2021 2nd International Conference on Artificial Intelligence and Education (ICAIE) | 978-1-6654-2492-9/21/$31.00 ©2021 IEEE | DOI: 10.1109/ICAIE53562.2021.00022

Research on the Application of Financial Intelligence Based on Artificial Intelligence Technology

Jinhua Ma[1, 2]
[1]Shandong Vocational College of Science and Technology
[1]Weifang, China
[2]University of San Carlos
[2]Cebu, Philippines
809352845@qq.com

***Abstract*—This article focuses on the application of financial intelligence based on artificial intelligence technology. The article first analyzes the artificial intelligence technology and its applicability in the financial field, and then analyzes the idea of financial intelligence application construction. This article takes a financial robot actually put into use by a company as an example, and introduces the specific applications and effects of financial intelligence applications in the financial field from four aspects: basic operation, intelligent processing, data statistics, and risk monitoring. This article provides empirical data from the application of artificial intelligence in finance, and provide reference for other enterprises to use artificial intelligence technology.**

Keywords-artificial intelligence; financial robots; financial management

I. INTRODUCTION

In recent years, new technologies and applications such as big data, cloud computing, artificial intelligence, mobile applications, and blockchain have become increasingly mature. New technologies have brought new development opportunities and challenges to all walks of life. Artificial intelligence technology realizes the intelligentization of preset application functions by integrating technologies such as process automation, automatic image recognition, machine learning, and deep learning with actual business scenarios. In the field of finance, financial management is actively seeking the integrated development mode of financial accounting and management accounting to accelerate the transformation from accounting to management. In recent years, the reform of the power system has made enterprises pay more attention to cost control and efficiency improvement. The requirements of enterprise management for financial informationization have also shifted from accounting computerization to financial digitization, which runs through the entire process of business activities. Electric power companies should seize the opportunities of digital transformation, carry out research and practice of financial intelligence based on artificial intelligence technology, and promote the digital transformation of financial management in terms of improving the work efficiency of financial personnel, improving the quality of financial information, and strengthening financial risk control. Therefore, exploring the application of artificial intelligence technology in financial management will help to improve the quality and efficiency of financial data processing, standardize business processes and management, and help financial management realize financial digital transformation, which is an important reality for improving the level of enterprise comprehensive management [1].

II. OVERVIEW OF ARTIFICIAL INTELLIGENCE

Artificial intelligence, also known as AI, is an organizational principle. Artificial intelligence can be divided into two stages: strong artificial intelligence and weak artificial intelligence. Strong artificial intelligence refers to intelligent technology that has perception and self-awareness, and can truly think. Strong artificial intelligence Artificial intelligence that can adaptively respond to the challenges of the external environment [2]. Weak artificial intelligence refers to intelligent technology that can't really realize reasoning and problem-solving. Weak artificial intelligence does not really have autonomy.

At present, the mainstream research of artificial intelligence is still in the stage of weak artificial intelligence. However, people have made some achievements in image automatic recognition technology, speech recognition, process automation, machine learning and deep learning. Artificial intelligence technology has been applied to many areas of life [3].

III. APPLICABILITY OF ARTIFICIAL INTELLIGENCE IN THE FINANCIAL FIELD

In the weak artificial intelligence stage, the business scenarios applicable to new technologies usually have clear rules and a large amount of repetition. There are standards and norms for financial management, which is also the key to the integration of artificial intelligence and financial management, and it is also the theoretical basis for the realization of intelligent financial applications [4].

The learning cost of financial personnel should be fully considered when designing financial intelligence applications. It usually takes 2 to 6 days for financial professionals to master it, which can accelerate the popularization of financial intelligence applications. The specific time is determined by the complexity of the business process processed by artificial intelligence [5]. As a virtual labor force, artificial intelligence technology can improve data accuracy, information security and work efficiency [6].

