

Digital Intelligence Operation Center of Tongwei: Research on the Value Creation Path of Digital Technology Application

Xinyao Zha*

School of Accountancy, Central University of Finance and Economics, Beijing, China

*Corresponding author: 2020310529@email.cufe.edu.cn

Abstract. In the digital era, new technologies such as big data and artificial intelligence are rapidly emerging. The speed of digital transformation in enterprises is also accelerating. Tongwei listed company has made an innovative exploration in the field of intelligent finance; and built a Digital Intelligence Operation Center based on artificial intelligence and Robotic Process Automation. This paper introduces the framework, digital technology and business application scenarios of Tongwei's new financial sharing center, discussing its innovation points and its future development path. This research expands the path of building intelligent finance workflows for enterprises and provides new ideas for the digital transformation of companies. The results of this paper have some reference value for corporate business process optimization and structural reorganization.

Keywords: Artificial Intelligence; Finance Robo; inance Shared Service Center; Enterprise Digital Transformation.

1. Introduction

1.1 Background

In recent years, technologies represented by big data, cloud computing, blockchain, and Artificial Intelligence (AI) have been emerging rapidly. To cope with the digital trend, enterprises have pressed the acceleration button of digital transformation and finance has moved from computerization to digitalization. Tongwei, whose core business is new energy and agriculture, relies on digital technologies such as Robotic Process Automation (RPA) and AI to transform various data assets into productivity, finally realizing comprehensive business digitization and intelligence.

1.2 Related Research

1.2.1 RPA financial robot

RPA finance robot is a specific application of RPA in the field of accounting. It acts as a virtual workforce in enterprises by efficiently completing repetitive and standardized tasks through fixed scripts entered in advance. Finance robots are suitable for highly process-oriented tasks, such as data recording. By applying RPA, companies can reduce labor costs and improve efficiency.

From existing studies, financial robots have already played an important role in voucher filing, expense management, etc. Huang and Dong analyzed the feasibility of RPA technology implementation in hospitals and designed a revenue accounting framework based on it [1]. Tang and Zhu constructed the RPA-based scientific research fund management process and extended the application scenarios of RPA [2]. China Traffic Guangzhou Waterway administration constructed an accounting voucher filing process based on RPA technology to automate voucher checking, matching, and printing [3].

1.2.2 AI and Accounting

AI has the ability of independent learning and self-iteration and cognitive ability through language recognition, natural language processing, and other technologies [4]. It also can continuously correct its behavior through big data to decide intelligently and control risk.

AI can make up for the limitation that financial robots cannot handle abnormal events. Based on reducing the intensity and improving the accuracy of financial work, AI uses technologies such as Optical Character Recognition (OCR) to process unstructured data. The use of AI in auditing has led

to ethical thinking, with stakeholders agreeing that new standards are needed to reflect the digital age[5]. Artificial intelligence techniques can also be used to explore the correlation between performance indicators and financial reports [6]. Figure 1 shows the application scenarios of combining AI technology and RPA financial robot, including five aspects of financial accounting—financial sharing, report management, system management, tax management, and fund management.

01 Financial Accounting

- Voucher generation and review
- Closing of accounts
- Accounting for fixed assets receivable and write-off

06 Funds Management

- Debit settlement
- Returning check-off
- Vank reconciliation
- Account reconciliation

05 Tax Administration

- Invoice checking
- Intelligent authentication
- Intelligent invoicing



02 Financial Sharing

- Smart auditing and reporting
- Compliance auditing
- Credit scoring

03 Report Management

- Report interfacing
- Report creation

04 System Administration

- Account creation and activation

Figure 1. Six application scenarios of "AI+RPA" in the field of finance

1.3 Objective

This paper studies Tongwei Digital Intelligence Operation Center to explore the application of RPA and AI technology in the accounting field, researching the path of digital value creation in the enterprise.

