

Application and Development of Big Data under Information Era — Take the Optimization of Financial Management System as an Example

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Abstract: The massive databases and fast information decisions brought by big data bring value to more and more fields, which can also be reflected in the financial management system of enterprises, given its main business processes of data processing and data prediction. Additionally, digital solutions give firms with a more dependable and efficient decision-making process, thus boosting corporate governance and financial management, both of which rely on some degree on estimation and experience. The essential characteristics of big data will be discussed first, followed by the inadaptability of standard financial management systems under big data. The study will next explore the trajectory of financial management reform using big data as a guide. Finally, the new big data system's associated difficulties will be investigated.

1. Introduction

Nowadays, the development of Internet and virtual platform in the information age not only connects global users together, but also connects these users with the company, making the company face the challenge of providing personalized and satisfying customer needs. Big data is a data set with high volume, variety, speed, and the ability to provide high value through data processing.

Fast and accurate data processing necessitates not only easy access to vast volume of current data, but also the ability to make decisions and forecasts by data analytics reporting, which could be accomplished more effectively through four characteristics of big data. The first two features are huge volume and different variety, which enable the creation of a large number of data bases for data gathering and analysis, speed the flow of information, and hence improve data correctness and trustworthiness (Ionescu and Andronie, 2020). The other two traits are quick velocity and high value. Enterprises could maximize the value of big data by processing data generated or imported into the business in a short time. In business, decision-making is based on data and analysis, not on experience or intuition. Because of the limitation of the traditional financial management on data sources, direct decisions are usually made by personal experience. As a result, subjective consciousness increases the likelihood of decision-induced deviation. Nowadays, due to the comprehensiveness and accuracy of data processing, it is usually proposed to be used to deliver strategic information and the bottom-line impact of decision-making to the stakeholders of the entire business. The era of big data may bring to life financial work that is dominated by transactions, company records, business accounting, and forecasts. Additionally, big data pushes changes in financial management concepts, models, and techniques by increasing transparency and using customer data (Ke and Shi, 2014). When financial data can be collected and integrated more easily in a worldwide big data network in the twenty-first century, it is hardly to break away from big data in order to save costs and boost company profits.

2. Problems faced by the traditional financial management system

Facing the data information challenge brought by massive structured and unstructured data, the traditional financial management system of enterprises might face two major problems: the backwardness of financial management mode and the lack of compound financial talents.

2.1 Backward traditional financial management model

The traditional after-the-event management from financial management system could no longer meet the needs of management innovation nowadays, and enterprises emphasize more and more on the before-the-event control brought by data processing. This is because the traditional financial management system only uses structured historical data such as sales revenue and cost to prepare financial statements, and does not involve the collection of unstructured data such as customer and market information. Additionally, the periodic results shown in the statements may cause delays in market analysis and decision-making.

Due to the scarcity of information sources, firms are less likely to reduce operational risks based on real-time data, which results in certain finance professionals making decisions based on their experience and intuition. As a result, the capability for rapid response and risk collection is rather limited. However, in the age of big data, businesses can acquire real-time access to company data, customer data, market data, and other information. By incorporating this data into organizations' financial risk assessments via a more information-based and intelligent workflow, market information may be efficiently filtered out, hence improving the efficiency of enterprise decision-making processes.

2.2 Lack of compound financial talents

According to a McKinsey assessment, the United States may suffer a shortage of approximately 150,000 employees with advanced analytical capabilities and 1.5 million managers and analysts capable of making good decisions using big data analysis by 2018 (Fanning and Grant, 2013). Shamim et al. (2019) believe that employees' duality is critical because data analysis skills and financial management capabilities are both necessary for managing the needs of global users, while timely understanding of customer needs and market pain points is critical for enterprise development and strategic change. Enterprise decision-makers expect data analysis to be insightful and forward-looking during production and operation management, which requires enterprise financial personnel to acquire and master the ability to collect, analyze, and integrate big data as soon as possible, in order to extract the most valuable information from complex data and analyze the integrated data flexibly and effectively (Pilipczuk et al., 2019). If the enterprise's finance professionals are unable to enhance their abilities in a short period of time, the enterprise's production and operation will fall behind the pace of the big data era.

3. Future financial management system optimization direction

In view of the above two problems, this paper argues that the optimization of enterprise financial management should be implemented from three aspects: upgrading organizational structure, changing data processing and building information management platform to meet the needs of big data for the transformation of enterprise financial management.

