

## Research Article

# Research on the Construction of Accounting Informatics System and Risk Assessment Method in Big Data's Era

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The traditional financial informatics administration system risk assessment method in the evaluation of system risk can deal with less data throughput, and the system risk assessment effect is not good, so the study of the financial informatics administration system of the risk assessment method under the background of big data is a necessity. The method sets logical nodes according to system modules and builds risk estimation models by finding logical relationships between data. Based on the big data background, according to the utility theory and the risk preference function estimation, choose the big data batch calculation and streaming calculation methods to calculate the system programme risk index and financial data faithless risk index. According to the risk residual value, the probability of a system function failure in the main module and submodule of the system is adjusted, and the risk level is defined by the exponential function to realize the system risk estimation under the background of big data. Experimental results show that compared with the two traditional system risk estimation methods, the proposed method has a larger data throughput and a wider range of risk indicators. It can be seen that the proposed method meets the risk estimation requirements of the enterprise financial informatics administration system.

## 1. Introduction

The growth of informatics technology and the advent of the big data's era provide a more convenient informatics resource sharing platform for accounting informatization, promote the growth of accounting informatization, reduce the cost of accounting informatization construction, and greatly enhance the efficiency of accounting work [1–3]. However, accounting informatization involves not only technical content but also administration and other aspects. Especially in big data's era, with the rapid growth of accounting informatization, there are also many risks. Through the evaluation of accounting informatization big data's era, the main risks of accounting informatization can be identified, and then targeted countermeasures can be taken to enhance the success rate and application effect of accounting informatization [4]. In big data's era, accounting informatization has become a hot issue for scholars. The financial administration system is the growth direction of the financial field. The system uses advanced data entry, data

processing, and data storage methods to realize the real-time synchronous processing of various financial data of enterprises [5, 6]. With the continuous improvement of the national economic system, the economic benefits of various types of enterprises in society are improved, and the industrial results have made a qualitative leap, which makes the volume of financial data huge.

There are many kinds of data, resulting in the formation of the current big data model in the financial field. Big data are a new concept that has attracted much attention in recent years. By discovering a large number of data features with complex sources, we can capture the correlation between data and analyze various data indicators [7].

Facing the new characteristics of the current financial data, when assessing the risk safety of the enterprise's financial informatics administration system, abandon the original traditional random sampling analysis and investigation method to process the data and process all the financial data and informatics of the enterprise in a large number, high-speed, diverse, and low-density value in a

diversified form, so as to accurately grasp the system risk and timely maintain the security of risk module to ensure the security of enterprise financial informatics [8]. The emergence of this estimation method reduces the pressure of risk administration and control of enterprise financial managers and provides a reference for other informatics administration departments.

## 2. Overview of Financial Informatics Administration System and Big Data Era

*2.1. Financial Informatics Administration System.* A financial informatics administration system is an organized and modular operation of data analysis, prediction, planning, monitoring, and other links in financial administration with the help of modern informatics and network technology [9–11]. According to the program structure widely used in current society, it can be divided into five parts: organization interconnection, accounting transaction processing, financial administration, financial decision-making, and financial supervisor. In the actual operation process, the financial informatics administration system is to implement the statistical regulation of financial informatics according to the general process of financial data manipulation.

*2.2. Big Data Era.* Big data refer to the confluence of huge amount of data. That is, an informatics transportation system with real-time characteristics is constructed in the form of multiple forms and the collection of informatics sources from many channels [12]. The era of big data is an effective quantitative communication environment built under the social background of expanding social informatics demand structure. Taking the enterprise financial informatics system as an example, the characteristics of the current big data era can be summarized as follows. (1) Large amounts of data: the financial informatics system big data's era contains informatics resources in the early, middle, and late stages of the enterprise with rich informatics content. (2) Low-value density and fast renewal: the informatics in the enterprise financial data administration system is updated almost all the time, and the data between the new data and old data are covered and connected at the same time. In other words, the arrival of the big data era provides a good informatics environment for the long-term growth of industry resources.

