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Identifying and Prioritizing the Dimensions of AI-Enabled Human Resource Empowerment in Government Organizations: Evidence from Semnan Province, Iran

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A B S T R A C T

This study identified and prioritized the dimensions of human resource empowerment in the context of artificial intelligence adoption in government organizations in Semnan Province, Iran. An exploratory sequential mixed-methods design was used. In the qualitative phase, semi-structured interviews were conducted with 20 academic and administrative experts selected purposively. The interview data were analyzed thematically to derive the major dimensions and subdimensions of AI-enabled human resource empowerment. In the quantitative prioritization phase, 20 managers and human resource experts completed pairwise comparisons, and the Analytic Hierarchy Process was used to calculate relative weights. Seven major dimensions and 22 subdimensions were identified. Organizational culture and attitudes received the highest weight (0.268), followed by technological infrastructure (0.249), digital competency development (0.164), digital leadership (0.135), AI-enabled human resource processes (0.086), continuous learning and development (0.062), and strategic governance (0.037). The highest-ranked subdimensions were promoting a culture of innovation and digital transformation (0.144), developing digital and computational infrastructure (0.127), creating integrated organizational data repositories (0.087), training employees in data analytics and artificial intelligence (0.084), and promoting acceptance of AI technologies (0.082). AI-enabled employee empowerment in public organizations depends primarily on organizational readiness, technological foundations, and employee capabilities. The proposed framework should be interpreted as a context-specific prioritization model rather than a validated causal model.

Keywords: *artificial intelligence; human resource empowerment; public organizations; organizational culture; digital leadership; Analytic Hierarchy Process*

1. Introduction

Human resource empowerment refers to organizational conditions and psychological experiences that enable employees to exercise competence, discretion, meaning, and influence in their work. Classic empowerment research emphasizes both the removal of conditions that create powerlessness and the development of meaningfulness, competence, self-determination, and impact (Conger & Kanungo, 1988; Spreitzer, 1995; Thomas & Velthouse, 1990). In public organizations, empowerment is especially relevant because employees must respond to complex

citizen needs while operating within formal rules, accountability systems, and resource constraints.

Artificial intelligence is changing how organizations recruit, train, evaluate, support, and allocate work. In human resource management, algorithmic technologies can improve information processing, personalize learning, support workforce planning, and identify patterns that are difficult to detect manually. At the same time, they may introduce opacity, bias, surveillance concerns, deskilling, or excessive automation. Contemporary research therefore treats AI in HRM as a socio-technical transformation rather than a purely technical upgrade (Dwivedi et al., 2021; Gong et al., 2025; Kim, 2025; Marler & Fisher, 2013; Raisch & Krakowski, 2021; Tambe et al., 2019). More broadly, interdisciplinary scholarship has emphasized that AI development should be examined together with its behavioral, organizational, ethical, and social consequences (Taheri, 2023).

The public sector presents distinctive implementation challenges. Government organizations typically face stronger legal obligations, greater public scrutiny, legacy information systems, and more formalized decision processes than private firms. AI adoption therefore depends on data quality, organizational capabilities, leadership, employee acceptance, and governance safeguards. Research on public-sector digital transformation similarly shows that technology alone is insufficient; institutional structures, organizational culture, and managerial capacity shape implementation outcomes (Mergel et al., 2019; Wirtz et al., 2019).

From an empowerment perspective, AI can expand employee access to information, enable personalized development, and support evidence-based decisions. However, empowerment is unlikely when systems are imposed without transparency, employee participation, digital competence, or opportunities for meaningful discretion. Algorithmic systems can augment judgment, but they can also reduce autonomy when employees experience them as instruments of control (Brougham & Haar, 2018; Jarrahi, 2018; Kellogg et al., 2020). Consequently, organizations need an integrated framework that combines infrastructure, culture, competencies, leadership, HR processes, learning systems, and governance.

Although AI-enabled HRM has received growing scholarly attention, most studies have focused on private organizations, recruitment technologies, or broad conceptual reviews. Context-specific evidence from Iranian government organizations remains limited. The present study therefore aimed to identify the dimensions of AI-enabled human resource empowerment in government organizations in Semnan Province and to prioritize these dimensions using expert judgments and the Analytic Hierarchy Process.