2. Construction of Digital Intelligence Operation Center based on RPA+AL Technology by Tongwei

2.1 Introduction of Tongwei

Tongwei is a listed company controlled by Tongwei Group, with its core business in agriculture and new energy. In terms of new energy, the company focuses on the Research and Development of high-purity crystalline silicon and solar cells, whose main customers cover the top ten global photovoltaic module enterprises. In terms of agriculture, the main business of Tongwei is the production of aquatic feed, livestock and poultry feed, and other products, with more than 10 million tons of annual feed production capacity. Its sale network covers most of China, as well as Vietnam, Bangladesh, Indonesia, and other Southeast Asian countries. In addition, Tongwei is also committed to the development and construction of the world's first "fishery and photovoltaic" business model. The model can realize outputting clean energy on the water and high value-added green agricultural products underwater, improving the efficiency of land resources.

As the only enterprise in the world that is involved in both agriculture and the new energy photovoltaic industry, Tongwei realizes the efficient and synergistic development of agriculture and photovoltaics. It has become a national key leading enterprise in agricultural industrialization and a global leading enterprise in high-purity crystalline silicon and solar cells.

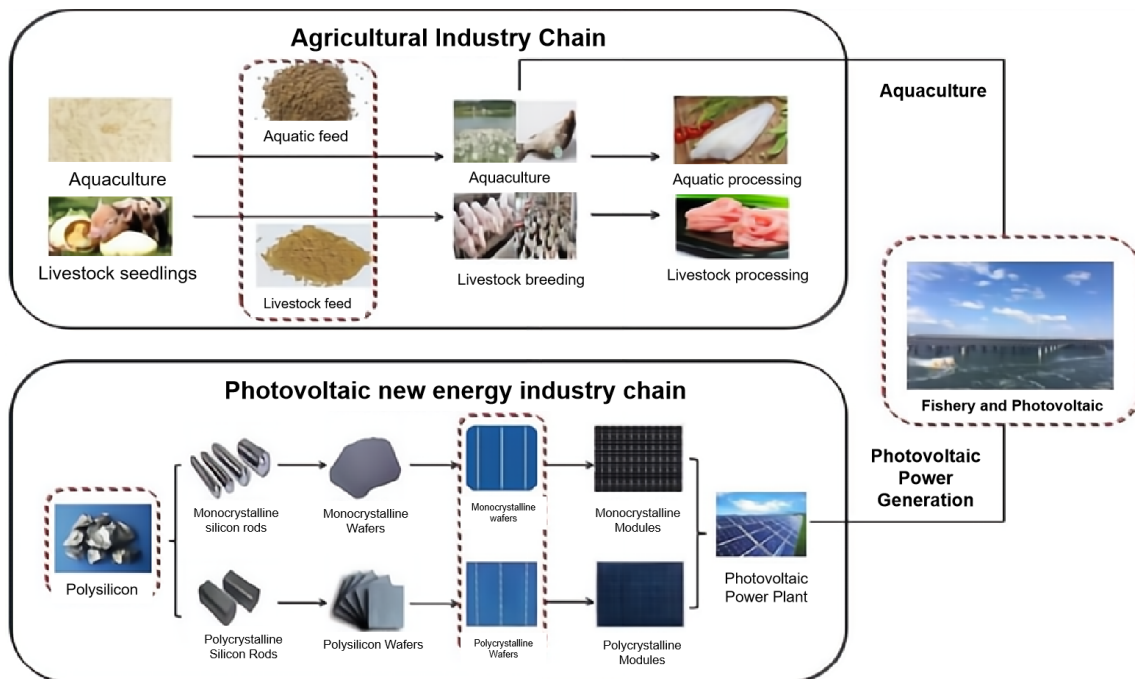


Figure 2. Tongwei double main business operation structure

2.2 Introduction of Tongwei Digital Intelligence Operation Center Framework

With the continuous expansion of the company and the gradual increase in production, the daily processing volume of business documents and financial vouchers of Tongwei has increased geometrically [7]. The original information structure and IT system processing capacity cannot effectively match the financial work processing efficiency. In the new wave of digitalization, how to use new technical means to support business development becomes an important issue that the management has to consider. In 2018, Tongwei started its digital transformation work. Through cooperation with Yuannian Technology, Tongwei has built a future-oriented "Always online, data-driven, intelligent operation" system and established the Digital Intelligence Operation Center (IOC) to realize business digitization and intelligence.

