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Designing a Model for Implementing a Data-Driven Human Resource Management System Using Digital and Intelligent Tools in the Tehran Blood Transfusion Organization

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Abstract

The aim of this research is to design a data-driven human resources system deployment model using digital and intelligent tools in Tehran Blood Transfusion Organization. This research is fundamental in terms of its purpose, and mixed in terms of its implementation method (qualitative and quantitative). The statistical population in the qualitative section includes 15 academic experts and scholars, faculty members, and managers of the blood transfusion organization, selected by a purposeful and theoretical (judgmental) method. The statistical population in the quantitative section includes 700 active employees in the Tehran Blood Transfusion Organization, with a sample size of 196 people selected by a simple random method. The data collection tool in the qualitative section includes semi-structured interviews and in the quantitative section, a questionnaire. MAXQDA2020 software was utilized to analyze the findings in the qualitative section, and SPSS and SmartPLS software were utilized in the quantitative section. The results of the qualitative section showed that through axial coding, 44 initial codes were categorized into 22 axial codes that express the key and structuring concepts of the data-driven human resources system. The quantitative section analysis also confirmed that causal, contextual, intervening, and strategic factors significantly affect the establishment of the data-driven human resources system. Coordination between organizational structure, technology, and policies was proposed as a prerequisite for the success of data-driven decision-making and increasing human resources effectiveness. By presenting an integrated and data-driven model, this research highlights the role of digital and intelligent tools in improving human resources processes and strategic decision-making and can provide valuable practical and theoretical guidance for organizations on the path of digital transformation.

Keywords:
Establishing a data-driven human resources system, digital and smart tools, Tehran Blood Transfusion Organization

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Extended Abstract

Introduction

Today, in the fast-paced and complex world of organizations, human resource management is recognized as one of the key factors for success. With the significant advances in digital technologies and artificial intelligence, this field is rapidly evolving, and organizations need data-driven management systems to remain competitive and respond to changing market needs (Okon et al., 2024). Data-driven HR refers to the accurate and targeted use of employee-related data to make management decisions based on real and analyzed information, not just experience or guesswork. This is especially important for organizations that play a vital role in the health of society, as optimal human resource management can have a direct impact on the quality of services and patient health (Conte & Siano, 2023). Therefore, the use of new technologies and the creation of a smart and data-driven system in the field of human resources have become a strategic necessity for organizations (Mujtaba, 2020). In this system, data related to various factors such as skills, job satisfaction, productivity, work history and even psychological factors of employees are collected and by analyzing them carefully, managers can gain a more comprehensive understanding of their workforce (Mateen et al., 2024). This understanding provides the basis for making strategic decisions such as optimizing human resource allocation, designing targeted training programs and predicting future workforce trends (Ajalli et al., 2023). Digital and intelligent tools include advanced human resource management software, big data analysis systems and artificial intelligence technologies such as machine learning and data mining, which enable the processing and analysis of very large volumes of data (Stankeviciute, 2024). These tools can identify hidden patterns in human resource data and predict various trends such as turnover rates, job satisfaction levels, or weaknesses in employee skills (Toghiani-Pezouh et al., 2025). In addition, smart technologies can automatically provide management suggestions and facilitate daily human resource processes. Using these tools in the Tehran Blood Transfusion Organization can increase the accuracy and speed of decision-making, reduce costs, and improve human resource productivity, while also allowing for faster response to environmental changes and organizational needs (Damnjanović et al., 2025). Conducting this research will not only help solve existing problems, but can also provide a usable and generalizable model for other similar organizations and help develop data-driven management in the field of human resources at the national level. Therefore, in line with this goal, the main question of the present study is: What is the design model for establishing a data-driven human resources system using digital and smart tools in the Tehran Blood Transfusion Organization?

Theoretical Framework

Establishing a Data-Driven Human Resources System

Establishing a data-driven human resources system is a process in which an organization employs accurate and comprehensive data related to human resources, including performance information, skills, behaviors, and employee needs, to design, implement, and optimize human resource management processes (Rohmah et al., 2025).

