Research on Improving Management Level of Large Enterprises through Information Technology

Wen Wu

Guangzhou Yiyun Supply Chain Technology Co., Ltd., Guangzhou, Guangdong, China
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Abstract: With the rapid development of global information technology and the changing concepts of enterprise management, using information technology to improve management levels has become a consensus among enterprises. Large enterprises face challenges such as multiple departments, diverse business operations, numerous employees, complex management hierarchies, and long decision-making processes. These factors often lead to issues such as information asymmetry, low communication and coordination efficiency, information silos, and business fragmentation, which affect enterprise efficiency. The application of information technology can significantly address these issues and support high-quality development. This paper first briefly outlines the concepts, characteristics, and significance of enterprise information management, analyzes the main shortcomings and deficiencies in the information management of large enterprises, and discusses strategies for improving management levels from four aspects: strengthening top-level design, adhering to system integration, reinforcing security barriers, and enhancing education and training.

***Keywords*:** large enterprise management; information technology; issues; strategies

1. Introduction

Currently, the world has entered the era of the Fourth Industrial Revolution, driven by information technology. New-generation information technologies, represented by the internet, big data, blockchain, and artificial intelligence, have been fully integrated into social production and daily life. The transformation of enterprise management into an information-based, digital, and intelligent system has become a crucial measure to enhance management efficiency and strengthen the core competitiveness of enterprises. In the fast-evolving landscape of information technology, relying on information technology to improve enterprise management is essential for promoting the healthy and sustainable development of large enterprises, and it is a common challenge that every large enterprise must face. This paper adopts a problem-oriented research approach, analyzing the shortcomings and deficiencies in the information management of large enterprises from aspects such as conceptual understanding, top-level design, infrastructure, software development, data connectivity, information security, and talent development, and proposes targeted strategies. It is hoped that this paper will serve as a reference for the industry.

2. Concept and Characteristics of Enterprise Information Management

2.1 Concept of Enterprise Information Management

Enterprise information management refers to the process of enhancing enterprise management through information technology. Specifically, it involves applying technologies such as the internet, big data, cloud computing, and artificial intelligence to integrate the entire process of production, operation, management, and decision-making within an enterprise, thereby improving management efficiency. Enterprise information management covers various aspects, including production scheduling information systems, business management information systems, administrative office information systems, warehousing and logistics information systems, and document management information systems, among others. Common enterprise information platform systems include OA office automation systems, ERP enterprise resource planning systems, SRM supply chain systems, PLM product lifecycle management systems, WES manufacturing execution systems, and CRM customer relationship management systems.

2.2 Characteristics of Enterprise Information Management

Compared to traditional management methods, enterprise information management has the following characteristics:First, High degree of digitalization and informatization: Under information management, traditional files, ledgers, and documents are significantly reduced, with operations increasingly relying on online platforms.Second, Scientific production and management: Information technology fully integrates into all areas and stages of enterprise production and management,

improving efficiency and promoting cost reduction and value enhancement.Third□Reduction in communication steps: Information management facilitates decentralization of the management center, helping to eliminate intermediate steps, reduce communication barriers, and improve communication effectiveness.

3. Significance of Applying Information Technology to Improve Management in Large Enterprises

3.1 Optimizing Workflows and Improving Efficiency

The application of information technology in enterprise management can further optimize workflows, reduce redundant tasks, and improve work efficiency. Large enterprises often have more work processes and longer workflows, and the use of information technology can yield significant results with less effort. For example, by using an ERP system, enterprises can achieve full-process automation in managing orders, production plans, sales, and inventory, optimizing workflow connections and enhancing efficiency. Additionally, employing other information technologies, such as various management software and RPA (Robotic Process Automation) robots, can replace manual work for many basic and repetitive tasks. This not only greatly improves work efficiency but also reduces human error and saves labor costs.