## 3. Risk Assessment of Financial Informatics Administration System under the Background of Big Data

Although the financial informatics administration system has been widely used in the growth of contemporary enterprises, there are many risks in program manipulation under the background of big data. Putting forward countermeasures for hidden dangers is a condition to reflect the value of resource administration in the big data's era.

*3.1. Organization Interconnection Risk Assessment.* The organization interconnection link in the financial administration informatics system is mainly used for informatics transmission and interaction between internal organizations and enterprises. It is a channel to ensure the interconnection of informatics in various fields of enterprise financial administration. With the gradual increase of informatics big data's era, strengthening the discrimination between true and false informatics connectivity links in the system has become the main aspect of effective risk prevention.

Figure 1 shows the curve distribution of the accounting risk coefficient under different flows of big data's era [13]. For example, in the process of using the financial informatics administration system for statistics, in order to ensure the long-term promotion of financial administration, the methods implemented by financial managers in the organization interconnection module are as follows. (1) Always adhere to the financial data administration arrangement, which is based on the current business state of the enterprise, to ensure the mutual regulation and arrangement of internal informatics of enterprise financial administration. (2) For asset operation-related informatics from the same industry and market environment, the method of multiparty comparison and confirmation is adopted to evaluate the financial informatics administration. (3) Form a big data informatics filtering structure, do a good job in the overall administration of financial informatics administration informatics in various fields in an orderly manner, and realize the coordinated undertaking of the two parts of financial informatics reception and integration based on reasonable resource administration methods.

When the financial administration informatics system is applied in the big data environment, the risk protection of informatics interconnection and communication links can avoid the imbalance of financial capital arrangement caused by the confusion of true and false informatics. It protects the security problems from the interactive channel of financial administration informatics.

*3.2. Accounting Transaction Risk Assessment.* Accounting transaction processing is mainly to provide enterprises with accurate and timely financial informatics to ensure the efficiency of financial administration [14–16]. During the practical operation of financial informatics administration system in the big data's era, on the one hand, the system operation should skillfully give play to the role of big data technical means to sort out and process financial data so as to ensure the optimal arrangement of internal capital of enterprises; on the other hand, it is to adjust the process of accounting transaction processing to avoid the confusion of data programme informatics manipulation process, so as to avoid the risk of financial informatics administration. The mathematical form of the weight of each correlation function is as follows, where  $\lambda$  is the characteristic root of  $A$  and  $W$  represents the vector:

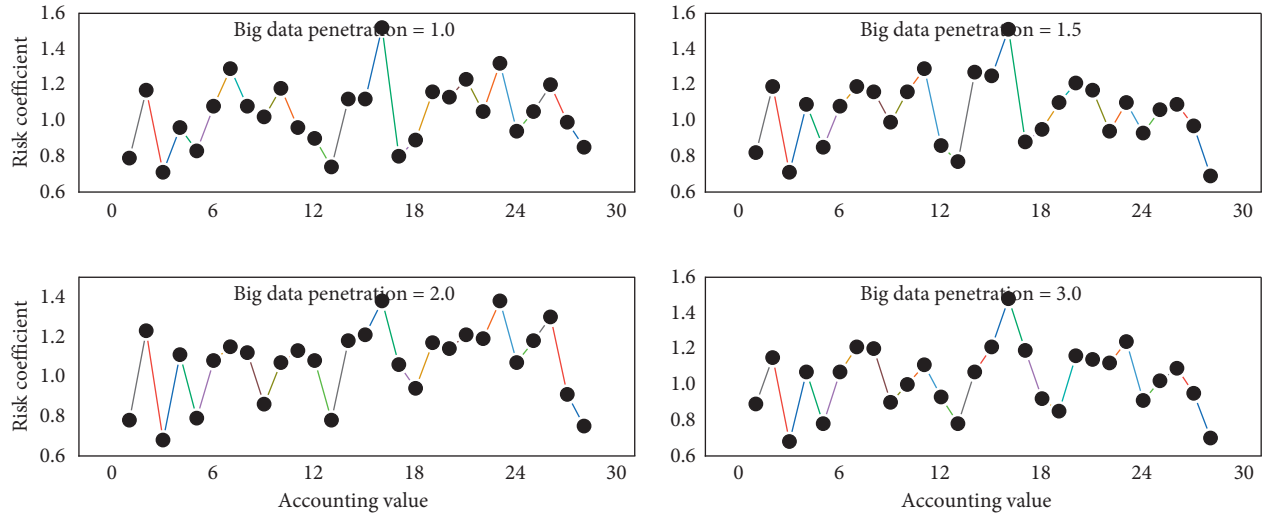


FIGURE 1: The curve distribution of accounting risk coefficient under different flows' big data's era.