Khashi & Pourshahabi (2026) examined the design of a symbiotic optimization model of artificial intelligence and human capital in providing urban services to municipalities in Sistan and Baluchestan province. The findings showed that the final research model has a good fit and includes six main constructs including contextual factors, artificial intelligence components, human capital components, mediating factors, coexistence strategies, and desired 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 a local model for optimizing human-AI collaboration in municipalities in underserved areas.
Tizfahm Fard et al. (2026) examined the impact of digital technologies on the transformation of human resource management practices and its consequences on employee outcomes. Findings showed that causal factors including technology-driven leadership, managerial support for innovation, and a data-driven decision-making culture play a key role in facilitating human resource transformation. Contextual factors including organizational learning culture and employees' digital literacy level provide the necessary platform for successful implementation of digital processes, while financial resource constraints, administrative rules, and employee resistance act as intervening factors. Strategies such as employee digital empowerment, cross-functional collaboration, and technological infrastructure development enhance employee productivity, satisfaction, and commitment. The study provides a comprehensive theoretical-practical framework that organizations can apply to effectively and sustainably implement human resource management practices by utilizing digital technologies.

Research Methodology

This research is fundamental in terms of purpose, and mixed in terms of implementation method (qualitative and quantitative). The statistical population in the qualitative section includes 15 academic experts and experts, faculty members and managers of the Blood Transfusion Organization, selected by a purposeful and theoretical (judgmental) method. The statistical population in the quantitative section includes 700 active employees in the Tehran Blood Transfusion Organization, with a sample size of 196 people selected by a simple random method. The data collection tool in the qualitative section includes semi-structured interviews and in the quantitative section, a questionnaire.

Research Findings

MAXQDA2020 software was applied to analyze the findings in the qualitative section and SPSS and SmartPLS software in the quantitative section. The results of the qualitative section showed that through axial coding, 44 initial codes were categorized into 22 axial codes that express the key concepts and structure of the data-driven human resources system. The quantitative analysis also confirmed that causal, contextual, intervening, and strategic factors significantly affect the establishment of a data-driven human resources system. Coordination between organizational structure, technology, and policies was proposed as a prerequisite for the success of data-driven decision-making and increasing human resources effectiveness. By presenting an integrated and data-driven model, this study highlights the role of digital and smart tools in improving human resources processes and strategic decision-making and can provide valuable practical and theoretical guidance for organizations on the path of digital transformation.

Conclusion

The present study was conducted with the aim of designing a model for establishing a data-driven human resources system using digital and smart tools in the Tehran Blood Transfusion Organization. The results of this research are in agreement with the results of Khashi & Pourshahabi (2026), Tizfahm Fard et al. (2026), Toghiani-Pezouh et al. (2025), Mujtaba (2025), Ghosh (2025), Liu (2025), Damnjanović et al. (2025), Iyer (2025), Toghiani-Pezouh et al. (2025), Ajalli et al. (2023), Bahari & Taheri Roozbhani (2023), Yang et al. (2021), Foroutan Eghlidi et al. (2021), Seyyed Naqavi et al. (2022), Zhang et al. (2025), Niu (2024), and Kambur & Yildirim (2023). Domestic research such as Mohammadi et al. (2022) and

foreign research such as Okon et al. (2024), Owusu-Berko (2025), and Mateen et al. (2024) show that data-centricity increases the accuracy and speed of decision-making, reduces human biases, improves transparency and employee trust, enhances the effectiveness of human resource management, and ultimately creates a sustainable competitive advantage for the organization. These outcomes are realized when there is complete coordination between infrastructure, organizational culture, human capabilities, and supportive policies.
Research suggestions based on the results include strengthening data-driven leadership through training managers, investing in smart technologies, prioritizing areas requiring data-drivenness, developing technology infrastructure and secure networks, explaining a transparent organizational structure, creating a data-driven culture, formulating data security and privacy policies, increasing organizational flexibility, managing change and reducing employee resistance, redesigning human resources processes with a data-driven approach, developing analytical skills and digital literacy, implementing predictive and prescriptive analytics, designing key performance indicators, and observing ethical principles in the use of data.

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Conflicts of Interest
The authors declare that they have no financial or non-financial, personal, professional, or institutional conflicts of interest relevant to this work.

Conflicts of Interest
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability Statement
The data supporting the findings of this study are available from the corresponding author upon reasonable request.

AI Use Statement
The authors declare that no generative artificial intelligence (AI) or AI-assisted technologies were used in the preparation, writing, or editing of this manuscript.

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Ethics Approval
All procedures performed in this study were conducted in accordance with the ethical standards of the responsible institutional and national research committee.