3.2 Improving Communication Efficiency and Reducing Information Asymmetry

In large enterprises, due to multiple departments, hierarchies, and dispersed personnel, it is easy for issues like poor information flow, low communication efficiency, and information asymmetry to arise. By applying information technology in management, such as using OA office automation systems and CRM management systems, communication and data exchange between departments and team members can be conducted more through online platforms. Compared to traditional face-to-face communication, this improves file transfer, approval efficiency, and overall communication, effectively reducing information asymmetry. Moreover, relying on online feedback platforms allows for collecting opinions from various departments, further optimizing internal management.

3.3 Strengthening Coordination and Scheduling, Optimizing Resource Allocation

The application of information technology can help reinforce internal coordination and scheduling, optimize resource allocation, and improve efficiency. For large enterprises, managing daily resource consumption is of significant importance. Leveraging information technology, various front-end sensing platforms, and centralized management systems allow for precise tracking of resources, and algorithms can be used to allocate resources. This approach offers better overall planning compared to traditional manual scheduling, eliminating bottlenecks, ensuring rational distribution, and effectively reducing costs and enhancing efficiency. Common management software like ERP, CRM, and PLM can automatically allocate enterprise resources, enabling a virtuous cycle.

3.4 Collecting and Analyzing Data to Support Enterprise Decision-Making

For large enterprises, the success or failure of decisions often determines the fate of the enterprise. The application of information technology allows for the collection and consolidation of vast amounts of internal and external data and information. Using big data models, this data can be analyzed and assessed to provide insights that support decision-making at the management level. For instance, through a CRM customer management system, enterprises can collect customer data, analyze consumption demands and preferences, and create customer profiles. This enables managers to adjust marketing strategies more effectively, thereby increasing customer satisfaction.

4. Major Difficulties and Issues in Enterprise Information Management

4.1 Insufficient Top-Level Design and Information Silos Among Subsystems

Currently, most large enterprises in China have reached a general consensus on the importance of information management. However, in practice, there are still many issues. Some enterprises face problems such as insufficient top-level design, lack of targeted planning, and unclear objectives, which lead to a lack of coordination in the informatization efforts of different departments and units. As a result, each department operates in isolation, with fragmented management structures, and no cohesive efforts are made. In some large enterprises, the information management system is not operated on a centralized and unified platform, but rather through multiple subsystems. These subsystems, each focused on their own functions, have differing architectures, data formats, and scattered information resources, which prevent effective integration and sharing of data. This leads to the formation of information silos. Furthermore, there are issues of redundant development and resource waste among different systems, which require significant attention.

4.2 Uneven Demand and Difficulties in System Integration

As time progresses, large enterprises are increasingly diversifying, resulting in numerous subsidiaries with independent operations and accounting systems. The management models and information technology needs between different industries and sectors vary significantly, making it difficult to achieve balance. Due to the difficulty of centralizing and unifying these demands, large enterprises face challenges in clarifying the boundaries between unified planning and decentralized construction. There are also difficulties in coordinating vertical business management with regional subsidiaries' horizontal business management. As a result, many large enterprises find it challenging to thoroughly plan and implement information technology development across their subsidiaries, with coordination of business management and system integration posing notable challenges.

4.3 Long-Term External Threats and Information Security Risks

For large enterprises, data such as raw material compositions, production processes, client lists, product cost prices, sales prices, and user data are considered absolute commercial and technical secrets, holding immense value. If such data is leaked, it can cause significant and immeasurable losses. Under the context of information management, enterprise data is stored on hardware and transmitted extensively over networks. With current technological conditions, the risks of data theft and leakage remain a long-term concern. The application of AI tools also increases the risk of data breaches. For example, misoperations and malicious destruction of databases may go undetected, internal legitimate accounts may be exploited by attackers to leak data, storage devices such as CDs or hard drives may be damaged, and computer viruses may infect systems, all of which pose serious security risks to information and data.

4.4 Insufficient Information Technology Talent, Hindering Effective Support for Information Management

The application of information technology in management also places high demands on the quality of enterprise personnel. In large enterprises, while the group headquarters and parent company may have sufficient funding and personnel, subsidiaries and lower-tier units often face a shortage of information technology talent, making it difficult to effectively support information management work. This problem is particularly significant as information technology evolves rapidly, with knowledge, skills, and platform systems constantly updating. Employees need to keep up with these changes, but many lower-tier units lack proper training and education programs. As a result, employees may struggle with daily operations such as system data entry, verification, and other tasks, leading to inefficiencies and errors.