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix} \text{ or } A = [a_{ij}], i, j = 1, 2, \dots, n,$$

$$AW = \lambda W,$$

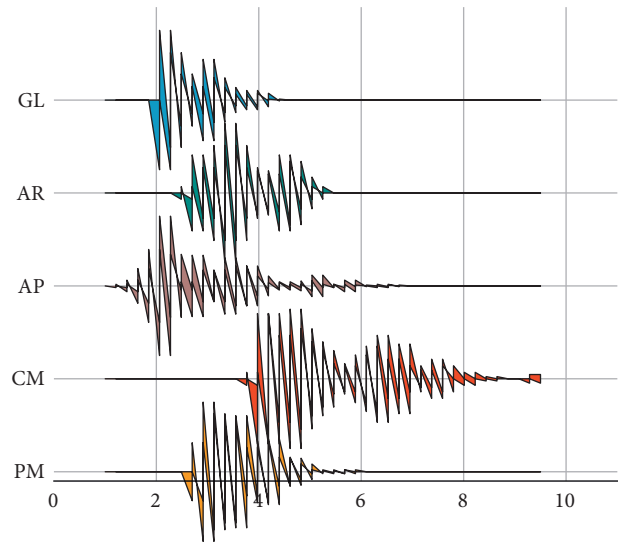
$$W = (W_1, W_2, \dots, W_n),$$

$$\lambda_{\max} = \sum_1^n \frac{(AW)^i}{nW_i}.$$

(1)

For example, in the process of an enterprise using the financial informatics administration system for capital administration, in order to meet the needs of contemporary social growth, the system application personnel summarized the key points of risk prevention in the system application as follows. (1) When operating the financial informatics administration system every day, start the program backup system at the same time to back up the daily enterprise financial update informatics and analyze the risk control mode from the application data link of the program. (2) Six per compartment, 12 months: update the financial informatics administration system applied in the enterprise and clean up the program garbage independently to ensure the internal informatics extraction rate of the program.

The risk prevention of the processing module of the financial informatics administration system is to analyze the manipulation from the perspective of the external factors of the manipulation program. The proper arrangement of the work of this link can reduce the hidden dangers in the field of external manipulation and reflects the safe application form of contemporary financial informatics administration system.



Distribution of VaR in different accounting departments (%)

FIGURE 2: The curve distribution of VaR in different accounting departments.

### 3.3. Financial Administration Module Risk Assessment.

The financial administration module is to record and analyze various account fields in enterprise finance in detail. Therefore, during the subsequent risk assessment of the financial administration module, it is necessary to conduct a detailed risk adjustment of the financial administration module from the aspects of general ledger [15], receivable and payable accounts [16], cash administration [17], project administration, employee salary, fixed asset administration, etc. The curve distribution of VaR in different accounting departments is illustrated in Figure 2. For example, when an enterprise uses the financial informatics administration system for internal asset administration, in order to reduce the hidden dangers in the field of enterprise asset administration under the big data environment, the risk

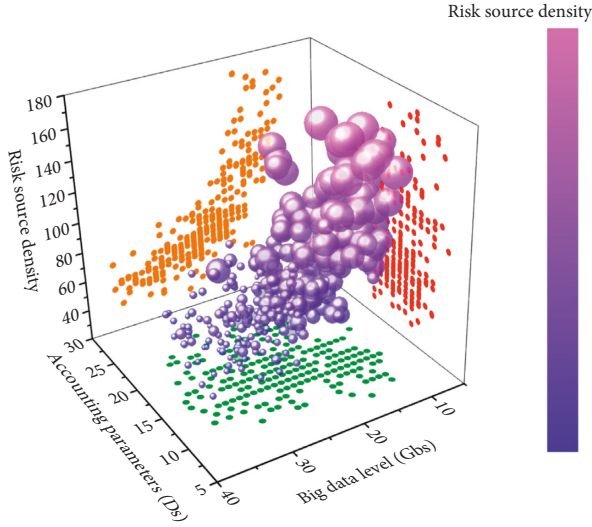


FIGURE 3: Three-dimensional scatter diagram between the density of accounting risk sources, accounting and financial parameters, and the big data level.

