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Identification and Validation of Change Management Components in the Implementation of Management Information Systems in Governmental Organizations of Rasht City

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A B S T R A C T

The present study aimed to identify and validate the components of change management in the implementation of Management Information Systems (MIS) using an exploratory mixed-method research design. Participants in the model development phase included faculty members in the fields of Public Administration–Organizational Behavior, Information Systems, and Information Technology Management in higher education institutions, senior and middle managers of governmental organizations, and subject-matter experts familiar with the research topic. In the quantitative phase, the population consisted of all senior and middle managers and information systems and IT management experts in 15 selected governmental organizations in Rasht City, totaling 460 individuals. In the qualitative phase, 21 experts were selected using the snowball sampling method, while in the quantitative phase, 210 individuals were selected through stratified random sampling. For data analysis, the qualitative phase employed inductive qualitative content analysis based on the approach of Elo and Kyngäs (2008), involving three stages: open coding, categorization, and abstraction, using semi-structured interviews conducted and analyzed with Atlas.ti software. In the quantitative phase, structural equation modeling (SEM) was conducted using a 115-item questionnaire in Smart PLS software. To assess validity and reliability in the qualitative phase, measures such as acceptability (expert review), confirmability (expert auditing), and consensus method were used. In the quantitative phase, questionnaire validity was confirmed through face validity, content validity (CVI ranging from 0.85 to 1 and CVR from 0.60 to 1), and construct validity (convergent validity ranging from 0.539 to 0.662, and discriminant validity confirmed by higher inter-construct correlations). Questionnaire reliability was verified using three methods: factor loading coefficients (above 0.40), Cronbach's alpha (ranging from 0.725 to 0.829), and composite reliability (ranging from 0.845 to 0.887). According to the qualitative findings, the final model includes six abstractions (dimensions) as follows: (1)

Leadership and governance of digital transformation, (2) Organizational culture and readiness for change, (3) Technological infrastructure and capabilities of the organization, (4) Training and development of human capital skills, (5) Structural and regulatory support, and (6) Stakeholder interactions and inter-sectoral collaboration. These dimensions encompass 24 categories (components) and 115 criteria (indicators). The quantitative results confirmed and explained the research model components within a real statistical population.

Keywords: *Organizational Change, Governmental Organizations, Management Information Systems.*

1. Introduction

In today's rapidly evolving digital landscape, the successful implementation of Management Information Systems (MIS) within public sector organizations hinges critically on effective change management. As governmental institutions increasingly rely on digital infrastructures to enhance service delivery, accountability, and operational efficiency, managing the organizational transition accompanying MIS deployment has become a focal challenge (Khan et al., 2025; Komariyah, 2024). Particularly in developing nations such as Iran, where bureaucratic inertia, cultural complexities, and resource limitations coexist, deploying MIS without a robust change management framework can undermine strategic digital transformation initiatives (Afasari & Aghagholzadeh, 2023; Nugraha et al., 2022). This underscores the necessity of investigating and validating the dimensions of change management specific to MIS adoption in the public administration context.

The literature on change management reflects a broad spectrum of approaches ranging from classical linear models to adaptive frameworks that integrate leadership dynamics, organizational learning, and digital capabilities. Phillips and Klein (Phillips & Klein, 2022) emphasize the importance of translating change management theories into practical mechanisms that are contextually responsive. In this regard, Bagga et al. (Bagga et al., 2023) highlight the mediating role of organizational culture in enabling transformational leadership to drive change in virtual and digitalized environments. This interrelation becomes particularly salient in MIS implementation, which demands simultaneous cultural realignment, technological literacy, and participatory governance.

Iranian governmental organizations, similar to their counterparts in other emerging economies, are increasingly under pressure to modernize their administrative systems through digital infrastructure, aligning with the global paradigm of e-governance. However, the resistance to change, lack of integration across departments, and underdeveloped human resource capabilities often impede this process (Hasanzadeh, 2023; Koohgivi, 2022). Change management, therefore, must not only address technical challenges but also encompass psychological, cultural, and structural aspects that influence the organizational climate during system transitions (Basouli & Jabbari, 2021; Fatehi & Kiani, 2023).

From a strategic perspective, effective MIS implementation is contingent on securing senior management commitment, developing a shared digital vision, and embedding accountability within IT governance structures (Chychun et al., 2023; Mehrī, 2024). The importance of leadership in shaping readiness for change has been well-documented. Khan et al. (Khan et al., 2025) argue that adaptive leadership models significantly enhance organizational sustainability in the digital era, particularly in sectors where rigid hierarchies and standardized procedures dominate. Furthermore, Amir et al. (Amir et al., 2023) demonstrate how consistent public service management rooted in good governance principles can facilitate smoother transitions during MIS rollouts in municipal settings.

Another crucial pillar of change management in MIS projects is capacity building and human capital development. The technological dimension of MIS adoption often overshadows the human aspects, despite evidence suggesting that employee skills, attitudes, and engagement levels are decisive for long-term success (Bhavani & Mahalakshmi, 2023; Teimouri et al., 2022). According to Afasari and Aghagholzadeh (Afasari & Aghagholzadeh, 2023), empowering personnel through training programs, feedback mechanisms, and role clarity increases their adaptability to technological transitions and reduces systemic resistance. These findings align with Lyria et al. (Lyria et al., 2013), who assert that talent management plays a vital role in sustaining performance during change-intensive periods.

Cybersecurity and data integrity represent another layer of complexity in MIS deployment. Government agencies that implement MIS without ensuring robust digital safeguards risk operational disruptions and loss of public trust (Amin, 2024; Vojdani, 2024). According to Shimels and Lessa (Shimels & Lessa, 2023), the maturity level of information system security frameworks is positively associated with stakeholder confidence and system reliability. Therefore, integrating cybersecurity into the change management process is not merely a technical requirement but a strategic imperative that underpins the system's legitimacy and continuity.

Moreover, legislative and policy alignment is a prerequisite for sustained digital transformation. Institutionalizing MIS within an enabling regulatory environment allows organizations to move beyond pilot implementations toward systemic integration (Psarras et al., 2022; Мясникова et al., 2023). In Iran's administrative context, policy misalignment, outdated procedural laws, and siloed digital initiatives have been identified as barriers to effective MIS execution (Ghadousi, 2022; Yousefi Zenouz et al., 2019). In this respect, Yanamandra et al. (Yanamandra et al., 2023) emphasize the need for Quality 4.0 frameworks that harmonize technological innovation with process governance.