As shown in figure 3, with the capability framework of "four centers and one platform", Tongwei Digital Intelligence Operation Center provides a new form of enterprise governance with comprehensive perception, active warning, scientific decision-making, linkage command, and efficient execution for enterprise management.

2.2.1 One platform

The financial digital platform created the data cornerstone of the enterprise, on which the AI competence center, business and finance competence center, and financial data competence center were established to provide data and financial basic processing capability to support front-end business analysis and realize the automation and intelligence of each business process.

2.2.2 Four centers: Rule Center, Monitoring Center, Decision Center and Command Center

(1) Rules Center: Rule Center is the management hub of Tongwei Digital Intelligence Operation Center, focusing on enterprise rules, precipitating expert knowledge, and improving operational rules control ability. It digitally converts decisions, policies, and rules that are closely related to the operational business and forms a unified rule base such as fiscal and taxation knowledge base, financial index base, and monitoring rules.

(2) Monitoring Center, Decision Center, and Command Center are the core of the digital operation. Among them, the Monitoring Center senses, warns, and monitors the operation situation in all aspects, and actively warns when abnormal conditions are found. After discovering the operation problems,

the Decision Center matches the solutions available in the financial and taxation knowledge base through model analysis and sandbox, and rapidly provides scientific decision-making solutions for the management. Finally, through the Command Center, the management issues decisions and conducts real-time tracking to ensure the consistency of solutions and execution.

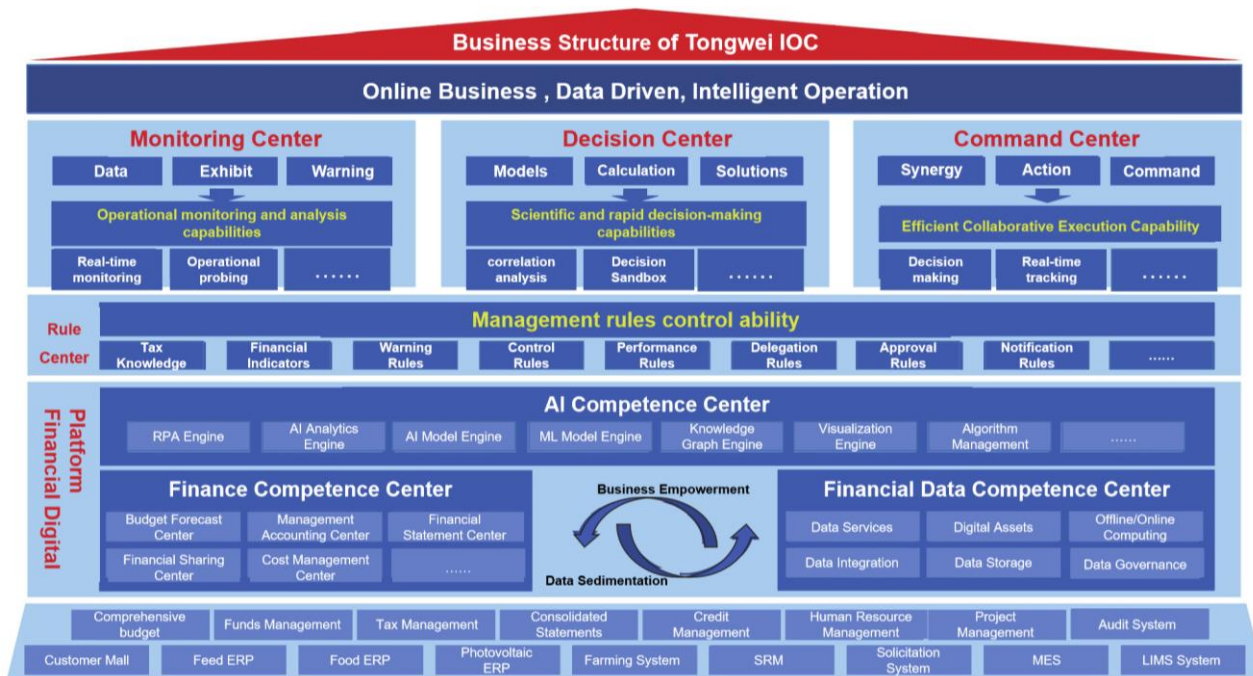


Figure 3. Tongwei Digital Intelligence Operation Center System Architecture Diagram

