Construction and Application of Financial Analysis Model Based on Big Data Technology

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Abstract. Big data technology provides powerful storage capacity and massive computing capacity, which has penetrated into all aspects of financial management. The paper designs a financial data analysis model platform based on big data, constructs a cost prediction big data model and algorithm model based on neural network, provides visual chart tools, and conducts multi-dimensional analysis of financial data to realize the effective use of data assets. Then, it introduces the operation of the financial big data analysis platform of Guangdong HY Group. Practice has proved that this model platform can improve the intelligence and automation level of enterprise financial management.

Keywords: big data · artificial intelligence · financial analysis model · construction

1 Introduction

Big data, cloud computing, artificial intelligence, blockchain and other emerging data technologies have had a huge impact on enterprise management ideas, business models, production processes, etc. As an important part of enterprise management, financial management also ushered in a new wave of change. Big data technology helps enterprises to better realize information sharing, strengthen internal control, reduce costs and improve efficiency. Traditional information technology can not meet the needs of digital transformation of enterprises. Therefore, building a financial analysis model based on big data technology is the basis for realizing enterprise value creation, multi-dimensional data display and efficient governance.

2 Application of Big Data Technology in Finance

Big data technology extracts value from massive financial data and business data with low cost and efficient data collection, data cleaning, data storage, data analysis and data management technologies. The multi-source and heterogeneity of data make the availability of data different [1]. For this reason, IBM's Data Stage and other companies have

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introduced data cleaning tools. Due to the structural, unstructured and semi-structured characteristics of financial big data, big data query, real-time and streaming big data storage and processing technologies are widely used. The diversity of financial big data processing has given birth to big data query, analysis and calculation, iterative calculation, graph calculation, batch processing calculation, stream calculation, memory calculation and other calculation modes [2]. The deep mining of financial big data makes RHadoop of big data mining and data mining tools developed based on MapReduce emerge as the times require. Software such as Power BI and Tableau clearly, intuitively and multidimensional display complex data through graphics or images, helping decision-makers explore and explain the hidden problems behind complex business data [3]. In order to prevent hackers from attacking business data and collecting data, big data security has become the focus of current research. The platform access encryption, anonymization protection, infrastructure encryption and other technologies are used to restrict illegal users' access to financial data and protect the security of financial data to the greatest extent [4]. Software such as Power BI and Tableau clearly, intuitively and multidimensional display complex data through graphics or images, helping decision-makers explore and explain the hidden problems behind complex business data. In order to prevent hackers from attacking business data and collecting data, big data security has become the focus of current research [5]. The platform access encryption, anonymization protection, infrastructure encryption and other technologies are used to restrict illegal users' access to financial data and protect the security of financial data to the greatest extent. Through big data technology, we can realize the application of multiple scenarios of enterprise finance, and help enterprises achieve cost control and operational efficiency improvement [6].

3 Construction of Big Data Financial Analysis Model Platform

Digital transformation is the only way for enterprises to develop in the future, and financial digitalization is the entry point of enterprise digitalization [7]. Enterprises should choose a financial sharing service center system suitable for enterprise development, and provide support for enterprise decision support and operation optimization with the help of big data technology. The financial analysis model platform based on big data technology consists of two parts, one is the big data platform, and the other is the financial data analysis model platform. These two sub platforms interact and influence each other, as shown in Fig. 1. The data resources required by the financial analysis model platform are all from the big data platform. The big data platform integrates and governs the big data required, provides standardized and high-quality data to the financial analysis model platform, solves the problem of "information island" of enterprises, and realizes the integration of industry and finance, enterprise strategy and enterprise value.

3.1 Big Data Platform

The big data platform collects, processes and converts the massive data of enterprises through data basic operation, data governance and data value chain analysis.