3.1 Upgrade of financial management organization structure

The upgrading of financial management organization structure can be realized by improving the comprehensive quality of financial department personnel and strengthening data sharing among departments. Financial analysis is based on data, which puts forward higher requirements for the quality of financial managers. According to Gartner survey in 2016, 59% of employers believe that by 2020, financial managers will be required to equip with data science and analysis skills (Hare et al., 2016). In addition, another survey on the required financial management skills in the next decade shows that data extraction tools, data mining and business intelligence knowledge have become stronger demands (Pilipczuk et al., 2019). Through necessary data analysis skills retraining, enterprises can establish corresponding financial data analysis model and make more forward-looking decision inference. Besides, the optimized financial management system can share information with other departments through more intelligent data systems and processes to break the data island. By

effectively integrating business data and financial data, it could ensure the integrity and health of enterprise assets.

3.2 Improve the approach of data processing

Secondly, by changing data processing methods, fully mining effective, the capital costs can be reduced and the profits increased. To transmit the meaningless massive data into useful information, the processing steps like integration, transformation are essential. The most significant change in data processing in the era of big data is the application of unstructured data such as user assessment, whereas traditional financial management systems solely use structured data such as sales volume. A concrete example is SAP HANA information query system, which enables organizations to evaluate transactions more intuitively through the use of graphical and text processing of semi-structured and unstructured data, resulting in reducing the operating costs and hazards (Fanning and Grant, 2013). Another example is Splunk system. Unstructured data beyond the scope of traditional financial management system is inevitable because it makes enterprise data not limited to financial statements, business background or development status, but integrate process information such as customer comments and media reports, conduct financial analysis more comprehensively through various types of data, and reduce information asymmetry in transactions to attract investment.

3.3 Building information management platform

In order to improve the efficiency of financial management and control and the effect of financial management, it is indispensable to build a financial management information system based on big data. Based on the real-time nature of big data, enterprises might no longer be satisfied with the traditional financial reminders after the event, but want to control in advance, which puts forward high requirements for the adequacy and accuracy of the forecasting ability of the financial management system. One of the main parts of the forecast is the enterprise budget, which includes various financial information such as cost budget and financing plan, helping managers make strategic adjustment and deal with risk management and cost control (Zhao, 2020).

Taking IBM TM1 as an example, TM1 system imports all historical business data, conducts multidimensional analysis based on these data, and then formulates the next budget. After accessing the actual data, the budget maker completes the budget implementation report by comparing the budget data with the actual data. The manager could adjust the next strategy and set the next management goal according to the budget execution report. Traditional mechanical work such as accounting treatment, data collection, classification, etc. is completed through the system; Thereby simplifying the process, allowing financial personnel more time to use data for analysis, and bringing more value to the operation and decision-making of enterprises.

4. New challenges to big data

While big data can provide organizations with extra value and higher returns, financial management transformation based on big data also introduces certain new issues, such as inconsistent data quality and data privacy. Trevor Hastic (Ke and Shi, 2014) once described that it is hard to find an important needle in a bunch of data straws because a large number of straws look like needles. Collecting data as the first step in big data analysis and processing appears straightforward, but it demands competence. If data collection is not constrained by specified requirements, the resulting database may lead in the wrong direction, resulting in organizations making incorrect forecasts and choices because of the jumble of data. Additionally, the privacy of consumers in big data applications must become a worry. According to a 2013 European Parliament research report (Ke and Shi, 2014), the threat of big data to privacy is usually present. When people use search engines to discover information nowadays, their data is collected and analyzed, and it is utilized to more precisely provide personalized content to consumers. However, there is no perfect solution for further protecting our privacy when personal information becomes profitable.

5. Conclusion

In light of big data's analytical and value-creating capabilities, this study focuses on the role of big data in financial management systems. Enterprises must prioritize the optimization and reform of corporate finance management if they are to maximize the benefits from cost and risk reduction, as well as efficiency and profit enhancement brought about by big data. The new financial management based on big data has evolved from a basic computation to a critical pillar of company decision-making, business planning, and competitiveness improvement. Change the transaction-based financial management approach and the typical financial management style of analyzing and making choices based on financial data. The organizational structure is modified by focusing on developing compound talents with parallel finance and data and integrating finance with other business areas. Enhance the value of data through reforming data processing and enhancing unstructured data analysis. And by establishing a financial management information system to eliminate the data island could effectively integrate business and financial data, and optimize data utilization, not only is enterprise informationization promoted, but also the process of integrating internal and external data resources is facilitated. By leveraging big data technology to construct a complete financial management system, organizations may improve their overall performance and lay the groundwork for long-term growth and change.

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