

A Research on the Impact of Artificial Intelligence on Corporate Working Capital Management—China Railway Construction

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Abstract. In recent years, with the rapid development of artificial intelligence, the impact of artificial intelligence on financial management has become a hot issue. This paper aims to explore the development process of China Railway Construction's financial robot based on the financial shared center, and evaluate the impact of artificial intelligence on the development of the enterprise. This paper used literature research method, direct method, case study method and other methods to analyze the inventory turnover days, total asset turnover days and accounts receivable turnover rate in the annual financial reports of China Railway Construction from 2015 to 2023, with the year as the horizontal axis and the indicator as the vertical axis, and carried out micro analysis. The research found that with the introduction of artificial intelligence robots and the implementation of business-finance integration, large enterprises such as China Railway Construction have achieved significant transformation in the field of financial management. This shows that the development of the potential of "digital employees" can enable enterprises to move towards modernization in financial management. This study provides a typical case study of China Railway Construction and provides new insights for enterprises in the construction industry and other industries.

Keywords: Construction Industry, Digital empowerment, Money Management.

1. Introduction

The State-owned Assets Supervision and Administration Commission of the State Council proposed in the "Guiding Opinions on Central Enterprises Accelerating the Construction of a World-Class Financial Management System" that: The reform and development of state-owned enterprises should pay more attention to quality and efficiency, take the deep integration of digital technology and financial management as a starting point, and accelerate the construction of a world-class financial management system.

In recent years, the digital economy, dominated by digital industrialization and industrial digitization, has swept across all industries and put forward higher quality requirements on the financial management capabilities of enterprises. On the other hand, as the production scale of construction companies continues to expand, the business volume of various tasks has gradually increased. However, the traditional financial settlement model of financial management is cumbersome and single, the efficiency of financial personnel is low, the manpower investment is large, the cost input and output do not match, and there is even a risk of favoritism and fraud, which brings hidden dangers to financial security. According to the goal of creating "two transformations and three types" mentioned in China's "14th Five-Year Plan", all enterprises are required to fully empower digital capabilities and build corporate financial management into a new intelligent financial management model. With the continuous improvement and development of financial management forms in China, many Chinese companies have followed the pace of national policy improvements and begun to adjust the traditional financial management model with manual participation to a digital and intelligent financial management model. As one of the most powerful and largest large-scale comprehensive construction groups in China and even in the world, China Railway Construction Corporation is facing increasing financial pressure. In this context, the Finance Office of China Railway Construction Corporation is focusing on researching new AI technologies. If artificial intelligence is introduced, it will not only shorten the company's financial analysis time

and reduce the pressure on financial personnel, but also improve the efficiency and accuracy of financial management.

There are two innovations in this paper. One of them is the innovation of the research object. Construction companies were selected as the research objects. By studying the digital and intelligent empowerment of construction companies, China Railway Construction Corporation innovatively established the first digital employee office composed entirely of robots, which is also the first unmanned office of China Railway Construction Corporation. The "digital employee office" has formed a robot team and introduced a new financial robot operation mode of robot assistants, robot command and monitoring systems, and operation guarantee systems. At present, there are 25 financial robots working in groups in the "Digital Employee Office" of the Financial Shared Service Center of China Railway 12th Bureau Group, digitizing the traditional paper-based office process and analyzing financial data through artificial intelligence. Management can monitor the operation of the system in real time. This transformation not only improves the accuracy of China Railway Construction's financial data, but also improves the response speed, providing support for decision-makers to make more scientific decisions. China Railway Construction's financial robot is based on the "RPA+AI+NLP" platform and uses robotic process automation technology, Artificial Intelligence Technology, and Natural Language Processing, three major intelligent technologies. Innovation in research content. Existing literature shows that digital transformation is the key to promoting innovation in traditional industries. The study on the economic potential of generative AI points out that the digitalization of the construction industry can greatly improve project management efficiency, especially by integrating information technology to solve all the information islands and complex process problems in traditional industries. China Railway Construction has digitized and automated its financial management platform by using technologies such as AI, effectively integrating complex data from multiple projects. In recent years, artificial intelligence technology has gradually been put into practice in the construction industry, helping companies improve project supervision and management efficiency. McKinsey & Company's study the economic potential of generative AI emphasizes that the Internet of Things (IoT) and AI have significant advantages in collecting real-time data, risk monitoring and progress management in the construction industry. China Railway Construction has seized the trend of the continuous development of artificial intelligence and achieved refined financial management by establishing a digital employee office, thereby improving the company's work efficiency and greatly reducing human errors in manual accounting processing.

