

Construction of Information Security Platform for China's Financial Industry Based on Big Data

Zixuan Zhang

{zjack429@gmail.com}

Viewpoint School, Calabasas, California, 91367, USA

Abstract. In order to understand the construction of China's financial industry information security platform, a research on the construction of China's financial industry information security platform based on big data was put forward. In this paper, the financial information security in the era of big data is comprehensively described, and the main risks and challenges faced by financial information security in the emerging stage are analyzed. Secondly, in view of the hidden dangers of financial information security in the era of big data, this paper puts forward corresponding measures to enhance the security capability of financial information security in the era of big data and effectively promote the stable economic and social development.

Keywords: big data; Financial industry information; Information security platform.

1 Introduction

Big data, also known as huge data, refers to the massive, high-growth and diversified information assets that need new processing modes to have stronger decision-making, insight and process optimization capabilities. As a hot topic in the new era, big data not only connects the society in series, but also exposes social data to the society, which makes the security of information data, especially financial information, face great opportunities and challenges. In the era of big data, the exponential growth of data volume is very amazing and quite complicated. For the financial field, it is very important to ensure the security of financial information data. With the increasing and upgrading of the financial system, more and more financial entities are interconnected in various ways, which also brings great challenges to information security supervision. Financial information will be exposed to various potential threats, and if financial information security is not well guaranteed, it may lead to serious consequences. With the rapid development of information technology, big data has become an important foundation in economic and social development. As far as the current development situation is concerned, there are still security problems. Big data brings both opportunities and challenges, especially financial information security. Big data is to collect, analyze and sort out data within a certain time and scope, and rely on new models to make information more comprehensive and accurate in the process of processing. Big data has the characteristics of large volume, many types, high value, fast processing speed and high accuracy, and has been gradually applied to various fields. In the process of processing and using, in addition to traditional data processing, unstructured data can also be processed accordingly to find out the correlation between different data, provide data support for making reasonable decisions, and

improve its rationality and scientificity. Big data is not only a kind of technology integration, but also a reflection of ideological values. It can make people change their traditional cognition in the process of processing data and get different solutions by using big data thinking and processing methods[1-2]. As shown in Figure 1:

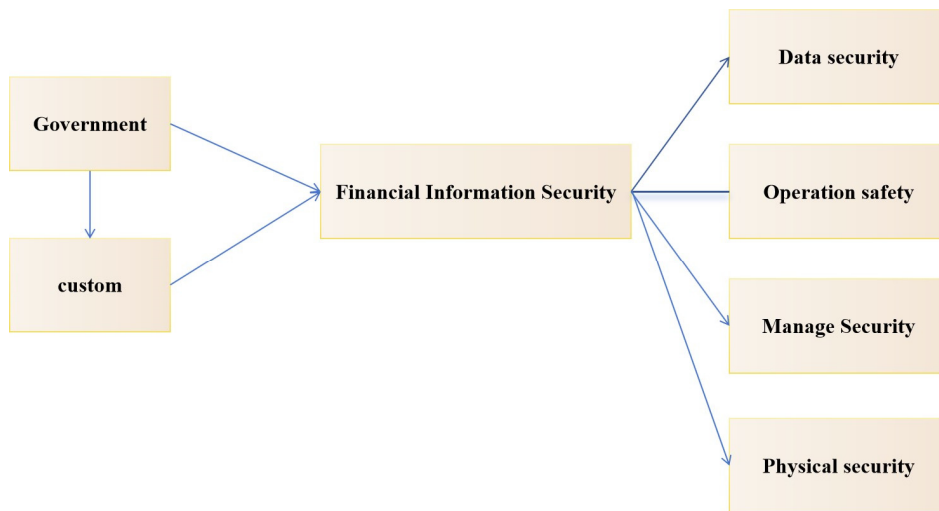


Fig. 1. Construction of Information Security Platform in Financial Industry.

2 Threats to financial information security in the era of big data

In the era of big data, with the increase of data volume and the increase of financial informatization process, the risk of data leakage will increase. In addition, if we can't make good use of some sensitive data and rely too much on foreign big data analysis technology, then the threat of information security in China will increase.

2.1 Big data cluster database data security threats

The amount of data in the era of big data is increasing, which will be enhanced in both complexity and sensitivity. Therefore, in the virtual space of the network, big data is easy to be attacked. There are more kinds of data in the era of big data, which will also make network hackers get more data. In the process of financial informatization construction, the scale of information system also increases, the data is more concentrated, and the amount of information assets is larger. The reliability and security of current business systems need to be improved. By analyzing the current financial information security system, we can find that its perfection needs to be strengthened. In terms of network technology and application system, many technologies need to rely on foreign countries, which will increase the risk coefficient of financial information security in China[3-4].

