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Elucidating and Evaluating the Digital Human Resource Management Model in Iran's Sports System

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Abstract

This study aims to elucidate and evaluate the digital human resource management model within Iran's national sports system. The research employs a developmental objective and adopts a descriptive-qualitative approach, utilizing the fuzzy Delphi method. In the initial phase, relevant indicators and dimensions were gathered through documentary and library research. Subsequently, the fuzzy Delphi method was applied. The statistical population for the qualitative approach consisted of 20 experts in sports management. A total of 23 digital human resource training and management models with various components were presented. The synthesis of these models identified 5 dimensions, 25 components, and 52 indicators. The five dimensions derived include digital recruitment, employee socialization and alignment, performance management and compensation systems, digital training and development, and digital retention and exit. The validity of the questionnaires in the qualitative section was confirmed using CVR and CVI methods, based on the opinions of sports experts. In the quantitative section, validity was affirmed through factor analysis. The normality test and reliability of the questionnaire were assessed using Cronbach's alpha, yielding a value of 0.96, which indicates strong reliability. SPSS23 and AMOS26 software were utilized for path analysis to illustrate the analytical model. Finally, based on the findings, research recommendations are presented.

Keywords: Human Resource Management, Digitalization, Fuzzy Delphi, Sports System.

1. Introduction

In the dynamic landscape of organizational development, the transition to digital platforms has profoundly reshaped the paradigms of human resource management (HRM). This transformation is particularly pronounced in sectors where operational complexity, performance optimization, and talent alignment are critical—such as in national sports systems. As organizations across industries pivot toward digital strategies to maintain agility and competitiveness, the concept of Digital Human Resource Management (DHRM) has emerged as a vital framework for ensuring strategic alignment between technological innovations and human capital development. DHRM integrates digital tools—such as artificial intelligence (AI), machine learning, cloud computing, and data analytics—into HR practices to enhance decision-making, streamline administrative processes, and optimize employee engagement and performance outcomes (Gao, 2024; Karuppannan et al., 2024; Stanley & Aggarwal, 2025).

The Iranian sports sector, guided by national development plans and facing increasing demands for accountability and excellence, stands at a critical juncture in aligning its human resource capabilities with digital innovations. Given the

government's vision in the Seventh Development Plan and increasing expectations for professionalization and efficiency in sports organizations, the strategic integration of DHRM has become not only desirable but necessary. This necessity arises amid growing calls from the Ministry of Sport and Youth for improved performance evaluations, transparent recruitment, scalable training systems, and sustainable talent retention models. Yet, while the strategic discourse around digital transformation in Iranian HRM is gaining momentum, its implementation—especially within the context of national sports systems—remains underexplored and fragmented (Dehghani, 2024; Emadi et al., 2023).

Digital HRM is more than a technological upgrade; it is a conceptual shift that redefines the nature of organizational engagement with its workforce. The approach advocates a data-driven, interactive, and adaptive management system in which digital technologies serve as both enablers and transformers of HR functions. It encompasses digital recruitment platforms, AI-assisted performance appraisals, e-learning environments for continuous development, and predictive analytics for workforce planning (Nilammadi et al., 2024; Yao et al., 2024). These innovations support workforce agility and organizational resilience—capabilities that are indispensable in fast-paced, results-oriented domains such as competitive sports (Jaan, 2024; Stanley & Aggarwal, 2025).

In practice, however, organizations face numerous structural and cultural barriers to DHRM implementation. These include limited digital literacy among staff, underdeveloped digital infrastructure, resistance to change, and inadequate alignment between HR policy and technological capacity (Fauzan et al., 2024; Forutan et al., 2023). Such challenges are compounded in the Iranian context, where legacy HR systems often lack interoperability, standardization, or scalability across different institutional levels—federations, provincial departments, and ministry headquarters (Jazaei et al., 2024; Ronaghi et al., 2024). The absence of an integrated DHRM model exacerbates inefficiencies, hampers talent development, and undermines the Ministry's goal of institutional excellence and operational transparency (Shehadeh & Abu Al-Haija, 2024).

