Advanced Artificial Intelligence Model for Financial Accounting Transformation Based on Enterprise Unstructured Text Data

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ABSTRACT

As an essential communication medium, the internet brings the freedom and convenience of publishing, transmitting, and acquiring information. At the same time, the problems caused by various kinds of information that endanger social stability and involve the vital interests of the country are also increasingly emerging. The traditional network supervision method can no longer adapt to the continuous development of content security needs. Internet regulators, in the analysis of network data and the retrieval process, mainly focus on structured text data.

KEYWORDS
Advanced Artificial Intelligence Model, Enterprise Unstructured Text Data, Financial Accounting Transformation, Mobile Data

INTRODUCTION

Currently, for network and information security issues, there are already a variety of security technologies, such as antivirus and firewall software, intrusion detection, authentication, encryption, security audit, etc., which provide practical solutions (Ahn, 2020). At the same time, central firewall and antivirus software companies at home and abroad are working on individual stand-alone or enterprise-level security protection. However, from the perspective of internet security supervision, this is based on network content and network behaviour of security means and measures (i.e., more attention to the content security of network transmission) (Allen, 2021). The current internet regulators have taken some effective countermeasures in blocking undesirable information. However, there are still many blind spots in detecting and supervising network attacks on the internet (Bertomeu, 2021). This is mainly due to the variety of attacks used by hackers; antivirus software companies do not easily detect the most effective attacks. At the same time, the national firewall is mainly aimed at blocking and filtering the content of parsable data. Still, some of the network data characteristics are not parsed for the corresponding analysis and processing, which makes, on the one hand, a large number of attacks by individuals and enterprises ignored. On the other hand, the state’s internet management level to block undesirable information can take some effective measures (Chen, 2021). On the other...
hand, there is a lack of adequate supervision at the national level of internet management, which has caused significant political, economic, and military losses to the country (Chattopadhyay, 2020).

Data from hacking attacks on the internet often differ from the traditional HTTP (HyperText Transfer Protocol), SMTP (Simple Mail Transfer Protocol), and other protocols to produce the structure. They can use natural language structured information extracted from the data and a large number of unstructured text and binary data (Fefferman, 2019). The so-called unstructured text data refers to the data that are not convenient for use in the database two-dimensional logical table to express the realisation of the data as opposed to structured data (i.e. row data stored in the database, which can be used to express the structure of the two-dimensional table logically), including all formats of office documents, text, images, XML(Xtensible Markup Language), HTML(HyperText Markup Language), various types of reports, images and audio/video information, and so on (Gim, 2019). Therefore, for internet regulators to solve this critical challenge of detecting attacks, an attack identification system is urgently needed as a powerful supplement to the current internet regulator’s regulatory platform for structured data content to strengthen the regulation of such security issues. Based on the above reasons, the author researches and designs a distributed unstructured text data security analysis system from the perspective of content security, in response to the lack of supervision of unstructured data by the current internet supervisory authorities. The successful development of artificial intelligence (AI) technology provides a feasible solution to address this urgent need of enterprises (Grammatikos, 2021). With breakthroughs in core algorithms, rapid improvements in computing power, and the support of massive amounts of internet data, AI has made a qualitative leap in the 21st century. Artificial intelligence has already revolutionised industrial production, medical diagnosis, financial services, security, environmental protection, etc., making operations, analysis, and decision-making, which were once mainly done by human beings, intelligent and unmanned (Haitston, 2019). Research points out that AI will replace more than 300 occupations in the future and can do more than 80% of human work. Representative technologies of artificial intelligence, such as data mining, deep learning, image recognition, natural language processing, knowledge mapping, human-computer interaction, and intelligent decision-making, combined with IT technology to transform financial processes, can significantly reduce the processing time of repetitive basic financial processes, reduce the reliance on manual bookkeeping, and reduce the labour costs of enterprises (He, 2020).