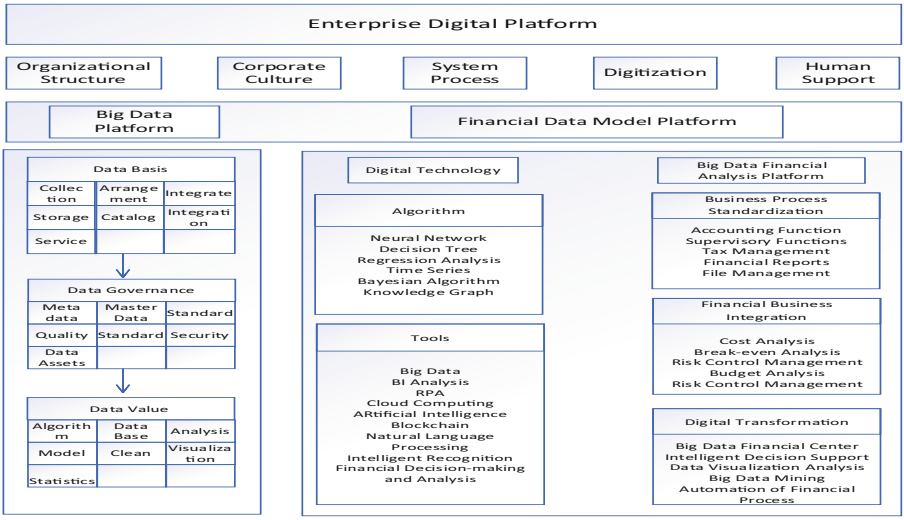

Fig. 1. Financial Analysis Model Platform Based on Digital Technology

Basic Data Operation The basic operation of data mainly refers to the process of data collection, storage, integration, integration and service using big data technology. These data include social data, industry data, environmental data, economic data and other big data materials, as well as enterprise management data, business data and financial report data.

Data Governance Data governance is to improve data quality by formulating data specifications, data standards and data security. For example, unified name, caliber and reference standards are prepared according to business characteristics to form a set of open, standardized and common business data standards. By setting technical standards, determine the data format, data type and data length, and provide guidance for the construction of the big data platform.

Data Value Raw data that has not been processed cannot automatically realize its value. The enterprise builds a data warehouse, uses various algorithms, statistical tools and other big data technologies and artificial intelligence technologies to build a data model, realizes big data analysis and data visualization, creates a data value chain, and realizes human-computer and object interconnection.

3.2 Big Data Financial Analysis Model Platform

The financial analysis big data model platform unifies the data caliber of finance and business, builds digital models and algorithm models, conducts multi-dimensional analysis of financial big data, provides visual data and charts, and realizes the effective use of data assets [8].

Big data technology is the basis for financial big data analysis and digital modeling. The digital model runs through the whole process of business processing, financial

