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Application of Industry Finance Integration Mode Based on Big Data in Enterprise Decision-Making

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Abstract: In the increasingly competitive market, companies face enormous challenges in implementing strategies and development activities, which puts forward higher requirements for financial management. As an important means of managing and enhancing business value, the integration of business and finance has led to the restructuring and modernization of financial management functions, promoting the transition from basic accounting and corporate governance to supporting business value creation. This paper explains in detail the meaning of the industry finance integration model, the difficulty of implementation, the establishment of the database, and the implementation path. Then, from the perspective of timeliness of information, the Inventory turnover rate of the company's operation, and less cost and time, the experimental analysis is based on the role of Big data industry finance integration model in enterprise decision-making. The final experimental results show that the industry finance integration model based on Big data can effectively reduce the cost by 0.73 and the time by 0.75.

1. Introduction

The rapid updating and dissemination of information is an important feature of the information age, therefore, the practice of knowledge management should be actively updated in sync with the changes in knowledge. Enterprise financial information is an important foundation for the operation and development of enterprises, therefore it requires more attention from the financial management department. In the context of modern management, there is an urgent need for Innovation management of enterprise financial information.

However, other scholars have already conducted relevant research on financial information management. In order to investigate the role of enterprise resource planning (ERP) in the quality of management accounting information system (MAIS), Astuty W adopted a questionnaire survey. The survey data is taken from employees of publicly owned enterprises in Indonesia. A total of 180 valid questionnaires were received as a result of the survey. Astuality W uses partial least square regression (PLSR) for data analysis. The results show that enterprise resource planning plays an important role in managing the quality of Accounting information system. ERP has the potential to

promote the reliability, efficiency, and flexibility of MAIS quality in Indonesian public enterprises [1]. In order to study the role of Accounting information system in the performance management of Iraq's oil industry, Al-Delawi A S collected data from the financial statements of 10 Iraqi oil companies and analyzed them using STATA. The results show that the information Accounting software is positively related to the performance of the management. These findings provide guidance for decision makers, who should focus on Accounting information system that can improve organizational performance [2]. In order to conduct field research on the Nile Bank in Sudan, Abdelraheem A studied the impact of the use of information technology on the quality of accounting information (collection, processing, storage, and transmission of data and information). He used some descriptive analysis methods for field research. He distributed 120 survey questionnaires and collected 104 of them. He concluded that the dimensions of information technology (collecting, processing, storing, and transmitting data and information) affect the dimensions of accounting information quality (relevance, reliability, comprehensibility, consistency, comparability) [3]. Although the techniques used in the above studies are different, the extent to which they improve the quality of financial information management is not significant.

The development process of company activities consists of many decisions, large and small, and many factors that affect these decisions are interrelated, guiding the company to develop along a certain path. Therefore, scientific and rigorous decision-making has a direct impact on the future development of the company. In order to improve the scientificity of decision-making, enterprises usually start from developing decision-making mechanisms, decision-making capabilities, decision-making optimization feedback mechanisms, decision-making responsibility systems, and other aspects to effectively improve the scientificity of decision-making. The integration of industry and finance discussed in this article provides new support for enterprise decision-making and is an important manifestation of improving the positive role of financial management in enterprise decision-making. Financial integration plays an increasingly important role in enterprise decision-making and has become an important progress in optimizing and improving decision-making.

2. Integration Model of Industry and Finance

2.1 Introduction to the Integration Model of Industry and Finance

Integration of industry and finance, also known as integration of industry and finance, is a combination of business experience and financial management [4]. In a rapidly changing market, how can we maximize the utility of resources and remain invincible in competition? The combination of business and financial management requires the development of a flexible business management method and the establishment of an effective business process, so as to analyze the macroeconomic environment, the industrial development trend, the competitive advantage of products, and the choice of Marketing strategy [5]. Financial management consists of three main contents, which are based on the current operating results, based on financial report data, and presented in an informational manner [6]. The integration of business and finance would help eliminate the gap between business operations and financial management, improve the integrity and timeliness of accounting information, improve corporate governance structure, and reduce business risks [7].