Through the independent analysis and decision-making of artificial intelligence, the intelligence of financial management is realised, and the work potential of the finance department is released. It allows the finance department to invest more energy and wisdom in business operations, more comprehensively grasp and analyse business operations, and provide more accurate and effective financial decision support for the enterprise. In recent years, the successful development of AI technology has provided a viable solution to address this urgent need of enterprises. The combination of AI technologies, such as data mining, deep learning, image recognition, natural language processing, knowledge mapping, human-computer interaction, and intelligent decision-making with IT technologies to transform financial processes can significantly reduce the processing time of repetitive basic financial processes, reduce the reliance on manual bookkeeping, and improve the efficiency of the finance department. Through the independent analysis and decision-making of artificial intelligence, we can realise the intelligence of financial management and provide more accurate and effective financial decision support for enterprises. In this paper, we study the group’s intelligent financial reengineering process to provide a reference for other enterprises to upgrade a similar financial system. The group is a capital-intensive and technology-intensive multinational group. Its industry is characterised by rapid technological iteration and fierce competition, which requires its finance department to effectively control the financial income and expenditure of its global branches, to collect and dynamically analyse the group’s comprehensive financial status and related information promptly, to propose decision-making recommendations and risk control warnings to the group’s decision-making bodies, or to evaluate the financial impact of the group’s decisions.
The group has thus started the road to financial intelligence (Han, 2021; Wu, 2021; Gang, 2021; Lu, 2021; Chang, 2019).

RELATED WORK

The research on financial management intelligence first began with deep data analysis technology development. European and American countries explored the basic technology level earlier, and the research focused more on the technology level (Honigsberg, 2019). The core key technologies, such as data mining, organising and classification, data sharing and interaction, and algorithmic data technology have been explored to change financial management. In contrast, less exploration has been made into organisational management change (Jovanović, 2021). The application of data mining techniques in data classification and analysis is proposed. Data mining techniques can automatically extract large amounts of data and use well-developed rules to classify and cluster them for association analysis. It also allows automatic correction of data deviations subject to specific rules. With more large capacity and high-speed hardware, data mining can be used for high-speed batch processing of large amounts of data (McCallig, 2019). Data mining technology has excellent potential for application in financial reporting processing, financial analysis, and audit review. Data mining and text analysis technology is proposed to extract data from database and page information, classify and organise data, and rearrange it according to the target requirements (Nicholls, 2020). The use of data warehouses for internal organisation and data categorisation is proposed. The data warehouse can prioritise various information units, such as bills and materials. Reclassification, data comparison, and relinking of data relationships can be performed within the data warehouse to create a structured data profile. A vision of real-time data exchange is proposed, and a compatible real-time interface for transactions and data exchange is designed.

With multiple logical rules set in advance, the program can apply logical judgments to independently select transaction types and entry methods and transfer transaction data to relevant software systems or accounts in real-time. This means that the real-time data exchange of the business finance system becomes a reality (O’Leary, 2021). Data analysis systems can extract the required information from data warehouses, perform subject-oriented data mining and scenario simulation with multiple objectives that respond to historical changes, and help make better decisions. It is pointed out that cloud computing provides an essential technical guarantee for finance intelligence. Cloud computing’s powerful cloud data processing capability and computing capacity can simultaneously process massive information from different terminals, making it possible to share financial information and track financial data in real-time. It dramatically improves the efficiency of enterprise financial data collection, analysis, and decision-making (Quagli, 2021). Cloud computing further reduces the pressure on data storage and calculation of financial terminals and improves the operational efficiency of financial terminals. The technologies used to automate process processing using information technology and the effect of each technology application are described. It is pointed out that automated robots can process most repetitive tasks and processes, and several criteria for evaluating the effectiveness of the application are proposed.

The researchers point to the application of AI in accounting, auditing, and taxation and the impact on the above finance functions. The application of artificial intelligence improves the accuracy of ex-ante analysis and forecasting and reduces the need for ex-post supervision (Riepe, 2019). At the same time, it puts forward different requirements for the allocation of talents in various parts of the financial process from those of traditional finance. The application of automated, automatic reporting, bookkeeping, accounting, and financial data analysis solutions for the information and large service industries are proposed, respectively (Singh, 2020). The specific applications of AI-based technologies, such as robotic process automation (RPA) technology, optical character recognition (OCR) technology, natural language processing, machine learning, and convolutional neural network algorithms in
financial automation and intelligence are also elaborated (Sysoieva, 2019). A series of issues were discussed on RPA technology, from technical implementation to organisational management change, from business process transformation to equipment testing online and post feedback adjustment, from daily system maintenance to emergency event handling, from user experience upgrade to enterprise effectiveness improvement (Velte, 2018). The application of artificial intelligence is emphasised to help the financial system realise the leap from informationisation to intelligence, improve the efficiency of enterprise grassroots data organisation, enhance the ability of enterprise middle level to apply enterprise data, use more complex scenario simulation, pictorial visual presentation, and other models and methods to help the top level of the enterprise to make better decisions. It enables the finance department to further explore the value of enterprise data and improve the service capability and scope of the department (Zeff, 2021).