The conceptual underpinning of DHRM lies in its five foundational pillars: digital recruitment, employee socialization and alignment, performance management and compensation systems, digital training and development, and digital retention and exit strategies (Kavand, 2024). Each of these dimensions corresponds to a critical function in the HR lifecycle, and their digital reconfiguration holds the potential to address long-standing challenges in the sports administration ecosystem. For instance, digital recruitment platforms that leverage AI can enhance the objectivity, speed, and scope of talent acquisition by automating resume screening, improving candidate-job matching, and reducing bias (Al-Qassem, 2025; Yao et al., 2024). Nevertheless, scholars have also noted that algorithmic decision-making in hiring can reduce perceived fairness, requiring careful calibration of AI tools with human oversight (Yao et al., 2024).

The second pillar—employee socialization and alignment—is particularly salient in environments where organizational culture plays a decisive role in long-term performance and cohesion. Effective digital onboarding programs help integrate new employees into organizational workflows, values, and expectations, thereby reducing time to productivity and enhancing role clarity. Research in academic and athletic organizations has shown that onboarding strategies, when implemented digitally, contribute significantly to employee satisfaction and alignment with institutional goals (Halim et al., 2024; Nemashkalo, 2024). Moreover, digital platforms allow for scalable, personalized socialization processes that accommodate a diverse and dispersed workforce (Karuppannan et al., 2024).

Performance management and compensation systems represent the third core dimension. In the digital age, performance appraisals have evolved from periodic, subjective evaluations to continuous, evidence-based feedback mechanisms facilitated by analytics dashboards and key performance indicators (KPIs). These systems enable organizations to track progress, identify skill gaps, and align individual performance with organizational objectives (Gholami et al., 2023; Hidayat & Basuil, 2024). Studies have shown that incentive-based systems supported by digital feedback loops enhance employee motivation, productivity, and retention, particularly in knowledge-intensive and goal-oriented sectors (Hameed et al., 2024; Jataei et al., 2023).

The fourth dimension—digital training and development—reflects the growing demand for agile learning environments that can rapidly upskill and reskill personnel in response to evolving institutional needs and technological disruptions. Digital learning platforms, virtual simulations, and AI-enabled tutoring systems offer scalable, personalized, and cost-effective

alternatives to traditional training programs. In the Iranian sports sector, where skill obsolescence and generational gaps are pronounced, digital learning ecosystems can bridge these divides and foster a culture of continuous development (Dehghani, 2024; Forutan et al., 2023). Empirical evidence supports the correlation between digital training interventions and enhanced employee adaptability, creativity, and strategic alignment (Halim et al., 2024; Poursoltani Zarandi & Nagandar, 2023).

Finally, digital retention and exit mechanisms address the often-overlooked end stages of the HR lifecycle. Retention analytics, sentiment analysis, and predictive modeling enable proactive identification of at-risk employees, allowing institutions to deploy targeted interventions such as mentorship, career development opportunities, or compensation adjustments (Gholami et al., 2023; Nilammadi et al., 2024). Digital exit interviews and knowledge transfer tools ensure that organizational memory is preserved even as employees transition out. In a sector marked by high turnover and burnout, especially among coaches and technical staff, these digital tools are invaluable for sustaining operational continuity and institutional learning (Al-Qassem, 2025; Fauzan et al., 2024).

Despite the evident benefits, implementing an effective DHRM model requires a strategic and evidence-based approach tailored to the specific needs, challenges, and cultural realities of the sports sector. Existing literature points to a growing but fragmented body of knowledge on DHRM in sports settings, with most studies focusing on isolated interventions rather than holistic models (Emadi et al., 2023; Jazaei et al., 2024). Additionally, while international case studies provide valuable insights, their transferability to Iran's unique administrative, cultural, and infrastructural context remains limited without localized empirical validation (Kavand, 2024; Shehadeh & Abu Al-Haija, 2024).

To address this gap, the present study adopts a mixed-methods approach to elucidate and evaluate a comprehensive DHRM model specifically for Iran’s sports system.

2. Methods and Materials

This study adopts a developmental purpose and an exploratory mixed-methods approach, conducted in two distinct phases: qualitative and quantitative. In the initial qualitative phase, we gathered indicators and dimensions of digital human resource management through documentary and library research. Subsequently, the fuzzy Delphi method was employed. The statistical population for this phase consisted of sports management experts. These experts, who provided input for factor identification, possessed the following characteristics: a minimum of a PhD in one of the fields of educational management, sports management, information technology and computer science, or public administration; teaching experience; and prior studies and research in human resource management, educational management, sports management, and public administration. The validity of the questionnaires in the qualitative section was confirmed using CVR (Content Validity Ratio) and CVI (Content Validity Index) methods, based on the opinions of these sports experts. In the second, quantitative phase, to test the digital human resource management model, our target population included the Ministry of Sport and Youth, its affiliated general directorates in the provinces, and the heads of sports federations. Given a total sample size of 500 individuals, we used simple random sampling and Cochran's formula to determine a sample size of 225 participants. Questionnaires were distributed among these sample members and the data was collected in Excel software.

