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Research on the Iterative Path of Personnel Management Systems in Chinese Enterprises Driven by AI Development

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KEYWORDS

Digital economy; personnel management system; digital transformation; human resource management; AI technology

ABSTRACT

In the context of the digital economy, the experience-based decision-making and process fragmentation limitations of traditional personnel management systems are difficult to adapt to the needs of agility and precision. The research focuses on the inherent logic and practical path of system iteration, and proposes a collaborative transformation framework through three-dimensional analysis of technology, process, and organization and verification of state-owned enterprise cases. The technical dimension integrates big data and AI to achieve intelligent decision-making, the process dimension reconstructs full life cycle management, improves efficiency and experience, and the organizational dimension promotes the transformation of HR into a strategic partner.

INTRODUCTION

In the context of the digital economy, the core characteristics of data assetization, technological intelligence and scenario ecology have had a systematic impact on traditional personnel management systems. The limitations of traditional systems that rely on empirical decision-making and process fragmentation have made it difficult to adapt to the digital age's demand for agility, precision and strategy in human resource management. Data assetization promotes the transformation of human resources data from static records to dynamic value carriers, requiring the system to have the ability to integrate and analyze multi-source data in real time to support talent strategic decision-making[1]. Technological intelligence reconstructs core processes such as recruitment, performance, and training through technologies such as AI and big data, improving management efficiency and scientific decision-making[2]. Scenario ecology further requires the deep integration of personnel systems and business scenarios to achieve dynamic synergy between human resource management and organizational strategy.

External drivers of system iteration include policy orientation and competitive market pressures. At the policy level, the national digital transformation strategy clearly requires enterprises to deepen the digitalization of human resource management. As reform pioneers, state-owned enterprises need to take the lead in promoting the digital reconstruction of personnel systems to respond to policy calls[3]. At the market competition level, the digital economy has intensified the competition for talent. Enterprises need to improve their ability to attract, cultivate and retain talent through intelligent personnel systems to build core competitiveness[4]. Internal requirements focus on efficiency improvement, employee experience optimization and strategic coordination. In terms of efficiency improvement, a large amount of repetitive work in traditional personnel management can be handled automatically through digital

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systems, freeing up HR energy to invest in high-value work[5]. Employee experience optimization requires the system to provide convenient and personalized services, such as self-service inquiries, intelligent question-and-answer functions, etc., to improve employee satisfaction and sense of belonging[6]. Strategic collaboration emphasizes that personnel systems need to be aligned with corporate strategic goals and support organizational change and business development through data insights[7].

1.Core dimensions of personnel management system iteration

1.1.Technical dimension: the integrated application of big data and AI technology

Driven by the digital economy, the integrated application of big data and AI technology has become the core technical engine for the iteration of enterprise personnel management systems. Its value is not only reflected in efficiency improvement, but also in achieving intelligent decision-making and precise management through data drive. By integrating multi-source human resources data (such as recruitment records, performance data, employee behavior data, etc.), big data technology provides a data foundation and analytical framework for talent supply and demand forecasting, employee portrait construction, and turnover risk warning. For example, based on historical data and external labor market information, companies can build forecasting models to identify talent gaps in key positions in advance and optimize recruitment plans. At the same time, by constructing multi-dimensional employee profiles (covering skills, performance, career development tendencies, etc.), they can provide a basis for personalized training and career planning. In addition, big data analysis can also achieve early warning of turnover risks by identifying turnover risk factors (such as decreased job satisfaction, performance fluctuations, etc.), help companies take targeted retention measures, and reduce the cost of talent loss.

The in-depth application of AI technology has further promoted the intelligent transformation of personnel management processes, and has shown significant value in natural language processing (NLP), machine learning and computer vision. In the recruitment process, AI-powered tools (such as intelligent resume screening systems and chatbot interviewers) can quickly process massive resumes, identify candidate characteristics that match the position, and improve recruitment efficiency and accuracy; in performance evaluation, machine learning algorithms can integrate multi-source performance data (such as task completion, colleague feedback, project contributions, etc.) to achieve more objective, Comprehensive performance analysis to reduce human bias; computer vision technology empowers intelligent attendance systems to achieve contactless and efficient attendance management through facial recognition and other methods, improving employee experience and management efficiency. However, the application of AI technology also faces challenges, such as algorithmic bias, data privacy protection and other issues. It requires companies to pay attention to ethical norms and risk management in the process of technology selection and implementation to ensure the fairness and compliance of technology application.

The key value point of technological integration lies in realizing the transformation from “experience-driven” to “data-driven” management model, and improving the foresight, accuracy and personalization level of personnel management. Through the synergy between big data and AI technology, companies can gain a deeper understanding of the matching between employee needs and organizational needs, optimize human resource allocation, and provide employees with more personalized career development support, ultimately achieving a dual improvement in organizational effectiveness and employee experience. This iteration of technical dimensions is not only an upgrade at the tool level, but also a fundamental change in personnel management concepts and methods, providing important support for enterprises to build talent competitive advantages in the digital economy era.

