Study on Circumvention Measures of Credit Information Security Risks in E-Commerce

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Abstract—Brief introduced the concepts of credit and credit risk in e-commerce, analyzed the impact of credit risks in e-commerce. Gave out the basic contents of personal credit information and business credit information in e-commerce, and analyzed and pointed out the main factors that caused the security risks of e-commerce credit information. At last, proposed some technical and non-technical measures to circumvent the credit information security risks in e-commerce, such as to improve the infrastructure of E-commerce and to strengthen researching on information security technology, to establish a unified platform for e-commerce transactions, to achieve the integration and sharing of the credit information resources, to obey the security E-commerce operation rules and to train good habits of online transaction, to establish and improve the social credit system, to strengthen the laws of being built, operated, to establish the system of punishing dishonesty and invigorating mechanism, to strengthen and to improve the credit information management, to regulate credit information services, and to train and improve the credit information security awareness.

Index terms—e-commerce, credit, credit information, security risks

I . INTRODUCTION

E-commerce has gradually become the dominant mode of modern business, and it has virtual and non-contact characteristics. In E-commerce, because the trade transactions between the two sides have been took by network , so both of tem can not intuitively understand each other and can not seen the transaction subjects, they can only make trading decisions by the information obtained online and subjective judging. However, due to false trading, counterfeiting, fraudulent contracts, credit distortion, bid up the value of subject by online auction etc., violates the legitimate rights and interest of consumers, and other illegal activities often occur, all these lead to more and more consumers will loss of confidence in E-commerce, and make them are not willing to choose E-commerce. There are many reasons make consumer lack of trust in E-commerce. But we consider that lack of credit has become a major obstacle during E-commerce developing. Therefore, an effective solution the credit problem in E-commerce and to foster consumer trust in E-commerce has become the key to develop E-commerce. The primary task to effectively solve the credit problem in E-commerce means to make the credit information security for the main body of transaction. So, to study and discuss the security risks of E-commerce credit information has important practical significance for building and improving E-commerce credit system.

II . CONTENT OF E-COMMERCE CREDIT INFORMATION

E-commerce credit information refers to the records which are created by enterprises and individual consumers in E-commerce activities, and relates to the credit behaviors, as well as the worthy information for using to evaluate their credit level. Accord to the different subjects of credit, the credit information in E-commerce can be divided into enterprise’s credit information and personal credit information [1].

A. Enterprise’s Credit Information

Enterprise’s credit information refers to the records and the relation data which formed in credit transactions to fulfill or non-fulfill obligations. It Includes:

1. Basic information. It includes registration data (for examples the enterprise’s name, registered address, legal represent, registered capital, type, business scope, setup date, business period etc. ), relationship information, rights of import and export, financial information etc.

2. Situation information of affiliates, subsidiaries, shareholding enterprises.

3. Information of capital construction. It includes shareholders, investment ratio, the rate of availability capital, investment methods etc.

4. Information of Board of Directors and managers. It includes board charters, organization structure etc.

5. Information of production and business status. It includes production-marketing situation, costs-earnings, production technology, production efficiency etc.

6. Information on the financial status. It includes asset situation, profit situation, account receivable/payable etc.

7. Exchanges bank information. It includes loan bank, loan amount, loan reputation and so on.

8. Litigation records. It includes the records of civil, administration, legal etc.

B. Personal Credit Information

Personal credit information is the records and relative data which are created by individual who performance or non-compliance in credit transactions. For the content
and scope of personal credit information, there are different requirements in different countries. We think that it should include:

1. Identifying information. It includes name, sex, original place, date of birth, identity card number, occupation, work and education experience, political orientation, home address, marital status, spouse information, health status, telephone, E-mail address etc.

2. Business Information. It includes personal income, assets, credit records, records of public utilities service, as well as individuals actual performance records which relate with finance institutions or housing fund management center and other organs on loans, guarantees, credit cards, insurance etc.

3. Public information. It includes personal taxes, participate in social insurance, and personal property status and changing etc.

4. Specific records. It includes the honorary title, awards, and records which may affect the personal credit situation, such as civil, criminal, administrative proceedings and administrative punishment.

5. Other information. It includes the credit-related information in addition to the above range.

III. CAUSING REASONS OF CREDIT INFORMATION SECURITY RISKS IN E-COMMERCE

There are many reasons to cause credit information security risks in E-commerce, the main reasons are:

A. Defects of Techniques in E-commerce

1. Because the network has opening characteristics, so it gives some illegal people or organization a choice to steal the user’s credit information.

2. The reliability of network is questioned. Sometimes it will be interrupt by some reasons.

3. The security of network is questioned. The malicious attacks, illegal invading, sniffers, monitors and other illegal behaviors will produce security risks.

4. The database system may be existing unsafe linking or backdoor for attackers.

5. The defects of transcating software and bad habit of developing application program will remain “backdoor” for cracks.

