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Original Research Article

Research on the dual middle platform architecture of enterprise integrated infrastructure foundation

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Abstract: This study delves into the dual-core architecture of an integrated infrastructure foundation for the digital transformation needs of enterprises. Through a literature review, it sorts out the current research status of enterprise architecture theory, dual-core architecture, and integrated infrastructure foundation. It then constructs an integrated foundation, data platform, technology platform, and organizational platform, explaining their respective functions and collaborative mechanisms. The research indicates that the dual-core architecture can enhance the reusability of enterprise business capabilities, reduce application complexity, and provide strong support for the digital transformation and intelligent upgrading of enterprises.

Keywords: Enterprise Architecture; Dual-Core Architecture; Integrated Infrastructure Foundation; Data Platform; Business Platform

1. Introdution

In the wave of the “Internet+” strategy and digital transformation, enterprise information construction has become key to enhancing core competitiveness. Integrated infrastructure foundation and dual-core architecture, as important forces driving the digital transformation of enterprises, are significant for research and practice in optimizing enterprise resource allocation and accelerating business innovation. This study aims to explore the role of dual-core architecture in improving the level of enterprise informationization, promoting system integration, and data integration, as well as its practical application value in driving enterprises towards intelligent and service-oriented transformation.

2. Literature review

2.1. Dual middle office architecture research

The dual middle office architecture, which combines the business middle office with the data middle office, has become a new trend in enterprise information construction. The business middle office abstracts common business requirements into reusable services, achieving the automation and intelligence of business processes; the data middle office is responsible for data collection, storage, processing, and analysis, building corporate data assets, and providing strong support for business decision-making. This architectural model has achieved significant results in various industries such as e-commerce and finance, for example, by implementing shared and reusable business services through product and order middle offices, and by improving the accuracy of risk control and marketing decisions through data analysis.

2.2. Integrated infrastructure foundation

The integrated infrastructure foundation is an important support for the dual middle office architecture.

It consists of an integrated foundation and a data middle office, providing a unified, efficient, and scalable infrastructure environment for the enterprise. The integrated foundation is responsible for the governance of basic data and system integration, ensuring the accuracy and consistency of data; the data middle office, on this basis, performs in-depth data processing and analysis, building corporate data assets, and providing data services for the business middle office. The construction of this foundation is crucial for achieving seamless integration between various systems within the enterprise and enhancing data integration and analysis capabilities.

3. Construction of an integrated infrastructure base

3.1. Overall architecture of the integrated base

The integrated base is key to ensuring data consistency and sharing within an enterprise. Its overall architecture includes a data source layer, a data integration layer, and a data service layer. The data source layer is responsible for collecting both internal and external data of the enterprise; the data integration layer ensures data accuracy and consistency through data cleaning, transformation, and integration; the data service layer provides data query and interface services to meet the data needs of various business systems within the enterprise. The integrated base achieves centralized data management and sharing through a unified data model and standards, reducing the complexity and cost of data management, and enhancing the availability and value of data.

3.2. Construction of the data middle office

The data middle office is the core component of building an integrated infrastructure base, responsible for comprehensive data collection, storage, processing, and analysis. The construction of the data middle office includes several aspects such as data collection, computation, storage, processing, and analysis. In terms of data collection, it supports the collection of various data sources and formats; in terms of data computation, it provides various computation modes including batch computation and stream computation; in terms of data storage, it adopts distributed storage technology to achieve efficient storage and access to massive data; in terms of data processing, it offers services such as data cleaning, transformation, and aggregation; and in terms of data analysis, it provides in-depth business insights and decision support to enterprises through data mining, machine learning, and other technologies.

The construction of the data middle office not only enhances the efficiency and analytical capabilities of enterprise data processing but also provides a wealth of data services such as data querying, report generation, and data visualization to meet the diverse data needs of enterprises. At the same time, the data middle office focuses on data security management and privacy protection, ensuring the security and compliance of enterprise data.