Integration of business and finance, also known as commercial financial integration, is an abbreviation for the integration of business and financial management [8]. How can we optimize the use of resources and maintain competitiveness in the constantly changing market environment? In order to achieve the integration of business and financial management, entrepreneurs need to adopt a series of flexible business practices, keep up-to-date with the latest information, and implement

effective business practices, such as analyzing the macroeconomic environment, analyzing industry trends, analyzing competitive product advantages, and selecting sales strategies [9]. Financial management includes preparing three main sets of financial statements based on the company's current performance, using the data in the financial statements to support internal business decisions, and presenting the company's performance to the outside world [10]. The integration of business and financial management can eliminate obstacles between traditional business practices and financial management, improve the integrity and timeliness of accounting data, promote better corporate governance, and more effectively prevent business risks [11].

Financial data and business data are closely related, and activities related to cash flow in business data would generate corresponding financial data. Compared to commercial data, the collection of these data is also relatively easy [12]. At present, institutions generally use Financial software, and the collection of financial data can be completed at the same time as their production [13]. Financial data related to procurement includes material names, specifications, unit prices, external order quantities, unit prices, quantities, inventory categories, inventory quantities and values related to suppliers, as well as procurement costs, packaging costs, transportation costs, and reasonable losses incurred during the procurement process. Financial information related to production includes output rate, output, process, raw material items, specifications, quantity, capacity, operating time, equipment depreciation cost, reasonable quality control losses, and cost allocation results of finished products [14]. Financial sales information includes customer information, credit information, payment method, order name, quantity, price, delivery address, etc. [15].

For companies, combating corruption and avoiding financial risks are crucial. Financial management integrated into the business chain plays a positive role in coordinating and maintaining upstream and downstream relationships, and can effectively manage existing interests. At the same time, in the era of Big data, the compliance and legitimacy requirements of finance and tax are increasing year by year. Enterprises need to integrate financial management into the operation process to effectively avoid various tax related risks [16].

2.2 Difficulties in Promoting the Integration of Industry and Finance in Enterprises

(1) Lack of consistent management objectives for business and finance

Due to the fact that the company has several functional departments, each department has its own problems to solve and specific goals to achieve [17]. For example, the sales department mainly focuses on achieving revenue targets such as promotion quantity, customers, and terminals, rather than operating and technical costs, marketing costs, tools, etc. If the short-term goals of each department are not consistent with the long-term goals of the enterprise management, it is difficult to combine business and financial activities in a balanced and transparent manner [18].

(2) Lack of versatile talents in the integration of industry and finance

Compared to traditional finance and business operations, integrating business and finance requires an understanding of the relationship between business and finance, as well as finance and business. This requires staff to have higher requirements in implementing financial and business controls through effective closed-loop management. At present, the situation of financial personnel in the telecommunications industry is as follows [19]. Traditional corporate finance personnel only support business departments based on their knowledge of accounting and financial logic, which makes it difficult for them to conduct continuous evaluation and supervision before and after business planning [20]. Although some business units have introduced resource allocation systems, the work of financial personnel still focuses on reimbursing expenses, paying invoices, collecting taxes, and reimbursing expenses. Centralized accounting has been widely adopted in

telecommunications enterprises, and many financial personnel have experienced this change. However, many financial personnel have limited knowledge and a one-sided knowledge structure, only knowing their previous work and lack a deep understanding of frontline functional departments, resulting in many gaps.

(3) Lack of integrated support system for industry and finance and effective management tools

Enterprises have various business systems, mainly to meet the management needs of different departments. Most business data cannot be automatically generated into financial data in the system. In terms of financial data, enterprises are unable to grasp the data source, and the phenomenon of "data silos" is very serious, making it difficult to establish a systematic system to support the exchange of business and financial data. In terms of business information, the business and finance departments are complex, and the level of information support from the business department to the finance department is not high. The integration between the business and finance departments is relatively difficult.