978-1-6654-2492-9/21/$31.00 ©2021 IEEE
DOI 10.1109/ICAIE53562.2021.00022

IV. IDEAS FOR THE CONSTRUCTION OF INTELLIGENT FINANCIAL APPLICATIONS

A. Combination of financial intelligence application scenarios

Financial intelligence is an important practice for companies to achieve digital transformation. Financial intelligence requires the use of artificial intelligence technology to realize account management, tax management, capital management, budget management, accounting management, engineering financial management, asset value management, financial reconciliation management, shared platform management, and financial risk management. Through the automation, digitization, and intelligence of these financial fields, a smart financial ecosystem can be established.

The application of artificial intelligence technology in the financial field has been relatively mature. For enterprises, it is necessary to use the principle of maximizing benefits to achieve scientific deployment of intelligent technology applications. Therefore, companies must clarify whether intelligent technologies are suitable for themselves and which processes are suitable for them. Intelligent financial applications are usually suitable for businesses operated by standardized rules and a large number of repetitive processes. In the process of combing, the financial department of an enterprise should focus on the discussion from the aspects of operation, reconciliation, statistical analysis and risk management and control, and then determine the links and possibilities of automation and intelligence in the financial field.

B. Financial intelligence system integrated with artificial intelligence technology

Integrate artificial intelligence technology and financial requirements, integrate technical solutions into business scenario requirements, plan overall financial intelligence application construction content, build a financial empowerment intelligent system based on "scenarios + smart technology", and combine business scenario requirements with smart technology. On the one hand, build an intelligent application platform to centralize user management, authority management, monitoring management, data analysis and storage, usage analysis, application scheduling, log management, and script management, so as to provide a full range of protection for intelligent applications; on the other hand, various intelligent applications can be planned to sort out and integrate financial intelligent application scenarios. Through the design of various financial intelligent applications to meet a variety of financial management needs, including account integration, reconciliation automation, and intelligent tax reporting.

C. Intelligent application research and development and effect analysis

According to the planning content of the financial intelligence system, design a practical research and development plan, apply the research and development results to the financial management work, and analyze the functions of financial intelligence and the actual application.

1) Economic benefits

When designing financial intelligence application scenarios, the degree of automation and intelligence should be predicted based on dimensions such as manualization, complexity, rule judgment, electronic field types, standard fields, and error rates. Practice results show that financial intelligence applications can not only save labor costs, but also improve the quality of business processing.

2) Management benefits

The application of financial intelligence can free human resources from tedious tasks, promote the transfer of the focus of financial work from basic accounting to management accounting, help financial personnel to transform their functions, promote management model upgrades, and achieve the goal of improving management efficiency.

D. Risk control

1) Application risk

In the intelligent application design stage, the application risk control design is carried out by focusing on key process nodes, establishing an abnormal warning notification mechanism, recording detailed log records, and establishing a result audit mechanism.

2) Information security risks

In the design of intelligent applications, software security risk control is designed through personnel login authority control and login information monitoring. At the same time, during the construction process, measures such as data transmission protocols and encryption algorithm systems are used for data security risk control design.

3) Regulatory risk

Build a comprehensive management platform to manage the permissions of intelligent application tools,

Realize the implementation and control of intelligent applications, and realize unified monitoring and scheduling through the platform.

V. CASE ANALYSIS

This article takes the financial robot actually put into use by a power company as an example, and introduces the specific application and effect of financial intelligence application in the financial field from four aspects: basic operation, intelligent processing, data statistics, and risk monitoring.

A. Financial basic operations

1) Application Scenario

The financial staff will sort out the electricity fee income according to the bank receipt every day, and enter the financial system after the data sheet is formed. This not only consumes a lot of time, but is also prone to errors. The voucher entry robot can replace the manual to sort out the received bank receipts, which specifically include payment to the company, replenishment of overdrafts, transfer of overdrafts, and collection of user electricity bills. The robot completes the sorting of voucher information according to preset rules and automatically enters the voucher information into the financial

system. Figure 1 shows the workflow of the robot for entering electricity bills receipts.