assessment of the financial administration module is carried out in combination with the specific application status of the system. (1) Do a good job in the general ledger administration of financial informatics. General ledger informatics includes accounts receivable, cash flow changes, fixed asset structure, and other aspects and uses the big data virtual analysis framework to track all data for informatics statistics and implement risk prevention in the fields of the integrity of financial informatics administration [18]. (2) The accounts receivable part mainly focuses on the risk protection of enterprise arrears, paid accounts, and customer informatics accounts; in the part of cash administration, the enterprise focuses on judging the changes of daily cash flow and project cash flow; fixed assets' administration is to analyze the operation of real estate, equipment, and other funds in the operation of enterprises. The mathematical form of the weight of each  $U$  correlation function is as follows:

$$U = \{U_1, U_2, U_3, U_4, U_5\}. \quad (2)$$

In the context of big data, the scope and form of enterprise financial resource administration are gradually increasing. Enterprises must comply with the basic practice trend of procedural manipulation in the big data environment [19–21]. However, in order to reduce the problems in the application of the financial informatics administration system, it is necessary to implement a targeted response to risk problems for each financial administration link. This process can solve the operation problems of the financial administration module in time, so as to reduce the crisis index in enterprise financial informatics administration.

**3.4. Financial Decision Support Risk Control.** The risk control of the financial decision support link is also the leading strategy of risk regulation in the application of financial informatics administration system under the big data environment. The financial decision support link is mainly the

enterprise financial data analysis based on the enterprise financial statement data. It can use the financial capital data decision-making using + VBA, lightship, and other tools based on the finance, business, and external data of each link. The financial informatics administration system of this part has well realized the factor control of enterprise long-term operation analysis. The mathematical form of the weight of each  $U$  correlation function is as follows:

$$CR = \frac{CI}{RI},$$

$$CI = \frac{\lambda_{\max} - n}{n - 1}, \quad (3)$$

$$\sum_{i=1}^n \sum_{j=1}^m W_j b_{ij} = 1.$$

Figure 3 shows a three-dimensional scatter diagram between the density of accounting risk sources, accounting and financial parameters, and big data level [22]. For example, in big data's era, an enterprise carries out capital administration with the help of financial informatics administration system. In order to reduce the problems in program administration, it not only controls the elements from the financial program informatics administration part but also analyzes the key points from the field of financial decision support control. (1) Create a program automation connection between the financial data decision-making risk prevention and control system. Whenever the project, structure, and other aspects of the enterprise need fund application or analysis, the technicians need to formulate the financial administration plan in the early stage and implement the tracking analysis of the content of financial decision-making according to the preliminarily evaluated risk prevention and control needs. (2) When all data links of the financial decision-making part are subject to risk control, the financial decision support risk control part needs to test the accuracy of the data in the statement. Once there are errors in the data in the statement, the risk prevention and adjustment of financial data should be carried out immediately.

In the big data's era, the control of financial informatics administration system lies in risk prevention from the application and supervision of enterprise financial informatics administration data in combination with the actual situation of the enterprise operation, and then a good job is done in risk control in the planning and evaluation stage of the financial informatics administration system [23].

