

《2010年网络与金融发展高层论坛论文集》是由湖北经济学院主办的2010年网络与金融发展高层论坛学术大会中收录的优秀论文汇集而成的。其作者大多是在金融、网络和信息技术领域中的科研与教育工作者，他们针对新的经济形态下的金融业务、金融风险、网络银行、电子商务、网络技术以及网络安全技术等方面进行了深入的研究、分析和探索性的实践，论文的选题、观点、理论与技术具有相当的时代感和现实意义。由于时间仓促，本论文集中或有疏漏与不妥之处，敬请广大读者批评指正，我们欢迎任何宝贵的意见和建议！

我们由衷的希望，随着《2010年网络与金融发展高层论坛论文集》的出版发行，可以促进更多的科研工作者、业界实践者、教育工作者们参与到新的经济形态下金融业、网络以及信息技术的研究与实践中来，从而加快我国经济建设的步伐，并为世界科学技术的进步，做出积极的贡献。

在此，我们还要特别感谢论文集的出版单位——美国科研出版社 (Scientific Research Publishing, SRP)，感谢贵单位在论文的出版过程中给予的大力帮助和支持！

论文编辑委员会

2010年5月10日

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# On the Error Handling and Safety Control in Electronic Funds Transfer

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**Abstract:** The safe electronic fund transfer is the important link of e-commerce. It is essential for us to guarantee the safety of electronic funds transfer and efficiently deal with the errors and other security problems. In this paper, by analyzing the liability of the safety problems, the processing methods that dealing with the errors of electronic funds transfer are represented from the aspects of standard, operation, technique and management to ensure safety in the security payment of the fund flow that took place between consumer and business, enterprise, intermediary agency and the bank through Internet network.

**Keywords:** electronic funds transfer; error dealing; safety control

## 1 Introduction

With the development of electronic commerce and the online banking, electronic funds transfer has become a popular payment method, which refers to the financial transaction and the exchange of information about funds through the network. It is a payment way that has real-time effectiveness by means of computer and network. In the open Internet environment, it is a common phenomenon that the data is intercepted or distorted in the process of electronic funds transfer. As we all know, safety and liability share is not only the primary problem in electronic funds transfer, but also what the bank and consumer concerns. In this paper, some measures of safety control are proposed from the aspects of standard, operation, technique and management.

## 2 Liability Standards in the Process of Electronic Fund Transfer

Electronic funds transfer errors, refers to the customer information leaked or tampered, or the Payment instructions is transmitted incompletely or tampered, or can't be transmitted in appointed time. Electronic payment instruction was not executed properly, punctually and even never be executed. It is necessary for us to define the duties and responsibilities clearly and follow the principle of truth and accuracy and on time when facing the electronic funds transfer errors. According to the existing regulations in China, the responsibility of the banks will be more considered. A series of operational errors such as improper storage and use by the bank, unfinished instruction, identity theft, improper operation of the customer and other risks caused by force majeure are bored by the bank .Meanwhile, the customer should still have some responsibility.

### 2.1 The Liability of the Bank

On October 26, 2005, the people's bank of China issued

*the first electronic payment instructions* (1) (the people's bank of China announcement [2005] NO. 23, which is abbreviated as guidance. There is provision in the fifth chapter, banks must take the responsibility for compensating for the customer if the mistakes are caused by the Banks system, internal control system of the banks or the third-party service providers. Even the electronic payment mistakes was caused by the customers, the bank should also actively announce and actively cooperate with clients to take remedial measures, find the reasons, try to reduce the loss of customers.

#### 2.1.1 Loss Remedy for Improper Storage and Use

Banks should keep the transaction records of the electronic payment properly, make careful record and registration of the errors which includes the proper time, context that the errors took place , the name who in charge of dealing with the errors, the customer information, the influence and the loss, the causes and handling results, etc.

If the customer information was leaked or tampered because of the improper storage and use of the bank, effective measures should be taken to prevent the loss of the customer, and inform and assist customers to remedy.

#### 2.1.2 The Loss Compensation for not Completing the Instruction

If the fact that the electronic payment instructions can't be transmitted in appointed time, or be transmitted incompletely or tampered was caused by the internal control institution and system of the banks, the bank should correct it in time and compensate for the loss. If the loss is caused by the third-party service providers, the banks should firstly compensate for it then ask the third-party service providers for the compensation.