ARTIFICIAL INTELLIGENCE MODEL FOR ENTERPRISE UNSTRUCTURED TEXT DATA

Motivation for Financial Intelligence

Regarding employee reimbursement, employee reimbursement bills still require employees to paste their bills and fill in their reimbursement items. The compliance of reimbursement needs to be judged manually by finance staff, and multi-level leaders must manually approve the reimbursement approval. The accounting method is still manual, and the efficiency is low. The reimbursement and approval of off-site reimbursement also require the remote transmission of bills, which takes longer to process and is not timely. Regarding bank-enterprise reconciliation, both receipt and payment need to be manually operated. The receipt needs to be based on the information provided by the front-end sales, which is manually queried and manually claimed by finance authentication tools. Payments also require manual verification by cashiers and payment through internet banking, which is also inefficient and occasionally results in payment errors. Application for withdrawal consumes extra time cost and additional financial costs. The matching of bank returns with accounting accounts also takes more time.

Invoice issuance lags and is slow to respond to the needs of the front-end operation departments. For invoice verification, the flow of paper invoices is the main focus, with manual verification of invoices and slow authentication after invoices are recorded affecting the offsetting of costs. The workload is high, and the efficiency is very low. There is a severe backlog of work in the finance department at the end of the month, requiring much overtime to complete the work. Another problem with more manual processes is that there are many errors and deviations, which require a lot of later corrections and corrections. In addition to the most common entry errors, what is more difficult to detect and correct are deviations arising from misunderstandings. Due to the uneven understanding of financial norms and financial systems among finance personnel, there may be significant differences in the financial treatment of the same matter or instrument during the bill identification and entry process. In matters requiring the professional judgment of financial personnel, the differences in financial processing are more prominent, and the financial statements of branches and subsidiaries are poorly comparable. The third problem of more manual processes is that it inevitably leads to slow financial access to relevant data. After the financial analysis, the relevant business has been closed for at least a month or more. The financial analysis report has lost its meaning of decision support. For the problems in the financial analysis report, it is even slower and more costly to trace the source. It can only be disposed of in a one-size-fits-all way, which does not help to improve business activities and may cause new conflicts between the finance and business departments, as shown in Figure 1. Moreover, for an enterprise in the high growth stage, lagging financial analysis makes it more challenging to make forward-looking business development forecasts. The enterprise cannot
grasp the capital demand and position in time, cannot make a scientific, financial decision, the cost of capital application is high and low, and the risk of a capital decision is relatively high.

The company is large, the organisational structure is long, the financial matters are approved at different levels, and the matters are complicated. It is difficult for employees to sort out which process to go through and which leadership level to submit to for approval. Moreover, the leaders in charge of approval are sometimes unclear about their approval authority, and what aspects of the approved items should be focused on. Moreover, there is also a crossover of work between the research and development department, operation division, and different operating divisions. For some cross-company and cross-departmental cooperation matters, the approval authority is not set, and the approval process occurs with process errors and needs to be resubmitted from time to time. Some leaders are busy with their work, formal approval and review process, and there are financial risks. The prolonged financial process also allows management at all levels to speculate. Although the company has developed a sound financial system, the level of implementation of the financial system is inconsistent. The more distant the departments and institutions from the headquarters, the worse the level of financial system implementation.

Moreover, it is difficult for the finance department at headquarters to have substantial constraints on these noncompliant behaviours. The subsidiaries and branches also intentionally take advantage of this time gap in financial processes and selectively and deliberately advance or delay the reporting and approval process, thus seeking personal benefits to the detriment of the company’s interests. The lengthy and slow financial process also masks many deep-seated problems at the business level, such as excessive operating expenses and high amounts of accounts receivable. The business level has a strong incentive to use the loopholes in the financial process to operate to the company’s detriment or even to commit financial fraud.