Feedback and participatory engagement are equally critical in building momentum for change. Stakeholders, including employees, managers, and external actors, should be involved throughout the planning and implementation phases to co-create value and minimize resistance (Chychun et al., 2023; Susilowati, 2025). Agbana et al. (Agbana et al., 2023) demonstrate that employee engagement practices embedded in change initiatives foster a sense of ownership and reduce the psychological costs associated with organizational transformation. Similarly, Cai (Cai, 2024) stresses the importance of incorporating digital risk awareness into organizational training to ensure employee preparedness during system transitions.

At the organizational level, readiness for change is influenced not only by individual competencies but also by structural and cultural configurations. Sancak (Sancak, 2023) proposes a model wherein sustainability-oriented transformation relies on a harmonious balance between formal structures and adaptive culture. In public organizations, rigid hierarchies, complex procedural layers, and fragmented communication systems often hinder cross-departmental alignment and agility (Amin, 2024; Waghid, 2023). Effective change management frameworks must therefore incorporate mechanisms for inter-unit coordination, streamlined decision-making, and culture-driven adaptability (Bagga et al., 2023; Kang & Na, 2024).

The dynamics of digital transformation within governmental settings further necessitate the design of scalable and interoperable systems. Given the diversity of departmental needs and legacy technologies, MIS solutions must offer flexibility, modular integration, and user-friendly interfaces to support diverse functional requirements (Komariyah, 2024; Nugraha et al., 2022). Research by Izugboekwe et al. (Izugboekwe et al., 2024) indicates that the effectiveness of MIS is tightly linked to the system's adaptability and the degree to which users are involved in iterative design processes.

Finally, continuous evaluation and performance monitoring play an indispensable role in sustaining MIS-led change initiatives. As Phillips and Klein (Phillips & Klein, 2022) argue, change management is not a one-time event but an ongoing process that requires systematic feedback loops, key performance indicators, and responsive interventions. In this context, Waghid (Waghid, 2023) underscores the relevance of technology-enhanced learning systems and educational tools for capacity development, especially in public institutions navigating complex change trajectories.

In sum, the implementation of MIS in governmental organizations—particularly in the context of Rasht, Iran—demands a multidimensional change management framework that integrates leadership, culture, technology, policy, stakeholder engagement, and organizational learning. This study aims to identify and validate the critical components of such a framework using a mixed-method approach, thereby providing empirical evidence to guide public sector transformation in digital environments.

2. Methods and Materials

This study employed an exploratory mixed-method research design. In the qualitative phase, an "interpretivist" approach was adopted, using inductive qualitative content analysis based on the Elo and Kyngäs (2008) framework. In the quantitative phase, the "inferential analysis (IA)" method was applied using the Structural Equation Modeling (SEM) technique.

Participants in the qualitative phase were selected from among experts and specialists to ensure the credibility of the interviews. The research participants included: (1) academic experts (faculty members in the fields of Public Administration, Organizational Behavior, Information Systems Management, and Information Technology

Management at higher education institutions), (2) organizational experts (senior and middle managers of governmental organizations), and (3) professionals and specialists in the fields of "Change Management" and "Management Information Systems." The criteria for expert selection included: (1) possessing academic qualifications in Public Administration, (2) academic background in Information Systems Management, (3) academic qualifications in Information Technology Management, (4) having authored books, articles, or academic publications related to the research topic, and (5) having executive experience in governmental organizations related to the research topic.

A range of key informants on the research topic were selected through snowball sampling. This selection and survey process continued until theoretical saturation was achieved, at which point it was halted. Theoretical saturation refers to the point where no new themes emerge from the last few expert interviews, as no new content was identified during open coding of the final interviews. Sampling continued using the snowball method until this saturation point was reached. Table 1 presents the demographic information of the 21 interviewed experts.

Table 1

Interviewee Information

No.	Gender	Academic Field	Degree	Experience (Years)	Organizational Position	Code
1	Male	Public Administration	Ph.D.	19	Middle Manager in Government Organization	N1
2	Female	Public Administration	Ph.D.	24	Senior Manager in Government Organization	N2
3	Male	Organizational Behavior	Ph.D. Candidate	27	Middle Manager in Government Organization	N3
4	Female	Information Systems Management	M.A.	11	IT Senior Expert in Government Organization	N4
5	Female	Information Systems Management	Ph.D. Candidate	19	IT Senior Expert in Government Organization	N5
6	Male	Information Systems Management	M.A.	18	IT Senior Expert in Government Organization	N6
7	Male	IT Management	Ph.D.	29	Faculty Member, Ministry of Science, Research and Technology	N7
8	Female	IT Management	M.A.	22	Middle Manager in Government Organization	N8
9	Male	IT Management	Ph.D.	26	Faculty Member, Ministry of Science, Research and Technology	N9
10	Male	Public Administration	M.A.	17	Senior Expert in Government Organization	N10
11	Female	Public Administration	Ph.D.	22	Faculty Member, Ministry of Science, Research and Technology	N11
12	Male	Public Administration - HR	Ph.D.	27	Faculty Member, Ministry of Science, Research and Technology	N12
13	Female	Public Administration - Org. Behavior	Ph.D.	28	Faculty Member, Islamic Azad University	N13
14	Male	IT Management	Ph.D.	19	IT Senior Expert in Government Organization	N14
15	Female	IT Management	Ph.D. Candidate	8	Executive Senior Expert in Government Organization	N15
16	Female	IT Engineering	Ph.D. Candidate	7	Deputy for Development in Government Organization	N16
17	Male	Public Administration - Org. Behavior	Ph.D.	7	Faculty Member, Islamic Azad University	N17
18	Male	Information Systems Management	Ph.D. Candidate	21	Faculty Member, Islamic Azad University	N18
19	Male	IT Engineering	Ph.D.	15	Faculty Member, Islamic Azad University	N19
20	Male	Public Administration - Org. Behavior	Ph.D.	6	Faculty Member, Islamic Azad University	N20
21	Male	IT Engineering	Ph.D.	22	Faculty Member, Islamic Azad University	N21

After interview number 18, the researcher encountered data saturation; however, to ensure the sufficiency of the data, the interview process was continued up to participant 21. Theoretical saturation refers to the point at which expert opinions in semi-structured interviews become repetitive, and no new codes are generated in the open coding stage of content analysis.

