

Designing a Data-Driven Human Resource Management System Implementation Model Using Digital and Intelligent Tools

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Abstract

The aim of this study is to design a model for the implementation of a data-driven human resource system by means of digital and intelligent tools. In terms of purpose, this research is fundamental; and in terms of implementation method, it is qualitative. The statistical population of the study consisted of 15 experts and specialists, including academic scholars, faculty members, and managers of the Blood Transfusion Organization, selected through purposive and theoretical (judgmental) sampling. The data collection instrument was semi-structured interviews. MAXQDA software was applied to analyze the findings.

The results showed that through axial coding, 44 initial codes were categorized into 22 axial codes, representing the key concepts and structural elements of a data-driven human resource system. A comprehensive examination of the factors influencing the implementation of a data-driven human resource system using digital and intelligent tools indicates that this process represents a multidimensional and strategic transformation that requires simultaneous attention to a set of causal factors (5 dimensions), contextual factors (4 dimensions), intervening factors (4 dimensions), strategies (4 dimensions), and consequences (4 dimensions). By presenting an integrated and data-driven model, this study highlights the role of digital and intelligent tools in improving human resource processes and strategic decision-making, and it can provide valuable practical and theoretical guidance for organizations in their path toward digital transformation.

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Extended Abstract

Introduction

In recent decades, organizations have faced complex and rapid changes in both internal and external environments, leading to an increasing need for innovative, technology-oriented managerial approaches. These changes include factors such as rapid advancements in information technology, the growing volume of organizational data, the increasing complexity of work processes, and the rising demand for fast and accurate decision-making (Mujtaba, 2025).

Traditional human resource systems have largely been based on administrative procedures, experience-based practices, and limited data collection, which often resulted in incomplete, slow, and reactive decision-making. These limitations created challenges for organizations in forecasting workforce needs, identifying the strengths and weaknesses of employees, and effectively managing their performance (Iyer, 2025). The emergence of digital technologies, intelligent tools, and advanced data analytics made it possible to collect, process, and analyze large volumes of human resource data (Panahi et al., 2024).

Designing and implementing a data-driven human resource system in organizations requires the accurate identification of key organizational components, analysis of informational needs, and the utilization of modern technologies. Such systems are capable of collecting accurate and up-to-date data on employee performance, training processes, motivation and job satisfaction, behavioral patterns, and future organizational needs (Zhang, 2024). Digital and intelligent tools such as Human Resource Information Systems (HRIS), data analytics software, artificial intelligence, and managerial dashboards enable complex analysis and the optimization of organizational processes (Gupta et al., 2025). The application of such tools ensures that decision-making is no longer based solely on intuition and experience but is grounded in data and rigorous scientific analysis. This is particularly critical in organizations that deal with human health and lives, where managerial decisions can have wide-ranging direct and indirect impacts on service quality and stakeholder satisfaction (Niu, 2024).

Advances in digital technologies and artificial intelligence have created unprecedented opportunities for organizations to collect and analyze extensive and complex workforce data (Niu, 2024). These analyses enable managers to identify trends and hidden patterns within data and make strategic decisions accordingly (Varma & Dutta, 2023). In the field of human resources, such data-driven approaches can improve processes related to recruitment, training, performance evaluation, and employee retention. The use of intelligent tools such as machine learning, predictive analytics, and human resource management systems facilitates and accelerates processes, enabling organizations to achieve their objectives more effectively and at lower cost (Dehmardeh Kamak et al., 2025).

The intelligent use of data enables organizations to identify weaknesses and opportunities for improvement, while also contributing to the development of an organizational culture based on transparency, continuous learning, and innovation. Overall, such a model can serve as a transferable framework for other service and healthcare organizations and provide a practical approach for improving the quality of human resource management at the national level. Accordingly, the main research question of the present study is: What is the model for implementing a data-driven human resource system using digital and intelligent tools?

Theoretical Framework

Data-Driven Human Resource System

A data-driven human resource system refers to a set of procedures, processes, and policies in which decisions related to employee management are based on the collection, analysis, and utilization of empirical data. This system leverages accurate data on employee performance, skills, training needs, and job satisfaction to enable forecasting of workforce requirements and strategic human resource planning. Its primary objective is to enhance productivity, reduce human errors, and improve the quality of organizational decision-making (Gupta et al., 2025).