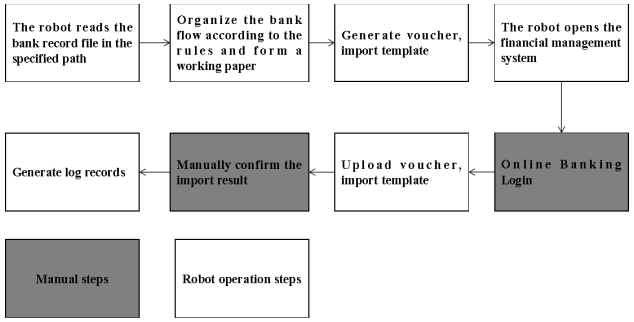

Figure 1 The workflow of the electricity bill vouchers robot

2) Application effect

In the bank streamlining process, each bank took an average of 2.5 hours. During the voucher entry process, each bank took an average of 2 hours. In the face of massive electronic data, the quality of manually sorted data faces great challenges. After the electricity bill entry vouchers are entered into the robot, the financial staff only needs to confirm the processing results of the robot. This process takes about 1 minute, which can save 4 hours on average, and effectively guarantees the accuracy of the data.

B. Financial Intelligent Processing

1) Checking and Accounting of Bank Receipts

In the marketing and financial reconciliation of electricity bills, finance needs to ensure the accuracy and completeness of revenue data. However, due to the inconsistent bank flow format and the large number of bank accounts, it has caused a large amount of work in processing and checking the bank flow. The bank receipt verification and accounting robot automatically performs the daily bank flow sorting, verification, push, certification and voucher modification work according to the corresponding parameters (see Figure 2 for the process), and realizes the automatic processing of the entire process of electricity bill data. At the same time, it has effectively improved the efficiency of financial management.

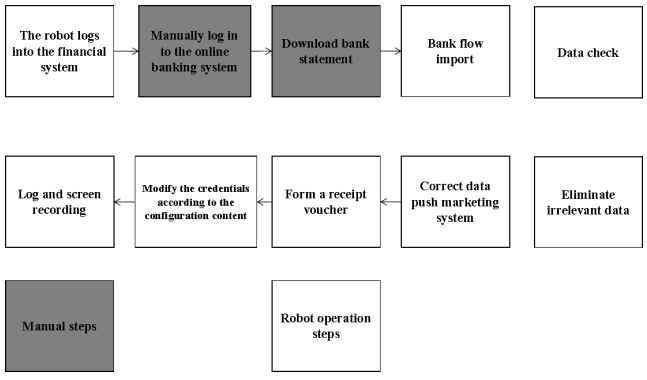

Figure 2 Bank Receipt Checking and Accounting Robot's Work

The key process of the bank receipt verification and accounting robot in the application scenario design process is as follows.

First, the security authority design. Taking into account the authority and security of the financial system and online banking system, logging in to the financial system and downloading the bank flow requires manual processing.

Second, intelligent identification of bank flow templates. The robot can intelligently identify the bank flow template data of different banks. Bank template changes only need to modify the configuration, without changing the robot program. Therefore, the stability of smart applications is greatly improved.

Third, the entire business process is automated. When sorting out the robot process, through repeated discussion of each operation step, the automatic processing of the whole process of bank flow introduction, removal, data verification, certification and modification was finally determined and realized.

Fourth, remind and log records. The completion of the robot operation will prompt the user that the business processing is successful or abnormal. At the same time, the robot records the complete operation process and operation data in the form of screen recording and recording log.