Semi-structured interviews were used as the data collection instrument. To ensure the validity and reliability of the tool, procedures such as expert review (for acceptability) and rechecking by experts (for confirmability) were employed. For establishing validity, the transcribed texts of the first five interviews along with the initial coding derived from them were given to the respective interviewees, allowing them to review and comment on the researcher's interpretations. In cases of disagreement, necessary corrections were made to ensure the analysis reflected the experts' intended meanings. To confirm reliability, final categories were returned to several of the initial participants for validation and suggestions were incorporated.

Content analysis is a research method with a relatively long history that has become widely used in both social sciences and other disciplines. In its simplest form, this method involves extracting the relevant research concepts from the studied text. The use of an inductive approach—also known as conventional content analysis—is especially appropriate when there is insufficient information about a phenomenon, and the researcher aims to build foundational knowledge in that area. This method primarily seeks to reduce data and provide a precise description of the topic. In inductive qualitative content analysis, dominant themes in the data help generate research findings. Like other qualitative methods, inductive content analysis follows standard and sequential approaches, with one of the most well-known frameworks being that of Elo and Kyngäs (2008). This framework includes three main phases: (1) Preparation, (2) Organization, and (3) Reporting.

The target population in the quantitative phase included senior and middle managers, as well as experts in Information Systems Management and Information Technology Management, in governmental organizations in Rasht City. Fifteen governmental organizations in Rasht were selected for this research: (1) Gas Company, (2) Regional Electricity Company, (3) Social Security Organization, (4) Agriculture Jihad Organization, (5) Foundation of Martyrs and Veterans Affairs, (6) Department of Education, (7) Department of Industry and Mining, (8) Water and Wastewater Company, (9) Telecommunication Company, (10) Oil Company, (11) Tax Affairs Office, (12) Department of Environmental Protection, (13) Post Office, (14) Road and Urban Development Department, and (15) Department of Youth and Sports Affairs. As of Summer 2025, the statistical population was 460 individuals.

Stratified random sampling was used. Rasht metropolis was divided into five strata, with each municipal district representing one stratum. Governmental organizations located in each stratum were selected. Within each stratum, some organizations were randomly chosen, and questionnaires were distributed randomly within each stratum proportionate to its population. Based on the Cochran formula, the sample size was determined to be 210 individuals.

In the quantitative phase, the data collection tool was a 115-item questionnaire derived from the conceptual model developed in the qualitative phase, in which the variables were converted from qualitative to quantitative form. Questionnaire validity was confirmed using three methods: face validity, content validity (CVI ranging from 0.85 to 1 and CVR from 0.60 to 1), and construct validity (convergent validity ranging from 0.539 to 0.662 and discriminant validity greater than inter-construct correlations). Reliability was confirmed using three methods: factor loadings (greater than 0.40), Cronbach's alpha (ranging from 0.725 to 0.829), and composite reliability (ranging from 0.845 to 0.887).

To analyze the data collected from the questionnaire in the quantitative phase, both descriptive and inferential statistical methods were used. Structural Equation Modeling (SEM) was employed to test the model. SEM is a statistical model used to examine the relationships between latent (unobserved) and observed variables. In other words, SEM is a powerful statistical technique that combines the measurement model (confirmatory factor analysis) and the structural model (regression or path analysis) in a single test. Path analysis, ideally illustrated through its graphical representation, shows probable causal relationships among variables. In this study, SEM was used to test the model, and the analysis involved exploratory and confirmatory factor analysis, path analysis, Friedman test, and one-sample t-test. The data were analyzed using SPSS and Smart PLS software.

3. Findings and Results

Among the 21 experts, 13 were male (61.9%) and 8 were female (38.1%). In terms of academic rank, 9 participants held a master's degree or were Ph.D. candidates (42.9%), 8 held a Ph.D. and were assistant professors (38.1%), 3 were associate professors (14.3%), and 1 was a full professor (4.7%). Regarding years of professional experience, 4 had 10 years or less (19.0%), 7 had between 11 and 20 years (33.3%), and 10 had more than 20 years (47.7%). In terms of institutional affiliation, 4 participants were affiliated with the Ministry of Science, Research, and Technology (19.0%), 6 were from Islamic Azad University (28.6%), and 11 were senior and middle managers from governmental organizations (52.4%).

Interview Analysis

Phase 1: Preparation

According to the Elo and Kyngäs (2008) framework, the first phase of interview analysis involved selecting the unit of analysis (e.g., a paragraph, sentence, or entire interview), conducting in-depth and repeated reading of the data to become thoroughly familiar with the content, taking initial notes, and structuring the data.

In this phase, the data were examined at the sentence and phrase level for each interview. Immersion in the data included repeated reading and active engagement with the content (i.e., searching for meanings and patterns).

Phase 2: Organization

This phase, considered the most critical step in inductive qualitative content analysis using the Elo and Kyngäs (2008) approach, included three sub-steps: (a) open coding, (b) categorization, and (c) abstraction, which are described below.

Phase 2: Organization – Open Coding

At this stage, initial codes were assigned to meaningful units of text, with notes taken freely and without a predefined framework. Essentially, this step involved generating preliminary codes, which required reading and familiarization by the researcher to derive initial codes from the data. The results of this process are presented in the following table, which shows that a total of 339 initial conceptual codes were identified.

Following the identification of these initial conceptual codes, the various codes were organized into selective codes and all coded data summaries were compiled. Duplicate codes were reviewed and removed, leading to the elimination of 224 codes out of the original 339, resulting in a final set of 115 extracted codes.

Phase 2: Organization – Categorization

This part of the second phase of coding involved grouping similar codes into conceptual categories. It is regarded as one of the most critical aspects of the coding process.