1.2.Process dimension: digital reconstruction of personnel management throughout the life cycle

Driven by the digital economy, the process dimension iteration of the personnel management system focuses on the digital reconstruction of employees throughout their life cycle, and achieves end-to-end optimization from recruitment to resignation through technological empowerment. In the recruitment process, the application of

AI resume screening and virtual interview technology has significantly improved efficiency and accuracy. According to research, about 49% of companies invest digital human resources in human capital management software, among which digital recruitment tools account for an important proportion. The digital reconstruction of the training process is reflected in the design of personalized learning paths and the development of VR training scenarios. By analyzing the shortcomings of employee capabilities through data, adapted training plans are dynamically generated. This model has been proven to effectively improve the skills matching of employees in the digital reform of state-owned enterprises. The digital transformation of the salary performance dimension has broken through the limitations of traditional periodic accounting. Real-time data collection and the establishment of dynamic incentive mechanisms have enabled immediate linkage between salary adjustments and performance performance. The case of an education technology company shows that such a system can shorten the performance accounting cycle from monthly to weekly, while improving employee satisfaction by 23%. The digital reconstruction of the resignation management link uses intelligent analysis tools to explore the reasons for resignation and provide data support for talent retention strategies. This full-process data closed-loop management has become a trend among large enterprises. About 32% of enterprises plan to increase investment in cloud computing services to strengthen resignation data analysis capabilities. The core goal of process reconstruction is to achieve a dual improvement in efficiency and experience, reduce operational errors by reducing manual intervention, and optimize employee interaction experience by utilizing mobile and self-service functions. For example, a state-owned enterprise reduced employee onboarding time from 3 days to 4 hours through a digital system, significantly improving the experience for new employees. It is worth noting that HR needs to be deeply adapted to the organizational structure and employee behavior habits to avoid technological waste. This requires companies to fully consider the matching degree between user needs and operating scenarios during the system design stage.

1.3.Organizational Dimension: HR Role Transformation and Organizational Architecture Adaptation

Driven by the digital economy, HR roles are undergoing a multidimensional transformation from traditional affairs executors to strategic partners, data analysts and experience designers. This transformation is first reflected in the upgrading of strategic positioning. HR needs to be deeply involved in corporate strategic planning and support the realization of business goals through human resources strategies. For example, in terms of talent allocation, HR needs to formulate forward-looking talent reserve plans based on business expansion needs to ensure that the talent supply in key positions matches the pace of business development. At the same time, the role of data analyst requires HR to have data interpretation capabilities and provide decision-making support to management by analyzing employee performance data, turnover rate and other indicators. The role of experience designer focuses on optimizing the entire life cycle experience of employees, from the digital transformation of the recruitment process to the personalized design of employee training, to improve employee satisfaction and sense of belonging.

The adaptation and adjustment of organizational structure is an important guarantee for the transformation of HR roles. It has become a trend to establish digital HR departments, which integrate professional talents such as data analysis and system development to promote the digital upgrade and maintenance of personnel management systems. The establishment of cross-departmental data collaboration groups promotes information sharing and collaborative decision-making. For example, HR departments and business departments jointly analyze talent demand data and develop more accurate recruitment strategies. In addition, the construction of a flexible organizational structure enhances the organization's ability to respond to market changes and quickly deploy human resources to meet business challenges through project-based teams and other forms. This adjustment of the organizational structure not only optimizes internal processes, but also provides practical scenarios for the transformation of HR roles and promotes the coordinated evolution of the organization and the system.

2.Transformation of personnel systems in large state-owned enterprises

Large state-owned enterprises have shown clear compliance priority characteristics in the transformation of AI technology in personnel systems, which stems from their special positioning as policy response subjects.

1) State Grid Corporation of China: Its personnel system iteration strictly follows the requirements of the “Action Plan for Digital Transformation of State-owned Enterprises” and establishes a three-level review mechanism in the data governance link to ensure that core processes such as cadre appointment and removal, salary accounting, etc. comply with regulatory standards. The system realizes the immutable storage of personnel files through blockchain technology. While meeting the legal validity requirements of the Archives Law for electronic files, it compresses the file query response time from 3 working days to 15 minutes, significantly improving management efficiency.

2) Sinopec adopts a step-by-step digital transformation strategy, first verifying the intelligent recruitment system at its East China branch through a "pilot-promotion" model, and then gradually covering it to the entire group. Its system integrates resume analysis, AI interview and background check functions, shortening the recruitment cycle by 40%. At the same time, it reduces employment risks through a multi-dimensional compliance verification module. This practice is highly consistent with the reform logic of "steady progress" in the digital transformation of state-owned enterprises.