2.3 Establish a Database for Integrating Industry and Finance

In the era of big data, companies need data support to achieve efficient profit growth. As an independent company, a large amount of information is generated in daily financial management and management support. Generally speaking, all data and information generated in various activities of a company can serve as a reliable basis for subsequent management decisions. However, a large amount of data and information has not been timely analyzed and processed in specialized databases, resulting in the dispersion of information. This has had a negative impact on the management's ability to extract useful information from a large amount of data. The concept of data inclusivity is complex, and if not implemented correctly, it may have counterproductive effects. The management should be aware of this, actively create a commercial and financial inclusion database, collect and analyze the data and information of the company's daily operations, and expand the scope of the database accordingly. Furthermore, creating a database for a company does not mean simply creating a "warehouse" to store data. Companies that have accumulated a large amount of information in their databases should designate dedicated personnel to continuously collect and manage this information, so that relevant management personnel can easily access it for business development and financial management [21].

2.4 Implementation Path of Industry Finance Integration

Business process reengineering, breaking organizational barriers and redesigning financial processes, not only eliminates the barriers between finance and business, but also simplifies the current financial process. It combines them with the value production chain of the enterprise, eliminates connections that cannot generate value, and ensures maximum internal and external information communication. Financial process restructuring can be divided into three stages: input stage, conversion stage, and output stage.

The goal of process redesign is to reduce the time spent in the production process of original documents and bills within the same organization. In ERP, unified accounting between various departments within the enterprise has been achieved, control over internal business processes has been achieved, and control over internal business processes has been achieved. This information is not just financial information, but includes information about suppliers, products, factories, and customers throughout the entire manufacturing and operational value chain.

BPR (Busines Process Reengineering) refers to the processing and integration of input information. In preparing various financial statements, internal accounting personnel often spend a lot of time. In this region, the implementation of business process restructuring requires financial

information personnel to work together from various departments to establish a determined information model. On the other hand, financial institutions standardize the input information and automatically convert it into existing patterns through the interface. During this process, information without any added value would be automatically excluded. Reorganizing the bottom-up business process requires the development of a decision-making user interface where the sales department obtains information and generates decision reports. This user interface should be a reverse interface with input and processing links, in order to make the entire process a closed loop [22].

3. Practical Application Experiment of the Integration Model of Industry and Finance

In order to verify the integration model of industry and finance for company decision-making and operational management, this article collects financial data from 7 companies, company earnings, and the application of financial information from an insurance company, and organizes and analyzes the data to obtain the following results.

Option 1: Accounting Information Management Based on Big Smart Cloud Technology
Scheme II: Accounting information management based on Big data
Option 3: Accounting Information Management Based on Grid Technology
Option 4: Web-based accounting information management
Plan 5: Enterprise Accounting Information Management Based on "Cloud Accounting"
Scheme VI: Accounting information management based on Big data mining
Scheme VII: Industry finance integration mode based on Big data

The temporal relationship of data: Suppose there exists a data set D with a data pattern of M. The records t_i and t_j have a temporal relationship $t_i < t_j$ on attribute A, if and only if both of the following conditions are true:

$$t_i[EID] = t_j[EID] \tag{1}$$

$t_i[EID]$ appears in set D before $t_j[\mathrm{EID}]$.

In different datasets, the priority relationship of attribute values for different entities often depends on the actual situation. For example, the value of attribute A_1 is directly proportional to the value of attribute A_2, which means that if the data is sorted by A_1, the order of A_2 must be the same as A_1. This constraint on the value of attributes in a dataset is called a temporal constraint on the dataset.

Generally speaking, given data always has a valid duration: some data has a shorter valid duration, such as personal information data on social networks, and some people's names have not changed since birth, so the valid duration can reach several decades.

The formula for calculating the timeliness of data with a timestamp is as follows:

$$cur = \max\left\{0,1-\frac{D_{RT}-D_{ST}}{D_{ET}-D_{RT}}\right\} \tag{2}$$

In the formula, D_{ET} is the deadline for the data.

When the cur value is zero, the data is invalidated; If the value is not zero, equation (2) can be used to calculate the timeliness of the data. The closer the final result is to 1, the better the timeliness; The closer to 0, the worse the timeliness. For a data table, there may be multiple pieces of data. When there are multiple pieces of data in the data table, the timeliness calculation can be performed on each piece of data first, and then the average or weighted average can be calculated.

