Research on Enterprise’s Total Budgeting Management in the Era of Big Data

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Abstract. With the continuous development of information technology, the application of big data has improved the efficiency and quality of total budgeting management in enterprises, and has opened up a new era of enterprise management. Based on the survey of big data and total budgeting management, this paper analyzes the impact of big data on total budgeting management of enterprises, constructs a total budgeting management system for enterprises in the era of big data, and proposes corresponding safeguard measures. The research results can provide a reference for enterprises to implement total budgeting management in the era of big data.

1. Introduction

In the era of globalization of economy and science and technology, the application of big data has become an important part of social production and life, and China thus has begun to build the basic theoretical framework of total budgeting management in the era of big data. The budgeting management of an enterprise involves various economic activities of the enterprise. In terms of the budgeting, the economic activities of the enterprise can be controlled within a range. Whether an enterprise can survive the fierce market competition lies in its ability to integrate big data into its total budgeting management. Therefore, it is of great theoretical and practical significance to study the total budgeting management in the era of big data.

2. Overview of big data and total budgeting management

2.1. Overview of big data

Big data refers to a large amount of data set which is far beyond the processing capacity of traditional data statistics software and tools in terms of width, breadth and speed, and it is sometimes called huge data. The massive data refers to the data volume with a data scale of more than 10TB. Big data is a huge data set, and its value does not lie in the data itself but in the effective standardization of the data to enhance the value of the data. Therefore, the concept of big data involves the processing technology of big data. Big data processing technology refers to the technology of extracting and processing massive
data to obtain valuable information. It mainly includes three aspects: firstly, there should be a tool platform that can collect massive data to manage structured and unstructured data; secondly, there should be data analysis software, which can mine and analyze in-depth data; thirdly, there should be professionals who can manage and utilize these data and software. Hence, in addition to big data processing technology, what we call big data should include the tool platform for data collection and data analysis system.

2.2. Overview of total budgeting management

Total budgeting management refers to the process that enterprises in particular budget period resort to budgetary methods for coordinating and arranging their operating activities, investing activities and financial activities, and take the budget as the standard to control, calculate, analyze, and evaluate a series of management activities, for the purpose of realizing their strategic planning and business goals. The content of the enterprise's total budgeting management involves budget preparation, budget implementation, and budget evaluation. These items of content are interconnected, interacted and interconnected, and there is a closed loop between these items and the strategic goals of the enterprise, so as to achieve scientific and systematic management and effective control of all economic activities of the enterprise, and ultimately to achieve the strategic goals of the enterprise.

3. Analysis of the impact of big data on total budgeting management of enterprises

3.1. Big data can promote the establishment of enterprise budgeting management data platform

Under the existing budgeting management, budgeting management data mostly rely on internal enterprise data, which is usually completed by the financial department alone. The financial personnel of the enterprise have to process large amounts of data, and budgeting management cannot exert its intended effect and provide effective guidance for the enterprise's operation decision-making. Due to the lack of an effective enterprise data sharing platform, all aspects of budgeting management need to be manually compiled and information transmitted, which cannot be controlled in a timely manner, and it is more likely to produce deviations between budgeting execution and actual conditions. In the context of the development of the big data era, enterprises can build a budget management data platform and carry out multi-dimensional data processing, can conduct more accurate financial planning and strategic deployment, and can further tap data, which will definitely improve its ability in budgeting management.

3.2. Big data can promote the optimization of enterprise budget management process

The traditional budgeting management process fails to create a useful information exchange platform and lacks standardized control, so that the approval process is slow or complex, which leads to errors in the control of the budgeting process. If an enterprise applies big data to carry out a comprehensive budget, it can fully understand the implementation of the budget in real time, adjust the deviation of the final budget target according to the change of the actual situation, and update it in real time, which is conducive to achieving the budget target of the enterprise. In this way, the enterprise budget is no longer limited to the post-analysis, and can be closely combined before, during, and after the event to promote the realization of the ultimate goal of the enterprise. Under the big data platform, the budget adjustment process no longer needs to be so cumbersome. Examination and approval through cloud system process will improve efficiency, and the whole enterprise budget management process will be more optimized, so that the enterprise can fully mobilize internal and external data resources, conduct accurate strategic analysis, and achieve standardized budget management.
4. Construction of the enterprise total budgeting management system in the big data era