3.3. Technology middle office and organizational middle office

The technology middle office and the organizational middle office are indispensable parts of building an integrated infrastructure foundation. The technology middle office provides basic technical services and technical support capabilities, such as cloud computing services, big data processing services, artificial intelligence services, etc., offering strong technical support for various business systems of enterprises, reducing the complexity and cost of technology implementation. The organizational middle office is responsible for breaking down departmental barriers, promoting business collaboration, and achieving information sharing and collaborative

work between internal departments of the enterprise through the establishment of cross-departmental collaboration mechanisms and processes, thereby improving the operational efficiency and innovation capabilities of the enterprise.

The construction of the technology middle office and the organizational middle office supports and promotes each other. The technology middle office provides technical support for the organizational middle office, realizing the automation and intelligence of business processes; the organizational middle office, in turn, provides business scenarios and requirements for the technology middle office, driving the innovation and application of technology. Together, they constitute an important part of the integrated infrastructure foundation, providing strong support for the digital transformation and intelligent upgrading of enterprises.

4. Design of the dual-core architecture for enterprises

4.1. Overall framework of the dual-core architecture

The dual-core architecture for enterprises consists of four core components: the business core, data core, technology core, and organizational core. These components work together to support the digital transformation of the enterprise. The business core is responsible for abstracting common business requirements into reusable services, automating and intelligentizing business processes. The data core is in charge of data collection, storage, processing, and analysis, building up the enterprise's data assets, and providing data support for the business core. The technology core offers basic technical services and technical support capabilities, ensuring the stable operation and high performance of systems. The organizational core breaks down departmental barriers, promotes business collaboration, and achieves information sharing and collaborative work across various departments within the enterprise.

Through a service-oriented and modular design philosophy, the dual-core architecture decouples the enterprise's business capabilities from its technical capabilities, enhancing the flexibility and scalability of the system. Moreover, the dual-core architecture employs a unified data model and data standards, achieving centralized management and sharing of enterprise data, providing a strong guarantee for data analysis and decision-making support. These advantages make the dual-core architecture significantly effective in enhancing the reusability of business capabilities and reducing the complexity of applications.

4.2. Design of the business middle office

The business middle office is one of the core components of the dual-middle-office architecture in enterprises. Its design requires full consideration of the business needs and processes of the enterprise. The design process of the business middle office typically includes several stages such as business requirement analysis, business service design, and business process design. During the business requirement analysis phase, a comprehensive review and analysis of the enterprise's various business needs should be conducted to identify common and unique requirements. In the business service design phase, common needs should be abstracted into reusable services, and corresponding service interfaces and service specifications should be designed. In the business process design phase, business processes should be designed based on the business services to ensure the automation and intelligence of the business processes.

The design of the business middle office not only improves the response speed and operational efficiency of enterprise business but also provides a rich set of business services to meet the diverse business needs of

enterprises. At the same time, the business middle office supports flexible expansion and innovation of business, offering strong support for the business development and market competition of enterprises.

4.3. Integration of data middle office and business middle office

The integration of the data middle office and the business middle office is key to the dual middle office architecture of enterprises. The data middle office collects, stores, processes, and analyzes corporate data to provide data support for the business middle office, achieving a deep integration of business and data. In the integration process, it is necessary to establish a unified data model and data standards to ensure the accuracy and consistency of the data. At the same time, it is also necessary to design reasonable data flows and data interfaces to achieve seamless data integration and sharing.

The integration of the data middle office and the business middle office not only improves the efficiency and value of enterprise data utilization but also provides comprehensive business insights and decision-making support for the enterprise. The dual middle office architecture, after integration, can respond in real-time to market changes, optimize business processes and resource allocation for the enterprise, and promote the digital transformation and intelligent upgrading of the enterprise.

5. Conclusion

This study indicates that the dual-core architecture of an integrated infrastructure base for enterprises is an effective way to enhance the level of enterprise informatization, and to achieve system integration and data integration. By constructing an integrated base, data platform, technology platform, and organizational platform, enterprises can form an efficient collaborative working mechanism, which improves business response speed and operational efficiency. In the future, with continuous technological advancements and the expansion of application scenarios, the dual-core architecture is expected to be applied and promoted in more enterprises, contributing even more to the digital transformation and intelligent upgrading of enterprises.

About the author

Dan Huagang (1973-), male, Han ethnicity, from Shaoxing, Zhejiang, holds a PhD and is a senior engineer. His research interests include geotechnical engineering, transportation construction, and enterprise management.

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