This paper mainly uses literature research method, direct method, case study method and other methods to conduct relevant research. The literature research method is to use online resources, library databases of major universities, in-depth industry reports and other channels to specifically consult domestic and foreign academic literature related to the development and application of digital technology and the digital transformation of enterprises to understand the relevant achievements in this research field; Using the direct method, it is directly pointed out that the research topic of the full text is the research on the effect of artificial intelligence on the working capital management of China Railway Construction. The research methods of this paper are as follows: First, it collected the accounting data of China Railway Construction and other major construction companies in the world, and carried out artificial intelligence data analysis on their accounts. Secondly, it analyzed their detailed financial indicators such as: Detailed analysis of data such as inventory turnover days, total asset turnover days, accounts receivable turnover rate, etc., showing how they affect the company's working capital one by one. This paper also uses the case study method. This paper uses typical cases, and the research method is clearer and more intuitive to conduct a horizontal and vertical analysis of the impact of digital empowerment on the finances of the construction industry [1].

2. Case Study of China Railway Construction Corporation's Financial Digitalization Reform

2.1. China Railway Construction Corporation AI Finance Development History

China Railway Construction Corporation is a large enterprise with decentralized management, making financial control extremely difficult. The leaders of the company's decision-making department decided to use intelligent financial robots to manage the company's finances. Digital transformation has become a new driving force for the growth of China's construction industry. Comprehensively promoting the digital transformation of enterprises is an inherent requirement for the high-quality development of the construction industry. There is a large amount of data reporting in Chinese construction companies, which violates the principle of "one source for data". Digital operations are "only for show", let alone the mining and application of "big data". There are two reasons why the numbers are not true. One is that construction companies have multiple sets of accounts. The other reason is that the data is collected manually, and the data reporting is quite arbitrary. In addition, there is a serious digital fence. Due to the management inertia of separate lines between departments, many management systems of construction companies are not connected, data statistics are difficult, and management coordination, quality improvement and efficiency increase have not been achieved. Therefore, data governance is the key for construction companies to carry out digital transformation. Only by building "digital management" life management mechanisms and measures, collecting valuable data and forming data assets can the value of "big data" be brought into play.

During the 11th Five-Year Plan period (2006-2010), China Railway Construction Corporation started to lay out its financial information technology. During the 12th Five-Year Plan period (2011-2015), it began to explore financial information technology and began to build a financial shared service center at the end of 2012: initially establishing a financial sharing platform, achieving unified processes, business norms, and establishing data standards. It has initially achieved financial transformation and established a multi-layer risk prevention and control system for projects, companies, and financial shared centers. During the 13th Five-Year Plan period (2016-2020), based on the original financial shared service center, it has further improved the shared operation system and financial control system by "integrating business and finance, and combining industry and finance", and have successively promoted the application of business modules such as contract management, project cost budgeting, expense budgeting, capital planning, accounts receivable and payable, and value-added tax invoice management. Looking back at the 13th Five-Year Plan, China Railway Construction Finance has made great progress in playing its role and supporting the development of its main business and the real economy. The balance of deposits absorbed increased by 2.5 times; the average daily deposit absorbed increased by 2.4 times. The balance of credit increased by 2.8 times; the average daily credit increased by 3.5 times. The cumulative reduction in fees and profits in 2020 was 3.5 times that of 2015; by replacing external borrowings with internal loans, the interest expenses that should have been paid to commercial banks were converted into internal interest income for China Railway Construction. During the 13th Five-Year Plan period, the cumulative average annual compound growth rate of operating income exceeded 10%, and the cumulative average annual compound growth rate of net profit exceeded 13% [2]. During the 14th Five-Year Plan period (2021-2025), China Railway Construction Finance Company is thinking and taking action. China Railway Construction's financial information construction is evolving in a more comprehensive and intelligent direction, and is continuously expanding from domestic to overseas sharing [3]. China Railway Construction's digital transformation journey can be traced back to 2006, as shown in Figure 1. Its transformation journey can be divided into four stages.