2.3 Relevant digital technologies applied

2.3.1 RPA Process Automation

Compared with traditional IT systems, RPA technology processes are less difficult to write, and less costly to develop. It has shorter development cycles and payback periods. Handing over the original manual-dependent and repetitive work to RPA financial robot can liberate financial manpower and reduce user operations. In the process of building RPA, Tongwei first considered how to use RPA to solve business problems, and made some attempts on single functions, including automation of overseas tax invoices, automatic maintenance of overseas exchange rates, internal business transfer checks, and spot checks of Financial Shared Service Center (FSSC) quality documents [8]. Based on the RPA single application, Tongwei further built the RPA monthly closing platform which can be applied in complex application scenarios, and finally achieved the goal of optimizing business processes and improving organizational efficiency.

2.3.2 AI Technology

While many enterprises are still using traditional Business Intelligence (BI) tools and management cockpits for data presentation, Tongwei has already started the practice of AI applications. Traditional financial tools, like BI, still have some shortcomings in the specific application: They can't quickly retrieve and apply the fragmented data in segmented scenarios, are difficult to respond to the flexible data required by leaders, and cannot effectively support users' personalized data needs.

In this situation, Tongwei adopted artificial intelligence technology to realize new modes of application such as intelligent interaction, intelligent visualization, and intelligent recommendation of data. Using the company's marketing and financial data as a pilot, it developed the "Xiaotong Q&A" AI application project, which involves about 30 indicators, 60 data tables, and more than 400 kinds of questioning support. "Xiaotong Q&A" innovatively combines Natural Language Processing (NLP), machine learning, knowledge mapping, and traditional BI analysis. Through natural language

interactions between users and PC or cell phones, It deposits and shared data anytime and anywhere, solving the problem of 90% fragmented data access for users. “Xiaotong Q&A” brings business employees, financial employees, and data closer and provides effective support for users' timely decision-making.