Table 1. Classification of population proportions of the target population spectrums

Category of Participants	Number
Senior Ministry Officials	80
Provincial Sports & Youth General Directorate Experts	58
Heads of Sports Federations	53
Heads of Sports Boards	52
Renowned Sports Personalities	150
IT Experts from Sports General Directorates	57
Sports Team Supervisors	50
Total Population Categories	500

In this study, we utilized four types of questionnaires to arrive at the final model. The first questionnaire was used to identify factors of the digital human resources model, the second concerned the Content Validity Ratio (CVR) table, the third dealt with the factors and indicators of the digital human resource management model, and the fourth focused on designing the digital human resource management model. The reliability of the questionnaires in the quantitative section was established using Cronbach's Alpha, yielding a value of 0.96, which indicates excellent internal consistency of the questionnaire items. Furthermore, the validity of the questionnaires and the sufficiency of the samples were confirmed using factor analysis, and the normality of the distribution was also verified. For drawing the analytical model (path analysis), SPSS and AMOS software were employed.

Research Questions:

Question 1: What components, dimensions, and variables does digital human resource management include?

Question 2: What is the relationship between the elements of the digital sports human resource management model?

Question 3: What is the digital sports human resource management model?

3. Findings and Results

Question 1: What components, dimensions, and variables does digital human resource management include?

Based on the conducted studies and research background, the aim was to extract all factors of digital human resource management from the existing literature. Therefore, in addition to studying relevant works on digital human resource management within the article's specified time and spatial scope, other relevant works were also examined. In this phase, similar terms were grouped into sub-categories. This process continued until no larger sub-category could be placed into another. After extracting and categorizing the factors, a three-step process involving experts was undertaken to refine the work and achieve a comprehensive table. Subsequently, the indicators, components, and variables were presented to 20 experts in the form of a (fuzzy) Delphi questionnaire over three stages. This was done to gather their opinions regarding the credibility and validity of these elements for the digital human resource management model. CVR and CVI techniques were used to assess the validity of the elements. After CVR and CVI calculations and analyses, the presence of 5 dimensions, 25 components, and 50 indicators was revealed (Figure 1).