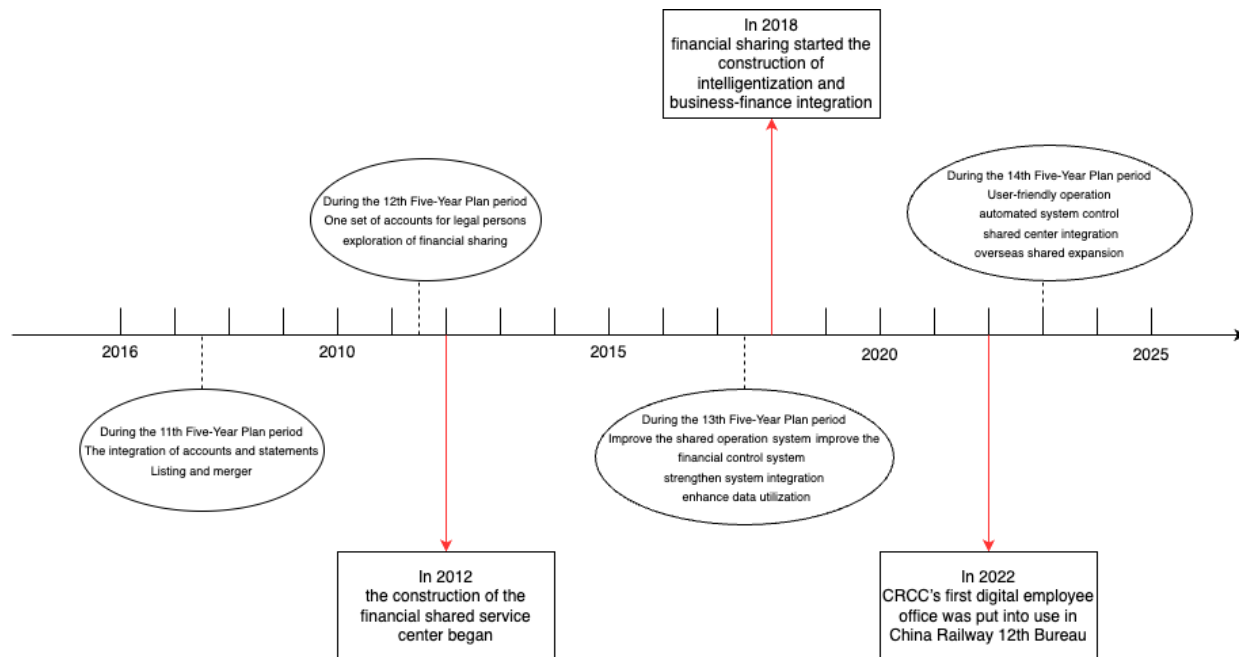


Figure 1. The digital transformation process of China Railway Construction

2.2. The Application Process of China Railway Construction's Financial Robot

During the robot R&D and deployment period, the shared center needs to conduct an in-depth review of the process pain points and detailed logic, and cooperate with technical personnel to complete the necessary environmental preparations. The basic principle is to use robots to strictly execute predetermined processes and repeat operations across systems without interruption, so as to realize the verification of online banking transactions and corporate bank receipts and payments by account number. The detailed steps are described as follows.

Step 1: Sort out the company's reconciliation data needs, including bank types, account types, reconciliation detail levels, reconciliation result feedback information, reconciliation rectification follow-up plans, etc. The second step: account aggregation, contact each commercial bank to authorize the opening of the Super Query Shield, and require accounts within the reconciliation scope to centrally authorize the bank's Super Shield. The centralization of data has an important impact on the execution efficiency of the entire process. This is the most critical step in the early preparation of the entire process. Step 3: Sort out the steps for retrieving data, organize the operation methods and steps of each online banking system and financial system, design an automatic export plan based on the customized needs of the enterprise, and provide command input for the robot to automatically log into each system and retrieve data. Step 4: Data verification logic: classify and analyze the verification plan based on the company's own business status, preset calculation process instructions to the robot, conduct a full verification of online banking and financial data, and output the results by category. Step 5: Automatically distribute the results. After the reconciliation operations of all accounts are completed, encapsulate the result data and feedback the reconciliation results to account administrators at all levels and financial department management. Step 6: Analysis report and rectification. This is the manual closed-loop link after the automated process. It is necessary to track the actions of managers at all levels after the reconciliation result analysis report is sent to support management risk prevention, decision analysis, and follow-up rectification. At the same time, the plan is improved according to the reconciliation effect to improve reconciliation efficiency [4]. The workflow diagram of the financial robot in this article is shown in Figure 2.