Table 2

Results of Category (Component) Identification

Criteria	Category (Component)	Row
[N12-9] End-user participation in needs analysis – 4 occurrences [N16-2] Staff attendance in system design and selection meetings – 2 occurrences [N15-7] Gathering staff opinions and suggestions on implementation – 3 occurrences [N3-3] Considering employee experience and knowledge for system improvement – 3 occurrences	Employee Participation in Decision-Making	1
[N13-8] Establishing an IT governance committee – 3 occurrences [N6-2] Defining specific roles and responsibilities in the project – 3 occurrences [N12-1] Effective coordination among organizational units – 3 occurrences [N21-8] Implementing monitoring and evaluation processes – 3 occurrences [N7-6] Using standard IT frameworks – 3 occurrences [N19-5] Ongoing interaction between IT and senior managers – 3 occurrences	IT Governance Structure	2
[N2-7] Empowering employees in the change process – 3 occurrences [N11-14] Participative and consultative leadership – 4 occurrences [N7-5] Encouraging innovation among employees – 3 occurrences [N6-1] Motivating acceptance of technological changes – 3 occurrences [N9-13] Direct leader involvement in MIS projects – 2 occurrences	Transformational Leadership Style	3
[N10-4] Introductory training sessions for system familiarization – 2 occurrences [N5-9] Providing guides and learning materials before project start – 2 occurrences [N12-8] Mental and practical readiness to face new systems – 3 occurrences [N20-2] Allocating sufficient time and resources for basic training – 4 occurrences	Pre-Implementation Training	4
[N2-4] Establishing formal feedback channels – 3 occurrences [N6-20] Systematic feedback analysis to improve project direction – 3 occurrences [N14-11] Transparent system performance reporting to stakeholders – 2 occurrences [N10-3] Prompt and effective response to reported needs – 4 occurrences [N8-13] Using feedback for continuous MIS performance improvement – 3 occurrences	Feedback and Two-Way Communication	5
[N11-8] Reducing management layers for faster decisions – 3 occurrences [N5-13] Delegating authority to operational levels for implementation – 3 occurrences [N14-9] Cross-functional teams in tech projects – 3 occurrences	Flexible Organizational Structure	6

[N4-7] Organizational structure responsive to environmental changes – 3 occurrences		
[N21-2] Reducing structural resistance to new technologies – 4 occurrences		
[N7-8] Joint committees between departments for project execution – 2 occurrences	Interdepartmental Communication and Internal Coordination	7
[N16-3] Clarifying roles and responsibilities across units – 4 occurrences		
[N20-5] Alignment of departmental goals with overarching digital goals – 3 occurrences		
[N3-4] Reducing conflict and rework through process coordination – 2 occurrences		
[N6-19] Data exchange among departments via MIS – 3 occurrences		
[N13-12] Management transparency in project objectives – 3 occurrences	Trust Between Employees and Management	8
[N6-7] Open access to project-related information for employees – 2 occurrences		
[N5-4] Managers welcoming employee feedback – 3 occurrences		
[N3-14] Employees' belief in managerial support during errors – 2 occurrences		
[N14-13] Honest collaboration among units during change – 2 occurrences		
[N9-2] Established and enforced information security policies – 2 occurrences	Infrastructure Security and Stability	9
[N19-6] Backup and rapid recovery capabilities in crises – 3 occurrences		
[N5-6] Data protection against intrusions and cyber threats – 2 occurrences		
[N3-16] System availability and stability under various conditions – 3 occurrences		
[N14-14] Employee training on information security – 4 occurrences		
[N15-3] Sharing successful MIS implementation experiences – 3 occurrences	Organizational Learning	10
[N5-12] Leveraging tacit knowledge of experienced personnel – 3 occurrences		
[N6-18] Documenting project learnings – 2 occurrences		
[N8-17] Creating team learning environments for challenges – 4 occurrences		
[N2-20] Promoting continuous organizational learning – 3 occurrences		
[N1-15] Proficiency in using MIS software and tools – 3 occurrences	Digital Competence of Employees	11
[N9-9] Ability to analyze and interpret system-generated data – 3 occurrences		
[N13-1] Problem-solving and understanding digital concepts – 4 occurrences		
[N21-1] Automating daily tasks using tech tools – 3 occurrences		
[N1-6] No fear of failure with new technologies – 2 occurrences	Change Acceptance	12
[N12-5] Lack of dependence on traditional/manual methods – 3 occurrences		
[N13-6] Confidence in outcomes of new systems – 3 occurrences		
[N6-6] No concern over workload or increased scrutiny – 3 occurrences		
[N3-12] Strong motivation to adapt to change – 2 occurrences		
[N14-12] Positive attitude toward previous transformation projects – 3 occurrences		
[N1-18] Documenting key organizational processes – 2 occurrences	Defined Organizational Processes	13
[N19-8] Aligning processes with MIS capabilities – 3 occurrences		
[N5-14] Automating repetitive and time-consuming tasks – 4 occurrences		
[N4-8] Reengineering processes prior to system implementation – 4 occurrences		
[N21-3] Clearly defining roles and responsibilities in processes – 4 occurrences		
[N1-7] Tolerating errors during innovation and change – 3 occurrences	Learning-Oriented Organizational Culture	14
[N17-12] Participation in MIS-related workshops and training – 4 occurrences		
[N20-8] Open space for improvement ideas – 3 occurrences		
[N9-6] Organizational inclination toward innovation and learning – 3 occurrences		
[N10-5] Step-by-step training during project implementation – 3 occurrences	Training During and After Implementation	15
[N19-11] Establishing communication channels for user queries – 4 occurrences		
[N6-14] Planning periodic retraining – 2 occurrences		
[N8-15] Assessing training program effectiveness – 2 occurrences		
[N2-18] Using internal or external trainers to transfer knowledge – 3 occurrences		
[N14-16] System upgradability without major changes – 3 occurrences	Technology Scalability and Flexibility	16
[N5-7] Infrastructure support for high data/user volume – 3 occurrences		
[N6-10] System customization based on organizational needs – 3 occurrences		
[N12-7] System flexibility for legal/process changes – 3 occurrences		
[N15-4] Use of emerging tech (e.g., cloud, AI) – 3 occurrences		
[N11-11] Existence of top-level documents supporting digital transformation – 3 occurrences	Legal Alignment with Information Technology	17
[N21-14] Regulation flexibility with tech-driven approaches – 3 occurrences		
[N16-1] Legal support for digital signatures/documents – 4 occurrences		
[N4-10] Alignment of regulatory and tech institutions – 2 occurrences		
[N7-12] Policy updates based on tech changes – 2 occurrences		
[N1-12] Simple, intuitive system design for users – 3 occurrences	System Accessibility and User-Friendliness	18
[N14-1] Access anytime/anywhere (web or mobile-based) – 4 occurrences		
[N6-11] Continuous technical support for users – 2 occurrences		