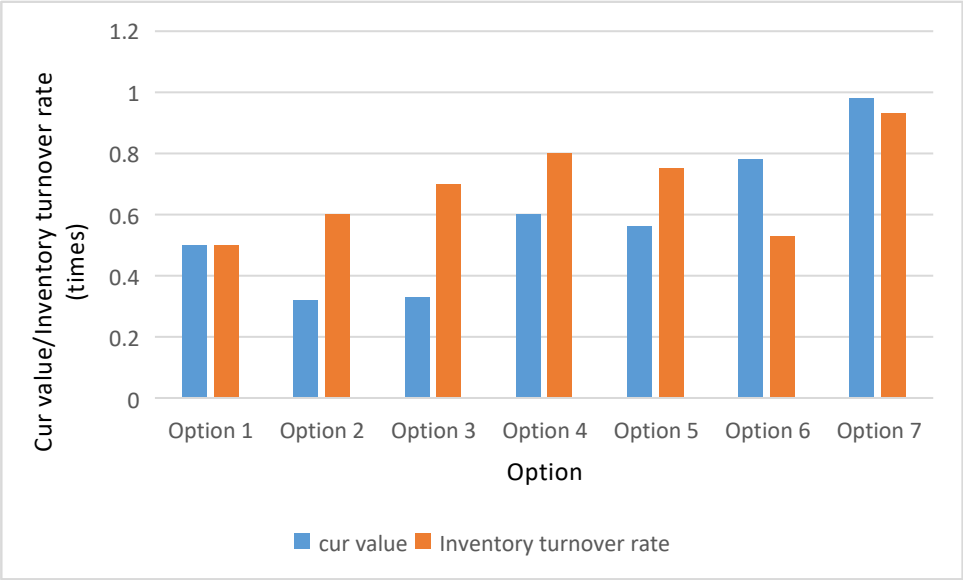

Figure 1: Cur value and Inventory turnover rate of different schemes

As shown in Figure 1, the industry finance integration model based on Big data is the most timely of the seven plans, because it can be seen from the figure that the cur value of the financial model based on this article is 0.98, close to 1, which is the highest of the seven plans. The Inventory turnover rate of the company is 0.93, which is also the highest compared with the other six plans. The higher the Inventory turnover rate, the stronger the company's operating capacity and the faster the capital flow. The above data shows that the industry finance integration model based on Big data makes the financial information collected by managers when making decisions more timely, which can increase the success rate of the company's top management in making decisions based on financial information. And because the industry finance integration model based on Big data effectively integrates financial data and business management, managers have a clear grasp of a series of process information such as company sales, inventory and cost control, which makes the company operate better, capital flows faster, and increases the company's revenue.