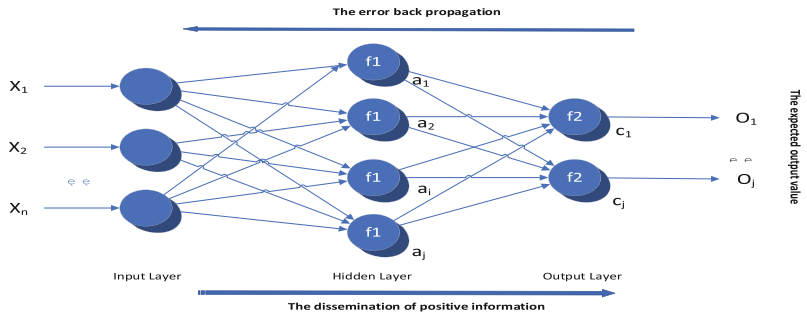

Fig. 2. Big data model of cost prediction based on neural network

accounting and enterprise value realization. For example, for cost forecast, we can collect and sort out the original data through enterprise research, business analysis, data exploration and other work, build time series, neural network, big data statistics, multidimensional analysis and other data models, achieve cost forecast for enterprises, and help enterprise management effectively control costs. The big data model of cost forecast is shown in Fig. 2. This model can be implemented in four steps. The first step is to generate model data according to activity drivers and resource drivers; The second step is to train the neural network according to the sample data, and analyze the nonlinear relationship between drivers and costs; Third, according to the training effect, adjust the parameters to make the prediction results more accurate; The fourth step is to implement the model, monitor the operation results, debug and optimize the model. Similar to cost forecast, sales forecast, risk management, investment management, asset management, etc. can be realized by using similar models. For another example, for the management of accounts payable, traditional finance controls from the aspects of supplier qualification ability investigation, prior management, post monitoring and product quality supervision. On the platform of financial analysis big data analysis model, we can collect Internet data and internal and external data of enterprises to form a data warehouse, use linear weight method, ABC cost method, procurement cost method, data envelopment analysis method, etc. to model the credit model of suppliers, realize the credit portrait of suppliers, and then use the data model to analyze and evaluate the qualification level of suppliers, inspect the quantity and quality of purchased goods, and formulate procurement policies, Improve procurement quality and efficiency. The financial analysis model platform based on big data technology is shown in Fig. 1.

4 Application of Big Data Financial Analysis Model Platform

Building a big data financial analysis model application platform is the only way for enterprises to achieve digital transformation of financial management. The following takes Guangdong HY Group as an example to introduce the application of the company's big data financial analysis platform. Guangdong HY Group is a diversified group company. At present, it has formed a cross regional and diversified development pattern

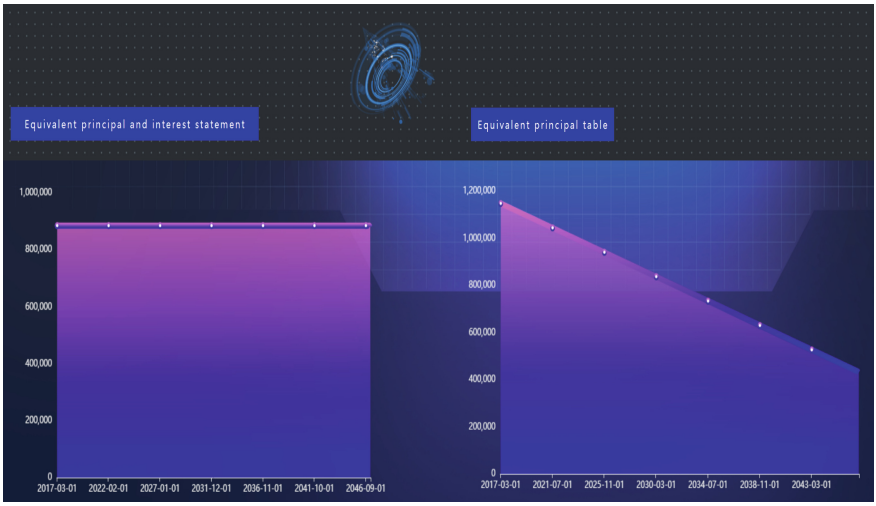

Fig. 3. Loan repayment plan

based on the development and operation of industrial zones, led by real estate development and pharmaceutical industry, supported by the development of sports industry, service industry, international trade and other industries.

In the traditional financial management mode of HY Group, due to the limited data processing tools and methods, the flow of financial information is not smooth, the financial business is fragmented, forming an information island, and the financial management does not give full play to its effectiveness. After implementing the financial big data analysis model platform, HY Group has adopted advanced algorithms and tools, and the financial business processing is characterized by comprehensive sharing, collaborative processing, deep integration, refined management, and intelligence. For example, HY Group designs a repayment analysis table through the platform to analyze the principal and interest returned in each period under the equal principal and interest method and the equal principal method. As shown in Fig. 3:

To sum up, the big data financial analysis platform has greatly changed the process and method of HY Group's financial management decision-making, helping the Group to give full play to cost control, risk management, tax planning, budget management and performance management, so that the Group's profits grow rapidly and capital value is maintained and increased.

5 Conclusions

Emerging digital technologies such as big data, artificial intelligence and blockchain have had a huge impact on the enterprise financial management model. The massive storage capacity of cloud computing and the massive data processing capacity of big data are restructuring the financial management process, making it easy to achieve the problems that traditional financial management cannot achieve. Build a platform based

on the financial digital analysis model, from design, implementation, evaluation, analysis, maintenance to re design and re implementation, realize the standardization and intelligence of financial data governance, achieve the quality control of financial data throughout the life cycle, and form a benign closed-loop management.

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