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Construction and Optimization of Intelligent Financial Decision-Making Models Under the Background of Enterprise Digital Transformation

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Abstract: At present, digital transformation has become an important strategy for enterprises to compete in the market and achieve high-quality development. Its gradual deepening is having a profound impact on financial management. Traditional financial decision-making models often face problems such as data islanding, simple analytical methods, and procedural delays. These models often have low efficiency and poor accuracy, and they are restricted to only providing post-event support based on expert experience. They find it difficult to meet the requirements of the digital era in terms of real-time information, early warning of information, accurate prediction, and strategic support. These limitations often become a drag on enterprise digital transformation. As an important solution to break through traditional models, intelligent financial decision-making models have advantages such as data integration, intelligent algorithms, and real-time responses. Based on the requirements of enterprise digital transformation in finance, this paper analyzes the impact of digital transformation on traditional financial decision-making and explores the characteristics of intelligent financial decision-making models, including data integration, intelligent algorithms, and real-time responses. The construction principles of data-driven process, business-oriented construction, and technology collaboration are discussed. The core objectives, full life cycle process, and multidimensional strategies of optimization mechanism and path are proposed.

Keywords: Digital Transformation; Intelligent Finance; Decision-Making Model; Model Construction; Optimization Path.

1. Introduction

Digital transformation has become an inevitable choice for companies to reposition their competitiveness. As an important link in the business process, the intelligent transformation of financial decision-making models is directly related to the effectiveness of transformation. Traditional financial decision-making is limited to manual experience and manual collection of event data after the fact. It is difficult to meet the requirements of the digital era in terms of real-time information, early warning of information, accurate prediction, and strategic support. Intelligent financial decision-making models use big data and artificial intelligence technology to realize comprehensive extraction of financial data information and dynamic optimization of decision-making logic. They become an important link to connect finance and business. It has adapted to the digital environment. Only by doing comprehensive research on the construction and optimization of intelligent financial decision-making models can we enrich the theoretical research system of financial intelligence and provide feasible solutions for companies to solve problems such as low financial decision-making efficiency and poor prediction accuracy. It has important practical significance in promoting the transformation of finance functions from accounting orientation to strategic orientation.

2. The Impact of Digital Transformation on Traditional Financial Decision-Making Models of Enterprises

2.1. Enhance Financial Decision-Making

In the digital economy, the quality of financial decision-making directly impacts the efficiency of enterprise resource allocation and market competitiveness. Traditional financial decision-making is limited by delayed data acquisition and single analytical methods. It mainly depends on historical data for empirical judgments and is often unable to meet the needs of changing markets [1-2]. There are clear deficiencies in the scientificity and foresight of decision-making. Relying on real-time aggregation of multi-source data and intelligent analysis technologies, digital transformation breaks the limitations of time and space, aggregates multi-dimensional information of finance, business, and the market, and offers quantitative support for decision-making to drive decision-making from passive response to active prediction.

As shown in Hubei Jiaotou Expressway Operation Group, one of the top performers in the transportation industry, the difference in the efficiency of financial decision-making after and before digital transformation is very obvious, and the relevant indicators after and before are shown in Figure 1. After the group introduces the intelligent financial platform, in addition to automatically reconciling accounts within 1 hour, it has also broken through data barriers existing in 7 systems and established a standardized data system, which not only broke through data barriers existing in 7 systems and established a standardized data system, which has also advanced the entire process of fund settlement online, greatly improved the efficiency of responding to risk early warnings, and provided accurate data support for decision-making such as resource allocation and risk prevention and control.

2.2. Reconstructing the Decision-Making Process

With the increasing complexity of enterprise business scenarios and the rapidity of market changes, the delay of traditional financial decision-making process has become a

prominent problem limiting the collaboration between business and finance. The reconstruction of financial decision-making process has become the important part of digital transformation. The digital transformation drives the reconstruction of the financial decision-making process from the linear phased model to the closed loop dynamic model[3].

The traditional financial decision-making process is a linear process of "data collection - aggregation and analysis - plan formulation - execution and feedback". The linear phased model makes each link disconnected with each other and there is obvious time lag between decision adjustment and business change.

