Research on Internet Financial Information Security Prevention and Guarantee System Under Big Data Environment

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Abstract. With the rapid development of social economy, China's Internet technology has made tremendous progress. Internet finance, which was born on the background of the Internet, is rapidly changing the overall pattern of the financial industry. However, while Internet finance has brought innovative development to the financial system, many risks have also emerged. This article provides an overview of the development of Internet financial information under the big data environment, and focuses on the analysis of threats to Internet financial information security. At the same time, based on the actual situation, the establishment of the Internet financial information security prevention and protection system was studied and judged, with a view to providing guidance for the development of related work.

Keywords: big data · Internet finance · information security

1 Introduction

With the integration and development of computer network technology and communication technology, the Internet has fully integrated with the financial industry. Internet finance has made financial services more convenient and faster, but it has also greatly increased information security risks. In the context of the rapid development of Internet finance, this paper systematically analyzes the potential information security risks after Internet finance, and puts forward specific prevention opinions, and hopes to make certain contributions to the healthy development of Internet finance in China.

2 Overview of the Internet Financial Information in the Big Data Environment

In the era of big data, a large number of financial products use the Internet to realize services. Internet finance has risen rapidly and has gradually become the main channel of financial services. Crowdfunding finance, cash management, insurance sales, online lending, payment and settlement services and products are all promoted and implemented

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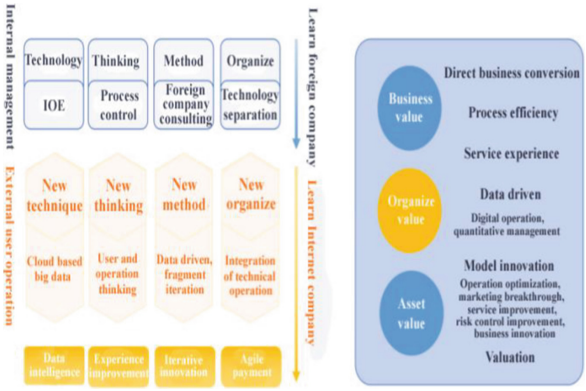

Fig. 1. Different types of Internet financial data Note: Fig. 1 is original.

through the Internet. The financial industry is currently one of the most data-intensive industries in the world. Internet financial data includes financial customer information, operating data, regulatory data, financial transaction data, and various types of data derived from these basic data. Internet finance uses the Internet and information technology to process banking business. It is not only different from bank loan financing, but also different from indirect financing in the capital market. As a third-party financing channel, Internet finance can significantly improve the transparency of the capital market and effectively weaken financial intermediaries, thereby greatly improving the efficiency of capital utilization, reducing transaction costs [1], and better promoting rapid economic growth. The essence of finance is intertemporal credit, which is the deep connotation of Internet finance companies and traditional finance companies throughout. However, there are still big differences between Internet finance and commercial banks. These differences are mainly manifested in technology and channel innovation. In terms of operating mode, compared with traditional finance, Internet finance has achieved subversive innovation. In general, the current Internet financial data mainly covers three aspects. The first is the diversification of data types and the coexistence of multiple forms of financial services, such as financial management services, third-party payment services, online platform lending services. Various types of services have generated different types of Internet financial data. The second is the large scale of data. Compared with traditional financial services, Internet finance has a lower barrier to entry, which makes the amount of Internet financial information even larger. The third is the high added value of data. This relevant information can effectively support the company's executives to make market-forward judgments, thereby helping companies better discover market opportunities and avoid market risks [2].

3 The Threats of Internet Financial Information Security Under the Big Data Environment

With the rapid development and iteration of Internet finance, the digitization of financial information has become more prominent. The information security problems faced by

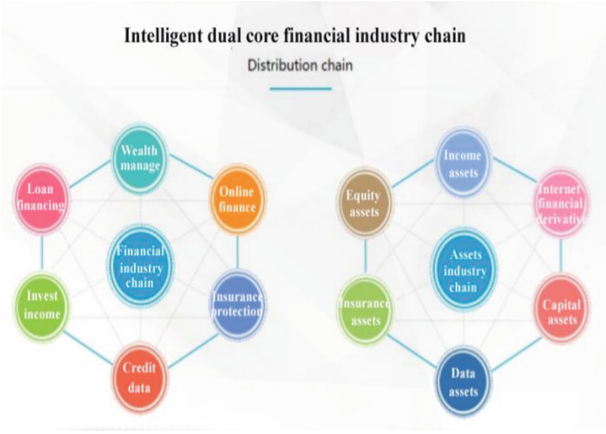

Fig. 2. Intelligent dual core financial industry chain Note: Fig. 2 is original.

