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Research on the Current State and Transformation Pathways of Corporate Financial Management in the Big Data Era

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Abstract: In the era of big data, the generation of massive data and innovations in data processing technologies have reshaped the business environment. Enterprises are facing new challenges and opportunities driven by data-based decision-making. As a core component of enterprise operations, traditional financial management models have become increasingly inadequate to adapt to these changes, making transformation an urgent necessity. This paper focuses on corporate financial management in the context of the big data era. It analyzes the current situation of enterprise financial management under the impact of big data, explores the opportunities and challenges brought by big data, and further investigates the transformation paths for financial management. The aim is to provide theoretical support and practical guidance for enterprises to adapt to the big data environment, enhance their financial management capabilities, and achieve sustainable development in an increasingly competitive market.

Keywords: big data era, corporate financial management, current situation, transformation path

1. The Current Situation of Corporate Financial Management in the Big Data Era

With the rapid advancement of information technology, corporate financial management is undergoing profound transformation in the big data era. The current situation presents a mixed picture. On one hand, some enterprises have begun to recognize the value of big data and are attempting to apply it in financial management (Wei, Zhao, & Chen, 2025). For instance, some large enterprises use data analysis tools to collect and organize financial data, enabling faster access to key information such as revenues, expenses, profits, and trends in financial reports, thereby providing intuitive references for management decision-making. This helps identify financial issues and make timely decisions. However, in general, most enterprises are still at the initial stage of big data application. Financial data are often scattered across different business departments without an effective integration and sharing mechanism. As a result, the finance departments find it difficult to obtain complete and accurate data, preventing them from fully leveraging the advantages of big data. Moreover, current financial management systems remain relatively traditional and struggle to cope with the diversity, volume, and velocity of big data. During complex data processing, these systems exhibit low efficiency and are prone to data loss or errors.

2. Opportunities and Challenges for Corporate Financial Management in the Big Data Era

2.1 Opportunities brought by big data

Big data presents unprecedented opportunities for corporate financial management by providing more comprehensive and accurate information for decision-making. Traditional financial decisions often rely on limited internal

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financial data, while big data encompasses vast information from both internal and external sources—including market dynamics, customer behavior, and supplier data. Through in-depth analysis of these datasets, enterprises can more accurately forecast market trends, customer demand, and cost fluctuations, enabling more forward-looking and scientific financial decisions (Liu, 2025). For example, e-commerce companies can analyze customers' purchasing histories and browsing records to predict seasonal and regional sales trends, adjust inventory levels accordingly, and optimize capital allocation to avoid financial losses caused by overstocking or shortages. Big data also facilitates refined financial management. With big data analytics, enterprises can decompose and monitor various financial indicators with greater precision. From a cost management perspective, enterprises can accurately calculate the cost of each product and production stage, identify key cost-control points, and take targeted measures to reduce expenses. Regarding revenue management, big data enables analysis of revenue contributions across product lines and customer groups, laying the foundation for optimal resource allocation and improved economic performance.

2.2 Challenges posed by big data

Despite the opportunities, big data also brings a series of serious challenges. The foremost issue is data quality. Big data sources are vast and diverse, covering internal departments, external partners, and social media. The lack of unified standards leads to inconsistent data quality (Zeng, 2025). Inaccurate or incomplete data not only fail to support financial management effectively but can also mislead decision-making. For example, during customer data collection, errors in data entry or delays in data updates can distort credit assessments and increase credit risks.

Another major challenge is data security and privacy protection (He, 2025). Big data contains massive amounts of sensitive corporate and customer information, and any leakage can cause severe reputational and legal consequences. Cyberattacks and data storage failures may result in serious data breaches. For instance, some financial institutions have suffered from customer financial information theft due to data security loopholes, causing financial losses and regulatory penalties. Furthermore, the big data era demands a transformation in financial management philosophy and models. However, entrenched traditional mindsets among management and financial personnel often hinder this change. Many still adhere to conventional practices, lack awareness of the transformative power of big data, and show weak motivation and determination for reform, thus impeding the integration of big data into enterprise financial management.

3. Transformation Paths of Corporate Financial Management in the Era of Big Data

3.1 Data-driven optimization of financial decision-making

In the era of big data, optimizing financial decision-making through data-driven approaches is crucial for enhancing enterprises' financial management capabilities. Traditional financial decisions were often based on limited data and subjective judgment. Now, vast data resources provide enterprises with more comprehensive and in-depth analytical possibilities. The primary task for enterprises is to establish a comprehensive data collection system that integrates various internal business data, including sales, procurement, and production, as well as external market and industry information (Shen, 2025).

For example, a manufacturing enterprise collects data on equipment operation on the production line, fluctuations in raw material prices, and changes in market demand to build a massive data pool. By applying advanced data analysis technologies, the enterprise develops financial analysis tools such as cost forecasting and profit sensitivity models to explore how various factors influence financial indicators (Zhang H. X., 2025). Taking the cost forecasting model as an example, it combines historical cost data, raw material price

trends, and production efficiency variations to predict future cost fluctuations, laying a foundation for cost control strategies. In investment decision-making, data analysis results are combined with business realities. Instead of relying solely on financial statements, enterprises also consider non-financial data such as market potential and competitors' conditions to comprehensively evaluate project feasibility and potential returns. Data visualization technologies are then used to present complex analytical results in intuitive charts and graphs, enabling management to make faster and more accurate decisions. By optimizing financial decision-making through data-driven methods, enterprises can enhance decision-making accuracy and scientific rigor, better respond to market changes, and strengthen competitiveness.