The work of posting invoices and organising bills needs to be done by the cost users themselves, which takes up a lot of working time of the business departments. The departments, especially the R&D and marketing, have great opinions about this issue. Because of the pressure of their work, they are the departments that work more overtime. Spending much time on finance-related work is a massive waste of resources for both individuals and the company. The subsidiaries and branches also need specialised personnel for expense auditing, which consumes a lot of human resource allocation. The enterprise has more information systems; ERP (Enterprise Resource Planning), OA (Office Automation), finance, and taxation systems are independent. The information transfer speed is slow in the headquarters finance department for data interaction. The work of some departments calls for access to multiple systems to operate, to learn the different rules of their respective systems, and become familiar with their various operating interfaces. Naturally, system issues can cause resentment, and the user experience is inferior. If there are occasional server glitches, it will affect the use of each system and will induce strong negative emotions among employees. The way of business
assignment and expense approval is relatively singular, and the rules are rigid, making it difficult to adapt to the business model’s needs. The enterprise constantly pushes new products out in the rapid development stage. In an emergency or unexpected event, the problem of low dispatching efficiency is more prominent.

On the one hand, the low dispatching efficiency reduces the efficiency of business departments and wastes more staff time. More importantly, the service to internal and external customers is not timely, causing unnecessary internal consumption and a relatively poor customer experience, which hurts the corporate and brand image. The dichotomy that finance departments do not trust business departments and business departments complain about the inefficiency of finance departments is familiar in enterprises. Many business departments believe that the function of the finance department is to control business department costs and tie up business departments, and they have a poor impression of the finance department.

APPLICATION INTELLIGENCE FOR UNSTRUCTURED TEXT DATA

Through a series of analyses and management research, the company’s headquarters finance centre summarised and sorted out the urgent problems that should be upgraded then transformed application scenarios to match new technologies. Next, the company searched for solutions from two routes: the internal R&D department and external qualified service providers. The internal route mainly takes advantage of the company’s R&D capabilities and resources to develop intelligent products and solutions with a high performance-to-cost ratio. The external route directly introduces mature products and services or jointly develops products with external system service providers to meet the company’s individual needs.

The solution search process follows the following principles: first, the product solution is mature, and the product or solution used to solve problems and realise application scenarios should be commercially applied, have superior performance, and run smoothly for more than 3 years; if not yet commercialised, it should have a short functional development cycle, a simple kernel, and is expected to run smoothly. Second, the performance-to-cost ratio is high. Intelligence aims to reduce costs, improve performance, and enhance value. Therefore, it is necessary to consider the time cost, service cost, fixed asset investment cost, and other multifaceted cost factors during the preinvestment and application, compare the performance improvement and value-added that can be generated, and choose the appropriate solution, as shown in Figure 2. It is necessary to invest rationally and not to invest blindly in the pursuit of flashy effects. Third, the system is scalable, new technologies are emerging and new demands will come one after another, and the system’s transformation needs to be gradual. The system needs to maintain good scalability; in the premise of maintaining the primary

![Figure 2. Application intelligence for unstructured text data](image)
stability of the architecture, you can continue to upgrade the function, functional expansion, and interface expansion.

The company has multiple purposes in carrying out intelligent finance construction. In addition to enhancing the capability of corporate finance and improving the level of financial support to other departments, there are two other purposes: first, to promote the overall intelligence of the enterprise through financial intelligence. Financial information is characterised by a high degree of data, structure, and standardisation, and financial processes are also highly standardised and repetitive. Therefore, taking finance as a breakthrough, gradually implement enterprise digital construction with lower learning costs and lower difficulty in project promotion. Second, we study intelligent technologies, products, and services. The group company itself is an intelligent product development enterprise with intelligent capability. With its ability to develop intelligent products independently, it can save costs and meet the enterprise’s individual needs with high security. The group company is in a rapid growth period, the direction of enterprise product development is more open, and the company also has the vision to enter the financial intelligence service market. Promoting financial intelligence from a developer’s perspective helps to enhance the understanding of the relevant market demand of enterprises, accumulate relevant knowledge and technology, and even launch commercialised products or services, as shown in Figure 3. Instead of directly and entirely introducing the financial system service provider system as most companies do, the group decided to cooperate with the financial system service provider to develop some modules independently, introduce some modules directly, and develop some modules jointly. In terms of external business interface docking, internal interfaces are chosen to adapt to external interfaces to maintain full compatibility and scalability.