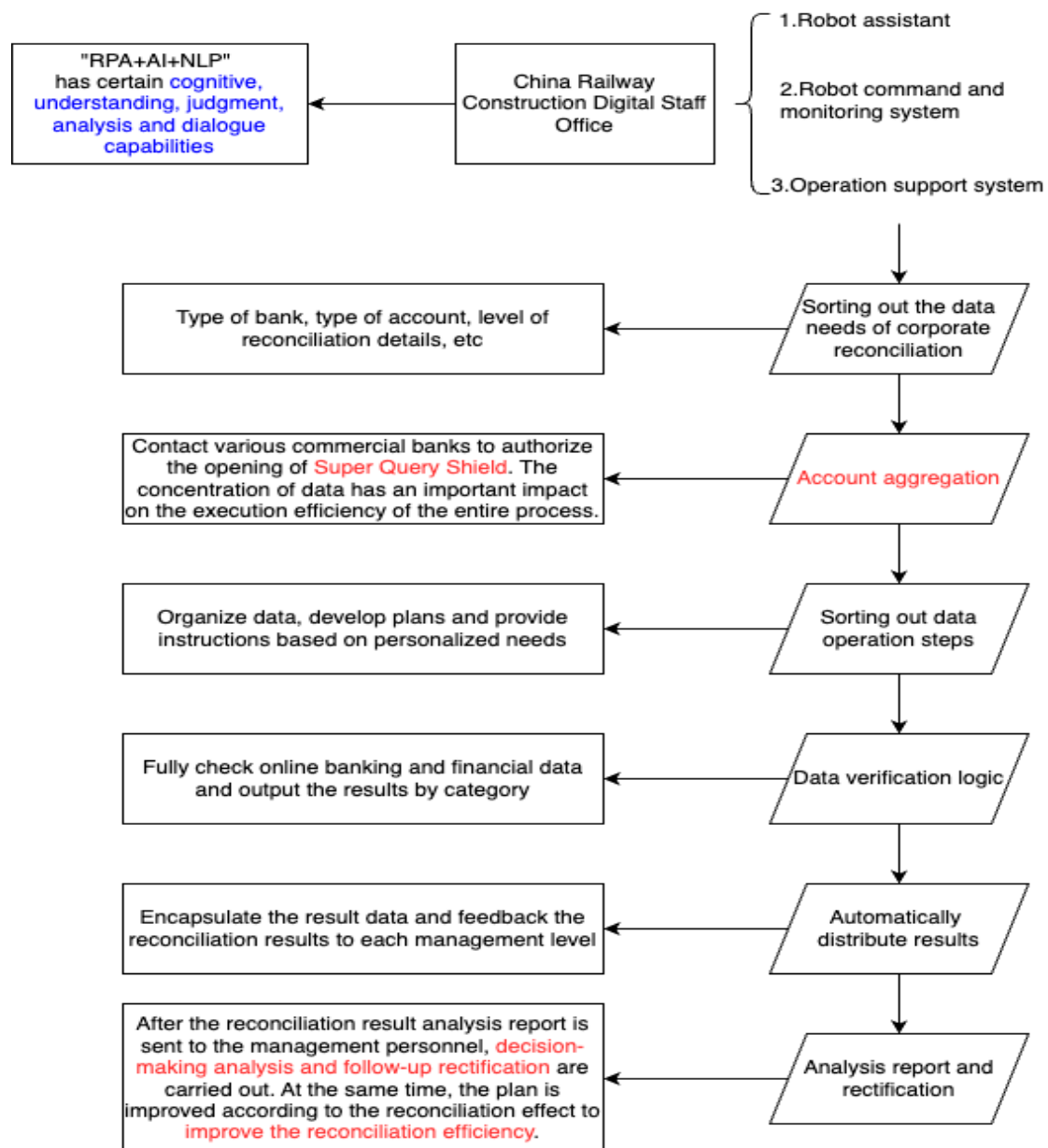


Figure 2. Financial robot workflow diagram [5]