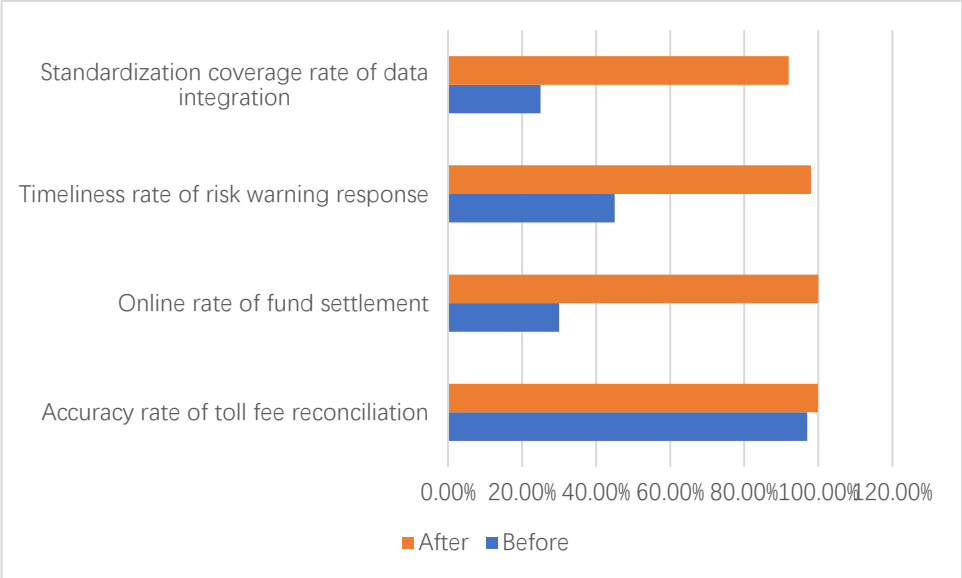


Figure 1. Indicators of Hubei Jiaotou Operation Group Before and After Financial Digital Transformation

Based on the background of digital development, the decision-making process achieves the connectivity of whole link with the help of intelligent technology: in the data collection link, real-time capture and cleaning are achieved by automated tools; in the analysis process, the deep mining and correlation analysis are carried out by algorithm models; in the decision-making process, multiple sets of plans are generated by scenario simulation; in the execution link, the dynamic adjustment is achieved by real-time monitoring. The whole link is connected into a complete closed loop and the response speed of decision-making is greatly improved.

3. Technical Characteristics of Intelligent Financial Decision-making Models Based on Digital Development

In the era of digital economy, data becomes the basic production factor of enterprise. The level of value released directly affects the quality of financial decision-making, and the dispersed data silos become the main factor restricting the exploration of value. Data integration becomes the important technical characteristic to achieve effective intelligent financial decision-making models. The importance of its existence lies in breaking the data silos and achieving unified governance and value mining from heterogeneous data from multiple sources.

The financial data generated by digital transformation comes from dispersed data sources, various data formats and complex data types. In addition to internal enterprise data such as accounting, budgeting and business transaction data, it also includes external information such as market index, industry policy and competitor situation. By establishing a unified data integration platform, intelligent financial decision-making models use data cleansing, standardization and feature engineering technologies. These technologies convert structured and unstructured data into a unified data format suitable for analysis, and establish a data quality control mechanism to ensure that the data fed into the model is accurate and complete, providing comprehensive support for decision making [4-5].

As financial problems present more nonlinear and dynamic features, traditional fixed analysis methods can't meet the needs of comprehensive decision-making. The intelligent upgrade of algorithm is an important way to improve the competitiveness of model. The characteristic of algorithmic intelligence is the most important technical characteristic that intelligent financial decision-making models differ from traditional analysis tools, which reflects the ability of model to learn from the past and solve complex problems.

Traditional financial analysis always uses fixed statistical methods, which cannot solve nonlinear and dynamic financial problems in the digital environment. Through the algorithm such as machine learning and deep learning, the intelligent financial decision-making model can choose the appropriate model framework according to the decision objective and data characteristics. For example, regression analysis is used for cost prediction, decision tree is used for risk classification, and neural network is used to explore the correlation between complex variables. More importantly, the algorithm has self-optimization ability. The algorithm can choose the appropriate parameters for training by historical data and real-time feedback, and then continuously improve the accuracy of prediction and adaptability of decision. Explainable ai technology is used to clarify decision logic, and balance the intelligence of model and transparency.