**3.5. Finance Officer Risk Assessment.** The chief financial officer's informatics risk assessment is mainly to prevent risks from the perspective of financial informatics administration system operators in the big data environment. First, strengthen the attention of enterprise financial managers to the prevention of program application risk and then create a new financial supervisor informatics system with multiple aspects of regulation and control by improving the ability of individual program manipulation and standardization, actively upgrading the equipment of financial informatics

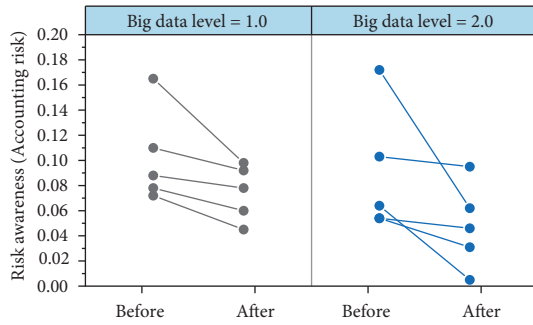


FIGURE 4: Relationship curve between risk awareness and accounting meaning ratio under different big data.

administration system and introducing the concept of modern financial informatics administration [24]. Second, the financial supervisor’s informatics risk control link is to do a good job in the supervision of each link of the financial informatics administration system in the enterprise in combination with the specific situation of the enterprise’s operation. For example, during the period when enterprises implement the risk prevention of financial informatics administration system in the big data environment, on the one hand, enterprises carry out risk prevention by formulating the informatics supervision system of a financial supervisor. On the other hand, they realize the effect of risk supervision in the application of the financial informatics administration system by setting program control standards and irregularly sampling and checking various parts of financial administration informatics.

3.6. *Dynamic Transformation of Financial Informatics Risk Awareness.* The growth of operational risk assessment of financial informatics administration system under the big data environment should also be reflected in that managers and should form a dynamic risk awareness. On the one hand, in the big data’s era, informatics changes rapidly, and the correlation, linkage, and coordination between informatics are relatively high. If enterprises/individuals simply grasp the key points from the perspective of the financial informatics administration structure, there will be risk assessment work, which cannot achieve the practical state of prevention [25–27]. On the other hand, in the systematic arrangement of the work of the financial informatics administration system under the big data environment, it is necessary to convert the planar risk assessment into a flat risk control form. Otherwise, during the operation of the financial informatics administration system, it is naturally unable to achieve the analysis trend of controlling the financial informatics risk assessment.

Figure 4 illustrates relationship curve between risk awareness and accounting meaning ratio under different big data. For example, in order to evaluate the risk of the financial informatics administration system in the big data environment, an enterprise mainly carries out the dynamic transformation of administration elements from the level of financial risk awareness. (1) During the operation of the financial informatics administration system, make full use of

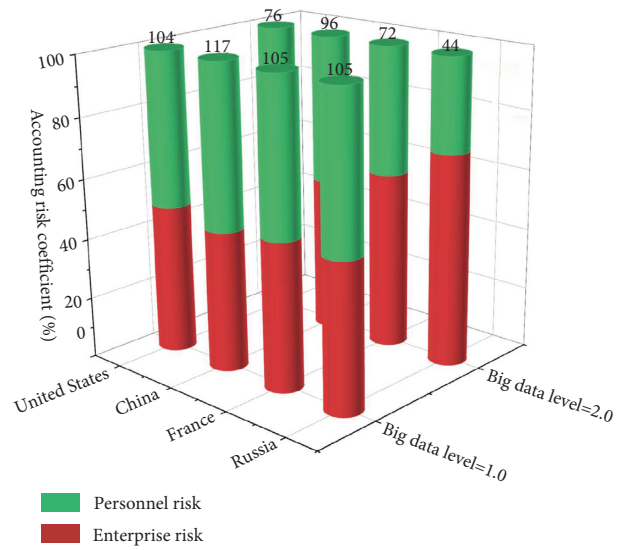


FIGURE 5: Relationship curve between risk awareness and accounting meaning ratio under different big data.

Excel financial statements and other data resources to build the personnel production raw materials. The widespread application of financial statement data structure in many aspects such as operation cost provides a basis for exploring good information system supervision. (2) The risk assessment structure of the financial informatics administration system in a big data environment needs continuous real-time online update processing, so as to realize the effect of multidimensional risk prevention of the financial informatics administration system. In the big data environment, it is an orderly risk assessment scheme to adjust the interrelated financial risk assessment methods of the financial informatics administration system.