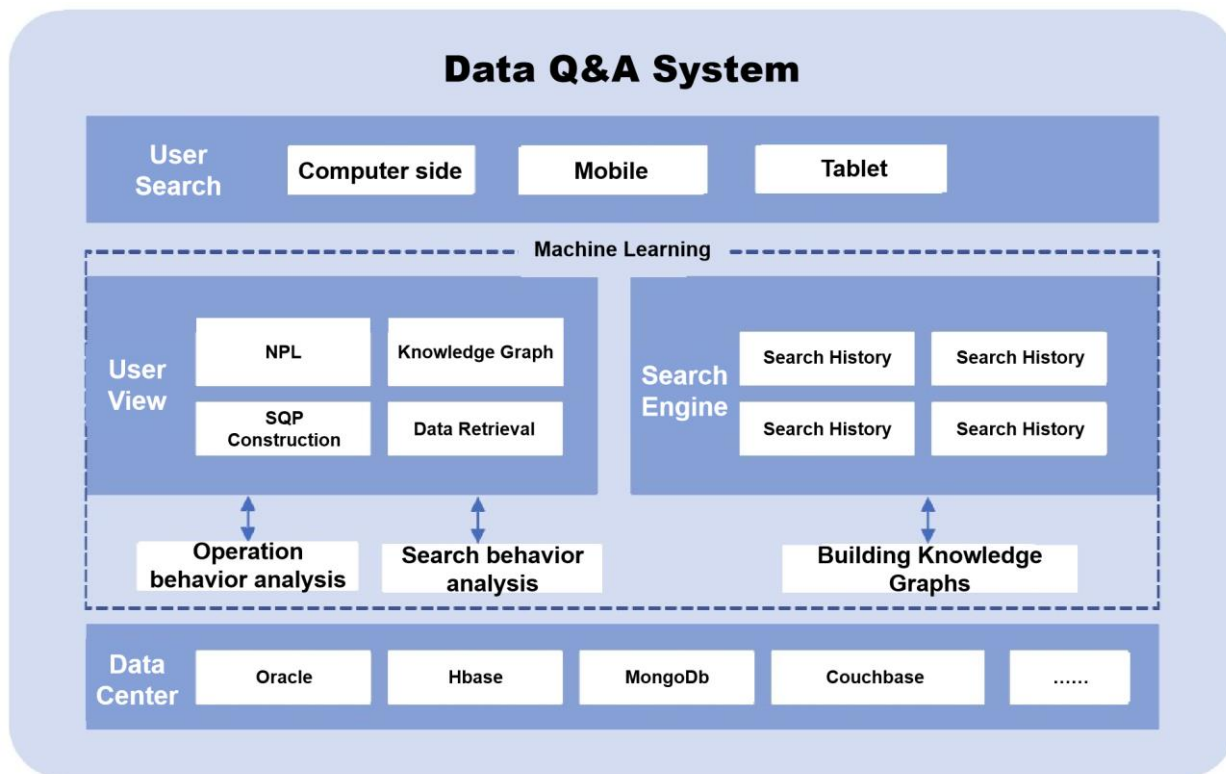


Figure 3. “Xiaotong Q&A” Application Architecture

3. Typical application scenarios

3.1 Scenario 1: Budget and Performance Management

"Budget traction, platform support, and system guarantee" is the positioning and action guide for Tongwei to implement corporate strategy and performance implementation. Manual budgeting has the defects of low efficiency, many errors, and the inability to compare with actual performance. The application of budgeting software system C1 in the Digital Intelligence Operation Center has made up for the shortcomings of manual budgeting by refining budget indicators for each molecular company, each department, and each employee [9]. So that employees can understand their positions, responsibilities, working goals, and the relationship with their colleagues. The Budget and Performance Management makes the budget truly become the basis of the Key Performance Indicator (KPI) performance assessment for each person and department. With the help of the digital software system, accounting, which was the back-end support department, is involved in the whole management closed loop. It gives the finance staff a deeper understanding of business and puts them in the shoes of the front-end business staff in terms of budgeting and cost control. It truly realizes the integration of business and finance and makes the front-line departments feel the support of the finance staff.

Through the preparation of the budget, every part of the company forms a consensus on the goal. The comprehensive budget system help forms a company-wide plan for the whole year, tracks indicators by month, and makes rolling adjustments every ten days. As of August 2019, the overall average accuracy rate of the budget was as high as 97%, truly realizing that every expense is implemented to every job and every job corresponds to the corresponding budget.

3.2 Scenario 2: RPA monthly closing platform

The challenge of financial monthly closing lies in data collection and report preparation. In 2019, Tongwei had more than 30 companies' monthly closing that need to be completed centrally by the sharing center. In 2020, based on the precipitation of RPA technology, Tongwei conducted a detailed combing of the monthly closing business, refined the operation steps, and quantified and standardizes all steps. Based on the standardized steps, the company built a unified scheduling platform for monthly closing. In this platform, RPA financial robot replaces the manual automatic operation, performing repetitive monthly closing tasks such as closing test check, expense carried forward, cost freeze, tail difference adjustment, closing or opening inventory period, and asset depreciation [10]. It significantly reduced the workload of finance personnel, realizing the automatic processing of each link in the shared docking and the visualization, and conducting automation of monthly closing business. During the July 2020 monthly closing period, RPA monthly closing robot went online for the first time to support the monthly closing work of 21 companies, running a total of 1,906 tasks. At 24 o'clock on July 31, the closing rate of the company which used RPA online was 71.43%. And the closing rate of the companies which didn't use RPA robots was 50%. By 2 o'clock on August 1st, the operating snapshot report submission rate of using companies applying RPA robots was 71.43% and 43.75% for the other companies. Besides, all companies in RPA monthly closing platform reported operating snapshot reports on time before 8:00 on August 1st.