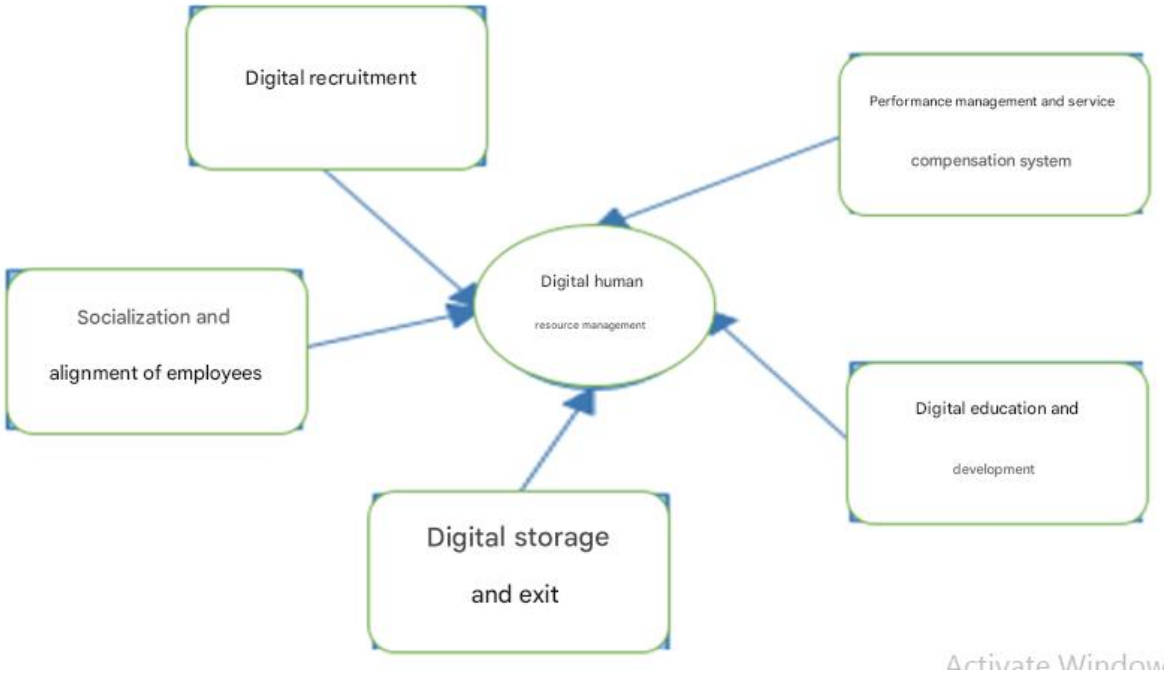

Figure 1. Components of the Digital Sports Human Resources Management Model

To achieve the governing structure of the criteria and indicators, the direct influence matrix was initially formed using expert opinions. Following this, the DANP method was utilized to construct the hierarchical structure of these criteria and indicators. The fuzzy DEMATEL method was employed to determine the relationships between the components. It's important to note

that the matrix resulting from the DEMATEL technique (the interrelationship matrix) reveals both the causal relationships between factors and demonstrates the influence and affectedness of the variables. Ultimately, the digital human resource management model was designed. The diagram illustrating the factors governing the relationships between criteria and indicators (Digital Human Resource Management in Sports), derived using the DEMATEL and DANP techniques, is presented as Figure 2.

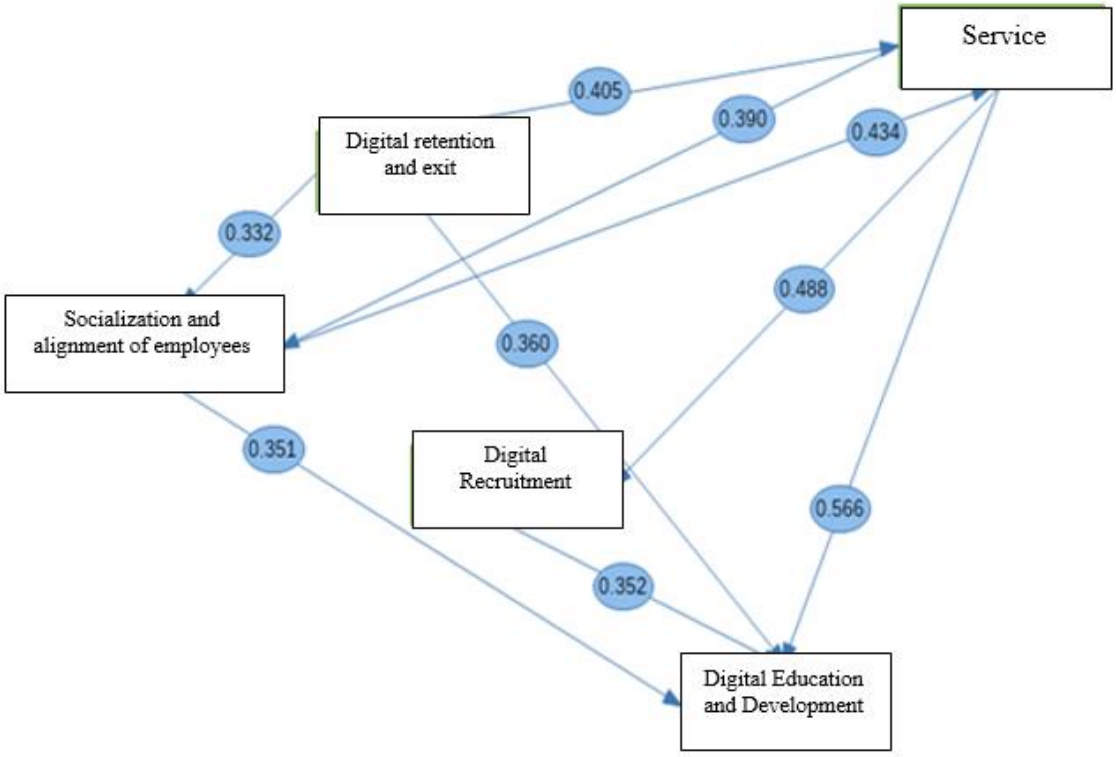

Figure 2. Digital Human Resource Management Model with Main Components

The DANP technique has been used to find the digital human resource management model by considering the indicators related to the components. The causal relationship pattern of the main criteria of the model can be seen in Table (2).