3.1. Real-time Performance of Decision

In the digital environment with increasingly fierce market competition, the speed of decision response directly affects the ability of company to seize the opportunity of the market and avoid the risk. The conclusion of traditional periodic

analysis model can not adapt to the change of business. Real-time decision performance is an important technology that makes the intelligent financial decision-making model adapt to the speed of digital operation, and achieves the transition from "post-event analysis" to "real-time information".

Traditional financial decision-making is periodic data aggregation, and the decision made based on this conclusion will lag behind the operation of the business. It is impossible to meet the demand of rapid response in the dynamic market environment.

Ii is impossible to meet the demand of rapid response in the dynamic market environment. Based on the cloud computing and real-time data processing technology, intelligent financial decision-making model can perform second-level analysis and calculation on the data collected from multiple sources and output the real-time decision basis [6-7]. The real-time performance of decision-making is reflected not only in the speed of data processing, but also in the dynamic and real-time updating of decision-making suggestions: When the market conditions, business data or political rules change, the model will automatically trigger the recalculation, revise the decision parameters and corresponding conclusions, and output the real-time feedback of resource allocation and risk prevention to management based on the management of political rules and the automatic update of decision parameters, so as to achieve the synchronization of decision and business changes.

4. Principle for the Construction of Intelligent Financial Decision-making Model

4.1. Data-driven Principle

In the face of the situation where digital transformation changes the operation logic of company, data becomes the link that connects finance to business and supports strategic decision-making. Financial decision-making without data support will fall into the trap of subjective assumption. The data driven principle is the basis of construction of intelligent financial decision-making model, and high quality data should be preferred as the basis of operation of model and output of decision.

In the process of digital transformation, data becomes the main production factor of companies, and the scientificness of financial decisions are closely related to the quality and level of application of data. Therefore, on the premise of construction of models, the integrity of data collection, the compliance of data cleansing, the reliability of storage of data and the timeliness of update of data should be established in whole process to ensure the input data can meet the requirement of analytical input of models. Use data as a bridge to connect finance and business, avoid that the model is detached from the concrete business in real life and forms data silos. Persist in verifying decision logic with data, and continuously calibrate the model according to the historical data training and real-time data feedback, ensure that conclusion of decision is reached according to data and avoid one-sidedly presuming conclusions of decision, and achieve traceability and verification of decision-making process.

4.2. Principle of Business Adaptation

The most initial goal of financial functions is to support the development of business. If the intelligent financial making decision model is detached from certain enterprise's concrete business scenario, no matter what advanced technology is used, it cannot create practical value, and even may mislead the direction of decision-making. The principle of business adaptation requires that intelligent financial decision-making models should adapt to the characteristics and development of enterprise business, and avoid the separation of technology and business.

The essence of financial decision-making is to serve the business and implement the strategy. The intelligent models detached from the business scenario can hardly create practical value. The implementation of the principle of business adaptation during the implementation of the model construction needs to coordinate the following three dimensions. The weight of resource investment and implementation of each dimension is shown in Figure 2. The collaborative effect of the three dimensions is an effective way to avoid the separation of technology and business, to ensure that the intelligent financial decision-making model meets the requirements of business, and to provide accurate support for enterprise business and strategy implementation.