Digital and Intelligent Tools

Digital and intelligent tools refer to software and systems that, through the use of information technology and artificial intelligence algorithms, collect, store, process, and analyze human resource-related data in order to enable data-driven and goal-oriented processes for employee recruitment, retention, development, and evaluation (Mujtaba, 2025).

Khashi and Pourshahabi (2026) examined the design of a model for optimizing the coexistence of artificial intelligence and human capital in the provision of urban services in the municipalities of Sistan and Baluchestan Province. The findings indicated that the final research model demonstrated a desirable level of fit and included six main constructs: contextual factors, artificial intelligence components, human capital components, mediating factors, coexistence strategies, and desirable outcomes. The strongest relationship in the model was observed between contextual factors and artificial intelligence components, with a path coefficient of 0.98. This study presents an indigenous model for optimizing human-AI collaboration in municipalities located in less developed regions.

Tizfahm Fard et al. (2026) investigated the impact of digital technologies on the transformation of human resource management practices and their consequences for employee outcomes. The findings showed that causal factors—including technology-oriented leadership, managerial support for innovation, and a data-driven decision-making culture—play a key role in facilitating the transformation of human resources. Contextual factors such as an organizational learning culture and employees' level of digital literacy provide the necessary foundation for the successful implementation of digital processes, while financial resource limitations, administrative regulations, and employee resistance function as intervening factors. Strategies such as digital empowerment of employees, interdepartmental collaboration, and the development of technological infrastructure lead to improved productivity, employee satisfaction, and organizational commitment. The study provides a comprehensive theoretical-practical framework through which organizations can effectively and sustainably implement human resource management practices by leveraging digital technologies.

Research Methodology

In terms of purpose, this study is fundamental; and in terms of implementation method, it is qualitative. The statistical population consisted of 15 experts and specialists, including academic scholars, faculty members, and managers of the Blood Transfusion Organization, selected through purposive and theoretical (judgmental) sampling. The data collection instrument was semi-structured interviews.

Research Findings

MAXQDA software was applied to analyze the findings. The results showed that through axial coding, 44 initial codes were categorized into 22 axial codes, representing the key concepts and structural elements of a data-driven human resource system.

A comprehensive examination of the factors influencing the implementation of a data-driven human resource system through digital and intelligent tools indicates that this process constitutes a multidimensional and strategic transformation that requires simultaneous attention to a set of causal factors (5 dimensions), contextual factors (4 dimensions), intervening factors (4 dimensions), strategies (4 dimensions), and consequences (4 dimensions).

By presenting an integrated and data-driven model, this study highlights the role of digital and intelligent tools in improving human resource processes and strategic decision-making, and it can provide valuable practical and theoretical guidance for organizations in their path toward digital transformation.

Conclusion

The present study was conducted with the aim of designing a model for the implementation of a data-driven human resource system applying digital and intelligent tools. The findings of this study are consistent with the results of Khashi and Pourshahabi (2026), Tizfahm Fard et al. (2026), Mujtaba (2025), Liu (2025), Iyer (2025), Damjanović et al. (2025), Toghiani-Pezouh et al. (2025), Dehmardeh Kamak et al. (2025), Mateen et al. (2024), Ajalli et al. (2023), Bahari and Taheri Roozbhani (2023), and Foroutan Eghlidi et al. (2021).

Iyer (2025) emphasizes the importance of data security, legal frameworks, and a supportive organizational culture. These factors function like the pillars of a building, ensuring the stability and effectiveness of other components; without them, even the most advanced intelligent tools will not achieve the required level of efficiency. A transparent organizational structure, standardized technological infrastructure, and clearly defined legal and ethical policies enable smooth data flow and reliable analytics.

Based on the research findings, the following recommendations are proposed:

- Design training programs for managers and decision-makers to enhance their capability in utilizing data and predictive analytics.
- Invest in data analytics tools, artificial intelligence, and machine learning to improve the accuracy of human resource decision-making.

Identify areas with the greatest need for data-driven approaches (e.g., talent acquisition, employee retention) and prioritize them accordingly.