To create a total budgeting management system under big data, the first thing is to build a comprehensive enterprise big data control platform, for collecting and storing enterprise's relevant business data information, and the industry and market-related important data information should also need to be collected and organized through a variety of channels. Secondly, it is necessary to analyze the internal and external data through the application software, for example, according to the internal historical budget data, current data and other business information, and according to the external industry data, relevant industry data, market macro environment data and other market environment data, so as to formulate the strategic plan and budget objectives of the enterprise. Finally, the total budgeting management center decomposes the tasks according to the budget goals, and executes the corresponding budget plan. The relevant departments formulate a targeted budget management data platform according to their own needs. The corresponding budgeting management center can combine the relevant budget management data sharing platform to achieve data upload and the budgeting management center can then compare the budget management data uploaded by relevant departments and formulate the ultimate budget plan. In the process of implementation, the data referred to include not only traditional unstructured data, but also unstructured data such as audio, video and pictures. According to the real-time update of these data, the data can be mined and analyzed in the data platform to make real-time adjustment to the budget. The results of budget implementation will be recorded in the cloud, and then the data will be analyzed and evaluated to produce the final budget evaluation. As shown in figure 1.

![Figure 1: Budget management system framework under big data](image)

4.1. Preparation of the total budget

The formulation of a company's total budget is related to the nature of the company, its stage of growth, and the concerns of the operating environment. In addition, the budget requirements of different departments of the same enterprise are not the same. Although different departments and roles may have different budget needs, it is indisputable that a comprehensive budget has become an indispensable part of the development of enterprises. Managers focus on the difference between the profit realized and the budget; business units look at the difference between production and marketing and budget amounts; the financial department will compare and analyze the budget amount from three aspects: financial position, profit and cash flow. It can be seen that the budgets of different departments in different stages are quite different, which requires enterprises to make use of existing data and share through data platform, maintain each other, continue to adjust, and establish a budget system suitable for the growth of enterprises. The balanced scorecard is a management tool that translates corporate strategy into action. It
can quantify the budget and better implement the budget. Therefore, the budget preparation system can also be implemented in conjunction with the balanced scorecard system. We divide the budget goals into financial dimensions, customer dimension, internal operation dimension, learning and growth dimension, etc., and then the budget is prepared according to the goals of these four dimensions. Firstly, the budgeting management center delivers budget goals to various budget departments according to the overall strategy of the enterprise; secondly, the internal and external data of the big data platform are used to carry out budget planning according to four dimensions. As shown in figure 2.

![Figure 2: Budgeting system under big data](image)

**4.2. Implementation of the total budget**

Budget execution mainly includes budget approval and budget control. Budget approval can be standardized through data permissions and data management at the platform layer, that is, approval must go through specific procedures to avoid unauthorized approvals and repeated approvals. Using data tracking technology to track the approval process, users can query the approval process in real time. If the person in charge of examination and approval cannot approve the budget plan in a timely manner, the user can apply through the system, and the system will take other measures in time to solve the problem of excessive approval time under the traditional model. Budget control is the core of budget implementation. Under the big data platform, the implementation of enterprise budget can be controlled in real time. After the budget is released by the budget management center, each budget implementation department will have real-time monitoring of the big data platform at every step. When there is a difference between the data provided by the platform and the budget, it will be fed back to each budget department. Each department should conduct a rigorous analysis and make timely adjustment according to the actual situation. Meanwhile, the adjusted data will be fed back to each related department to achieve the information unification between departments. When there are changes in national policies and regulations, external market environment, etc., the big data platform will feed the differences back to each budget department, and adjust the budget in time according to the changes; when there are emergencies or major deviations, the system will give an early warning, and the adjusted budget data will be modified and stored in the cloud, so that the budget can be effectively.