#### 4. Construction of Accounting Informatization Risk Index System in Big Data’s Era

This study mainly measures the risk factors of accounting informatization big data’s era from the following aspects:

- (1) Risk of accounting informatization sharing platform: in the big data’s era, the focus of accounting informatization is the sharing of relevant informatics. However, at present, the growth of accounting informatization in China is slow, and insufficient attention is paid to the construction of the accounting informatization platform [28]. The accounting informatization sharing platform cannot meet the requirements of flexibility, adaptability, and expansibility of informatics sharing platform. It also causes the construction risk of the accounting informatics sharing platform.
- (2) There are risks in the accounting informatics system software itself: compared with the growth level of foreign accounting informatics, the construction of accounting informatics in China started late and developed slowly, resulting in many internal risks in

the accounting informatics system software. In big data's era, software upgrading is fast, but the R & D cycle is long and the cost is high, which will also cause risks in the accounting informatics system software itself.

- (3) Security risk of accounting informatics system: the growth of network technology provides an opportunity for some hackers and criminals to use system vulnerabilities to attack the informatics system. Figure 5 shows the relationship curve between risk awareness and accounting meaning ratio under construction of the accounting informatization risk index system in the big data's era. Especially, in big data's era, with the deepening of accounting informatization, more and more accounting businesses rely on informatization means, which further increases the security risk of the accounting informatics system.
- (4) Risk of imperfect accounting informatization standards and regulations: the XBRL series of national standards and expandable business reporting language based on accounting standards issued by the Ministry of Finance (XBRL) general classification standard is deficient in publicity and practice. Moreover, at present, the accounting informatics law has not yet been issued, and the imperfection of relevant laws and regulations is also an important factor causing the risk of accounting informatization.
- (5) Risk of cloud accounting service providers: in big data's era, due to the huge amount of data, for enterprises, a large part of the construction of accounting informatization depends on the services provided by cloud accounting service providers. Once the professional level or after-sales service quality of cloud accounting service providers fails, it will bring great risks to the construction of enterprise informatization.
- (6) Enterprise personnel risk: the quality of accounting operators is very important in the process of enterprise accounting informatization construction, but at present, the level of accounting operators is low, and enterprises lack compound talents proficient in technology and professional knowledge. Especially in big data's era, the requirements for accounting operators are higher, which further increases the growth risk of accounting informatization.
- (7) Accounting informatics risk: in big data's era, the magnetic medium mainly relied on for data storage in the accounting informatics system which is very vulnerable to the external environment (such as external magnetic field) [29], and there is informatics that is not controlled by the enterprise, which will cause the risk of data distortion and loss. In this case, employees' attention to accounting informatics and enterprises' audit of accounting

informatics will also affect the size of accounting informatics risk.

- (8) Enterprise administration risk: in big data's era, there are a large amount of data, fast change speed, and many formats, which makes the current informatics processing technology unable to effectively manage data, increasing the difficulty and risk of enterprise administration. In addition, some enterprises, especially small- and medium-sized enterprises, due to insufficient funds and other reasons, pay insufficient attention to the construction of accounting informatization, lack of maintenance funds, and maintenance technology, which will also cause the risk of accounting informatization.
- (9) New informatics island risk: it mainly refers to the risk that informatics cannot be shared and exchanged [30]. However, in big data's era, the problem of nonsharing and exchange of informatics will be solved, and the corresponding risk is the risk of new informatics island, that is, the phenomenon that the accounting informatics system cannot be effectively integrated with other informatics systems of the enterprise.
- (10) Industry competition risk: the convenience of the big data's era makes the competition in the accounting informatics industry generally exist in the process of market growth. Unfair industry competition, such as hiring network hackers and other illegal intrusions into the competitor's informatics system, stealing and spreading the competitor's accounting informatics on the network, and disclosure of secrets by employees within the enterprise, will be a great blow to the competitor. Therefore, the insufficient internal control of enterprises can easily lead to the risk of industry competition.

## 5. Influencing Factors of Enterprise Accounting Informatization in Risk Big Data's Era

In the growth of accounting informatization, the stability of the platform, data encryption loopholes, authentication defects, and other problems will bring certain risks to accounting informatization.