#### 2.1.3 The Investigation on Identity Theft

The sponsoring bank should cooperate with customers to find the reasons, try to minimize the loss of customers if non-capital owner steal others' access tool and issue the

orders which can make its identity authentication and authorization be accepted by the safety procedure of the sponsoring bank.

#### **2.1.4 Assistance in the Improper Operation of the Client**

If the electronic payment instruction was not executed, or improper executed, or be delayed because the customers can't operate according to the rules, the customer should inform the bank in appointed time by appointed procedure and method. The bank should notify the client to make correction or cooperate with clients to take remedial measure.

#### **2.1.5 The Prevention of the Loss Expanding Caused by Force Majeure**

If the electronic payment instruction was not executed, or improper executed, or be delayed because of force majeure the bank should adopt positive measures to prevent further loss.

### **2.2 The Responsibility of the Client**

The client is responsible for safekeeping, using electronic payment transaction access tool, and assuming the obligations in accordance with the provisions of the operation. If the customer can't act within the framework of the obligation, they will bear the loss.

In one hand, the customers should keep and use the electronic payment transaction access tool properly. If the business information about the electronic payment and the access tools is lost or stolen, they should immediately notify the bank in appointed ways and procedures.

Similarly, if the electronic payment instruction was not executed, or improper executed, or be delayed because the customers can't operate according to the rules, or in the other word, the error is due to the client, the client should inform the bank in appointed time by appointed procedure and method.

### **3 Safety Control Methods in the Process of Electronic Funds Transfer**

The transfer of capital and personal privacy or commercial secret is involved in electronic funds transfer. Many administrative regulations such as *Guidelines on Electronic Payment*, Measures for the Administration of the Electronic Banking Business issued in 2005 have the rules about safety control of the electronic funds transfer in accordance with the potential safety hazard. Giving consideration to the practice of the electronic funds transfer and based on the existing law, the safety control of electronic funds transfer should be strengthened from the aspect of standard, business operation, technology and management.

#### **3.1 The requirement for the Standard of E-Payment Service**

The information security standards, technical and busi-

ness standards adopted by the banks in the electronic payment business should meet the business specification on technical and application level that determined by relevant state departments.

According to the relevant provisions, the banks use various means to ensure the safety of the operation system, the authenticity of the identity of clients, non-repudiation of the transaction data, confidentiality of the customer information, the integrity and reliability of transaction data, prevent them being tampered. The following conditions adopted in the standard must be satisfied at least, the first is to ensure the confidentiality of the data. During the process of the trading, all the data about the electronic funds transfer should be strictly confidential, nobody can understand the transaction data except the both transaction parties and the third party authorized. The second is to guarantee the integrity of the data. It means that the integrity and validity of electronic funds transfer data in the process of the transmission, the data sent by the message sender is the same and with that received by the receiver, without changed. The unexpected errors or fraud action of input data, the loss, repetition, wrong sequence and being tampered could lead to differences of all trade parties. All these are to ensure the integrity of the data and the data received by the receiver is the same with the original data. The third is the identity authentication. Even the transaction parties never meet, the bank can ensure they are the just both parties. The last standard is about the access control. After the completion of the identity authentication, the payment system can confirm the permission of the customer, and it can help the customer visit which protected data.

#### **3.2 The Reasonable Limitation on the Business Operation**

The banks are required that reasonable limitation should be made about the electronic payment type, single payment amount and daily total amount in terms of different customer.

The first is that when the bank handle e-payment service for individual customers through internet, the single payment amount can't be more than RMB1,000, daily total amount can't exceed RMB5,000 except security authentication is adopted such as digital certificates and electronic signatures. If the service is for the unit customer, the single payment amount that the unit customer paid for individual bank settlement accounts from that of the bank can't exceed RMB50,000. The condition that the bank and the customer made a appointment that they can provide the proof of effective payment is excluded.

The second is that online payment transaction amount for the customer is up to the customer, but the amount shall not exceed the cash advance limit of the credit card.