5. Implementation Strategies for Enhancing Management in Large Enterprises through Information Technology

5.1 Strengthening Top-Level Design and Breaking Data Silos by Connecting Data Links

In advancing information management, large enterprises should closely align with their actual conditions, further strengthen top-level design, and develop short-term, medium-term, and long-term development plans. Clear goals and tasks for each phase should be set to ensure that work progresses efficiently and systematically. For large enterprises with the necessary conditions, a unified system platform should be established within the company based on the principles of "unified planning, unified standards, unified development, unified construction, and unified management." New business developments across subsidiaries and units should be integrated and developed under the "big system" of the parent company, ensuring uniform data formats and smooth data sharing. For enterprises that already have decentralized subsystems, efforts should be coordinated to promote interconnection between subsystems, standardize data types, and resolve the issue of data silos.

5.2 Adhering to System Integration and Establishing a Comprehensive Information Management Platform

Large enterprises with the necessary conditions should actively deploy cloud computing, big data, the Internet of Things (IoT), digital twins, artificial intelligence (AI), and other applications to build a comprehensive information management platform focused on the group headquarters or parent company's business. This platform should create a centralized, unified, integrated control, and business-collaborative information management system. Enterprises can select and integrate modules such as ERP (Enterprise Resource Planning), SRM (Supply Chain Management), PLM (Product Lifecycle Management), WES (Manufacturing Execution System), and CRM (Customer Relationship Management) to achieve information management across these modules. An OA (Office Automation) system can be used to streamline internal approval processes

and improve internal operation efficiency. Additionally, RPA (Robotic Process Automation) robots and generative AI tools can be developed to assist in daily tasks, improving work efficiency. Strengthening data collection, analysis, and mining will provide strong support for corporate decision-making.

5.3 Strengthening Security Measures to Safeguard Enterprise Information and Data Security

Data security is a crucial component of information management and must be given high priority. Large enterprises must adopt multiple strategies to strengthen data security and prevent core data leaks. First, employee education and training should be enhanced to raise awareness of data security and compliance. Second, data security regulations should be further refined, including the categorization and classification of information and data, and daily supervision and enforcement should be strengthened to ensure implementation. Third, technical measures should be reinforced, including encrypting and anonymizing sensitive data to reduce the risk of data leaks. Firewalls should be established, antivirus software should be updated regularly, and proactive data security measures should be implemented. Furthermore, critical data backups should be conducted, and regular security assessments and vulnerability repairs should be organized. Daily maintenance of hardware facilities should be ensured to fortify the enterprise's data security.

5.4 Strengthening Education and Training to Enhance Information Technology Talent Development

As the scale of enterprises grows, there is an increasing demand for deeper and broader applications of information technology, and higher expectations for employees' digital literacy. For large enterprises, especially those at higher organizational levels, it is necessary to focus on system operation, information technology tool and platform applications, data analysis and visualization, data mining, AI system applications, and the integration of business and financial management. A combination of online and offline training methods should be adopted, using formats that employees find engaging, to strengthen education and training. This will improve employees' ability and proficiency in using information technology software and participating in information management. Enterprises should accelerate the cultivation and recruitment of multidisciplinary talents with business, management, and information expertise to strengthen the enterprise’s information management capabilities and support its digital transformation.

6. Conclusion

Looking ahead, large enterprises, as important pillars of national economic development, must adhere to a problem-oriented approach, focusing on the issues present in their information technology development. By continuously advancing information management, enterprises should strengthen top-level design, break data silos by connecting data links, adhere to system integration, build comprehensive information management platforms, reinforce security barriers, and ensure the safety of enterprise data. Furthermore, enhancing employee education and training to nurture information technology talent is essential. Through coordinated efforts in these four areas, enterprises can fully leverage information technology to continuously improve their management efficiency.

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