*5.1. Self-Construction of Informatics Platform Construction and Growth of Accounting Informatization.* A large amount of public resource informatics sharing platform support is needed. For example, the growth of cloud accounting needs the support of a cloud computing platform. Cloud computing has strong scalability. A large number of users provide resource convenience for cloud computing providers. At the same time, the scale effect also reduces the cost of software services. Traditional software only needs to investigate and analyze the needs of customers and finally provide a set of financial software according to the

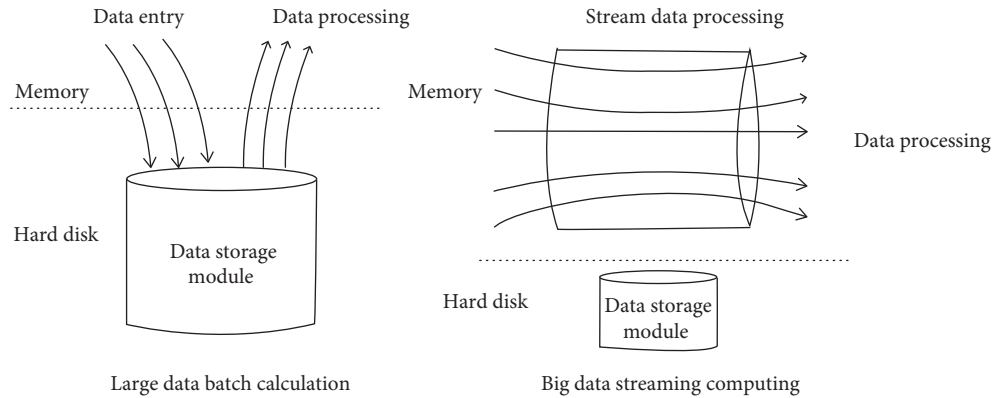


FIGURE 6: Calculation model of the accounting risk index.

requirements of customers. However, cloud computing faces different industries and businesses, so it is more difficult to build than traditional software. It has stronger adaptability, higher flexibility, wider scalability, and stricter technical standards. Therefore, the construction process of a cloud computing platform takes a long time, costs a lot of money, requires high skilled technicians, may be developed for a long time, and finally declares failure. At present, foreign cloud computing platforms are more advanced than domestic ones. The cloud computing platforms of companies such as Google are already in the lead, and Microsoft and other companies also have their own cloud computing platforms. The cloud computing platform just developed in China is based on accounting informatization. Many technological processes are not mature, some small problems will appear in the operation process, and the promotion effect is not very good. The cloud computing technology is more advanced abroad than at home, but domestic enterprises are unwilling to store all kinds of informatics on foreign cloud computing platforms. The research and growth of cloud computing platforms in China lag behind, which also directly affects the growth of cloud accounting in accounting informatization.

5.2. *Informatics Data Use Security.* Many enterprises are reluctant to store accounting data on the public cloud platform, mainly because they are worried about the security of data. When building the cloud accounting informatics system, we should consider the security factors from the following an aspect. One is the identity authentication during login. The informatics system is set manually. He only recognizes the login mode set in the program, so the problem of identity authentication is related to the security of the whole informatics system [31, 32]. The accounting informatics system is a part of informatics system. It also needs identity authentication to ensure the security of informatics. At present, the authentication methods used in the informatics system mainly include user name and password, key, dynamic password board, and fingerprint or face recognition system. However, the authentication method adopted by the accounting informatics system, especially the cloud accounting informatics system, is user

name and password. This authentication method is simple to use, but the security factor is too low, and it is easy to be intercepted by Trojan horse programs. Figure 6 illustrates the calculation model of the accounting risk index for informatics data use security.

In addition, because some operators do not pay enough attention to identity authentication, they often use their birthdays or telephone numbers as the operation password. These two simple numbers are easy to be cracked. Some operators do not change the operation password all the year round and do not pay attention to avoiding the surrounding personnel when entering the operation password, which is easy to cause password leakage. The second is the problem of data encryption. In accounting informatization, cloud accounting data are transmitted through computer network. In the transmission process, the carrier of data is no longer paper, but other media.