### 3.3 The Safety Aontrol Measures in the Technology

The bank should take necessary technical measures to protect the integrity and reliability of the data of electronic payment transactions. At the present, the data security protection technology is the basic technique used in the electronic funds transfer, it can prevent the different payment link of the same customer and the repetition of the payment information in the e-funds transfer by technical protection of the identity and trading location of the customer. The specific safety protection technologies include:

#### 3.3.1 The Technology of Data-Encrypting

The technology of data-encrypting is the usual method of ensuring the safety of electronic funds. The basic principle is based on the mathematical algorithm procedures and encryption key to encode information by generating string that difficult to understand, it is known as a procedure of turning plaintext into ciphertext. The first step is to encrypt the payment data of electronic fund transfer, then transmit the encrypted data to the other transaction party through the Internet, they can decrypt the encrypted data with the appointed encryption key. According to the password that used in data encrypting and decrypting is the same or not, the encryption system can divided into two kinds, symmetric cryptosystem and asymmetric cryptosystem.

#### 3.3.2 PKI Technology

In the electronic funds transfer the identity of each transaction (such as the consumer who use the bank card, the merchant and the payment gateway of the bank) must be assessed firstly. In the current PKI technology we adopted, the digital certification are used to manage the public key, it must be approved by the certification authority--- the trusted third party. In the digital certificate the public key and other identifier Information of the customer are bundled, the corresponding digital certificate represents the identity of the customer. The PKI technology and symmetric cryptosystem and asymmetric cryptosystem are combined to manage the encryption Key automatically.

#### 3.3.3 Digital Certificates and CA

Digital certificate is the basic technique used to verify the identity of the website or users in electronic funds transfer. It is under the charge of CA ---the authoritative and impartial institution. The digital certificates can be combined with the digital abstraction technique and used to perform the function of digital signature and digital envelopes to ensure the integrity and nonrepudiation of the data in the electronic funds transfer.

#### 3.3.4 SSL and SET

SSL refers to secure socket layer, it support the safety

connection between two computers, which is put forward by Netscape company. SSL is composed of SSL Record Protocol, SSL Handshake Protocol and SSL alert protocol and applied in the transport layer and application layer of TCP/IP. SSL can finish the encryption of the sent message and decryption of the received message transparently and automatically by digital certificates and encryption technology. SET refers to Secure Electronic Transaction, it is a technical standard draw up by Visa international and Mastercard international to ensure safe payment through open internet. SET can certificate both the credit card of the customer and the identification of the merchant. Because of reasonable design, SET has been widely used in the electronic funds transfer.

The bank should take necessary measures for the confidentiality of the electronic payment transaction data, it includes the access to the data must be reasonably authorized and confirmed; electronic payment transaction data must be safe preserved to prevent the data from being examined unauthorized and intercepting illegally. The third-party must acquire electronic payment transaction data in compliance with the relevant laws and provisions for the data use and protection. All the access to the transaction data must be registered, even the record of the registration can't be tampered.

### 3.4 Improving the Management in the Electronic Funds Transfer

Electronic bank should build up the effective management system in accordance with the safety problem of electronic funds transfer, According to the No. 22 guideline in the First Electronic payment instruction, the bank should give authorization control to the bank electronic payment processing system operators, managers, and service providers. The authorization control includes: setting up corresponding tactics of risk control to prevent the intentional or unintentional change of the payment processing system from endangering the integrity and reliability of the data, ensuring the business effective capacity, continuous plan and emergency plan of the payment processing system, ascertaining the effective detection when the design of electronic payment and the data recording procedure alter, every modification of the electronic payment data can be detected by the detect of the transaction and data record to prevent the data is tampered in the process of transmission, operation, storage and modification; keep the record appropriately by the photo medium or magnetic media on the request of accounting records management, the file retention period reaches to 5 years and the retrieval of the data must be easy. The bank should ensure the data not being tampered by the way of visit authorization and confirmation. All the transaction data must be kept safe to prevent transmission by visit and interception without authorization.

According to No32 guidelines in the First Electronic payment instruction, the bank should take effective measures to ensure the separation of duties in the electronic payment processing system such as test it and the duty of the staff in the development and management section is separate, and the design of the transaction procedure and the internal-control system can ensure any individual employees and external service providers can't finish the deal independently.

In the safety management, the bank shall refuse the inquiry of any company and unit and individual expect the client otherwise stipulated by state laws and administrative regulations, keep the customer's information, transaction records secret and agree with the client about the providing of his transaction records, fund balance and account status.

