

Research on the Integration of Industry and Finance of Coal Chemical Enterprises under the Background of Lean Management Accounting

Yanan Li ^{1,2}, Lina Xu ^{1,2,3,*}, Zhao Liu ⁴

¹ School of Business, Shanxi Datong University, Datong, Shanxi 037009, China

² Energy Economics and Environmental Policy Research Centre, Datong University, Datong, Shanxi 037009, China

³ Datong Macroeconomic Research Center, Datong 037009, Shanxi, China

⁴ School of Economics and Management, Guizhou Institute of Technology, Guiyang, 550003, China

* Corresponding author: Lina Xu

Abstract: In this paper, the production and operation characteristics of coal chemical enterprises are combined with the goals of creating enterprise value, strengthening strategic leadership, rationally controlling risks, effectively reducing costs, and making full use of the supply chain to enhance performance evaluation management in the management accounting information system. By analyzing the needs of coal chemical companies for the construction of industry-financial integration information systems and coal chemical companies' deficiencies in cost control and operation management, the logical framework and implementation plan for industry-financial integration informatization are constructed, and coal chemical companies are further clarified. In this way, the competitive advantages of coal chemical enterprises can be improved, and the energy strategy security can be ensured while taking into account the economic benefits of the enterprise.

Keywords: lean management; business-financial integration; management accounting

1. Introduction

As the Chinese government puts forward the goal of "carbon peak and carbon neutrality", the whole society has continuously strengthened the measurement and control of carbon emissions and the remediation of air pollution, and the environmental protection standards and requirements have been continuously improved. Under the economic background of coal decapacity, the utilization rate of clean energy has increased significantly, and international crude oil prices continue to fluctuate. These reasons make it necessary to re-emphasize the properties of coal raw materials and pay attention to the use of coal in the production process. In addition, the investment projects of coal chemical companies have the characteristics of high capital and technology density, high safety risks, and high environmental protection

standards, which also constitute difficulties in operation and management that need to be resolved. Based on the analysis of the lean management accounting system combined with the basic theory of industry-financial integration, this paper proposes to integrate the information flow, capital flow and business flow of coal chemical companies to cover the entire production and operation process, and to solve the problems faced by the company in the operation process. The company can take both economic benefits and social energy security into consideration.

2. Theoretical Analysis

2.1. Theoretical Basis of Industry-Financial Integration

With the advent of the era of big data accounting, it has brought challenges and opportunities to traditional accounting functions. On the one hand, it shows that the Internet and cloud data provide technical support for financial sharing, which makes data integration unnecessary to be completed by financial personnel. The process of accounting is completed by the computer through formulating rules and algorithms [1]. On the other hand, for the internal financial management activities of the enterprise, due to its strong comprehensiveness, the flexible decision-making ability of the management personnel is required. Therefore, it is necessary to combine business with finance and simultaneously utilize the advantages of information system hardware to jointly create more value for the enterprise, which has become the development trend of business management [2].

The integration of industry and finance is a new type of management mode, which can complete the pre-risk assessment, profit and loss prediction in the management process, budget monitoring and control during the event, and evaluation and summary analysis of the business results after the event [3]. On the one hand, by participating in the whole process of operation and

management, The integration of industry and finance can complete business processing at low cost, quickly and efficiently, and generate a flow of financial information for internal and external users of giant information [4]. Used in the next business decision-making, for the sake of continuously optimizing and guiding for business management. In contrast, the basic function of traditional accounting type finance is to perform accounting, which can be achieved through computing technology, which can reduce the workload of financial personnel. So business-oriented finance requires financial personnel to be familiar with the business and extend the work content forward to collaborate with business departments to implement corporate strategic goals [5]. Furthermore, strategic finance is based on the company's strategy, combining business processes and business department functions, decomposing and quantifying strategic objectives to ensure the smooth implementation of the strategy [6].