2.3. Changes in Detailed Indicators of a Company's Working Capital Management after Digital Transformation

2.3.1. Inventory turnover days

In 2012, China Railway Construction already had a financial shared center, which means that data processing has been greatly improved. From Table 1, it can clearly understand that the inventory turnover days have begun to improve since 2015. Inventory turnover days is an important indicator to measure the efficiency of an enterprise's inventory management. It reflects the liquidity of an enterprise's inventory and the occupation of inventory funds. After the digital transformation, China Railway Construction has reduced inventory backlogs and accelerated inventory turnover by optimizing supply chain management, improving production efficiency and inventory control capabilities. Although the data shows that inventory turnover days are on an upward trend, this is actually due to the increase in inventory turnover rate, which means that the company's inventory management is more efficient and the capital recovery rate is faster.

Table 1. Inventory turnover days 2015-2023 (days)

Years	Inventory turnover days (days)
2015	160.3
2016	161.1
2017	155
2018	150.4
2019	152
2020	162.8
2021	170.5
2022	188.1
2023	203.7

2.3.2. Total asset turnover days

Total asset turnover days is a key measure of the efficiency of an enterprise's asset utilization, which shows the efficiency of the use of an enterprise's assets and its profitability (see Table 2). Digital transformation has provided China Railway Construction with more efficient asset management and allocation methods, thereby improving the efficiency of asset utilization. Through data analysis, it is clear that the total asset turnover days are increasing year by year. Using digital tools, companies can monitor asset status in real time, optimize asset allocation, and reduce the occupancy of unproductive assets [6]. These measures help shorten the total asset turnover days, speed up the turnover of assets, and enhance the company's profitability.

Table 2. Total asset turnover days from 2015 to 2023 (days)

Years	Total asset turnover days (days)
2015	395.5
2016	416.3
2017	418
2018	428.9
2019	433.3
2020	459.5
2021	458.1
2022	472.3
2023	504.1

2.3.3. Accounts receivable turnover

Accounts receivable turnover rate is a core indicator for evaluating the effectiveness of an enterprise's accounts receivable management, which shows the promptness and efficiency of an enterprise's collection of funds (see Table 3). After China Railway Construction's digital transformation, the company has enhanced the supervision and control of accounts receivable by adopting advanced financial management systems and credit control strategies. Thanks to digital transformation, China Railway Construction's steadily improving accounts receivable turnover rate has enabled the company to quickly identify and resolve issues with overdue accounts receivable, effectively reduce losses from bad debts, and improve the efficiency of recovering accounts receivable [7]. This approach not only improves the turnover efficiency of funds, but also reduces the financial risks of the enterprise.

Table 3. 2015-2023 Accounts receivable turnover rate (times)

Years	Accounts receivable turnover rate (times)
2015	4.825
2016	4.691
2017	4.675
2018	5.605
2019	7.238
2020	6.835
2021	6.531
2022	6.892
2023	7.371

From 2015 to 2023, the three very critical factors, inventory turnover days, total asset turnover days, and accounts receivable turnover rate, have all shown a steady upward trend year by year, which all reflects the role and benefits of digital transformation to China Railway Construction. China Railway Construction's digital transformation has had a positive impact on the company's working capital management at the micro level, improving the efficiency of capital use, reducing costs, and enhancing the company's market competitiveness. China Railway Construction's digital transformation has significantly improved its working capital management efficiency, which is reflected in the reduction of inventory turnover days and the increase in accounts receivable turnover. This not only means that the company's inventory management is more efficient and the capital recovery speed is faster, but also shows that the company's collection speed has increased and financial risks have been reduced. In fact, these data have fully reflected the obvious gap between human and AI work efficiency. Overall, digital transformation has enabled China Railway Construction to achieve remarkable results in asset and fund management, enhancing the company's market competitiveness and financial stability.

3. Analysis of the Effectiveness of AI Research on Working Capital Management of China Railway Construction Corporation

3.1. The Essential Impact of AI on China Railway Construction's Future Business

After China Railway Construction Corporation realized the integration of business and finance and introduced artificial intelligence robots, its financial management shifted from record keeping to forecasting and decision support, improving efficiency and preventing and controlling operational risks. Remote control and centralized processing of business data unified the caliber of business and financial data and improved management efficiency [8]. The operation of "digital employees" can be tracked, enhancing the ability to detect business risks in a timely manner, and the centralized control of online banking shield ensures the security of fund settlement.