Table 2. Causal Relationship Pattern of the Main Criteria of the Model

Symbol	Main Criteria	D	R	D+R	D-R
A	Digital Recruitment	4.218	4.368	8.586	-0.15
B	Employee Socialization and Alignment	4.503	4.688	9.191	-0.185
C	Performance Management and Compensation System	4.571	4.521	9.092	0.05
D	Digital Training and Development	4.647	4.34	9.087	0.207
E	Digital Retention and Exit	4.456	4.382	8.838	0.074

The matrix resulting from the DEMETL technique (internal relations matrix), which shows both the cause-and-effect relationship between factors and the effectiveness and impact of variables. The DANP method was used to build the governing structure of criteria and indicators.

Table 3. Structure governing the model criteria relationships

	Digital Recruitment	Employee Socialization and Alignment	Performance Management and Compensation System	Digital Training and Development	Digital Retention and Exit
Digital Recruitment	0	0	0	0	0
Employee Socialization and Alignment	0.208	0.205	0.211	0.21	0.21
Performance Management and Compensation System	0.21	0	0	0	0
Digital Training and Development	0	0.203	0	0	0
Digital Retention and Exit	0	0	0	0	0.201

After designing the digital human resource management model, the resulting model was presented to experts and specialists in sports management. For this purpose, Questionnaire No. 4 was developed with the assistance of esteemed supervisors and advisors, yielding an overall reliability coefficient of 0.96. It was then validated by 7 Iranian sports professors and experts. Subsequently, data obtained from 225 completed questionnaires were analyzed. The collected data from this research process were analyzed using the Structural Equation Modeling (SEM) method. The research model was then analyzed and its fit tested using AMOS software. Figure 3 illustrates the fitted model. This comprehensive model diagram pertains to the five variables: "Digital Recruitment," "Employee Socialization and Alignment," "Performance Management and Compensation System," "Digital Training and Development," and "Digital Retention and Exit.

Table 4. Summary of path coefficients of structural equations

Path (Formative-Reflective)	C.R (Critical Ratio)	P (Significance Level)
Digital Human Resource Management → Employee Socialization and Alignment	13.22	0
Digital Human Resource Management → Performance Management and Compensation System	38.96	0
Digital Human Resource Management → Digital Training	72.67	0
Digital Human Resource Management → Digital Recruitment	57.97	0
Digital Human Resource Management → Digital Retention and Exit	84.36	0
Digital Human Resource Management → Employee Socialization and Alignment	13.22	0

According to the C.R. values obtained in Table (4) of the path analysis, the digital human resource management model among Iranian sports organizations can be designed as shown in Figure (3).