2.2 Data security threats of intelligent terminals

At present, China is already one of the largest smart terminal markets in the world. We know that intelligent terminal is a very core part in data security management. In the use of smart

terminal devices, personal information is stored in large quantities. When the intelligent terminal device receives the attack, the probability of personal financial information being leaked is greatly increased. With the financial information becoming more networked, the financial information system is connected with equipment through the network, which will increase the amount of information collected and transmitted by the financial information system. When the system exchanges data with external terminal equipment, some hackers will use this data exchange to invade the information system, which will greatly threaten the financial information security of intelligent terminals.

2.3 The threat of leakage caused by data virtualization

We know that it is precisely because of the emergence of data virtualization technology that users can access and manage data more quickly. Assuming that data is wealth, then big data is a huge treasure house, and data virtualization technology can realize the mining function of treasure. After data virtualization, information storage has become a problem. Among them, how to prevent data leakage is very critical. In the process of expanding financial electronic channels, online business has been popularized continuously, and the data to be processed is becoming more and more complicated. Looking at the current financial crimes, we can see that the virtual data intrusion and attack on the Internet are very frequent, which is one of the important incentives for financial information risk[5-6].

2.4 The Information Advantage of Internet Finance

The classical effective market hypothesis points out that information is the core of modern finance. According to the financial intermediary theory, the moral hazard and adverse selection caused by information asymmetry seriously reduce the efficiency of financial services, while the emergence of financial intermediary makes this phenomenon better. As a professional institution, the financial intermediary can obtain professional information and analyze effectively, obtain the credit information and reduce the generation of moral hazard. As a financial institution, with the development and expansion, the default probability will become smaller and smaller, thus reducing the risk of adverse selection.

Private information can be converted into market prices through certain rules. When financial intermediaries conduct financial activities, to judge the private information of enterprises or individuals, that is, the credit situation and repayment risk of enterprises, it is necessary to judge through the market situation and the project investment situation of enterprises, and require the enterprises to provide collateral. Below, we will discuss the advantages and disadvantages of traditional financial intermediaries (commercial banks as an example) and Internet finance in credit through the model. Take an enterprise as an example, assuming that the private information of the enterprise contains two aspects, one is the risk of the enterprise, λ The other is the success rate of the project, P. Commercial banks, because they can only have access to external information and cannot identify risks, they will require enterprises to provide collateral. If the project fails, the bank will have collateral. But the bank needs to pay the cost of the collateral, for the value of the collateral β . The value of the collateral that an enterprise can mortgage is W, and the amount of the mortgaged assets is independent of the risk. Under the model of commercial banks, the loan income model of commercial banks can be obtained:

$$\theta_i = P_i(1 + \mu)K + (1 - \beta)(1 - P_i)W_i - K \quad (1)$$

Among, μ It is the interest rate, and K is the project investment amount. Because banks have limited access to the information of enterprises and information asymmetry, they cannot directly judge the risk situation of enterprises and projects, so they can only provide a series of loan contracts containing interest rates and collateral for enterprises to choose. But for the banks, θ_i Banks will invest only if it is greater than zero. Therefore, the conditions for banks to issue loans are follows:

$$(P_i + \mu P_i - 1)K + (1 - \beta)(1 - P_i)W_i > 0 \quad (2)$$

That is, the value of the collateral of the bank is:

$$W_i > \frac{(1 - P_i - \mu P_i)K}{(1 - \beta)(1 - P_i)} \quad (3)$$

However, due to the information asymmetry, the bank cannot identify the risk situation of the enterprise, so the enterprises are regarded as high-risk enterprises, then P_i Approaching 0, then:

$$W_i > \frac{K}{(1 - \beta)} \quad (4)$$

As can be seen from the above, the basic requirements of the bank and the project investment price of collateral, and it as the most important information product. A large number of low-risk and promising small and micro businesses may be unable to obtain funds because they lack collateral and banks deny it. The number of enterprises that obtain bank loans is:

$$\frac{W - W_i}{W} \quad (5)$$

Suppose that the risk of a high-risk enterprise is λ , The risk of the low-risk enterprises is 1-

λ , The number of high-risk enterprises that receive bank funds is: $\lambda \frac{W - W_i}{W}$, The number of low-risk enterprises is $(1 - \lambda) \frac{W - W_i}{W}$.