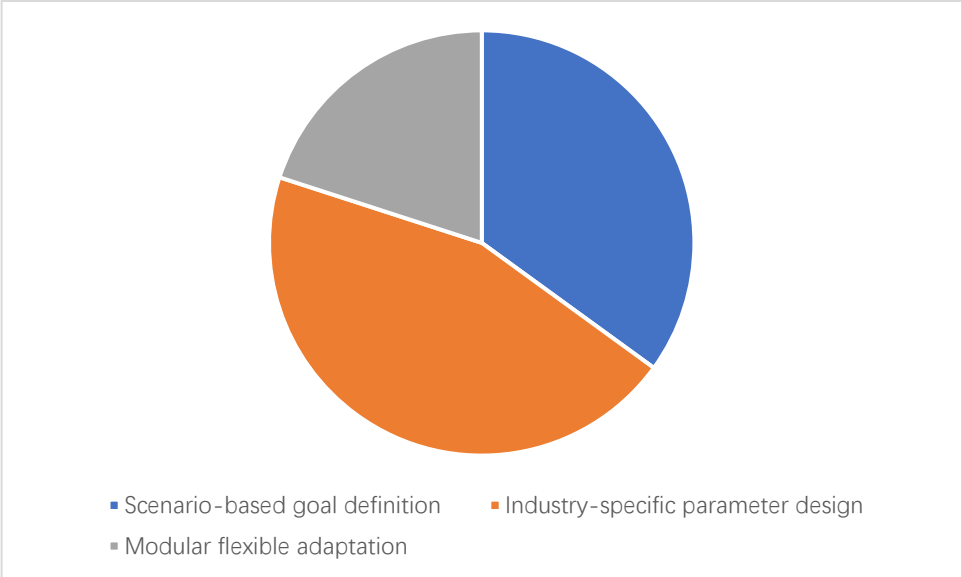


Figure 2. Proportion of Core Elements for Business Adaptation of Intelligent Financial Decision-Making Models

4.3. Principle of Technology Collaboration

The construction of intelligent financial decision-making model uses the technologies of multiple fields. A single technology has certain limitations, and can not meet multidimensional requirements of the model in terms of data processing, analytical computing and security assurance. Only the collaboration and integration of technologies can make the model run effectively. The principle of technological collaboration emphasizes that the technical resources of multiple fields should be integrated to form a technical ecosystem that supports the operation of intelligent financial decision-making models[8].

The construction and operation of an intelligent financial decision-making model do not depend on a single technology, but on the comprehensive application of multiple technologies, including big data, artificial intelligence, cloud computing, and blockchain. Therefore, it is necessary to obtain complementary advantages in the selection of technologies: using big data technology to solve the problem of massive data storage and computing, using artificial intelligence technology to provide analytical basis for technical means, using cloud computing technology to ensure the elastic expansion and efficient operation of the model, and using blockchain technology to improve data credibility and security. Hierarchical collaboration is reflected in the technical architecture, and the efficient data flow, efficient operation of algorithms, and efficient decision-making are ensured by properly connecting the data, algorithm, and application layers.

5. Optimization Mechanism and Implementation Path of Intelligent Financial Decision-Making Models

5.1. Main Ideas of Model Optimization

Due to the dynamic changes in the environment, intelligent financial decision-making models will easily fall into the situation of making blind adjustments without clear optimization goals, making it impossible to provide continuous and effective support for business decision-making, so the optimization of intelligent financial decision-making models should be based on the following three basic goals: adapting to environmental changes, improving decision-making efficiency, and ensuring compliance.

Adapting to environmental changes is the basic guarantee of survival for the model. In response to the iteration of technology, business, and policy in digital transformation, ensure that the model does not lose its effectiveness due to changes in the external environment.

Improving decision-making efficiency is the main goal of optimization. By optimizing the data processing method, algorithm logic, and output format, further improvement in the accuracy, timeliness, foresight of decisions and support for strategic decisions can be achieved.

Ensuring compliant deployment of models is a basic requirement. The model needs to meet the requirements of data privacy protection and accounting standard updates. By optimizing data governance and model interpretability, it ensures that the process of making decisions with the model and the results are legally compliant with enterprise internal control requirements, and realizes the coordinated integration of intelligent decision-making and compliance management [9].

5.2. Overall Optimization Process of Lifecycle

Given the problems and needs for intelligent financial decision-making models at different stages are various, it is inevitable to establish an optimization process based on actual situation. The optimization of intelligent financial decision-making models is not a single-time optimization, but a whole life cycle optimization process of "design - deployment - operation - iteration". In the design stage, the data dimension and algorithm are optimized based on initial operation feedback to make the model structure coordinated with the core problem of decision-making. In the deployment stage, the technical adaptation issues are found through simulation tests and stress tests, and the problems of business docking are found. Then, the efficiency and stability of model operation are optimized. In the operation stage, the real-time monitoring mechanism is established to monitor the performance of algorithm, data quality and effect of decision-making in real time, and the anomaly situation of data drift and concept drift is discovered in time. In the iteration stage, based on the monitoring data and business feedback, the plan of parameter adjustment, algorithm upgrade and architecture reconstruction are made. After the model is optimized, the model is operated again into operation, thus establishing a whole closed loop and ensuring that the model can be continuously developed with the internal and external environment.