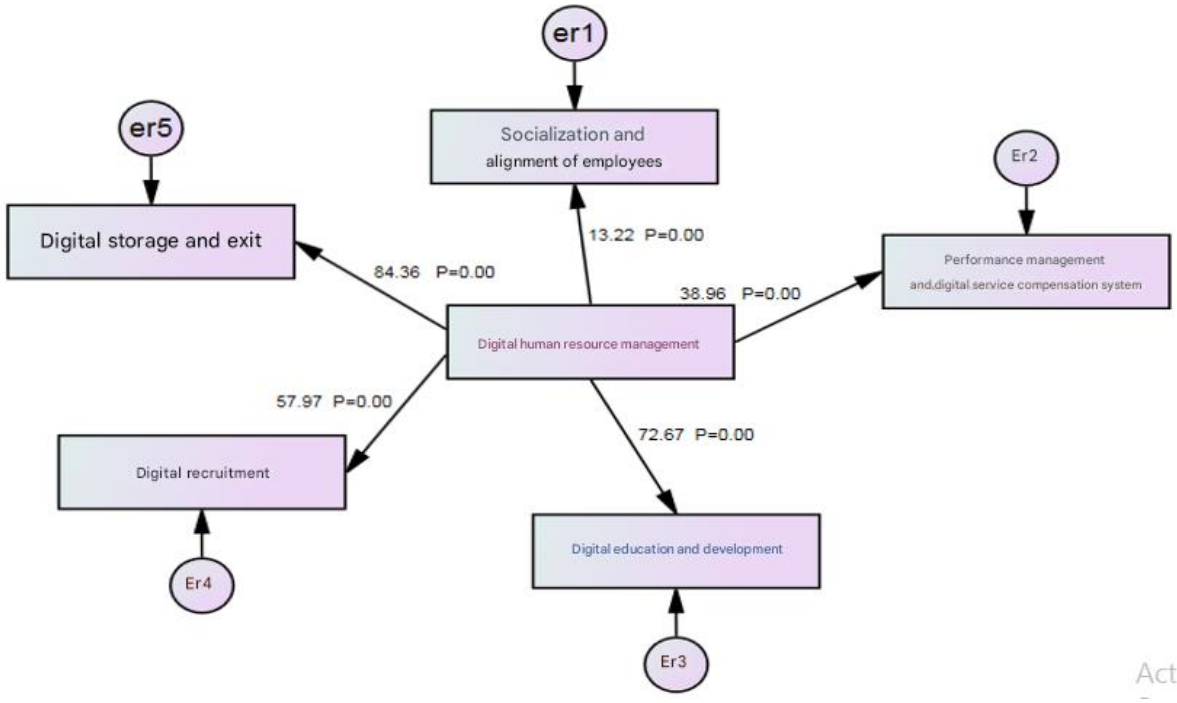

Figure 3. Digital Sports Human Resources Management Model (in standard mode)

4. Discussion and Conclusion

The primary objective of this study was to develop and evaluate a comprehensive digital human resource management (DHRM) model tailored to the unique context of Iran's sports system. The results of both qualitative and quantitative phases confirmed a five-dimensional model comprising digital recruitment, employee socialization and alignment, performance management and compensation systems, digital training and development, and digital retention and exit. The model was empirically validated through structural equation modeling (SEM), revealing strong and statistically significant path coefficients across all dimensions. The findings not only confirm the multidimensionality of DHRM but also underscore the interdependent nature of its components, particularly in a performance-intensive and culturally complex sector such as national sports governance.

The most striking outcome in the SEM path analysis was the profound impact of digital retention and exit and performance management and compensation systems on other components—especially on employee socialization and alignment (β = 0.33 and β = 0.39, respectively), and digital training and development (β = 0.35 each). This suggests that institutions that are able to retain and reward their employees effectively are better positioned to integrate newcomers, reinforce organizational culture, and create a developmental climate. This finding aligns with the broader DHRM literature asserting that retention mechanisms and performance-based compensation schemes are foundational for fostering organizational commitment and continuity (Fauzan et al., 2024; Halim et al., 2024; Hameed et al., 2024).

Interestingly, digital recruitment—although essential—was found to exert minimal influence on most other dimensions, except for a moderate impact on digital training and development (β = 0.35). Conversely, it was significantly influenced by performance management systems (β = 0.48). This asymmetry implies that while recruitment introduces talent into the system, it is the post-recruitment environment—comprising performance feedback, training access, and institutional support—that ultimately shapes the effectiveness of workforce integration and development. These findings resonate with those of (Stanley & Aggarwal, 2025), who emphasized that digital HRM's true value lies in post-hire processes and the adaptability of talent systems to technological innovations.

The performance management and compensation systems emerged as the most central dimension in the causal network. Not only did it affect all other variables, but it was itself influenced by socialization and retention factors. This finding supports (Yao et al., 2024), who highlighted that performance systems in the digital age are no longer unidirectional evaluation tools but are dynamically linked with employee onboarding, capability-building, and motivation. Similarly, (Gao, 2024) argued that performance evaluation frameworks must evolve from episodic appraisal methods into continuous feedback loops integrated with organizational learning systems, particularly when dealing with digital natives and multi-generational workforces.

Moreover, the significant effect of employee socialization and alignment on performance and training metrics underlines the importance of cultural onboarding and shared value systems. This insight supports findings by (Nilammadi et al., 2024), who noted that digital onboarding platforms facilitate rapid employee integration, but their success depends on personalized communication and role clarity. In sports organizations, where team cohesion and discipline are central to organizational identity, effective digital socialization processes are essential for aligning newcomers with institutional missions (Jaan, 2024; Ronaghi et al., 2024).

Another noteworthy result concerns the digital training and development dimension, which was both influenced by and influential upon multiple components, particularly recruitment and retention. In a domain where the pace of technological innovation frequently outstrips traditional training mechanisms, organizations must invest in scalable and adaptive learning ecosystems. This is consistent with the argument made by (Forutan et al., 2023), who emphasized the centrality of digital literacy in empowering public-sector HR systems, and (Dehghani, 2024), who demonstrated the necessity of automation-aligned training structures in manufacturing and public administration contexts.