In the case $Ti$ and $Pj$ do not match in a certain matching process, but the first $j-1$ characters have been matched, just move the pattern string $P$ right, the target string $T$ does not move, that is, pointer $i$ does not backtrack, and let $Pk$ and $Ti$ continue to compare. The position $k$ where the comparison starts again after the shift is only related to the pattern string $P$ but not to the target string $T$. Therefore, $k$ can be determined in advance by the following next function.

Define the $n(t)$ function as:

$$n(t) = \begin{cases} 
0, t = 0 \\
1, t = 1 \\
-1, 0 < t < 1 
\end{cases}$$

(1)

Figure 3. Building financial intelligence
The target string $T$ is left-aligned with the pattern string $P$ at the beginning and compared character by character from right to left, that is, first compare $(P_m$ with $T_m)$. When $T_i$ does not match the corresponding character of the pattern string at a certain trip, the pattern string is slid right by a distance of $d(x)$ and a right-to-left matching check starting from $P_m$ with $T_i + d(x)$ is executed. The BM (Boyer-Moore) algorithm uses the following two rules to calculate the distance the pattern string is shifted right:

$$\text{dist} = \max\{n_1(t), n_2(t), \ldots, n_t(t)\}$$

$$n_i(t) = T_i + d(x)$$

$$d(x) = \frac{d(T_i)}{dx}$$

The minimum value of $s$ that satisfies the above two cases is taken as the moving distance. Thus, a distance function $\text{dist1}(j)$ can be defined:

$$\text{dis}(i) = \max\{x|P[j + 1\ldots x]\}$$

$$P[i] \neq P[i - 1]$$

A character in $P$ is not the same as a character in $T$ using the bad character shift. The right slide distance function $\text{dist2}(x)$ is defined as follows:

$$\text{dis}_x = \begin{cases} m \\ 0, i = \max[P_i] \end{cases}$$

$$P[j] = T$$

The Hash function is constructed, and the corresponding Hash value is calculated as follows:

$$\text{Hash}(c) = \text{asc}(c) \mod q$$

The BM algorithm can achieve more efficient pattern matching. Analyses and experiments show that the BM matching algorithm works fastest for those times when the character set is relatively large and the characters appearing in the pattern string are relatively few. In this system, the pattern strings we selected are network attack feature codes, and their length is less than 100 bytes. Therefore, we
select the KMP algorithm as the core algorithm of the system and make some modifications based on this algorithm to improve the execution efficiency of the algorithm.

IDENTIFICATION AND ANALYSIS OF SMART RISKS

The risks of the company’s intelligent financial management can be divided into two main categories: the application risk from the software and hardware (and various related equipment of the intelligent management system). Software risks mainly include bill identification, entry and bookkeeping error risks, data accounting and calculation error risks, analysis and prediction error risks, intelligent learning risks, software stability risks, and software security risks. Hardware risks include hardware performance risk, hardware stability risk, and hardware security risk. The comparative analysis method, scenario testing method, and simulation reasoning method are used to analyse the risk probability and risk hazard level. The comparative analysis method compares an intelligent system’s operation results with the operation results of a traditional manual financial process. It compares the differences in error points, rate, timeliness, etc. The scenario testing method assumes a typical problem scenario in financial activities and tests the system’s response effect under the scenario. The simulation inference method is to simulate the operation of a past period or point in time. This is done by inputting the corresponding historical data and comparing the differences between the output results and analysis conclusions of the intelligent system and the accounting results and analysis conclusions of the corresponding historical period. The reasons for such differences are inferred and the reasonableness of such differences are evaluated, as shown in Figure 4.