The total income of the bank is:

$$\frac{W - W_i}{W} \mu K \quad (6)$$

Therefore, for banks, because of information asymmetry, they can only rely on high collateral to judge whether the enterprise has the ability to repay. As a result, low-risk enterprises cannot obtain loans and their own risks will also increase. If banks want to improve their returns, they can only simply rely on increasing interest rates, rather than increasing the number of effective loans, which will eventually lead to fewer and fewer high-quality loans, forming a vicious circle.

3 Financial information security system and platform construction under the big data environment

3.1 Financial information security system construction

To ensure financial security, it is necessary to use diversified information security technologies, strengthen financial information security management, improve financial information standard system, build the backing of information security service, and train financial information security professionals. The construction of financial information security guarantee system should start from these five aspects, as shown in Table 1.

Table 1. Financial Information Security System.

professional	Security management	Financial information security guarantee system	information technology
Security service platform	information technology	Financial information security guarantee system	Security service

3.2 Construction of financial information platform

Through the analysis of the financial industry, combined with the characteristics of the era of big data, building an Internet financial information platform in line with the new era requires the cooperation and role of multi-level and various security mechanisms. Therefore, the architecture of the financial information platform under the big data environment mainly includes four parts (as shown in Table 2), which are divided into base layer, resource layer, management layer and application layer from bottom to top. Information technology mechanism, security service mechanism, confidentiality management mechanism, standard system mechanism and professional talent mechanism act as the guarantee mechanism of the platform at all levels to ensure the safe operation of the system[7].

Table 2. Construction of Financial Information Platform.

Application layer	Intelligent investment consulting	Big data credit reporting	Financial knowledge service
Management layer	User feature analysis	user demand analysis	Financial information analysis
Resource layer	Data import	Data classification	Information capture
Base layer	operating system	network settings	Security settings

(1)Base layer. The base layer mainly provides hardware support for the operation of the platform and ensures the normal operation of the platform. The basic layer is the support and basic guarantee of the financial information platform.

(2) Resource layer. The resource layer mainly crawls, imports, classifies and labels information resources.

(3) Management layer. It is mainly to analyze the characteristics and needs of users, as well as the information of the resource layer, so as to obtain valuable financial information in a targeted manner.

(4) Application layer. This level mainly provides financial knowledge services, and provides all kinds of consultation and services for users in need. The application level is also the greatest value embodiment of the platform.

4 Experiments and Result Analysis

In order to further demonstrate the actual effectiveness of China's financial industry information security platform based on computer big data, a comparative analysis will be conducted on the differences between China's financial industry information security platform based on computer big data and traditional security technology platforms around privacy leakage risk[8]. The experiment consists of three servers, namely the main server, server 2, and server 3. Among them, the content deployed in the main server is the big data security technology platform, while the content deployed in the second and third servers is the big data platform. From Figure 2, it can be observed that compared to traditional security technology platforms, China's financial industry information security platform based on computer big data has obvious advantages in terms of security level, which can better protect user information and maximize user information security. As is well known, traditional security technology platforms have many drawbacks in their design, resulting in users' privacy information being easily leaked. Based on this issue, the author proposes a design pattern for the big data security technology platform, which has a good protection effect on the underlying data and can meet the security needs of most scenarios. It is worth promoting in subsequent applications[9-10].

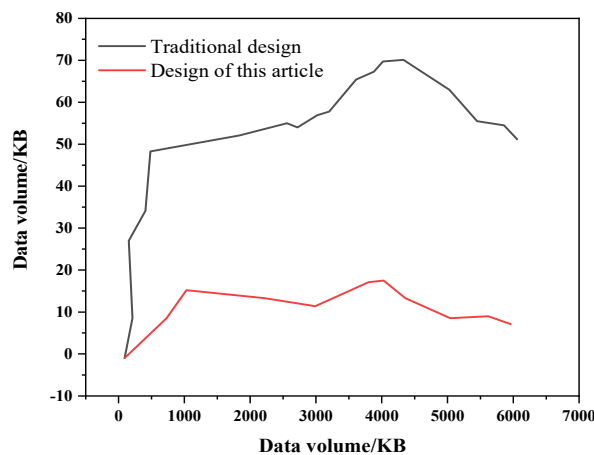


Fig. 2. Comparison of the two security technology platforms.

5 Conclusion

Today, with the increasing amount of data and the vigorous development of information technology, big data applications with distinctive characteristics of the times are coming to us quickly, and big data information has enabled people to find many opportunities in the process of social development. In the process of effectively promoting the development of the financial industry, financial information security is also facing a great information threat, resulting in a gradual increase in the risk of big data financial information security. In order to effectively protect information security, it is necessary to carry out new technology research and development, improve the relevant information security governance system and other measures to ensure the financial information security in the era of big data.

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