2.2. The Theory of Business-Financial Integration in the Context of Lean Management Accounting

Both the management accounting information system and the integration of business and finance can provide information support for the management decision-making and evaluation of enterprises [3]. The essence of the integration of business and finance is the background management activities supported by information technology, and its main content is recording measurement and reporting [7]. In addition, the functions realized by the business-finance integrated information system are consistent with the value functions of management accounting, which are based on strategically-oriented risk control, cost control, supply chain management, and performance management [8]. Therefore, studying the integration of industry and finance can enhance the ability of corporate management accounting [9]. What is important is that coal chemical companies want to achieve the integration of industry and finance, coal chemical companies need to continuously innovate management methods and concepts in financial accounting and management accounting, and need to use advanced information technology and methods at the same time, so that the business flow, capital flow and information flow of the enterprise can be integrated and integrated [10]. Building a financial management information system is suitable for the operation of coal chemical enterprises in the context of industry-finance integration.

3. Analysis of Current Situation and Existing Problems

3.1. The Status Quo of the Construction of Industry-Financial Integration of Coal Chemical Enterprises

In the new round of coal chemical technology industry demonstration process, the management system of some coal chemical companies has fallen behind the process of technological development, unable to achieve the requirements of lean management, and unable to give full

play to the management functions and lack of guidance and auxiliary role for the overall planning of the industry. However, in the process of the new round of industrial restructuring, many coal chemical companies are developing like a broken bamboo, which has brought considerable economic benefits to local governments. Therefore, many local governments and enterprises ignore the technological development level of the industry, the local construction environment and conditions, and the supply and demand market. And they are driven by short-term interests to build and invest in coal chemical projects, resulting in low energy conversion efficiency, high investment risks, and industry overcapacity and other issues. How to achieve lean production under cost control and improve the utilization rate of energy and capital is the main development problem faced by these enterprises. That is, how to use informatization means to carry out the informatization construction of the melting of business assets to resolve the difficulties faced by coal chemical companies in the operation process, such as high capital, personnel and technology density, high security risks and high environmental protection requirements. The reality is that the function of management accounting has not been fully utilized in coal chemical companies, and lean management and the production cannot be effectively carried out. The utilization rate of coal and other energy sources is not paid attention to the value of its raw materials, and the carbon emission target is not up to standard. To sum up, the degree of informatization of industry-financial integration is relatively backward, and it has not been used for the scale effect of integration, which has led to the lack of competitive advantage of some enterprises in the industry.

3.2. Problems in the Construction of Industry-Financial Integration

There are the following problems in the process of informatization construction of industry-financial integration in coal chemical enterprises: (1) The level of informatization is relatively backward, and there are information barriers within the enterprise. The specific manifestation is that the information between the various business departments and the financial department is not shared in time. And there is a time lag effect in the exchange of information. Although the resource manufacturing planning system ERP or basic systems such as MIS systems have been introduced into some enterprises. The system does not play a substantial role in the process of business flow, information flow and capital flow and integration, but only assists in basic financial accounting. However, the decision-making auxiliary functions of these information systems are generally absent, lacking the functions of comprehensive information integration and utilization.

(2) Some companies pay more attention to hardware than software, and the funds cannot be used rationally. On the one hand, there are problems such as the small scale of investment in information construction in domestic coal chemical companies, and on the other hand

there is the problem of unreasonable investment structure. Compared with software, software maintenance and daily management, some companies pay more attention to hardware and its hardware construction and technology. What's more serious is that these phenomena have existed for a long time, which directly led to problems such as the construction of the coal chemical industry's industry-financial integration information system, the slowing down of the construction process and the low maintenance efficiency. The role of industry-financial integration cannot be fully carried out to assist management decision-making. If funds are insufficient, the complete construction and operation of functional modules will be incomplete, and the functioning of the entire system will be affected.

(3) The lack of professional talents and innovation in management mechanisms and models make it impossible to adapt to the industry-financial integration information system. At present, there is a general lack of compound talents who understand technology and are proficient in business and management in enterprises, which has become an obstacle in the process of information integration of industry and finance. In the process of implementing business-financial integration, the management system and model have not been reformed and innovated accordingly, so that these two systems cannot work with each other and even cause the established system to fail to operate. In addition, the corresponding coordination mechanism has not been constructed, and the old management system and mode are not thoroughly reformed, which will affect the operation of the industry-financial integration information system.

(4) Lack of unified norms and standards in the industry. The lack of a unified standard for enterprise informatization is manifested in the confusion of internal product and technology coding and the different standards of different enterprises, which is not conducive to horizontal communication and information sharing between enterprises. It is also not conducive to the overall development of industry informatization. The informatization construction of coal chemical enterprises is seriously hindered by these problems. At the same time, these problems are not conducive to the risk being controlled in the enterprise.