5.3. Formulating Multi-Dimensional Model Optimization Strategies

The optimization of intelligent financial decision-making models includes multiple aspects such as data, algorithms and applications. Therefore, for the optimization of models, it is necessary to formulate systematic strategies from three dimensions of data, algorithms and applications. The optimization of data dimensions is to improve input quality and expand data range. It reduces the outliers and missing values of data by improving the data governance system, introduces external third-party data to give additional analytical information, and extracts high-value data features by feature engineering to provide more accurate input support for the model. The optimization of algorithm dimensions is based on applicability and advancement. It selects more advanced algorithm frameworks for different decision-making scenarios, improves the accuracy of models by tuning parameters and cross-validation, uses new algorithm technologies to solve the shortcomings of traditional models, and improves the interpretability of algorithms to meet the rigorous requirements of financial decision-making [10]. The optimization of application dimensions is to improve the implementation effect. It optimizes the output format according to the needs of decision-makers, reduces the difficulty of using formats by simplifying the operation process, and establishes a seamless connection between models and business systems to ensure that decision suggestions can be quickly transformed into executive actions.

6. Conclusion

Abstract: This paper focuses on the construction and optimization of intelligent financial decision-making models in the process of enterprise digital transformation. The value

of this paper is to provide a theoretical basis and implementation path for the transformation of financial functions from accounting thinking to strategic thinking. System analysis shows that the intelligent financial decision-making models are not simply technical tools. They constitute a complete decision-making system based on data management, business adaptation and technical collaboration principles. They break information isolation by integrating data. They enhance the decision-making accuracy through algorithm intelligence. They quickly realize the business-finance collaboration through process reengineering. The optimization mechanism of intelligent financial decision-making models further ensures that the model can adapt to the development of business from the goals, process and strategy dimensions. To promote the implementation of intelligent financial decision-making models, the enterprises should abandon the single concept of "technology priority", deeply promote the data governance integration with business needs, and establish a long-term optimization mechanism. Only in this way, can the model exerts its support role of decision-making, and quickly promotes the digital transformation of business through finance wisdom.

References

[1] Zong S, Yang F, Long L, et al. (2025). Promote or Inhibit? The Double-Edged Sword Effect of Adopting Generative Artificial Intelligence on Creativity. Advances in Psychological Science, 33(06): 905–915.

[2] Wang H, Ding S. (2025). Research Progress on the Economic Impact of Generative Artificial Intelligence. Economic Dynamics, 2025: 1–18.

[3] Tang L, Xu Y. (2025). Research on the Efficient Development Path of China's Generative Artificial Intelligence Industry: Configuration Analysis Based on TOE Framework. Scientific Research, 2025: 1–13.

[4] Feng Q. (2025). New Paradigm of Management Accounting Research Driven by Artificial Intelligence. Finance and Accounting Monthly, 46(11): 31–40.

[5] Zhao J, Dou Z, Yang H, et al. (2025). The Impact of Artificial Intelligence Technologies Represented by DeepSeek on Discipline Development: Tool Innovation and Method Integration. Journal of Beihang University (Social Sciences Edition), 38(03): 36–51.

[6] Jiang H, Zeng W. (2025). Generative Artificial Intelligence Drives the Transformation of Educational Evaluation. Chinese Journal of Education, 2025(08): 41–48.

[7] Liang L, Song M. (2025). Exploration of Agile Audit Mode Transformation and Practice Framework Driven by Digital Intelligence Technology. Finance and Accounting Monthly, 46(15): 91–96.

[8] Wang W, Deng Y. (2025). The Symbiotic Logic and Practical Path of Human–Machine Composite Educators. Journal of Central China Normal University (Humanities and Social Sciences Edition), 64(04): 90–99.

[9] Xue L, Jiang L. (2025). Generative AI Drives the Paradigm Change of Future Industrial Innovation. Journal of the Chinese Academy of Sciences, 40(05): 820–827.

[10] Zheng Y, Wang Y. (2025). How Generative Artificial Intelligence Empowers High Quality Development of Science Education. Science and Society, 15(01): 18–21.