Internet financial information have become more obvious. Due to the high value content of financial data, Internet financial data, as one of the core assets of the financial industry, becomes the first choice for hackers or criminals to attack. Moreover, due to the concentration of financial information data, the cost of attacks is relatively small, and the benefits obtained after successful attacks are often higher, which makes the attacks on Internet financial information emerge endlessly. In the era of big data, due to the development of various complex businesses of Internet financial companies, financial big data not only records the personal identity data of customers, but also stores comprehensive data such as user search, shopping, social networking, and Internet information. More centralized storage of data broadly increases the risk of information leakage [3]. Big data technology can use the Internet to collect comprehensive personal information, and perform comparative analysis with the superior computing power of computers, so as to restore related information such as personal personality, identity, and habits. Although providers will try to eliminate user identity information in transactions, these methods are relatively insignificant in terms of maintaining the privacy and security of financial users, and continue to increase the risk of personal privacy leakage.

4 The Practice of Internet Financial Information Security Prevention and Guarantee System in the Big Data Environment

4.1 Improve the Security Performance of the Internet Information System

In the context of big data, Internet finance faces a higher risk factor, and information security and reliability are more prominent in this context. As financial data has higher sensitivity and higher mechanisms, if financial information is leaked. Under less severe circumstances, the safety of funds will be threatened, and customers of financial institutions will generally panic. In severe cases, financial shocks will occur, bringing systemic risks to social and economic development. Therefore, relevant financial regulatory agencies must take precautions and make full use of the combination of technical and

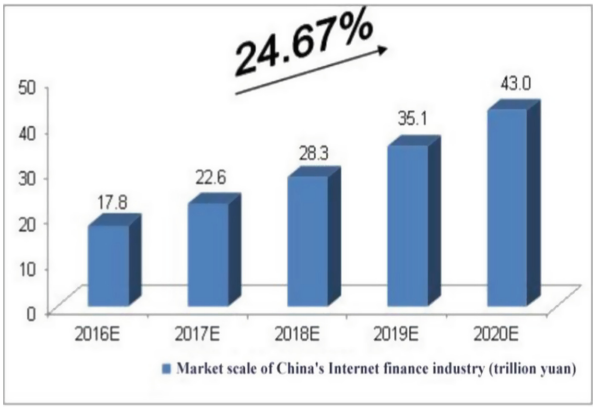

Fig. 3. Market scale of China's Internet finance industry Note: Fig. 3 is original.

management methods to further ensure the security of Internet financial information in the context of big data.

The improvement of the security performance of Internet information systems should proceed from three levels. Firstly, relevant companies should pay more attention to capital investment in technology. Its construction work should focus on adjusting research and development costs in the field of information security technology. In this way, multiple security measures such as identity authentication, digital certificate authentication, firewall, and data encryption can be fully integrated and applied. To strengthen the security barrier of the Internet system, it can increase the cost and technical difficulty of hacker intrusion, so as to better protect the security of Internet financial consumer information [4]. The second lies in the more effective intervention of relevant regulatory agencies. Information security regulatory agencies should guide and supervise Internet financial service providers. In this way, it strengthens the security construction of the Internet information system and fully depends on the actual situation. According to the level of information security, establish corresponding rating standards. Furthermore, the review of the information security system is carried out, and the information security status of each system is confirmed on a regular basis. It can realize the dynamic monitoring of the security level of the financial service provider's network platform through stronger technical implementation. The third is to strengthen the collaborative relationship between Internet finance companies. The Internet finance industry as a whole, the whole industry is faced with the problem of information system security. Strengthening the collaboration among Internet financial service companies is the only way to further develop network information security. Through the establishment of a joint defense mechanism, the overall safety factor of the industry will be gradually improved, and the cost of technology development and information protection of each enterprise will be further reduced, so as to achieve the goal of reducing the operating cost of each enterprise [5].

4.2 Improve the Legal Protection System

Before the complete construction of the legal protection system, the research and development of the Internet financial big data information security system should be accelerated. When developing development plans, Internet finance data providers should study and judge the current financial data security situation from a strategic perspective, and make reasonable judgments on major information security risks they face. In this way, the investment in the research and development of information security technology will be strengthened, and the training of Internet financial security professionals will be strengthened in a targeted manner. It will gradually establish and improve the Internet financial information security protection system from the fields of talent management, platform construction, risk assessment, standardized operation, and data application.