[N21-12] Fast system responsiveness – 3 occurrences [N4-2] Minimal need for advanced training – 3 occurrences [N10-9] UI tailored to staff skill levels – 3 occurrences		
[N9-1] Data exchange capability among various systems – 3 occurrences [N13-13] Use of open standards in system design – 4 occurrences [N12-4] MIS support for existing/legacy systems – 3 occurrences [N11-2] Availability of various technical interfaces – 3 occurrences [N19-2] Avoidance of fragmented information silos – 3 occurrences	System Integration	19
[N16-11] Approved guidelines for tech implementation – 3 occurrences [N11-15] Clarified responsibilities in MIS execution – 3 occurrences [N9-17] Legal structure for risk management – 3 occurrences [N17-6] Coordination among departments for rule execution – 3 occurrences	Executive Requirements and Guidelines	20
[N1-2] Developing a digital roadmap – 2 occurrences [N13-7] Aligning digital strategy with organizational goals – 3 occurrences [N4-16] Defining measurable goals for MIS – 3 occurrences [N9-12] Tech environment analysis and future outlook – 3 occurrences	Digital Strategy and Vision	21
[N2-5] Allocating sufficient financial and human resources – 3 occurrences [N1-1] Symbolic and practical support by top managers – 3 occurrences [N21-6] Active managerial participation in key meetings – 3 occurrences [N8-14] Prioritizing MIS in strategic planning – 3 occurrences	Senior Management Commitment and Support	22
[N1-5] Employee psychological readiness for tech change – 3 occurrences [N17-11] Reduced anxiety over system complexity – 3 occurrences [N13-5] Willingness to learn and work with new tech – 2 occurrences [N20-7] Job security amidst digital transformation – 3 occurrences [N18-3] Clear understanding of change necessity and benefits – 3 occurrences	Psychological Readiness for Change	23
[N12-10] Ongoing communication about project pros/cons – 4 occurrences [N20-11] Clear documentation of objectives and outputs – 3 occurrences [N15-8] Interaction with external users (clients, regulators) – 3 occurrences [N3-5] Clear frameworks for system performance evaluation – 2 occurrences	Stakeholder Expectation Management	24

Phase 2: Organization – Abstraction Stage

In this stage, the construction of subcategories and main categories, as well as the precise definition of each category and their interrelationships, are determined. The definition and naming of abstractions (dimensions) were carried out to enable a satisfactory representation of each category (component) at this stage of coding. Table 3 presents the results of the abstraction coding stage, in which 115 final codes, previously categorized into 24 components, were grouped under 6 overarching abstractions (dimensions).

Table 3

Results of the Third Coding Stage – Abstraction (Dimension)

Row	Abstraction (Dimension)	Categories (Components)
1	Leadership and Governance of Digital Transformation	Senior Management Commitment and Support Digital Strategy and Vision Transformational Leadership Style IT Governance Structure
2	Organizational Culture and Readiness for Change	Psychological Readiness for Change Change Acceptance Learning-Oriented Organizational Culture Trust Between Employees and Management
3	Technological Infrastructure and Capabilities	System Integration Infrastructure Security and Stability Technology Scalability and Flexibility System Accessibility and User-Friendliness
4	Human Capital Skills Training and Development	Pre-Implementation Training Training During and After Implementation Digital Competence of Employees Organizational Learning
5	Structural and Regulatory Support	Flexible Organizational Structure Defined Organizational Processes

6	Stakeholder Engagement and Cross-Sectoral Collaboration	Executive Requirements and Guidelines Legal Alignment with Information Technology Employee Participation in Decision-Making Interdepartmental Communication and Internal Coordination Stakeholder Expectation Management Feedback and Two-Way Communication

Phase 3: Reporting

In the final step of inductive qualitative content analysis based on the Elo and Kyngäs (2008) approach, detailed elaboration of categories, inclusion of example codes, the process of concept development, the presentation of the final conceptual model (if applicable), and establishing coherence between data and findings are conducted. The final results of the qualitative analysis are presented in Table 4 as follows:

Table 4

Results of Abstractions (Dimensions), Categories (Components), and Criteria (Indicators) in the Final Research Model

Row	Abstraction (Dimension)	Category (Component)	Number of Components	Number of Indicators
1	Leadership and Governance of Digital Transformation	Senior Management Commitment and Support	4	19
		Digital Strategy and Vision		
		Transformational Leadership Style		
		IT Governance Structure		
2	Organizational Culture and Readiness for Change	Psychological Readiness for Change	4	20
		Change Acceptance		
		Learning-Oriented Organizational Culture		
		Trust Between Employees and Management		
3	Technological Infrastructure and Capabilities	System Integration	4	21
		Infrastructure Security and Stability		
		Technology Scalability and Flexibility		
		System Accessibility and User-Friendliness		
4	Human Capital Skills Training and Development	Pre-Implementation Training	4	18
		Training During and After Implementation		
		Digital Competence of Employees		
		Organizational Learning		
5	Structural and Regulatory Support	Flexible Organizational Structure	4	19
		Defined Organizational Processes		
		Executive Requirements and Guidelines		
		Legal Alignment with Information Technology		
6	Stakeholder Engagement and Cross-Sectoral Collaboration	Employee Participation in Decision-Making	4	18
		Interdepartmental Communication and Internal Coordination		
		Stakeholder Expectation Management		
		Feedback and Two-Way Communication		

In the descriptive analysis of research participants, 148 were male (70.48%) and 62 were female (29.52%). In terms of marital status, 51 participants were single (24.29%) and 159 were married (75.71%).

Regarding age distribution, 26 participants (12.38%) were 30 years old or younger, 58 participants (27.62%) were aged 31 to 40, 69 participants (32.86%) were in the 41 to 50 age range, and 57 participants (27.14%) were older than 50.

As for educational attainment, 39 individuals (18.57%) held a bachelor's degree or lower, 134 individuals (63.81%) had a master’s degree, and 37 individuals (17.62%) either held or were pursuing a doctoral degree.