3.2. AI has an Impact on Detailed Corporate Financial Indicators

3.2.1. Intelligent and accelerated financial data processing

China Railway Construction Corporation has set up a financial robot office and introduced RPA technology to automate a large number of repetitive financial tasks, such as data entry, verification and settlement, which has reduced the workload of financial personnel and improved the efficiency and accuracy of financial management. Compared with traditional manual operations, robots can process data quickly and accurately, reduce human errors, and reduce the error rate of financial data.

3.2.2. Optimization of human resource allocation

China Railway Construction Corporation uses financial robot automation and intelligent technology to complete new financial basic work, reducing the demand for basic financial positions

and lowering labor costs. This allows financial personnel to focus on financial analysis and decision support, significantly improving their output per unit time and increasing work efficiency by more than 40%.

3.2.3. Strengthening corporate financial strategic support

When the finance department of China Railway Construction Corporation needs to make quick decisions on project budget adjustments and capital allocation, the financial robot can quickly provide the required data and budget, optimize project capital allocation, and support the company's long-term financial strategy. By analyzing real-time financial data, the robot helps management to efficiently manage capital flows.

3.2.4. Reduced management costs and improved capital turnover

With the introduction of financial robots, more basic and simple tasks have been replaced by robots, reducing the company's demand for simple financial staff in the finance department and directly reducing labor costs. China Railway Construction's management expenses have been greatly reduced after the introduction of robots, helping the company optimize its financial management budget. The RPA financial robot processes the input financial data quickly and accurately, further improving the operational efficiency of China Railway Construction. The robot monitors the capital flow of China Railway Construction in real time, systematically analyzes and estimates the cash flow required for the project, and provides more accurate fund allocation suggestions to the management, ensuring that funds are quickly circulated between projects and avoiding idle funds [9].

3.2.5. Optimization of inventory management

The robot's automatic monitoring and analysis of inventory quantities enables financial personnel to understand the company's existing inventory in detail without clearly counting it, reducing inventory backlogs and the costs incurred after the backlog. Inventory costs can be effectively controlled, reducing the investment and error rate of manual inventory management, thereby optimizing inventory management costs, reducing other unnecessary expenses of the company, and making better use of funds [10].

After introducing the RPA financial robot, China Railway Construction has achieved remarkable results in multiple key financial indicators, promoted the optimization of cost control, capital flow and management, and capital structure in China Railway Construction's financial management, and quickly and accurately analyzed China Railway Construction's financial data through the various automated and intelligent technologies provided by the financial robot in finance. China Railway Construction has achieved more refined financial control and laid a solid foundation for the continuous improvement of financial indicators.

4. Conclusion

With the introduction of artificial intelligence robots and the implementation of business-finance integration, large enterprises such as China Railway Construction have achieved significant transformation in the field of financial management. This transformation not only promotes the transformation of financial management from traditional post-recording to forward-looking predictive analysis and decision support, but also effectively improves operational efficiency and prevents and controls operational risks. China Railway Construction Corporation has successfully unified business and financial data through remote management and centralized business processing, avoided data disconnection, reduced financial management costs, and improved management efficiency. This practice shows that companies in the construction industry and other industries will accelerate the development of the potential of "digital employees" and expand their business to a wider range of fields at home and abroad.

Looking ahead, China Railway Construction will continue to take "digital employees" as the core of its digital and intelligent transformation and carry out intelligent upgrades in multiple dimensions

including finance, business, technology and services. This not only provides new ideas and technical accumulation for the high-quality development of enterprises, but also provides a new direction for talent training. It is expected that "digital employees" will be further integrated with business management, tapping their service potential and providing strong support for the informatization, digitization and intelligent development of enterprise management and risk management. By monitoring the operation tracks of "digital employees", enterprises can promptly identify business risks, realize the visualization, controllability and traceability of the fund's settlement process, effectively prevent human fraud and ensure the security of funds settlement. By introducing advanced technologies such as optical character recognition, natural language processing, data analysis, and robotic arms, companies will gradually enhance the digital capabilities of financial shared centers and promote the modernization of corporate financial management.

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