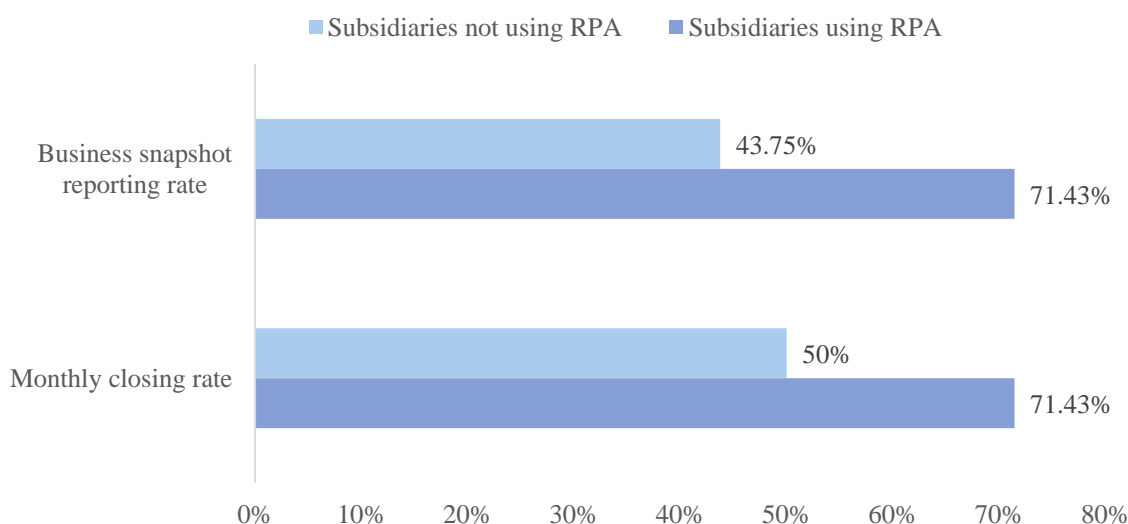


Figure 4. The impact of whether applying the RPA monthly closing platform on the company's financial efficiency

Through the construction of the RPA monthly closing platform, managers can pay attention to the progress of the financial monthly closing of each area in the company for the first time. They can see the reported reports of each molecular company, including the timeline trend report. In response to the new platform, the original system of Tongwei was optimized and iterated, with the development of new forms, the release of new systems and standards to jointly improve the efficiency of monthly closing.

4. Innovation points and plans of Tongwei

4.1 Innovation points

Tongwei has established a digital intelligence operation platform to solve two main problems. First, the company hopes to establish a business monitoring model through data enhancement to detect business constantly and identify potential risks of operation. After identifying the potential risks, the

decision center will find the most appropriate countermeasures through simulated decision results to improve the management's decision-making ability. Second, Tongwei hopes to optimize the existing business processes and establish a new process that is standardized and automated to better match the business of the finance center. Through the Digital Intelligence Operation Center, the company improves overall operational efficiency and reduces risks and operating costs. The company business achieves integration in decision making and execution, providing a new idea and path for the enterprise to build an intelligent financial sharing system.

4.1.1 Deep integration of business and finance

When establishing a financial shared service center, enterprises need to integrate business, data and technology to form a new business management model. In the financial shared business process, financial processes are more standardized, intelligent tools organically combine finance, business, tax, and budget, etc. Managers assess whether the process is ready for automation and further realize the intelligent operation of the process. The behavior in the enterprise management process begins to become driven by data rather than by human intuition or experience, and the complete closing loop of enterprise management activities is completed in a data-driven manner. In this way, Data will generate value in business activities and realizes the business metamorphosis in the process of digital transformation of enterprises.