To sum up, the electronic funds transfer has increasingly become the popular mode of fund payment and settlement, the present problem in the electronic fund transfer is how to solve the problems of the mistakes in

the electronic funds transfer and the safety control, especially how to determine the duties the bank should bear. If we can take more consideration in the duty of the bank, pay more attention to strengthen the technology and management control and keep the safety of the electronic funds transfer with the existing laws and regulations as guide, given the practical experience in electronic funds transfer, electronic fund transfer can become more and more feasible and efficient.

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# A Study of Emerging Third-Party Payment and the Profit Model in China

## —Take Lakala for Example

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**Abstract:** Third-party payment tools use more and more widely today. But as a commercial enterprise, third-party payment companies rarely profit because the existing third-party payment is immature as well as the third-party payment company. The facts tell that a third-party payment company which is desirous to possess some proportions in this industry needs to avoid the competition of homogenization and actively seeks for new ways to profit.

**Keywords:** third-party payment; profit model; Lakala

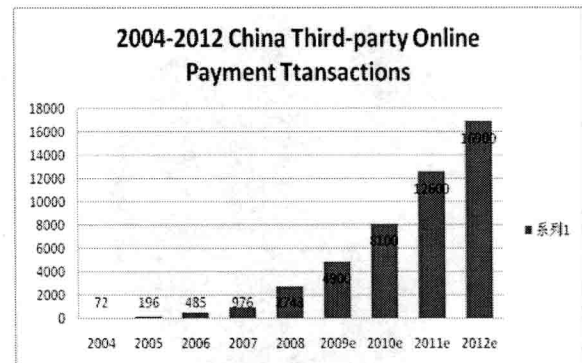
## 1 Introduction

People who are familiar with the e-commerce know that e-commerce built up by information flow, capital flow and logistics. While e-commerce becomes more and more developed today, the development of cash flow, one of three components of e-commerce takes on a pivotal position. People found that "payment" becomes a bottleneck in the evolution of e-commerce. In order to solve the problem, third-party payment came into being. Developed until present, online payment of domestic business can be divided into three categories. First, dominated by the five major commercial banks, payment gateway services, such as UnionPay, have the biggest advantages of the platform in the financial backgrounds and familiarity about this type of business; The second one, the non-independent payment instruments, such as Alipay, are based on large-scale B2C, C2C website; The third one is an independent third-party payment platform and terminal with online payment, phone payment, mobile payments and other means of payment<sup>[1]</sup>. The platform likes 99bill and the latter likes Kyifu and Lakala,. As a convenient and financial service, Lakara is growing. We attempts to study the profit model of third-party payment, taking Lakala for an example in this issue.

## 2 Chapter 1: the Status Quo of Domestic Third-Party Payment Development

When the financial crisis brings a vast impact on a lot of industries, the "electronic payment" industry is still at high speed. IResearch report shows that China's trading volume of online payment amounted to 274.3 billion yuan in 2008, 1.8 times more than in 2007. Moreover, the turnover of PayPal, a United States company, reached 2.4 billion dollars in 2008<sup>[2]</sup>.

The following is profit and operation model of third-party payment platforms:



Source: 《iResearch 2008-2009 China Online Payment Research Report》

Figure 1. 2004-2012 China Third-party Online Payment Transactions

**Alipay:** Charge fees to all cooperative businesses including TaoBao internet. Alipay is an online payment tool, achieving its function through cooperation with businesses.

**PayPal:** After landing in China, it is free of charge first time, but charge the seller of the handling fees. PayPal is an online payment instrument, too.

**99bill:** Charged a low rate to corporation, it is free of charge for personal users now. It will consider charging value-added service in the future. 99bill supports different terminals such as the Internet, cell phone, telephone and POS.