6. The bad habits of online transactions will give a choice to attackers.

7. The number system is not standard and uniform will cause credit information security risks.

B. Characteristics of E-commerce Transaction

1. Information of each side in transaction is not asymmetric. This will cause credit information security risks.

2. Property boundary of E-commerce transactions will be fuzzy. It will make the both sides of transaction difficult to sign equality contract.

3. Game between the main bodies of transactions [2]. In E-commerce, the sale is always opposing with another on interest, so each one will be in order to his own interest, may deliberately modify his credit information and provide false credit information to another in order to win the trust and to achieve his own commercial purpose.

C. Driven by Market Profits

Now, the data warehouse technology and data mining technology are developing quickly. Some illegal individuals or organizations use them to process and use user’s credit information in E-commerce to obtain reap benefits, and trigger credit information security risks [3].

D. Inadequate Laws and Regulations

1. Inadequate laws and regulations. Because of E-commerce started late in China, the construction of corresponding laws and regulations delays to the E-commerce rapid development. This situation leads to the relative laws and regulations have still existed many shortages, although there are many items increased in our in the Constitution law, civil law and many other laws and regulations. Such as "electronic signature law" has been published two years ago. But the construction of laws on business information protection and privacy protection is still not perfect. Particularly, the laws of security protection on the credit information of main body in E-commerce are still to be strengthened.

2. The intensity of legal punishment for dishonesty is not very strong. Although it has a certain constraint for "dishonesty" and "false" credit phenomenon in some laws and regulations. But the intensity of punishing and enforcement of performing are still not strong enough, and the effectiveness of restraining is still less than ideal.

3. A lack of credit incentive mechanism. The incentives mechanism for honesty and trustworthiness of the main body in E-commerce is still underdeveloped.

E. Imperfect of Credit Information Management and Service

1. Imperfect of social credit information management system. At present, the social credit system is still imperfect, and the large database network of social credit information which covers the whole society is still setup. It leads to that does not realize "anytime, anywhere" querying the credit information of main body in E-commerce. In addition, some businesses or individuals ignore the role of credit information management, and even, can not understand the credit information management. They think that this may affect the relationship with customers, and does not adopt effective measures to manage and organize the credit information. And, lacking of professionals is still an important reason for poor management.

2. Low level of credit management and credit information intermediary service. The so-called credit is a credit agency which uses various means to extensively collect, process credit information to verify the credit status of the survey object. However, the level of some credit management and credit intermediary service organizations is not high, and the security management of credit information is poor, and the credit information is incomplete, data updated is not timely and other factors,
leads to the result of credit management is distortion, and leads to the security risks of credit information.

F. Human Factors

(1) Credit awareness is not high. In the current market environment, the "supreme interest" dominates the ideology of some ones in business and their sense of "honest, trustworthy, fair competition" is weak, and they neglect the credit information and its security protection.

(2) Credit ethical standard is not high. Credit belongs to the realm of ethics. However, the credit is extremely pale in some ones’ moral thought. They lack of good moral cultivation, and wantonly spread, distort other’s credit information to fulfill their own interest.

(3) Impacting of the traditional economic system. In the traditional economic system, the two sides of transactions are face to face. Their credit status is evaluated by past "dealings", so the credit has a profound sense. But in E-commerce, the credit situation is determined by analyzing and evaluating the credit information on all aspects of the main bodies in transactions. Therefore, the traditional economic system make the main bodies of E-commerce weaken their emphasis extent on credit information, and this will indirectly cause credit information security risks.

IV. CREDIT INFORMATION SECURITY RISKS AFFECTING TO E-COMMERCE

In E-commerce, the credit information security risks have a strong influence either for main bodies of transaction or for E-commerce Website. It shows below.

(1) For customers. The first is that it will affect the customers’ credit level and their credibility status. The second is that it will affect to the customers’ online consumption behaviors. The third is that it will cause the customer’s credit information disclosed, such as consumption records, bank card number etc.

(2) For enterprises. The first is that it will affect the enterprises’ credit level and their credibility status. The second is that it will affect to the direction of enterprises’ E-commerce Websites. The third is that it will affect to the enterprises’ privacy information disclosed, such as financial status, status of contract fulfillment, bank account etc.

V. CIRCUMVENTION MEASURES OF CREDIT INFORMATION SECURITY RISKS IN E-COMMERCE

A. Technical Measures

(1) To improve the infrastructure of E-commerce and to strengthen researching on information security technology. The first is that the supporting technology system of E-commerce should be improved continuously. Such as authentication, signature, network and information security, payment, database technologies and so on. The second is that research on the technological innovation and application of information security technology should strengthen, such as improvement study on encryption, digital certificates, digital signature, intrusion detection, firewalls and other infrastructure security technology, and the application research on P3P, digital watermarking, information hiding techniques in E-commerce credit information security, and comprehensive integration research of variety security technologies.