In terms of job experience, 19 participants (5.02%) had five years or less, 37 participants (17.62%) had six to ten years of experience, 49 participants (23.33%) had eleven to fifteen years, 46 participants (21.90%) had sixteen to twenty years, and 59 participants (28.10%) had more than twenty years of professional experience.

To determine the adequacy of the dataset (sample size and variable relationships) for factor analysis, the Kaiser-Meyer-

Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were applied. The KMO index assesses the partial correlations among variables to evaluate whether data are suitable for factor analysis.

The KMO values for the six constructs were as follows:

1. Leadership and Governance of Digital Transformation = 0.873
2. Organizational Culture and Readiness for Change = 0.882
3. Technological Infrastructure and Capabilities = 0.870
4. Human Capital Skills Training and Development = 0.884
5. Structural and Regulatory Support = 0.864
6. Stakeholder Engagement and Cross-Sectoral Collaboration = 0.885

The significance level of Bartlett's test of sphericity was 0.0009, indicating that the correlations among variables were sufficiently large for conducting factor analysis. Hence, in addition to adequate sampling, performing factor analysis based on the correlation matrix was justified.

According to the results, the extracted factors and explained variance for the *Leadership and Governance of Digital Transformation* component indicated that all four extracted eigenvalues were greater than 1, and the total explained variance was approximately 55.5%. After Varimax rotation, the variance explained by each factor was as follows: Factor 1 = 15.03%, Factor 2 = 14.27%, Factor 3 = 13.20%, and Factor 4 = 12.90%.

For the *Organizational Culture and Readiness for Change* component, the four extracted eigenvalues were also all greater than 1, explaining a total of approximately 53.42% of the variance. After Varimax rotation: Factor 1 = 15.62%, Factor 2 = 13.76%, Factor 3 = 12.08%, and Factor 4 = 11.96%.

For the *Technological Infrastructure and Capabilities* component, all four eigenvalues exceeded 1, accounting for about 51.27% of the total variance. After Varimax rotation: Factor 1 = 13.70%, Factor 2 = 13.31%, Factor 3 = 12.21%, and Factor 4 = 12.05%.

For the *Human Capital Skills Training and Development* component, all four extracted factors had eigenvalues greater than 1, with a total explained variance of approximately 53.44%. After Varimax rotation: Factor 1 = 14.54%, Factor 2 = 14.38%, Factor 3 = 13.83%, and Factor 4 = 10.68%.

For the *Structural and Regulatory Support* component, the four extracted factors had eigenvalues greater than 1, and they explained approximately 53.28% of the total variance. After Varimax rotation: Factor 1 = 13.90%, Factor 2 = 13.70%, Factor 3 = 13.53%, and Factor 4 = 12.14%.

For the *Stakeholder Engagement and Cross-Sectoral Collaboration* component, all four eigenvalues exceeded 1, explaining approximately 56.21% of the total variance. After Varimax rotation: Factor 1 = 14.70%, Factor 2 = 14.66%, Factor 3 = 14.48%, and Factor 4 = 12.36%.

To evaluate the research model, second-order confirmatory factor analysis was conducted, and the results are presented in Table 5.

Table 5

Path Coefficients and Significance Levels of the Research Model

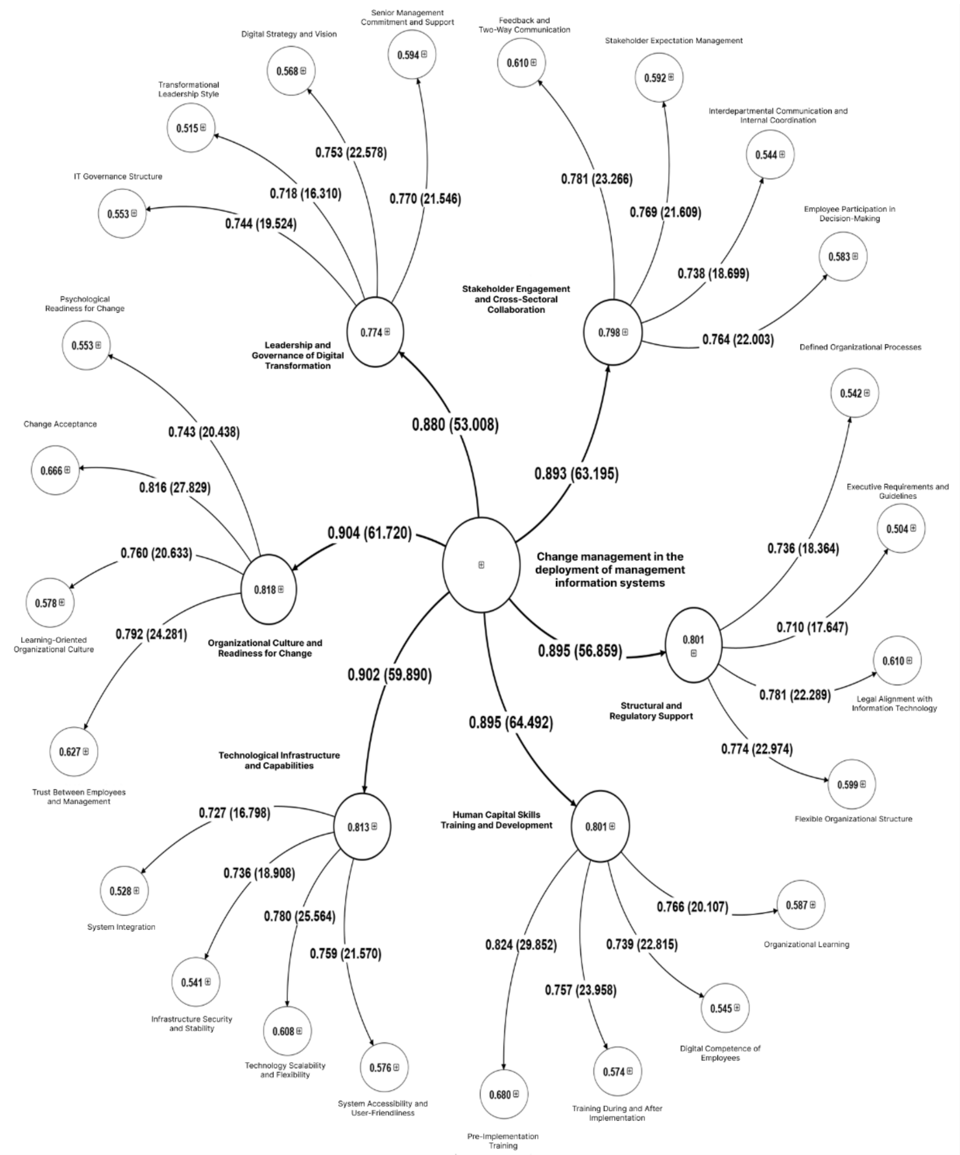
Path Between Variables	Path Coefficient	t-Statistic	p-value	Result
Leadership and Governance of Digital Transformation → Senior Management Commitment and Support	0.770	21.546	0.0009	Significant
Leadership and Governance of Digital Transformation → IT Governance Structure	0.744	19.524	0.0009	Significant
Leadership and Governance of Digital Transformation → Transformational Leadership Style	0.718	16.310	0.0009	Significant
Leadership and Governance of Digital Transformation → Digital Strategy and Vision	0.753	22.578	0.0009	Significant
Organizational Culture and Readiness for Change → Psychological Readiness for Change	0.743	20.438	0.0009	Significant
Organizational Culture and Readiness for Change → Trust Between Employees and Management	0.792	24.281	0.0004	Significant
Organizational Culture and Readiness for Change → Learning-Oriented Organizational Culture	0.760	20.633	0.0009	Significant
Organizational Culture and Readiness for Change → Change Acceptance	0.816	27.829	0.0009	Significant
Technological Infrastructure and Capabilities → Infrastructure Security and Stability	0.736	18.908	0.0009	Significant
Technological Infrastructure and Capabilities → System Accessibility and User-Friendliness	0.759	21.570	0.0009	Significant
Technological Infrastructure and Capabilities → Technology Scalability and Flexibility	0.780	25.564	0.0009	Significant
Technological Infrastructure and Capabilities → System Integration	0.727	16.798	0.0009	Significant
Human Capital Skills Training and Development → Training During and After Implementation	0.757	23.958	0.0009	Significant
Human Capital Skills Training and Development → Pre-Implementation Training	0.824	29.852	0.0009	Significant
Human Capital Skills Training and Development → Digital Competence of Employees	0.739	22.815	0.0009	Significant
Human Capital Skills Training and Development → Organizational Learning	0.766	20.107	0.0009	Significant