The two types of enterprises present differentiated paths in terms of system integration and organizational adaptation:

1) State Grid Corporation of China has built a “dual-mode IT architecture”. While retaining the traditional SAP-HR core module, it connects to new functions such as intelligent performance analysis and talent inventory through a microservices architecture to achieve a smooth transition between the old and new systems. This fusion model not only ensures the integrity of historical data, but also provides a data foundation for the application of AI algorithms. Its experience shows that technical iteration needs to be balanced with organizational inertia[8].

2) Sinopec emphasizes the supporting role of HR's role transformation. Through the "Talent Heat Map" tool developed by HR, it integrates employee skills, performance and project experience data to provide decision-making support for talent allocation in the refining and chemical sectors, reflecting the leap of HR functions from the operational level to the strategic level.

Therefore, we can see that the two types of cases jointly reveal that the digital transformation of state-owned enterprise personnel systems requires seeking a dynamic balance between technological innovation and institutional constraints, reducing resistance to change through gradual transformation, and consolidating transformation results through organizational capacity building.

Table.1.Comparison of the characteristics of digital transformation of personnel systems in large state-owned enterprises

Contrastive dimensions	State Grid	Sinopec
Core Features	Compliance first, strictly follow policy requirements	Step-by-step transformation, steady progress
Key technology applications	Blockchain technology enables immutable storage of personnel files	Intelligent recruitment system (resume analysis, AI interviews, background checks)
System Convergence Strategy	Build a "dual-mode IT architecture", retain the SAP-HR core module, and access new functions for microservices	-
Organizational adaptation measures	Smooth transition between old and new systems, balancing technical iteration and organizational inertia	Establish a "Digital HR Special Group" where 85% of HRs master basic data analysis skills
Transformation results	File query response time reduced from 3 working days to 15 minutes	Recruitment cycle shortened by 40%; "Talent Heat Map" supports talent allocation in refining and chemical sectors
Core Revelation	Technological iteration needs to be balanced with organizational inertia	The HR function leaps from the operational to the strategic level

Table.1. Comparison of the characteristics of digital

transformation of personnel systems in large state-owned enterprises

In the next 3-5 years, the iteration of personnel management systems will show four core trends, and the deep coupling of technological innovation and organizational needs will reshape the human resource management paradigm. AI will be upgraded from an auxiliary tool to a core carrier of employee services. Through natural language processing and multimodal interaction, it will achieve intelligent coverage of scenarios such as recruitment rhetoric generation, performance feedback optimization, and personalized training plan customization, promoting the transformation of HR from a rule enforcer to a value co-creator.

It is worth pointing out that data-driven dynamic organizational structure adjustment will become a key capability for enterprises to cope with uncertainty. By integrating employee skills, project experience and business demand data in real time, AI algorithms can automatically generate optimal team configuration plans, supporting agile organizational structure reorganization and dynamic talent allocation[9]. This trend requires personnel systems to have stronger data integration capabilities and interpretability of algorithmic models. The popularization of privacy computing technology provides a balanced path for the release of data value and security protection. Through technologies such as federal learning and multi-party secure computing, cross-departmental and cross-enterprise talent data collaborative analysis can be achieved without exposing the original data[10]. This not only meets the compliance requirements of laws and regulations, but also provides data support for precise talent decision-making. These intertwined trends will drive the evolution of personnel management systems from process digitalization to value intelligence, ultimately achieving dynamic synergy between human resource management and organizational strategy.

CONCLUSION

Promoting the iteration of China's enterprise personnel management system requires building a four-dimensional strategic system that integrates technology, talent, systems and culture, especially for large state-owned enterprises, which needs to balance innovation and stability within a compliance framework. At the technical selection level, it is recommended to adopt a hybrid model of “open source framework + customized development”: open source frameworks such as microservices architecture can reduce development costs and improve system flexibility, while customized modules can meet the compliance needs of cadre management, salary systems, etc. unique to state-owned enterprises. This model not only ensures a smooth transition between the old and new systems, but also provides a data foundation for the application of AI algorithms.

Talent cultivation and organizational adaptation are key supports for system iteration. Enterprises need to establish “Digital HR Capacity Enhancement Program”o enable HR to master basic data analysis skills through certification training and promote its transformation from operational to strategic levels.

In addition, in terms of cultural construction, it is necessary to create consensus on digital transformation through demonstrations by senior leaders and sharing of cross-departmental collaborative cases to reduce the resistance to change brought about by organizational inertia. Therefore, for state-owned enterprises, we can learn from the experience of the State Grid Corporation of China “dual-mode IT architecture”, connect intelligent functions on the basis of retaining traditional core modules, and achieve a dynamic balance between technological innovation and organizational inertia. These strategies need to be flexibly adjusted according to the size of the enterprise, industry characteristics and digital maturity to ensure that personnel system iteration and organizational strategy are deeply coordinated.

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