3.2 Building and applying intelligent financial systems

Constructing and applying intelligent financial systems is a key direction in the transformation of corporate financial management under big data. By integrating big data, artificial intelligence, and cloud computing, intelligent financial systems can automate and optimize financial processes, thereby improving efficiency and quality. When building such systems, enterprises must first clarify their needs and develop a system plan aligned with their business characteristics and financial goals (Hua, 2025). For instance, a large chain enterprise with many stores and complex operations requires strong data analysis and automation capabilities to centrally manage and monitor financial data from all locations. During system construction, data integration and standardization are essential—internal financial data should be consolidated, data formats and coding rules standardized, and data accuracy ensured. An intelligent financial system should have strong analytical and predictive capabilities, enabling real-time collection and analysis of financial and business data to provide management with real-time reports and insights. For example, by analyzing sales data, enterprises can forecast future trends, develop production and procurement plans, and optimize cash flow arrangements. Intelligent financial systems must also be scalable and compatible with other business systems for seamless integration, data sharing, and operational coordination, thus comprehensively supporting financial management (Zhang F. M., 2025).

3.3 Digital reengineering of financial processes

Digital reengineering of financial processes is necessary for enterprises to adapt to new management requirements in the big data era. Traditional financial workflows are often inefficient, with poor information transmission and heavy manual intervention. Enterprises should review existing financial processes to identify problems and bottlenecks. Taking expense reimbursement as an example, the traditional paper-based process with multiple approval layers consumes significant time and labor. Through digital reengineering, this process can be moved online—employees submit electronic reimbursement forms, and the system automatically routes approvals according to preset rules, greatly shortening processing cycles. By leveraging big data and automation technologies, enterprises can streamline accounting processes and connect financial software with business systems so that accounting vouchers are automatically generated, reducing human error and improving efficiency. Big data analytics can also be used to monitor and optimize processes—for example, analyzing invoice processing times and payment data to identify inefficiencies. During digital reconstruction, integration with other business processes is essential to achieve real-time data sharing and interaction. This enables the finance department to monitor business progress and provide more accurate financial support. In the procurement process, for instance, the finance department can access real-time purchase orders and delivery data to manage budgets and arrange payments, achieving business-finance integration

and improving overall operational efficiency.

3.4 Developing interdisciplinary financial talent

In the big data era, financial management demands interdisciplinary professionals skilled in both finance and data analytics. Cultivating such talent is essential for financial transformation. Enterprises should cooperate with universities and training institutions to develop targeted talent development programs. Finance-related courses in universities should incorporate big data analytics, data mining, and artificial intelligence to enable students to handle financial problems with data-driven techniques. Within enterprises, regular training and workshops should be organized, inviting industry experts to teach the integration of big data and financial management, enhancing employees' professional competence. Financial staff should also be encouraged to participate in enterprise data projects—such as developing financial data models and intelligent financial systems—to gain hands-on experience. In addition, enterprises should build incentive mechanisms to reward financial staff who proactively learn and apply big data technologies. Recruitment efforts should focus on candidates with strong data analysis, innovative thinking, and teamwork skills. Through both internal training and external recruitment, enterprises can develop a workforce that meets the requirements of big data–driven financial transformation.

3.5 Deepening the integration of business and finance

The integration of business and finance has become a major trend in financial management under big data. Deepening this integration helps enhance financial management and overall competitiveness. Enterprises should promote collaboration between financial and business departments through cross-departmental training and communication, allowing financial staff to understand business processes and business staff to gain financial awareness, thereby breaking departmental silos. For instance, financial personnel can participate in project planning meetings to provide cost-related insights that help optimize resource allocation. Through big data, enterprises can integrate business and financial data into a unified platform for real-time sharing and analysis. For example, sales orders, production costs, and financial capital data can be aggregated and analyzed to identify products and customer groups that contribute most to profits, forming the basis for marketing strategies and resource allocation. In strategic planning, budgeting, and performance evaluation, the synergy between business and finance should be fully considered. During budgeting, for example, business departments propose budget needs based on market conditions, while financial departments review and adjust them to ensure financial feasibility. Deepening the integration of business and finance enables enterprises to optimize resource allocation, enhance operational efficiency, and respond more effectively to market dynamics.

3.6 Establishing data security and privacy protection mechanisms

In the era of big data, ensuring data security and privacy protection is of paramount importance. Enterprises must build robust mechanisms to safeguard financial data. Strict data security policies should be established, including access controls and operational standards. Different levels of financial data should have corresponding access permissions—sensitive financial information should be accessible only to senior financial officers. Data operations should be logged and audited to ensure accountability. At the technical level, encryption technologies should be used to secure data storage and transmission, while backup and recovery mechanisms ensure data integrity and availability in case of disasters or system failures. Network protection measures such as firewalls and intrusion detection systems should be implemented to prevent cyberattacks. Enterprises must also comply with relevant laws and regulations when collecting, using, and sharing data, obtaining user consent and applying data anonymization techniques to protect personal

privacy without compromising analytical effectiveness. Confidentiality agreements with external partners should be strictly enforced to ensure data security in collaborative environments. By establishing a comprehensive data security and privacy protection system, enterprises can create a secure and reliable data environment for financial management, thereby maintaining operational stability.

4. Conclusion

The era of big data presents both unprecedented opportunities and challenges for corporate financial management. Enterprises must fully recognize the transformative power of big data, analyze the current state of financial management, and formulate feasible strategies to promote digital and intelligent transformation through changes in mindset, technology, models, and talent. Only by doing so can enterprises enhance financial management, strengthen competitiveness, and achieve sustainable development. With the continuous advancement of big data technologies, financial management transformation will further deepen, injecting new vitality into corporate innovation and growth.

Conflict of Interest

The author declares that he has no conflicts of interest to this work.

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