Structural and Regulatory Support → Executive Requirements and Guidelines	0.710	17.647	0.0009	Significant
Structural and Regulatory Support → Flexible Organizational Structure	0.774	22.974	0.0009	Significant
Structural and Regulatory Support → Legal Alignment with Information Technology	0.736	18.364	0.0009	Significant
Structural and Regulatory Support → Defined Organizational Processes	0.781	22.289	0.0009	Significant
Stakeholder Engagement and Cross-Sectoral Collaboration → Interdepartmental Communication and Internal Coordination	0.738	18.699	0.0009	Significant
Stakeholder Engagement and Cross-Sectoral Collaboration → Feedback and Two-Way Communication	0.781	23.266	0.0009	Significant
Stakeholder Engagement and Cross-Sectoral Collaboration → Stakeholder Expectation Management	0.769	21.609	0.0009	Significant
Stakeholder Engagement and Cross-Sectoral Collaboration → Employee Participation in Decision-Making	0.764	22.003	0.0009	Significant

From the perspective of the sample, the results indicated that the change management model for implementing Management Information Systems (MIS) in governmental organizations in Rasht includes 24 components.

Figure 1

Final Model of the Study



The data obtained from the field study were analyzed using SMART-PLS software, and the following results were derived.

Table 6

Standardized Path Coefficients and Significance Values of the Research Model

Paths	Standardized Coefficients	t-value	p-value	Result
Change Management in MIS Implementation → Human Capital Skills Training and Development	0.895	64.492	0.0009	Significant
Change Management in MIS Implementation → Stakeholder Engagement and Cross-Sectoral Collaboration	0.893	63.195	0.0009	Significant
Change Management in MIS Implementation → Leadership and Governance of Digital Transformation	0.880	53.008	0.0009	Significant
Change Management in MIS Implementation → Technological Infrastructure and Capabilities	0.902	59.890	0.0009	Significant
Change Management in MIS Implementation → Structural and Regulatory Support	0.895	56.859	0.0009	Significant
Change Management in MIS Implementation → Organizational Culture and Readiness for Change	0.904	61.720	0.0009	Significant

Prioritization of the Model Dimensions and Components Based on Friedman Test

The functional prioritization of model dimensions and components was conducted using the mean ranks obtained through the Friedman test. Among the dimensions, *Structural and Regulatory Support* had the highest priority with a mean rank of 3.848, ranking first. It was followed by *Leadership and Governance of Digital Transformation* with a mean rank of 3.812, and *Human Capital Skills Training and Development* with 3.479, ranking second and third, respectively.

Organizational Culture and Readiness for Change ranked fourth with a mean of 3.476, and *Stakeholder Engagement and Cross-Sectoral Collaboration* was ranked fifth with 3.331. *Technological Infrastructure and Capabilities* received the lowest priority with a mean rank of 3.055, placing sixth.

In the dimension of *Leadership and Governance of Digital Transformation*, the component "Senior Management Commitment and Support" ranked first (mean = 2.579), followed by "Digital Strategy and Vision" (mean = 2.548), "IT Governance Structure" (mean = 2.448), and "Transformational Leadership Style" (mean = 2.426).

In the dimension of *Organizational Culture and Readiness for Change*, "Psychological Readiness for Change" had the highest rank (mean = 2.574), followed by "Learning-Oriented Organizational Culture" (mean = 2.507), "Change Acceptance" (mean = 2.483), and "Trust Between Employees and Management" (mean = 2.436).

In the dimension of *Technological Infrastructure and Capabilities*, "Technology Scalability and Flexibility" ranked first (mean = 2.669), followed by "System Accessibility and User-Friendliness" (mean = 2.598), "System Integration" (mean = 2.424), and "Infrastructure Security and Stability" (mean = 2.310).

In the dimension of *Human Capital Skills Training and Development*, "Training During and After Implementation" ranked highest (mean = 2.643), followed by "Digital Competence of Employees" (mean = 2.533), "Organizational Learning" (mean = 2.532), and "Pre-Implementation Training" (mean = 2.290).