Comparative analysis was applied to compare the bills and other data identified, entered, and booked by the intelligent robot with manual operations. The accuracy of processing standardised invoices, tickets, and airline tickets for the mechanism was less than $1 \times 10^{-4}$ for one entry by the intelligent robot, much lower than $6 \times 10^{-3}$ for manual operation, while for nonstandardised tickets made by hand, the accuracy of one entry by the intelligent robot was only 50%, lower than 95% for manual entry. The discrepancy mainly appears in bills with handwritten text scribbles, unclear text, and ambiguous text descriptions. The intelligent robot has a high error rate and risk level in identifying such bills. The number and amount of handwritten notes are less than 1% of the total number and amount of notes, which is a low level of risk. The way to reduce this risk is to categorise and manage the bills by automatically identifying the handwritten bills through the system and transferring them to the centralised manual processing. The accounting and calculation of the intelligent system were

Figure 4. The output of the intelligent system
compared using the comparative analysis method, and the speed and accuracy of the intelligent system were significantly higher than that of the manual one. Using the scenario test method to stress test the system under the scenario of large data flow, the advantages of the intelligent system are more prominent. Therefore, the error rate and risk level of the intelligent system in accounting and calculation are meagre.

ANALYSE AND PREDICT THE RISK OF ERRORS

Financial analysis is consistent under traditional tools and models, intelligent systems, and manual conclusions. On the other hand, the intelligent system can provide a more diverse analysis perspective. The operating data of the enterprise over the years are input into the system to form a primary database. The intelligent system is trained by machine learning using the base database. Then, the financial data for each period of 2018 and 2019 are selected, respectively, and the analysis and forecast made by the intelligent system are evaluated using a combination of comparative analysis and simulated reasoning. For the financial analysis conclusions of machine intelligence, excluding some worthless results, the remaining conclusions have high reference value for financial decision-making. In terms of early financial warnings, machine intelligence is more forward-looking and more accurate in making early financial warnings. The more significant advantage of machine intelligence lies in its mighty computing power, which enables it to simultaneously make forecasts for many different scenarios and give more decision options. Machine intelligence also allows for better dynamics in financial forecasting, allowing for timely corrections to financial forecasts based on the latest data obtained simultaneously. As a result, intelligent systems outperform humans in terms of analysis and prediction errors, with lower error rates, as shown in Figure 5. Since machine intelligence can perform richer perspective, level, volume, and scenario analysis and make forecasts and warnings, there is more information redundancy in machine intelligence. That is, too many options, conclusions, and recommendations are provided, increasing information users’ decision burden. To address this problem, some options can be excluded, and the sensitivity threshold of the system can be adjusted according to the development goals and strategies of the enterprise to obtain more concise decision-making recommendations.

In theory, the risks of machine learning will always exist and cannot be eliminated. However, it is tough to assess the risk of machine learning. Practical training for machine learning comes from repeated exercises on historical data with human intervention, which is limited. Additionally,
by excluding data from particular operational phases, data that can be used for machine learning is even more scarce and has minimal support and training for machine learning. On the other hand, the application of machine learning occurs in advancing the chronology of financial activities. Moreover, machine learning capabilities evolve as more data become available. It is not practical to evaluate the effectiveness and risk of machine learning at a single event point or for a selected short period.

Moreover, after intelligent systems replace most of the manual work, machine learning conclusions become part of the evaluation criteria, and self-evaluation will occur, making it more difficult to detect problems with machine learning. Moreover, once the direction of machine learning deviates, there will be systematic errors, making the whole system’s recognition, analysis, and prediction functions seriously deviate. Therefore, machine learning risks belong with other issues with a high-risk level. It must be checked by regular sampling for the prevention and detection of machine learning risk and immediately corrected once found. The check on the identification function of the intelligent system is mainly through manual rechecking, and a certain amount of tickets and information already processed by the system is extracted for a manual process to discover discrepancies and error cases, as shown in Figure 6. The intelligent analysis and prediction function check require specialised data analysis talents to parse the conclusions of machine learning to find the deviation from financial guidelines or targets.