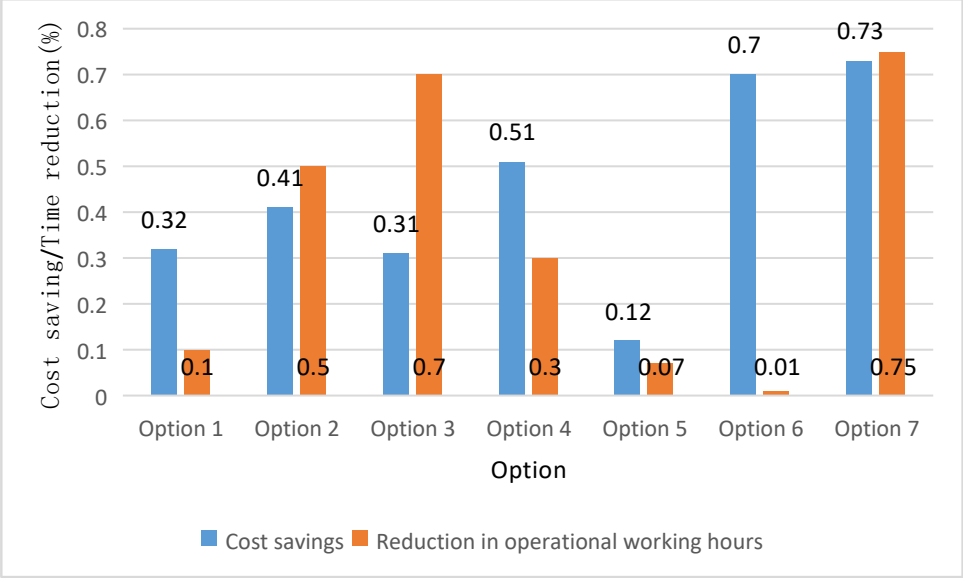

Figure 2: Cost savings and reduced working time of the solution

As shown in Figure 2, the financial shared services of the industry finance integration model integrate effective resources in the operation process of enterprises, input lower operating costs, output higher service levels, provide financial services for enterprises at the enterprise process level, and create wealth for enterprises at the enterprise goal level. The competitive effectiveness of shared services is long-lasting, reducing the consumption of mutual transformation between distribution centers, reducing business working hours, and enabling enterprises to achieve sustainable benefits. In addition, shared services not only reduce costs and increase efficiency, but also have adjustability tailored to the market environment, thereby attracting customers to purchase services in pursuit of value.

Financial functions generally include decision support, regulatory control, operational commentary, bookkeeping, and reporting.

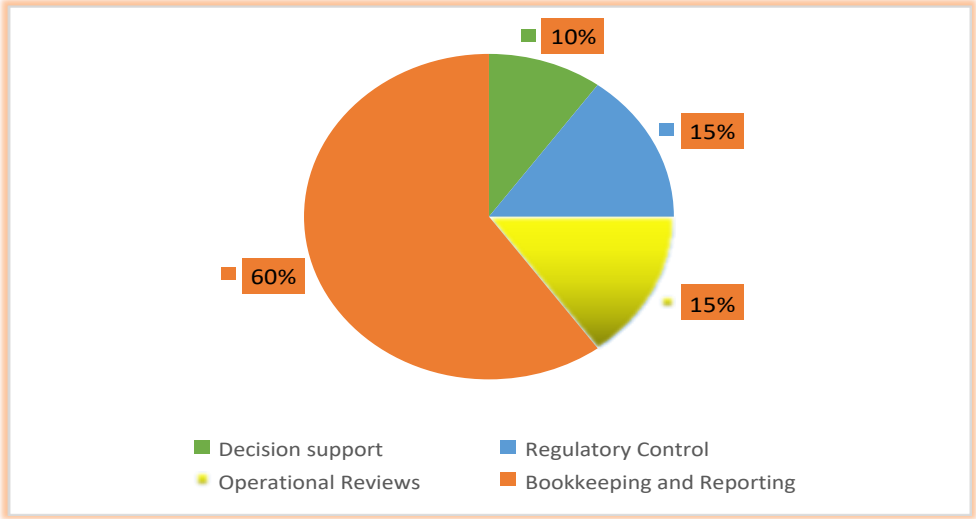

Figure 3: Distribution of Financial Functions in Original Provinces/Cities

As shown in Figure 3, in traditional accounting information processing systems, the largest proportion of financial functions is accounting and reporting, with almost no regulatory control, operational commentary, and decision support functions.