4.1.2 Find high-value application scenarios

Enterprises need to take their business requirements as the core, understand the essence of digital logic and landing path, and gradually establish their digital management capabilities. In the process of building a financial sharing center, enterprises need to evaluate whether their own organizational structure and corporate financial situation are suitable for financial transformation. High-value intelligent financial application scenarios are a prerequisite for enterprises to realize data-driven business. Enterprises should measure and judge from five aspects: model innovation, user experience, work efficiency, business benefits, and social effects, focus on workflows with high development potential and high business value, conform to the enterprise's development strategy, and focus directly on business and financial pain points.

4.1.3 Ensure data quality

During the construction of intelligent financial sharing, enterprises need to unify the governance and management of data assets, provide consistent and identifiable data for digital business scenarios, and effectively leverage the value of data. The core goal of digital transformation of Chinese enterprises is to use data to fully integrate the production management and business operations of enterprises, forming a new management form that is real-time online, data-driven and automatically operated. The truthfulness and validity of data become the top priority of the digital transformation of enterprises. Biased data may cause the management of enterprises to make wrong decisions and bring huge losses to shareholders and debtors.

4.1.4 Personnel quality improvement

The construction of intelligent financial sharing is a process of introducing new technologies and a process of business process optimization and transformation. With the development of technology, existing financial positions such as cashier, general ledger accountant, cost accountant and tax accountant will be gradually disappeared, and new "finance + computer" positions such as data asset positions, human-computer interaction positions and information demand positions will be created. Smart Finance Center requires finance staff to think outside the box, understand the principles of relevant technologies, and master the content of enterprise products and services to interface with the company's sales, suppliers, human resources management and other departments. Smart Finance team members need to master financial knowledge, project management, process optimization, staffing and other comprehensive capabilities, with cross-border thinking and being good at working with employees in other departments to complete tasks.

4.2 Plans of Tongwei

2021 is the year when Tongwei's financial sharing service was fully reached. At present, the company's Digital Intelligence Operation Center exceeds 77% of domestic shared service centers in terms of business coverage construction. The center maintains efficient business processing efficiency. For 2022, Tongwei has proposed many new plans. In terms of work strategy, Tongwei has put forward the strategy of "micro-innovation", from "point" to "surface". Within the department, Tongwei continues strengthening job rotation within, sinking to the front end of the business and improving the understanding of operation and business for achieving business improvement. Then, in terms of team management and talent construction, the company has proposed a plan for team operation and training base construction. Further clarifying the direction of future talent construction. In the process of development, the company will consider how to constantly improve its business capabilities and working methods based on the existing work [11]. It will continue the construction of finance functions in "digital drive, professional empowerment, and strong risk control" through the financial shared service center, helping the digital development of finance.

Tongwei's "four centers and one platform" financial platform realizes the in-depth integration of technology and creates "Tongwei Intelligent Brain". No matter the technical capability of IT or the digital application of business, Tongwei is already in a position to build a new management mode for the future. The Digital Intelligence Operation Center will continue to lead the innovative development of Tongwei business and achieve a significant leap in operational efficiency and business effectiveness.

5. Summary

Through the integration of existing information, this paper examines Tongwei's exploration of intelligent finance, analyzes the organizational structure and application scenarios of its digital intelligent operation center, and explores its innovation points that can be learned by other companies. In the new round of technological revolution and industrial change, Tongwei reorganizes its business processes, introduces AI, RPA financial robot and other emerging technologies, integrates and standardizes the company's business and finance processes, and establishes a data-driven "intelligent brain of Tongwei". Through the study of Tongwei Digital Intelligence Operation Center, this paper finds that the deep integration of business and finance, high-value data application scenarios, standardized financial processes, high-quality data assets and quality of personnel are the elements that enterprises need to consider for digital transformation. Finance shared service centers can greatly save increasingly expensive human capital, improve enterprise operational efficiency, extend the original 8-hour working hours to 24 hours, and provide investors and management with better and more efficient services. In the future, intelligent finance will become the chain that connects all the affairs of the enterprise, gradually forming a data network with intelligent procurement and intelligent customer transactions.

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