Empowerment includes structural and psychological dimensions. Structural empowerment concerns access to information, resources, support, and opportunities, whereas psychological empowerment concerns employees' perceptions of meaning, competence, self-determination, and impact (Spreitzer, 1995). An AI-enabled empowerment model must therefore address both organizational arrangements and employees' subjective ability to use technology effectively.

AI-HRM includes the use of machine learning, natural language processing, predictive analytics, recommendation systems, and generative AI in HR functions. These applications can support recruitment, training, performance management, talent analytics, and workforce planning. However, responsible adoption requires explainability, human oversight, data protection, and mechanisms for contesting automated decisions (Gong et al., 2025; Kim, 2025; Unesco, 2021).

Technology acceptance and organizational readiness depend on perceived usefulness, ease of use, facilitating conditions, and social influence (Davis, 1989; Venkatesh et al., 2003). Digital leadership is important because leaders allocate resources, legitimize experimentation, communicate the purpose of AI, and protect employee participation. Evidence from public healthcare also suggests that digital leadership can strengthen employee empowerment and technology-related engagement (Khan et al., 2025).

2. Methods and Materials

2.1. Design

The study used an exploratory sequential mixed-methods design. In the first phase, semi-structured expert interviews were used to identify the dimensions and subdimensions of AI-enabled human resource empowerment. In the second phase, the resulting qualitative framework was converted into a hierarchical pairwise-comparison structure and prioritized using the Analytic Hierarchy Process (AHP). The two phases were integrated by using the qualitative themes as the criteria and subcriteria evaluated in the AHP phase. The design

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generated a context-specific prioritization framework and was not intended to test causal relationships.

2.2. Participants and Sampling

The qualitative panel comprised 20 purposively selected academic experts and senior managers or specialists from government organizations in Semnan Province. Academic participants were required to have relevant management expertise, at least the rank of assistant professor, and a minimum of three years of teaching experience. Administrative participants were required to hold senior managerial or specialist positions and to have at least ten years of professional experience. Interviews continued until successive interviews no longer produced substantively new themes.

The AHP phase involved 20 managers and human resource experts who were considered capable of evaluating the relative importance of the dimensions and subdimensions derived from the qualitative phase. Participants completed structured pairwise-comparison questionnaires. Because the purpose of this phase was prioritization rather than independent hypothesis testing, expert judgment was treated as the unit of analysis.

2.3. Qualitative Data Collection and Analysis

Semi-structured interviews addressed the technological, organizational, managerial, developmental, and governance requirements of AI-enabled employee empowerment. The analysis proceeded through repeated familiarization with the transcripts, initial coding, grouping related codes into subthemes, and integrating conceptually related subthemes into higher-order dimensions. The final thematic structure was reviewed for conceptual coherence and then translated into the AHP hierarchy. This process was consistent with the staged logic of thematic analysis described by Braun and Clarke (2006) (Braun & Clarke, 2006).

2.4. Analytic Hierarchy Process

AHP was used to estimate the relative priorities of the seven principal dimensions and their 22 subdimensions. For the seven principal dimensions, each expert completed 21 pairwise comparisons. Individual judgments were aggregated using the geometric mean, and normalized priority vectors were calculated for the main dimensions and their subdimensions. Final global subdimension weights were obtained by multiplying each local subdimension weight by the weight of its parent dimension. The consistency ratio for the principal-dimension matrix was 0.073, below the conventional threshold of 0.10, indicating acceptable consistency of the aggregated judgments (Saaty, 2008).

3. Findings and Results

3.1. Identified Dimensions

The thematic analysis produced seven principal dimensions and 22 subdimensions, as summarized in Table 1. These dimensions represent organizational conditions and implementation requirements that may support AI-enabled human resource empowerment rather than direct measures of employees' psychological empowerment. Their conceptual organization is illustrated in Figure 1.

Table 1

Dimensions and subdimensions of AI-enabled human resource empowerment

Dimension	Subdimensions
Technological infrastructure	Digital and computational infrastructure; integrated organizational data repositories; information security and data privacy
Organizational culture and attitudes	Innovation and digital-transformation culture; acceptance of AI technologies; positive orientation toward learning new technologies
Digital competency development	Data analytics and AI skills; digital literacy; intelligent-tool problem solving; ability to work with intelligent systems and algorithms
Digital leadership	Managerial support for AI; data-driven decision making; leadership of technological change
AI-enabled HR processes	AI-enabled recruitment; intelligent performance evaluation; personalized employee training and development
Continuous learning and development	AI education programs; organizational learning and digital knowledge sharing; future-oriented skill development
Strategic governance	AI implementation strategies; standards for AI use; evaluation and monitoring of intelligent technologies