The construction of the legal protection system should first include the new type of Internet finance subject into the category of obligation subject. As an important participant and emerging participant in business activities, Internet financial consumers still play a relatively weak role at the moment of the initial development of Internet finance. Therefore, the society should fully adapt to the development form of Internet finance, so that the new entities of Internet finance can be effectively included in the scope of the obligation of Internet financial consumer information protection. The formulation of relevant laws and regulations should fully integrate the development trend of Internet finance in the future, and conduct effective research and judgment on the development direction of big data, so as to accelerate the legal construction of personal information protection and big data management under the premise of encouraging and protecting financial innovation to better standardize big data sharing and open platforms. Based on the principle of prudential supervision, the monitoring and management of sensitive data will be strengthened, and punishments will be increased for acts related to the leakage of financial information security. Secondly, the protection scope of information security should be clarified. In the context of big data, the information that should be protected by law does not only include relatively primitive information such as customer transaction records and identifiable information.

Instead, it should cover in-depth information such as investment intentions and consumption habits. This type of information often comes from the collection, processing, and analysis of basic consumer information, which can have a more profound impact on consumers. This has significantly expanded the scope of information security that the law should protect compared to the past. In the context of big data, it is of great importance to clarify the scope of information security protection for Internet financial names. The third is to further improve and modify the regulations on illegal information security protection. The relevant laws currently have different standards for the starting and punishment of illegal acts. This is incompatible with the difficult situation faced by Internet financial consumers in information security. This has caused many inconveniences in the handling of illegal activities, so the regulations on illegal information security protection should be improved and revised. In this way, the measurement indicators of the severity of illegal information usage rules in the law are unified, and the punishment and punishment standards for various types of financial information crimes are updated in conjunction with the current development, so that the punishment is well-founded and the rights and responsibilities are clear.

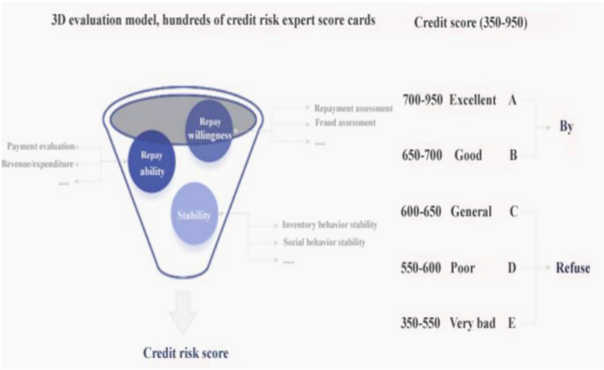

Fig. 4. 3D evaluation model, hundreds of credit risk expert score cards Note: Fig. 4 is original.

4.3 Enhance the Protection Awareness of Internet Security Consumers Themselves

As Internet finance gradually participates in people's lives and work, the popularization of Internet finance knowledge and related information security elements becomes particularly important. This requires Internet financial service institutions and relevant regulatory authorities to conduct information security protection and Internet financial knowledge propaganda through various platforms. As a result, media platforms can expose cases of infringements on the information security of Internet financial consumers, and the public's awareness of prevention and self-protection has been significantly enhanced [6]. In order to better promote consumers to develop better Internet financial consumption habits. It can pay more attention to the custody of account information and ID verification information with a certain resistance to malicious phishing websites. At the same time, the improvement of risk analysis and response capabilities of relevant regulatory agencies and corporate departments should follow the three directions of benchmark principles, combination principles, and detailed analysis principles. When analyzing the construction of an information security system for the relevant Internet financial system, the asset valuation, information value, weaknesses and threats, and scope of influence should be fully evaluated, and risk coefficient calculations should be carried out on the basis of the evaluation. On the other hand, the establishment of the Internet information security prevention and protection system requires relevant parties to strengthen the protection of physical environment facilities. This requires related parties to more complete and strictly implement the computer room audit system and management system, better improve the monitoring layout, and regularly report equipment codes [7]. The operation and access control authority of office computers and peripherals should be further strictly enforced, and at the same time, business continuity risk response measures should be improved, the operation capability of the backup environment should be improved, and the network monitoring system should be more improved. At the same time, in order to effectively deal with abnormal situations, a risk response team should be set up in time to reduce financial security risks as much as possible. However, traditional virus protection technologies, information security protection strategies and related information

security precautions cannot effectively meet the needs of financial information security maintenance in the context of the emergence of technologies such as big data and cloud computing. Therefore, new financial information security tools should be developed in combination with the latest technologies such as data mining, artificial intelligence, and machine learning. In this way, the past passive protection situation will be changed, and active protection will provide a new starting point for financial information security in the context of big data [8].

5 Conclusion

Internet finance has brought leapfrog development to the financial industry, enabling individuals to enjoy more convenient financial services. But because of the high value of its information, it also brings new challenges to information security. With the further integration and development of Internet technology and the financial industry, more related security risks of Internet finance have gradually emerged. To this end, legal protection should be strengthened at the national level, while enterprises and relevant units should further strengthen the establishment of an Internet information security system. Through large-scale publicity of information security, the information security awareness of consumers can be effectively promoted, so as to better promote the stable and orderly development of the Internet financial industry.

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