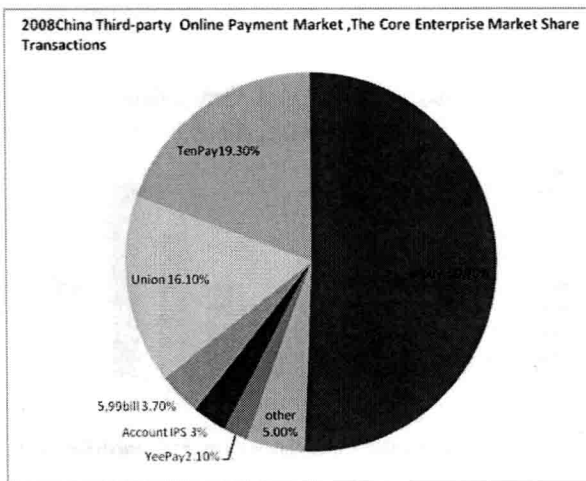
**Tenpay:** The value of user is so large that it will naturally have a profit model. As an online payment tool, you can use it not only for shopping on Paipainet and more than 200 thousand shopping websites, but also for some convenience services such as recharging mobile phone, Games, credit card repayment and passenger ticket. It has a multi-service platform for enterprises rather than individuals.

**Lakala:** It will benefit a little in each transaction on the



terminals by consumers; it breaks down the sink between Internet and convenience stores, conducts e-commerce services and provides other value-added services business. It also provides consumers with a variety of convenient financial services and e-commerce payment services.

Through the analysis of third-party payment above, we conclude that third-party payment function is homogenizing. Because of the homogeneity of the provision of services, it results that a third-party payment company has to operate below cost to survive and that the current third-party payment companies almost do not profit, including Lakala. The following is our analysis about profit model of third-party payment, in allusion to Lakala.



Source: «iResearch 2008-2009 China Online Payment Research Report»

Figure 2. 2008 China Third-party Online Payment Market, The Core Enterprise Market Share Transactions

### 3 Chapter2: the Notion of the Present and Future Profit Models of Third-Party Payment

Founded in 2005, Lakala is a financial services company to provide facilitates, constructing and operating China's largest network of the convenient payment. It has covered stores, supermarkets, convenience drugstore surrounding nationwide offices and residential area in major cities. Until February in 2009, Lakala has already opened up in 23 cities, with an amount of more than 20,000 outlets of convenient payment. Lakala's operation including the following:

A. Lakala cooperates with the telecom operators, for telecommunications operators to facilitate payment to pay the charges, service charges recharge.

B. Lakala co-operation in the CRM call center, that is

to say, after users buy merchandise, users will receive a message of the Lakala bill number and pay the bill on any outlet of Lakala convenient payment.

C. Lakala cooperate with online account operators, that is to say, users enter the amount of recharge and mobile phone number and pay by credit card in any network of the UnionPay smart card terminal,. Users receive recharge password by Lakala, then land their own account, press the password and complete the recharge.

D. la co-operation with the Internet business, that is, users buy merchandise, click UnionPay standard card convenience site or "Lakala facilitation payments" on the website, and Lakala send bills number to its users on mobile phone. Users can do the "Lakala facilitation payments" . In all kinds of these services, it's out of fee for users except that users recharge to Alipay or Tenpay through Lakala. Besides, Lakala charge upstream business which cooperates with Lakala, like UnionPay.

We can claim that the most important feature of Lakara is convenient for users. Lakala original network of facilitated the payment and service platform of e-bill created so far, a "monopoly" enterprise at the national level. That is why domestic competitors have not been found yet even Lakala has possessed 95% of market share. Lakala is still in the duration of constructing the network, but according to the plan of Lakala, It will profit by the current pace of development in two or three years. The most important question is what Lakala could profit by?

"Lakara's characteristics of the business determine that only getting a large-scale and bigger volume can get profit." The founder of Lakara, Sun Taoran said that only in a large enough market share, the company will probably get profit by the effect of scale, especially for third-party payment enterprises which are small profits but quick turnover as. Moreover, after predominate the big scale in the market, companies can also increase bargaining chips with the banks and other upper reaches of business.

However, if you want to gain a firm foothold in the third-party payment industry, do the enclosure on the line is enough? Obviously not, as far as I know, not only Lakala, but also AliPay, Tenpay, 99bill are doing the "enclosure movement". I concede that, in addition to get profit by increasing market coverage, profits making through the value-added services is an inevitable choice for Lakala and other third-party payment enterprises. To explore the underlying reasons, the mainly is the following.

A. The market is limited. With the increase in third-party payment instruments, the cake of payment is divided by more and more enterprises. Therefore, whether online or offline payment, consumers can choose one from a growing number of tools .The result of the homogenization of competition is various non-profitable enterprises.

B. The source of profits is limited. The third-party payment enterprise maintains the operation mainly through