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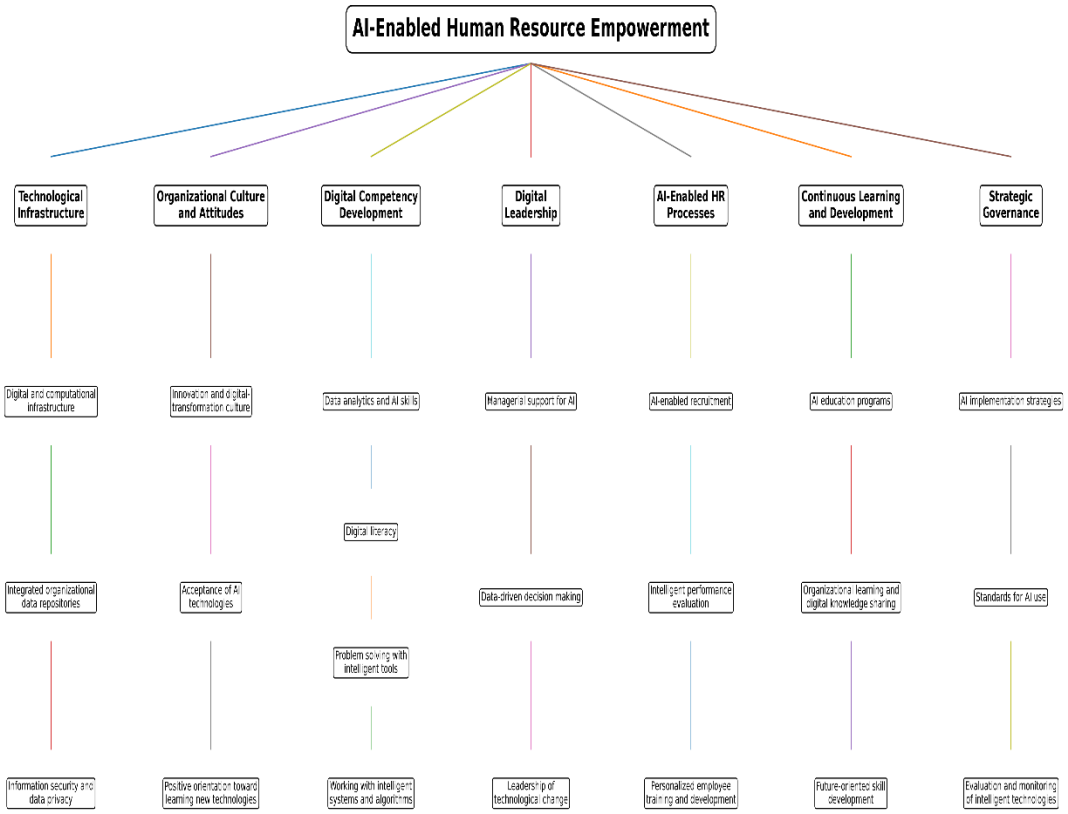
Figure 1

Conceptual model of AI-enabled human resource empowerment and its principal dimensions and subdimensions.



3.2. Priority of the Main Dimensions

The pairwise comparisons produced the weights and ranks presented in Table 2. The graphical distribution of the seven principal-dimension weights, together with the overall inconsistency ratio, is shown in Figure 2.

Table 2

AHP priorities of the principal dimensions

Dimension	Weight	Rank
Organizational culture and attitudes	0.268	1
Technological infrastructure	0.249	2
Digital competency development	0.164	3
Digital leadership	0.135	4
AI-enabled HR processes	0.086	5
Continuous learning and development	0.062	6
Strategic governance	0.037	7

Note. Consistency ratio = 0.073.