4. Countermeasures and Suggestions

4.1. Analysis of Requirements

By summarizing the problems that coal chemical companies have in the process of information integration of industry and finance, the reasons are summarized as information islands, lack of unified standards and norms, and unclear management interfaces. Among them, the problems existing in the business modules of infrastructure and material management, production cost control and management, and administrative management are the most prominent and have a greater impact. In order to solve the above problems, the design and improvement of these three modules are focused on, which is conducive to the smooth implementation of the

industry-financial integration information system.

4.2. Design of a Coal Chemical Enterprise Industry-Financial Integration Scheme

The logical relationship between the two core mainline building modules based on the enterprise's information flow and capital flow is also the two core mainlines of the information construction of the integration of business and finance [11].

(1) Implement double modularization

(2) Dual modular functions can be realized through the following ways, such as technically integrating customer resource management systems, lean process information of production organizations, automation of processing and manufacturing, and the construction of intelligent manufacturing and standard working hours systems, etc. [12] First of all, the company implements modularization of business organization. The goal of business organization modularization is to establish a highly innovative, flexible and disciplined organization within the enterprise, and to reconstruct the original vertical or flat organization. [13] The modularization divides the importance of enterprise business into main business and sub-business organization modules. Secondly the business organization module is based on the value chain of the enterprise. The information exchange between the modules is identified by the system. The sub-business module is a process-based subdivision of the main business module and integrates information through the value chain to realize real-time information sharing. At last both the main business and the sub-business modules are vertically connected based on the business flow to improve the flexibility of the management system.

(3) Industry-to-finance integration plan for production management and cost control

The coal chemical industry is a continuous production enterprise. According to the business content of production, there are mainly production plans, technological processes and technological formulas [14]. According to the requirements of lean production management, after the end of the product costing cycle, the cost of resources and materials is calculated by the financial department, and the cost is collected and allocated, which constitutes the calculation of the cost of products and finished products. After confirming the cost accounting method in the system, the corresponding data is decomposed and extracted [15]. The accuracy of business data can be improved through the integration of business and financial information.

(4) Industrial and financial integration plan for infrastructure and material management

The infrastructure management module is closely connected with the capital flow, and the infrastructure management module and the material management module are coordinated to integrate the main infrastructure business and financial management activities on the basis of the conversion of the physical business and financial accounting [16].

The material management system is mainly operated with the support of the enterprise asset management

system and OPM. Besides, the related fuel coal and raw coal inventory and cost are also managed in the OPM system [17]. In the above system, the "moving weighted average pricing method" and "period moving average cost" are used for cost accounting. After clarifying the functional modules and interfaces of the business system and the financial system, the two systems are respectively used as the main inventory, and the inventory of the goods and the accounting accounts are corresponding to complete the cross-check relationship between the flow of materials and the flow of funds [18]. In the meantime, the business department and the financial department should carefully review and confirm the process, and accurately describe the business scenario when designing the plan. By building a general classification system for materials, standardized coding is conducive to the investigation and modification of data.

(5) Business-finance integration plan for integrated business management

The integration of business and finance in integrated business management is mainly reflected in the expense reimbursement and the period expenses incurred by the management department. And the physical carriers of business activities are mainly contracts and payment receipts. Furthermore, it is necessary to build an intelligent declaration system and access the system's business forms and accounting systems, and then integrated business management and financial management are integrated. Then, the documents and contracts are efficiently approved, and the internal control system of the enterprise is strictly implemented, in order to ensure the legality and rationality of economic business.

5. Conclusion

In summary, the completion of the integration of business and finance in coal chemical companies will essentially share the company's business flow, capital flow, and information flow in a timely manner, and then the problem of information asymmetry between the financial management process and various business processes will be solved. In the context of lean management accounting, the integration of business and finance is implemented in the process, and all links of the enterprise's production and operation management need to be fully included based on the enterprise value chain, which enables effective prediction, decision-making, control, analysis and control evaluation. Only by adopting the above measures can the value of the enterprise be enhanced and economic benefits can be increased to achieve the goal of cost saving.