There are many ways to confirm data. In this case, the security of cloud accounting is particularly important. The growth of accounting informatization in China has lagged behind, and the network accounting data encryption technology is also very immature. When developers develop network software, the setting of data encryption module is simple, and the focus of encryption is on software itself to prevent other manufacturers from stealing the software, while little investment is made in data encryption technology. Although the accounting personnel will be required to enter the user name and password when logging in the accounting software, this is only the setting of the operation authority of the software, not the setting of the data encryption program. When accounting data are transmitted in the network, there must be a certain encryption method to ensure the safe transmission of accounting data. If the data are not encrypted, it is easy to be intercepted by network hackers or competitors during network transmission, stealing the enterprise's financial data or changing the enterprise's financial data through specific virus software programs, so that the receiving department makes wrong decisions.

5.3. *National Industrial Policy Standards.* The arrival of big data makes many enterprises pay more and more attention to the growth of informatization. The administration mode

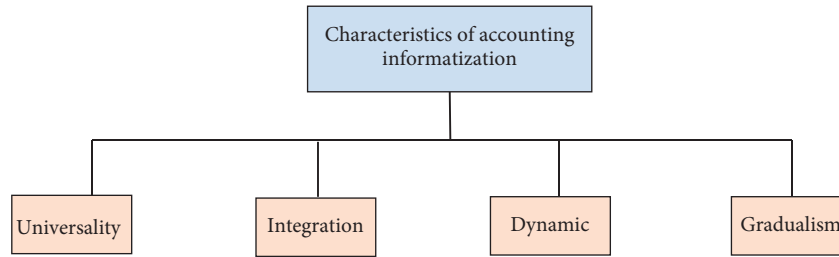


FIGURE 7: Characteristics of accounting informatization in policy standards.

of enterprises is gradually connected with informatization, and accountants also begin to accept cloud accounting, which is inseparable from the growth of the Internet. The rapid growth of the Internet is due to the use of unified standards all over the world. Accounting informatization is based on the Internet, and its growth should also follow the growth law of the Internet, so we must unify the technical standards of informatization construction [33]. The standards are unified, and the construction of accounting informatization will continue to develop with the growth of big data. If the standards cannot be unified, the construction of accounting informatization will be diversified, which will affect the growth of the whole industry and even disrupt the whole industry. In order to further standardize accounting informatization standards and promote the rapid growth of accounting informatization, the Ministry of Finance issued the extensible business reporting language (XBRL) general classification standard based on enterprise accounting standards five years ago.

Figure 7 shows characteristics of accounting informatization in policy standards. The promulgation of the standard has made the growth of accounting informatization a step further towards standardization. According to the arrangement of relevant national departments, the general classification standard of accounting standards will be first implemented in some enterprises. These enterprises are mainly some large- and medium-sized enterprises listed abroad and some accounting firms involved in securities and futures. At the same time, domestic listed companies and large- and medium-sized enterprises are also encouraged. However, this is a long process. If all enterprises want to implement XBRL, it needs to be further popularized and used. In addition to the accounting informatization standard is still in its infancy, China's legislation on informatics security has not been carried out. In big data's era, data are growing rapidly all the time. Enterprises transmit data informatics and financial informatics through the network, but it still lags behind in network financial supervision. Up to now, China has not promulgated any laws on informatics security, which makes enterprises unable to find appropriate laws to protect their legitimate rights and interests once they encounter informatics security violations.

## 6. Conclusion

To sum up, the risk estimation of financial informatics administration system under the background of big data is a theoretical induction of the integration of digital means in

the enterprise capital administration structure. On this basis, this study explores the risk estimation method of the financial informatics administration system through the aspects of organization interconnection risk assessment, accounting transaction risk assessment, financial administration module risk assessment, financial decision support risk control, financial supervisor informatics risk assessment, and so on. Therefore, the research results of this study provide a new idea for the scientific regulation of domestic enterprise capital. In short, this study reveals the business and industrial economics of data economy in the era of big data. The development law of economic business integration is also a reference of the humanistic economic development view. One of the products of guiding the development of sharing economy is also to promote industrial economy and the digital economy. The integrated development of the Chinese economy provides a new accounting model.

## Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The authors declare that they have no conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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