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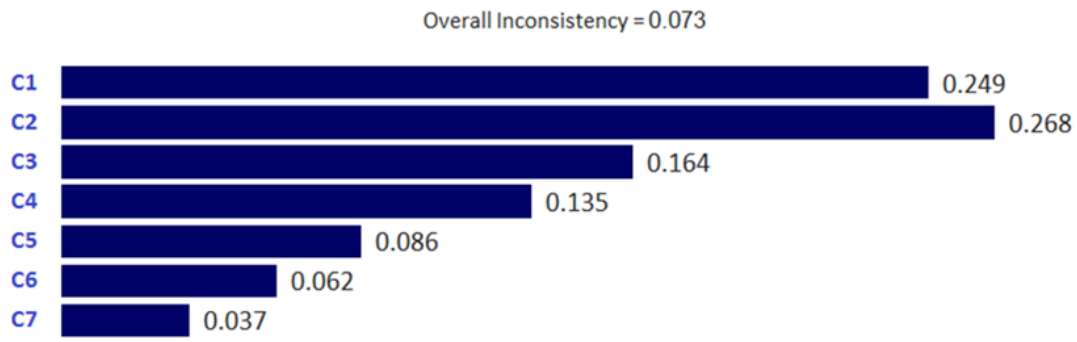
Figure 2

AHP weights of the seven principal dimensions. The overall inconsistency ratio was 0.073.



3.3. Final Priority of the Subdimensions

Global subdimension weights were calculated by multiplying each local subdimension weight by the weight of its parent dimension. The complete ranking is reported in Table 3 and visualized in Figure 3.

Table 3

Final global weights of the subdimensions

Subdimension	Final weight	Rank
Promoting innovation and digital-transformation culture	0.144	1
Developing digital and computational infrastructure	0.127	2
Creating integrated organizational data repositories	0.087	3
Training in data analytics and artificial intelligence	0.084	4
Promoting acceptance of AI technologies	0.082	5
Managerial support for artificial intelligence	0.075	6
Data-driven decision making	0.042	7
Positive orientation toward learning new technologies	0.042	8
Personalized employee training and development	0.039	9
Improving digital literacy	0.037	10
Information security and data privacy	0.035	11
Intelligent performance evaluation	0.027	12
AI education programs	0.024	13
Problem solving with intelligent tools	0.023	14
Organizational learning and digital knowledge sharing	0.021	15
Ability to work with intelligent systems and algorithms	0.020	16
AI-enabled recruitment	0.020	17
Leadership of technological change	0.019	18
Standards for AI use	0.017	19
Future-oriented skill development	0.016	20
AI implementation strategies	0.011	21
Evaluation and monitoring of intelligent technologies	0.009	22

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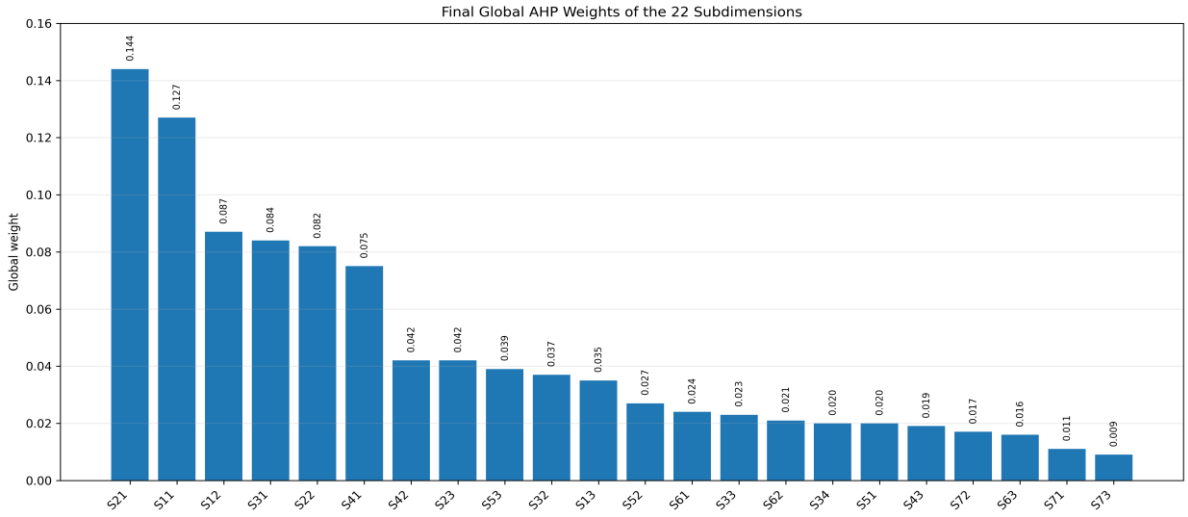
Figure 3

Final global AHP weights of the 22 subdimensions.