2) Application effect

The application of bank receipt verification and accounting robots can not only reduce the workload of financial staff but also improve the quality of business processing. At the same time, it can also record the entire process of financial business processing, which improves the ability to identify and control financial risks. Financial staff can save 38 minutes a day by using financial robots. It saves about 3 days of time per month for other work processing, which greatly improves work efficiency. (See Table 1)

Table 1 Application effects of bank receipt verification and accounting robots

Steps	Before using the robot	After using the robot
Organize bank flow data	Each bank takes 1 minute every day	0
Financial and online banking data verification	Each bank takes 4 minutes every day	0
Data removal, verification and modification	Each bank takes 2 minutes per day	0
Working time of the whole process	5 bank accounts every day takes 40 minutes	Machine 25 minutes, manual operation 2 minutes

C. Financial data statistics

1) Financial data summary statistics

In financial work, it is often necessary to consolidate and summarize data, including summarizing data in the same form or in the same dimension. The workload of some financial data aggregation process is extremely large, for example, budget management, engineering finance, and asset management. The general table summary robot can summarize and analyze one or more tabs or cells in the tabs in multiple Excel files, and display them according to the set dimensions.

2) Application effect

The universal application form robot greatly reduces the workload of financial staff to manually organize and summarize forms. Financial personnel only need to fill in the summary table to complete the data summary with one click. By solidifying the data collection rules, the standardization and standardization of data collection can be ensured, thereby avoiding the interference of human factors, and thus improving the quality and efficiency of data collection.

D. Financial risk monitoring

1) Invoice verification and verification

Business personnel need to check whether the paper VAT invoice is consistent with the tax bureau information every month. Manual verification of input is not only time-consuming but also prone to errors. Due to the huge workload of checking invoices, it takes a lot of time. The invoice verification robot can be applied to the verification of the value-added tax invoice deduction. After filing the invoice as a picture through a high-speed scanner, use OCR recognition technology to read the invoice information and sort it into Excel. After the information is successfully matched, you can check the files in batches, and finally log in to the tax platform for invoice verification.

2) Application effect

By using the invoice verification and verification robot, the time for manual and mechanical entry, verification, selection, and verification of invoices can be effectively shortened. The processing time for monthly invoice verification and verification has been reduced from 60 hours per month to the current 10 minutes (see Table 2 for details). At the same time, the invoice verification robot can realize the automatic entry of invoice information, which greatly improves the efficiency of electronic data and data formatting.

Table 2 Application effect of invoice verification and verification robot

Steps	Before using the robot	After using the robot
Invoice collation	Each chapter of the invoice takes 1 minute	Each invoice takes 5 seconds
Invoice verification	100 invoices take 10 minutes	100 invoices take 1 minute
Working time of the whole process	3000 invoices take 60 hours	Machine running for 30 minutes, manual operation for 10 minutes

VI. CONCLUSION

Based on the research of artificial intelligence technology, financial intelligence application scenarios and the integration of the two, this paper puts forward the planning idea of "scenario + artificial intelligence technology" financial intelligence system. Through applied research and practice, this paper verifies the promotion effect of artificial intelligence application on financial management. The effect of case application proves the importance of artificial intelligence technology. It also provides a reference for the future financial development of enterprises.

REFERENCES

[1] Teng Mingming. Research on the Application of Intelligent Financial Decision Support System[J]. Journal of Science & Technology Economics, 2021, 29(13): 55-58.

[2] Song Xuan. Application analysis of artificial intelligence technology in enterprise financial management[J]. Bohai Economic Outlook, 2019(11):90.

[3] Zhang Qinghua. Application of Artificial Intelligence in Financial Decision Support System[J]. National Circulation Economy, 2019(08): 66-67.

[4] Xiang Dan. The application of artificial intelligence in the financial decision support system of Yuyao Power Supply Company [J]. Enterprise Reform and Management, 2018(13): 155-156.

[5] Wang Shihuai. Discussion on the construction of enterprise intelligent financial decision support system [J]. China Management Information, 2009, 12(05): 26-28.

[6] Liang Ronghua, Shi Jijian. The application of artificial intelligence in the financial decision support system [J]. Computer Engineering and Applications, 2001(08):118-121.