System stability risks can be further divided into system operation stability risks, system compatibility risks, network stability risks, terminal stability risks, etc. These risks depend mainly on the technical level of the software development industry, the construction level of the regional network infrastructure, and the high or low configuration of staff terminals. The overall system stability risk is low in most domestic and economically developed countries. While in some economically less developed regions, the network stability is poor. The probability of occurrence of risks affecting system stability is high. Even so, compared with manual business, the advantages of an intelligent system in terms of efficiency and centralised control are undeniable. The negative impact of systemic risks is still within the financially tolerable range. The system’s security is a critical issue for the system to be launched, and the risk level is high. The software system’s security includes the security of the environment and the software itself. The security of the environment depends on the security of the operating system. Genuine operating systems with firewalls, antivirus software, and electronic encryption devices can guarantee the operating system’s security to ensure the security of the intelligent software environment, as shown in Figure 7. The security of the intelligent software system depends on whether there are loopholes and defects in the system. The development team of the group company and its partners have rich experience in software development and have a solid ability to guarantee

Figure 6. Differentiation of intelligent system recognition functions
the security of the developed software system. Through the 9-month-long system testing, most of the vulnerabilities and defects have been fixed. Therefore, the probability of system security risk is low.

The problem of capacity mismatch is mainly manifested in three aspects: first, the redundancy of cashiers, financial assistants, and accounting staff at the grassroots level. After the intelligent financial system is put on the line, the human resources department of the group company expects to cut more than 80% of the grassroots auxiliary financial staff, cashiers, and accounting staff. It takes about 12 months to divert and digest these staff. Second, there is a lack of intelligent hardware and software system maintenance personnel. An intelligent financial system involves a large number of different types of input terminals, including IoT (Internet of Things) terminals and intelligent input terminals. These different terminals involve different fields of technology and require professional and technical personnel with comprehensive quality to maintain them. Currently, such talents are scarce, and enterprises mainly rely on product suppliers to deal with terminal failures, which is less efficient.

Third, there is a shortage of management accounting talents. After the intelligent system replaces most of the essential manual work, the focus of the financial department staff goes from ‘accounting’ to ‘benefit creation’. Through the analysis and forecast of business strategy, they can make the most reasonable asset and capital planning. According to the capital needs of business activities, they make the most timely capital allocation, cost management, and risk control. At the same time, the finance department personnel need to deeply understand the importance of ‘financial integration’, take the initiative to study the business, and improve the service capability. The shortage of management accounting talents is a common problem in Chinese enterprises. This problem will exist for a long time. The mismatch of financial personnel’s ability will cause the system to run poorly due to the lack of timely maintenance. It will also cause the functions of the system to not be fully applied, and the company’s construction capital investment and system resources will be wasted. The risk of capacity mismatch will gradually decrease with the expansion of the enterprise and the gradual grinding of personnel. Taking into account the initial investment costs, enterprises should not take ‘one step in place’ of the full implementation of intelligent financial systems but should be gradual, according to the development stage of the enterprise’s upgrade. This can minimise the risk of mismatch of financial staff capabilities.

**CONCLUSION**

Financial intelligence has long been a topic of common interest for the financial sector, securities regulators, the technology sector, and the industrial development sector. On the one hand, the use of
new technologies to improve labour productivity is what the government expects to see. However, it is also a significant concern of the governmental authorities whether the new technology will become a helper for the development of enterprises or a tool for corporate fraud. The practice of intelligent financial management of group companies proves that intelligence can help increase the transparency and compliance of corporate finance, reduce the cost of supervision, enhance investors’ confidence in the market, enterprises, and securities, and increase the activity of the financial market. Relevant government departments can establish standards and systems for financial intelligence to guide the industry’s compliance and legal development. They can also establish a certification system for financial intelligence system and intelligent financial management so that financial intelligence can become a tool to regulate the financial behaviour of enterprises and improve the quality of their financial information and financial management. The intelligent change in financial management is coming, bringing great opportunities for theoretical innovation and application development. The intelligence of financial management impacts the traditional financial management concept, connotation, process, rules, and system in many aspects. The primary task of future research is to unify the concept of cognition as soon as possible, establish the knowledge boundary, establish a new theoretical system to guide the practical application, and establish new regulatory rules to regulate the behaviour of enterprises. In particular, the standardisation of concept names and connotations, process transformation and compliance, financial objectives — functional requirements and modularity, financial management organisational hierarchy, and authority and responsibility reconstruction are becoming hot spots for research and will make breakthroughs progress shortly. In product development, combining industry-academia-research will become the mainstream product development mode and promote more rapid commercialisation of intelligent products and services.
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