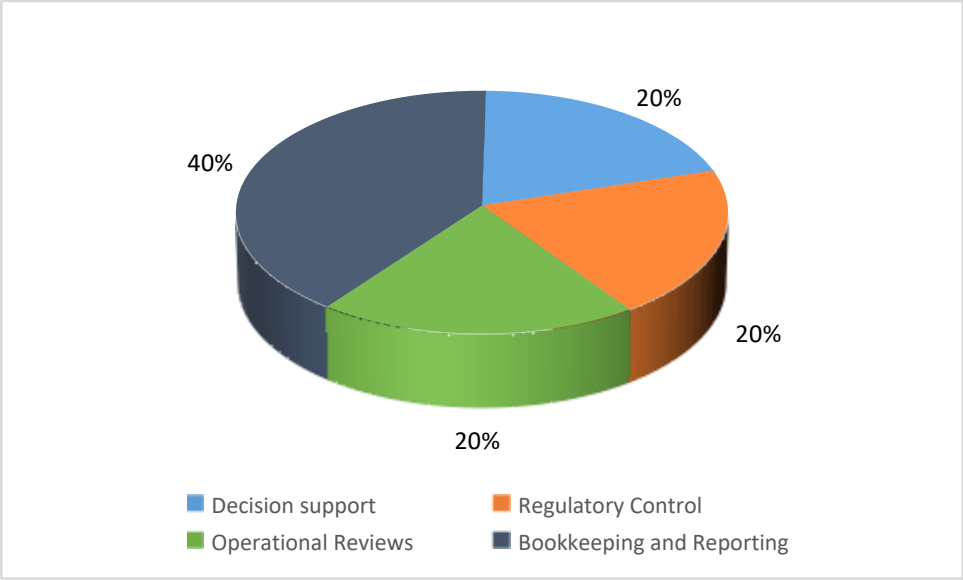

Figure 4: Distribution of Financial Functions of Provincial Companies

As shown in Figure 4, the insurance company has transformed the mode of financial department and business department and constructed an industry finance integration mode based on Big data, which has greatly changed the financial function of the provincial company. From Figure 4, it can be seen that the largest proportion of the company's financial functions is still accounting and reporting, but it only accounts for 40%, a decrease of 20% compared to before.

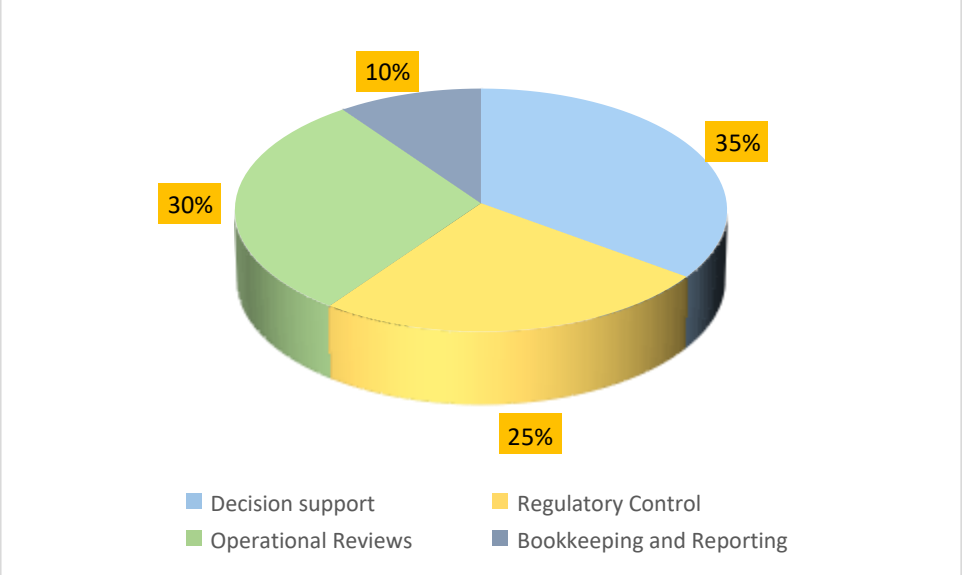

Figure 5: Distribution of Financial Functions of Municipal Companies

As shown in Figure 5, under the new business finance integration model, the highest proportion of the company's financial function is decision support, accounting for 35%. Next is operational evaluation, accounting for 30%. The smallest proportion is accounting and reporting, accounting for 10%.

4. Conclusions

Generally speaking, in order for a company to achieve better and healthier development, it is necessary to pay attention to financial integration, coordinate the interests of various departments, improve the company's corporate governance structure, effectively manage the risks faced by the company, and strengthen the personnel quality of the company, thereby enhancing the company's competitiveness in the competitive market. At the same time, enterprises also need to focus on achieving their own business goals, establish a scientific corporate governance structure, stimulate employees' work enthusiasm, establish a timely feedback mechanism, and effectively supervise it, in order to promote the sustainable development of the enterprise. The industry finance integration model based on Big data discussed in this paper is based on advanced technology, which can realize the effective transition from financial accounting to management accounting, improve management performance, promote the value creation of the group company, and eliminate the obstacles to the integration of management and finance by supporting the platform of the technology ecosystem. Its focus is to eliminate obstacles, establish a management Accounting software based on the establishment of large-scale computerized database, and realize the integration of management and finance.

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