(2) To establish a unified platform for e-commerce transactions, to achieve the integration and sharing of the credit information resources

It exits a serious bottleneck of credit information in the process of E-commerce credit system construction, for example, the credit information held by the various departments whose credit data are closed, credit information resources fragmented, and this make a great obstacle for E-commerce credit market developing [4]. Therefore, we should play the role of the government promotion to allocate special funds, lean on government to establish a credit information integration management system on enterprises and individuals by coordinating banks, business administration, public security, taxation departments etc. to achieve the integration of credit information resources and fully open, to achieve the credit information interconnection which crosses departments, crosses industries and crosses areas, to achieve query by network in the whole nation, to effectively overcome the information security risks due to information asymmetry [5].

(3) To obey the security E-commerce operation rules and to train good habits of online transaction

In E-commerce activities, to obey standard and security E-commerce operation rules is useful for improving the security of main body’s credit information, and reducing the credit information security risks due to make unsafe transaction operation. Specific measures are [6]: The first is proper use and set up Cookie to avoid information disclosure. The second is to avoid using simple passwords and to reduce the risks of being cracked. The third is the ActiveX should be masked in E-commerce activities. The forth is to erase the traces of computer timely. The fifth is to implement hiding or encrypting for credit and privacy information. The sixth is to refuse being visited by threatened Websites. The seventh is to install firewall software to shield the illegal invasion and malicious attacks. The eighth is to use proxy server and to amend windows’ BUG timely, to prevent the intrusion using IP fraud. The ninth is to clear the "saved files" and the log files, as well as the files accessed in favorites and temporary files folder, to avoid disclosing privacy due to these files being accessed. The tenth is to login internet by VPN.
E-commerce situation in China to cooperate multi-parties, and to make government, associations, enterprises, intermediaries developing their own credit system simultaneously, and then to be integrated, to gradually construct the social credit system at different levels, and which is interoperable, sharing, all-round, three-dimensional and efficient.

(2) To strengthen the laws of being built, operated, to establish the system of punishing dishonesty and invigorating mechanism. To strengthen building laws on credit information, to speed up the process of building the laws which relate to E-commerce credit information, such as credit, electronic transactions, electronic information protection, personal data protection, trust management, credit information agency management, and enterprises’ credit information management and consumers’ credit information management, etc. Having built the relation laws to make the content of E-commerce credit information, and its management responsibilities and the use of permissions being clear, to constraint and regulate the individuals or organizations querying and using and managing the E-commerce credit information, to effectively curb the illegal behaviors occurring by wanton spreading, tampering credit information and forging unreal credit information. Especially, in enforcing laws, it is important to establish mechanism for disciplining dishonesty and encouraging trustworthy, and to publish severely the legal and natural persons who have bad credit records, but to inspire that of having good credit records. In addition, it should build electronic transactions, electronic payment systems, credit card system according to the characteristics of E-commerce environment and transactions. Such as “Electronic Signature Law” which has been formally implemented in April 2005, it has played an active role to effectively protect the interests of both sides, to eliminate credit crisis, to reduce credit information risks. It has effectively improved the legal environment of China's E-commerce and reduced the credit information security risks.

(3) To strengthen and to improve the credit information management. First is to build inter-regional, cross-sectoral and inter-departmental unified credit information management system which is promoted and coordinated by the specific credit information management department of government. Second is that the special department of government should strengthen supervising for the credit agency. Third is that enterprises or individuals should fulfill reporting and updating of the obligation for their own credit information.

(4) To regulate credit information services. The services, relating to credit information, which the credit information service agencies can provide include [7]: providing credit information, evaluating credit level and using of enterprise’s credit resources. In order to ensure the authenticity of the services provided to reduce the security risks of credit information, we consider that they should have a good credit level and regulate the credit information services by establishing appropriate service standard, management system, disciplinary and incentive mechanisms and so on.

(5) To train and improve the credit information security awareness of the main bodies in E-commerce. This is most important in the variety measures of preventing credit information risks in E-commerce. The content of training includes the education on credit morality and information technology.

VI. CONCLUSIONS

To sum up above, in E-commerce developing process, in order to resolve the issue of credit information security risks, and to create an honest, trustworthy, and honest credit environment for the E-commerce developing rapidly. The first is that we should to strengthen the application research on information security technologies using in credit information protection, and to develop good habit of safe online transactions, to build platforms of credit information management and its services which covers the entire society and fully open, and to effective resolve the information asymmetric problems between both sides of transaction in E-commerce. The second is that we should to accelerate and improve social credit system, to strengthen legal construction, to strict reinforcement of the laws, to build the mechanism for publishing dishonesty and encourage trustworthy, and to strengthen credit information management, to standardize credit information services, to establish a correct and healthy credit ethic, and to enhance the people’s security consciousness.

VII. ACKNOWLEDGMENT

This work is supported by Philosophy and Social Sciences Foundation (07O05) of Guangdong Province, China.

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