**4.3. Evaluation of the total budget**

The evaluation of the total budget involves budget result evaluation and budget process evaluation. The budget result evaluation can be carried out from four aspects: finance, customers, operations, and growth. When each activity occurs, it is collected through the data entry in the cloud, and compared with the budget of the enterprise stored in the cloud, and the actual number will be compared with the budget in a timely manner. At the same time, it will also be compared with the average data of the same period,
last period, industry and competitive enterprises. Thus the budget analysis report is automatically generated, which makes the budget analysis more scientific and practical. Budget process evaluation refers to the analysis of product revenue, cost, and expense of this process on the basis of the big data platform recording the data of each step in the budget execution process, to obtain detailed data of each product. At the same time, it will analyze the implementation and adjustment of the budget implementation process, strengthen the adjustment capacity of the budget execution, improve the early-warning mechanism and crisis handling capacity for unexpected situations, accumulate more data for future budget preparation, lay a solid foundation for the future production, operation and management of the enterprise, so as to obtain greater profits.

5. Safeguard measures for implementing the enterprise total budgeting management system in the era of big data

5.1. Building awareness of big data

Big data has opened up a new era of management, and in order to stand firm in the fierce market competition enterprises should integrate big data into their total budgeting management. Therefore, they should raise the awareness of the importance of applying big data to the overall management of the enterprise. To ensure the use of big data, there must be three aspects of awareness. First, governments at all levels should increase the publicity of data applications. Secondly, when teaching accounting in colleges and universities, big data should be added to the teaching of enterprise management accounting, so as to conduct a more in-depth analysis of enterprise budgets. Finally, managers should realize the importance of big data and take the initiative to learn knowledge related to it. By introducing the big data analysis system and organizing financial personnel to carry out training and learning or communication activities, employees can pay more attention to big data, so that employees can experience the efficiency and convenience of big data application.

5.2. Improving the confidentiality of the budgeting management system

Big data platform information is inseparable from the network, and most data analysis is done through the network. With the development of modern science and technology, cyber crimes against big data are becoming more and more frequent, and information security is an issue that needs attention. Therefore, it is important to establish a comprehensive data protection system. First, it is necessary to do relevant defenses in advance, establish a firewall network, and effectively isolate the big data of the enterprise from the surrounding environment. Establish a safe and effective data sharing mechanism within the enterprise, between the enterprise and the supplier to prevent data from being halfway stolen. Second, different levels of encryption and management are required for data information with different degrees of importance. Control the contact of personnel at all levels to the big data platform, establish a hierarchical authorization mechanism, and the next level cannot obtain data information before the previous level. Different levels of personnel to master different levels of important data information can effectively restrict the internal staff of the enterprise. Unauthorized information can be set access rights, which effectively prevent the leakage of data. Third, regularly conduct security assessment on the data management platform, trace the root causes of the problems during the assessment, and manage them until the causes of the problems are found, formulate a solution in time and carry out repair and prevention, and timely clean up the hidden dangers to ensure data platform security.
5.3. Training financial personnel with big data knowledge

The role of big data in the enterprise budget needs to be played by personnel. Therefore, financial personnel should not only understand the budget process of the enterprise, but also the risk management and credit management. In the era of big data, the financial department will become a highly integrated department, and financial personnel need to process and integrate data, as well as systematic and managerial thinking. On one hand, companies should recruit a large number of professional talents in the society who understand management accounting knowledge and big data software applications, so as to make up for the shortage of and ease the pressure on talent demand. On the other hand, enterprises need to strengthen internal training, communication and learning, and cultivate financial personnel suitable for their company in the era of big data. While strengthening accounting, finance, and legal training, it is necessary to improve the computer knowledge of financial personnel, and lay the foundation for the training of management and accounting personnel for professional big data operations. In addition, companies should also improve the financial staff's insight and crisis resolution capabilities. By rotating jobs in different positions, financial staff will be more familiar with each step of the process, better understand the advantages of big data mining, have enriched practical experience and improved problem solving capabilities, and ultimately achieve the strategic goal of using big data for comprehensive budget management.

6. Conclusion

The emergence of the era of big data has brought new opportunities for enterprises to fully implement total budgeting management. Traditional budgeting management no longer meets current needs, and thus must be adjusted. When formulating long-term development strategic goals, we must adopt means of budget control, to ensure the effective allocation of resources and grasp the value of data. Take meeting customer needs as a starting point, to ensure the core competitiveness of the enterprise, and to promote the realization of corporate strategic goals.

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