The causal asymmetry in the model—where retention and performance management are mostly influencers, and recruitment is mostly influenced—also reflects theoretical models of human capital development under digital transformation. Specifically, the DHRM model resonates with the "process-based HR architecture" proposed by (Kavand, 2024), which conceptualizes DHRM as an interlocking system where processes such as performance evaluation, training, and socialization play central mediating roles between inputs (recruitment) and outcomes (retention and productivity).

Another compelling insight is the finding that digital retention and exit, while not directly influenced by the other four dimensions, significantly shaped three key domains: performance, socialization, and training. This suggests that retention is not merely an endpoint in the HR cycle but a recursive force that shapes organizational effectiveness. The notion that effective exit strategies—such as knowledge transfer systems and structured offboarding—enhance organizational learning is well-supported in the literature. For instance, (Shehadeh & Abu Al-Haija, 2024) demonstrated that even in resource-constrained public institutions, digital offboarding tools contribute to institutional memory and mitigate disruption during staff turnover.

Importantly, the results validate the emphasis placed by (Al-Qassem, 2025) on adapting HRM practices to match the affordances and constraints of the digital era. The empirical confirmation of the five-dimensional model indicates that sports organizations—particularly those governed under national ministries—must move beyond fragmented, ad hoc digital initiatives

and toward coherent and strategic DHRM systems. This argument is reinforced by (Karuppannan et al., 2024), who contended that e-HRM is not just about adopting digital tools but about transforming organizational culture and operational logic through digital integration.

In terms of sector-specific applications, the results are consistent with the contextual realities of Iranian sports organizations, which are often characterized by bureaucratic inertia, inconsistent training protocols, and politically influenced recruitment systems. The comprehensive model developed in this study offers a strategic framework for addressing these challenges. The inclusion of performance-based, training-centric, and retention-sensitive components makes the model not only theoretically robust but also practically actionable.

The alignment of the model with previous studies further confirms its relevance. For instance, (Poursoltani Zarandi & Nagandar, 2023) emphasized human capital as a competitive advantage in sports service organizations, a notion clearly reflected in the model's emphasis on development and retention. Similarly, the importance of motivation and employee engagement—validated in this study through strong socialization-performance linkages—aligns with the findings of (Halim et al., 2024) among university sports centers, where HRM practices were found to significantly correlate with employee engagement levels.

Furthermore, the validation techniques used—including CVR, CVI, and SEM—reinforce the methodological rigor of the study. The use of the fuzzy Delphi method to capture expert consensus lends additional robustness to the conceptualization of the model. These methodological choices also align with best practices suggested in recent empirical HRM research (Gholami et al., 2023; Jazaei et al., 2024).

Despite its strengths, this study is not without limitations. First, the model was developed and validated specifically within the context of Iran's national sports system, which may limit its generalizability to other sectors or countries with differing institutional logics and technological infrastructures. Second, while the study employed a mixed-methods approach and used expert consensus through the Delphi method, potential biases could have emerged from the homogeneity of expert backgrounds—most of whom had academic and administrative experience in sports. Third, although structural equation modeling provided a strong statistical basis for model validation, dynamic feedback loops and longitudinal effects among dimensions were not captured due to the study's cross-sectional design.

Future research could address the above limitations by conducting comparative studies across different public service sectors—such as health, education, or urban planning—to test the adaptability of the DHRM model in varying organizational contexts. Longitudinal studies that observe how digital HR practices evolve over time, especially in response to emerging technologies such as generative AI and blockchain, would provide deeper insights into the temporal dynamics of DHRM. Moreover, future research could investigate the role of organizational culture as a mediating or moderating variable in the implementation of digital HR practices, particularly in traditionally hierarchical or centralized institutions.

For practitioners, particularly senior managers and policymakers within the Ministry of Sport and Youth, the findings of this study suggest that investing in integrated digital HR systems is critical for organizational agility and workforce effectiveness. Initiatives should prioritize performance-based feedback systems, adaptive learning platforms, and retention-focused policies that are informed by real-time analytics. Recruitment should not be viewed in isolation but rather as the entry point into a digitally supported employee lifecycle. Institutions are also encouraged to establish digital socialization protocols and transparent exit strategies to sustain institutional learning. Ultimately, strategic alignment between HR practices and digital transformation objectives will be essential to achieving excellence in Iran's sports administration.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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