4. Discussion

The highest priority assigned to organizational culture and attitudes indicates that AI-enabled empowerment was understood by the expert panel primarily as an organizational-readiness challenge rather than a software-acquisition problem. Employees are more likely to use intelligent systems constructively when innovation is legitimate, experimentation is supported, and technology is framed as an augmenting resource rather than a mechanism of replacement or surveillance. This interpretation is consistent with socio-technical perspectives and with research emphasizing the organizational and human consequences of AI adoption (Dwivedi et al., 2021; Raisch & Krakowski, 2021; Taheri, 2023).

Technological infrastructure ranked second, reflecting the dependence of AI applications on reliable computing resources, integrated data, security, and privacy. AI-HRM systems require accurate and interoperable data; fragmented databases and weak governance can undermine technical performance, perceived fairness, and employee trust. The high global weight assigned to integrated organizational data repositories further supports the need for data readiness before advanced automation is introduced (Mergel et al., 2019; Wirtz et al., 2019).

Digital competency development ranked third. Employees require more than basic digital literacy: they must understand data, recognize the limitations of algorithmic recommendations, and know when human judgment should supplement or override automated output. AI capability is therefore partly an organizational learning capability rather than only a technical asset (Mikalef & Gupta, 2021).

Digital leadership ranked fourth but remained more important than the direct automation of HR processes. Leaders shape adoption by allocating resources, communicating expectations, supporting participation, and addressing concerns about displacement and surveillance. This result is consistent with evidence that digital leadership can strengthen employee empowerment and technology-related engagement (Khan et al., 2025).

The lower weight assigned to strategic governance should not be interpreted as evidence that governance is unimportant. AHP weights indicate relative priority within the specific implementation context examined here, not whether a dimension is optional. Ethical standards, monitoring, transparency, accountability, and mechanisms for contesting automated decisions remain necessary for responsible AI adoption in government organizations (Unesco, 2021).

Several limitations should be considered. The expert panels were relatively small and were drawn from one Iranian province, which limits transferability to other administrative settings. The framework was derived from expert judgment rather than employee-level measurement, and the study did not test whether the prioritized dimensions predict psychological empowerment, performance, technology acceptance, or public-service outcomes. The study also did not conduct confirmatory factor analysis, Delphi validation, or sensitivity analysis of

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the AHP rankings. Accordingly, the findings should be interpreted as a context-specific prioritization framework rather than a validated measurement model or causal explanation.

5. Practical Implications

- Government organizations should begin with organizational-readiness interventions, including communication about AI objectives, employee participation, pilot projects, and managerial support.
- Technology investments should prioritize interoperable data infrastructure, secure access, data quality, and privacy protection before advanced predictive or generative applications are deployed.
- Training should combine practical AI and data skills with critical literacy concerning bias, uncertainty, explainability, and appropriate human oversight.
- AI should initially augment rather than replace professional judgment in recruitment, performance management, and employee development.
- Governance mechanisms should include documented responsibility, audit trails, appeal procedures, periodic performance evaluation, and limits on employee surveillance.

6. Conclusion

The study identified and prioritized seven organizational dimensions and 22 subdimensions associated with AI-enabled human resource empowerment in government organizations. Organizational culture and attitudes, technological infrastructure, and digital competency development received the highest priorities. The results indicate that public organizations should approach AI-enabled empowerment as a socio-technical transformation that combines organizational readiness, infrastructure, employee capabilities, leadership, redesigned HR practices, continuous learning, and governance. The framework provides a basis for planning and future validation, but its transferability and predictive value should be examined in larger employee samples and across different public-sector settings.

Authors' Contributions

Mohsen Alibeyki: Conceptualization, investigation, data collection, and writing—original draft. Seyed Hossein Hosseini: Supervision, methodology, validation, and writing—review and editing. Samaneh Bahramian: Formal analysis, interpretation, and writing—review and editing. All authors reviewed and approved the final manuscript.

Declaration

Generative artificial intelligence was used for English-language editing, structural organization, reference checking, and document formatting. It was not used to create interview data, expert judgments, AHP weights, or research findings. The authors reviewed the complete manuscript and remain responsible for its accuracy and integrity.

Transparency Statement

De-identified interview materials, pairwise-comparison matrices, and calculation files are available from the corresponding author upon reasonable request, subject to participant-confidentiality and institutional requirements.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

This computational study used the publicly available X-FACT benchmark and involved no direct interaction with human participants, no collection of identifiable private information, and no animal experimentation. Therefore, institutional ethics approval and informed consent were not required. The dataset was used and reported in accordance with its documentation and citation requirements.

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