Acknowledgment

The authors gratefully acknowledge the financial support from Horizontal Project of Datong Development and Reform Commission, Shanxi Datong University PhD Start-up Foundation (2014-b-16), Datong Soft Science Foundation (2017151), Philosophy and Social Science Planning Foundation of Shanxi Province—"Study on Mechanism and Policy of Industrial

Structure Optimization in Shanxi Province under the Target of Low-carbon Transformation", Soft Science Foundation of Shanxi Province (2018041067-4, 2018041060-7), Philosophy and Social Science Planning Foundation of Shanxi Province (2019B294,2019B308), Philosophy and Social Science Project of Colleges and Universities in Shanxi Province(2020w1080).

References

- [1] Zhang, X.Y. Analysis of Enterprise Financial Business Integration System. *Finance and Economics* **2018**, no. 33, pp. 82-83.
- [2] Yan, P.F. Research on the Informationization Construction of a Coal Chemical Enterprise Industry Finance Integration. *Beijing Jiaotong University*. **2019**.
- [3] James P; Womack; D.T, Jones. World -changing Machine. *Beijing: The Commercial Press* **2000**, pp. 22-28.
- [4] Allen, J; Robinson, C; Stewart, D. Lean Manufacturing: A Plant Floor Guide. *Michigan:Society of Manufacturing Engineers* **2001**, pp. 106-151.
- [5] Seyedhosseini, S.M; Taleghani, A.E; Bakhsha, A; Partovi S. Extracting Leanness Criteria by Employing the Concept of Balanced Scorecard. *Expert Systems with Applications* **2011**, no. 8, pp. 10454-10461.
- [6] Vinodh, S; Vimal, Kek. Thirty Criteria Based Leanness Assessment Using Fuzzy Logic Approach. *International Journal of Advanced Manufacturing Technology* **2011**, no. 60, pp. 1185-1195.
- [7] Dennis, P. Lean Production Simplified: A Plain Language Guide to the World's Most Powerful Production System. *New York: Productivity Press* **2007**, pp. 138-256.
- [8] Wan, H.D; Chen, F. Quantifying Leanness and Agility of Manufacturing Systems. Atlanta, GA (US): *Proceedings of the Conference on Industrial Engineering Research*, **2005**.
- [9] Tekez, E.K; Tadeviren, G. A Model to Assess Leanness Capability of Enterprises. *Procedia Computer Science* **2016**, no. 100, pp. 776-781.
- [10] H.R, Leite; G.E, Vieria. Lean philosophy and its applications in the service industry: a review of the current knowledge. *Production* **2015**, no. 3, pp. 529-541.
- [11] Mohr, Z.T; Ringa, R; Douglas, J.W. Is Cost Accounting Used with Other NPM Practices Evidence from European Countries. *Public Performance & Management Review* **2018**, no. 9, pp. 696-722.
- [12] M.Lopez-Alonso, M.P; Ibarondo, D; Rubio, M.C. Safety cost management in construction companies: A proposal classification. *Work* **2016**, no. 3, pp. 617-617.
- [13] Nowak, E. Cost Control and Its Role in Controlling Company Operation. *Research Papers of the Wroclaw University of Economics/Prace Naukowe Uniwersytetu Ekonomicznego we Wroclawiu* **2016**, no. 441, pp. 125-133.
- [14] Emblemstvag, J; Cokins, G. Calculating Hourly Cost Rates In Project-Based Industries Part 2: cost management. *Modern Project Management* **2020**, no. 4, pp. 1-22.
- [15] Jasti, N.V.K; Kodali, R. An empirical investigation on lean production system framework in the Indian manufacturing industry. *Benchmarking* **2019**, no. 1, pp. 296-316.
- [16] JALDANIYAZOV, KN. Organizational Chart Improvement on the Strategic Product Cost Management. *Economic Perspectives* **2016**, no. 4, pp. 284-290.
- [17] Elena, R; Georgiana, S. The Role of Cost Accounting in the Management of the Activity Center. *Ovidius University Annals, Economic ences Series* **2013**, no. 8, pp. 1-5.

- [18] Anna, D. Strategic cost management across boundaries of firms. *Industrial Marketing Management* **2003**, no. 5, pp. 365-374.