In the dimension of *Structural and Regulatory Support*, "Defined Organizational Processes" ranked first (mean = 2.595), followed by "Legal Alignment with IT" (mean = 2.524), "Flexible Organizational Structure" (mean = 2.493), and "Executive Requirements and Guidelines" (mean = 2.388).

In the dimension of *Stakeholder Engagement and Cross-Sectoral Collaboration*, "Stakeholder Expectation Management" had the highest rank (mean = 2.681), followed by "Feedback and Two-Way Communication" (mean = 2.512), "Employee Participation in Decision-Making" (mean = 2.493), and "Interdepartmental Communication and Internal Coordination" (mean = 2.314).

Considering the sample size (Central Limit Theorem), a one-sample t-test was applied.

The variable *Leadership and Governance of Digital Transformation* had a mean of 3.04 and a standard deviation of 0.59. With a t-value of 0.90 and p-value of 0.370 (greater than 0.05), the null hypothesis was confirmed, indicating that this variable is at a moderate level from the participants' perspective.

The variable *Organizational Culture and Readiness for Change* had a mean of 3.00 and a standard deviation of 0.61. With a t-value of 0.05 and a p-value of 0.964 (greater than 0.05), the null hypothesis was confirmed, and this variable was also assessed to be at a moderate level.

The variable *Technological Infrastructure and Capabilities* had a mean of 2.92 and a standard deviation of 0.56. With a t-value of -2.00 and p-value of 0.047 (less than 0.05), the null hypothesis was rejected, and this variable was evaluated as being below average.

The variable *Human Capital Skills Training and Development* had a mean of 2.99 and a standard deviation of 0.62. With a t-value of -0.20 and a p-value of 0.838 (greater than 0.05), the null hypothesis was confirmed, indicating a moderate level.

The variable *Structural and Regulatory Support* had a mean of 3.06 and a standard deviation of 0.59. With a t-value of 1.40 and a p-value of 0.164 (greater than 0.05), the null hypothesis was confirmed, showing this variable to be at a moderate level.

The variable *Stakeholder Engagement and Cross-Sectoral Collaboration* had a mean of 2.96 and a standard deviation of 0.60. With a t-value of -1.00 and a p-value of 0.319 (greater than 0.05), the null hypothesis was confirmed, and this variable was also reported to be at a moderate level.

4. Discussion and Conclusion

The findings of this study indicate that effective change management in the implementation of Management Information Systems (MIS) within government organizations in Rasht relies on the integrated influence of six core dimensions: leadership and governance of digital transformation, organizational culture and readiness for change, technological infrastructure and capabilities, human capital training and development, structural and regulatory support, and stakeholder engagement and cross-sectoral collaboration. Structural equation modeling results demonstrated significant path coefficients between the overarching construct of change management and all six identified dimensions, confirming their explanatory and predictive power in the successful execution of MIS initiatives. These results emphasize the multidimensional nature of change in the digital era, particularly within bureaucratic public sector environments.

Among the most influential dimensions, *structural and regulatory support* emerged as the highest-ranked priority according to the Friedman test, indicating that legal alignment, flexible organizational structures, and clear operational procedures are considered foundational for initiating and sustaining change. This finding echoes prior research that asserts that regulatory flexibility and structural adaptability are critical in enabling digital transformation, especially in highly regulated governmental settings (Basouli & Jabbari, 2021; Sancak, 2023; Мясникова et al., 2023). Without clear procedures and enabling policies, even well-designed MIS may face institutional resistance or remain underutilized. The significant path coefficients between structural support and its components—such as defined processes and legal alignment—confirm their centrality in shaping the success of MIS implementation.

The results also revealed that *leadership and governance of digital transformation* significantly influence multiple sub-components, including senior management support, IT governance, strategic digital vision, and transformational leadership style. This supports the argument that leadership commitment is not only symbolic but also operational, guiding resource allocation, prioritization, and strategic alignment (Amir et al., 2023; Bagga et al., 2023; Khan et al., 2025). Leaders who visibly champion the transformation process build trust, reduce uncertainty, and set expectations that influence organizational behavior (Bhavani & Mahalakshmi, 2023; Komariyah, 2024). Moreover, strategic digital vision—linked with long-term planning and goal setting—was found to be among the highest-rated components, aligning with the findings of (Yanamandra et al., 2023) who noted that digital strategy plays a central role in aligning change management with organizational competitiveness.

Organizational culture and readiness for change was another significant factor, particularly psychological readiness, learning-oriented culture, and acceptance of change. This dimension demonstrated robust path coefficients and high composite reliability, reflecting its weight in facilitating transitions during MIS implementation. These findings support previous research showing that change acceptance is strongly influenced by organizational norms, values, and openness to innovation (Bagga et al., 2023; Hasanzadeh, 2023). The recognition of "psychological readiness" in the current model also advances the literature by emphasizing the emotional and cognitive dimensions of change—a domain often overlooked in technical projects. This aligns with (Fatehi & Kiani, 2023) who argue that emotional commitment and belief in the benefits of transformation are critical in building momentum for change.

The analysis of *technological infrastructure and capabilities* revealed it to be the lowest-ranked dimension in terms of implementation readiness, as indicated by the one-sample t-test. Despite its significant relationship with MIS change management, this component's mean was below average, suggesting potential infrastructural deficiencies within Rasht's governmental organizations. This is particularly concerning given the increasing reliance on secure, scalable, and interoperable systems for digital governance (Amin, 2024; Vojdani, 2024; Yousefi Zenouz et al., 2019). The strong path coefficients between this dimension and indicators such as scalability, user accessibility, system integration, and security validate the assertion that technical preparedness is not merely a support element but a prerequisite for digital transformation (Cai, 2024; Shimels & Lessa, 2023).

In contrast, *human capital training and development* showed favorable ratings, with significant relationships across all sub-components including pre-implementation training, continuous learning, and digital competencies. These findings corroborate studies that argue that digital skills training is a cornerstone of successful MIS adoption (Lyria et al., 2013; Teimouri et al., 2022). Furthermore, the high rank of "training during and after implementation" highlights the necessity of sustained capacity-building efforts that go beyond one-off workshops. The role of digital competence as a mediating factor between technology adoption and organizational performance has been emphasized in recent scholarship (Koohgivi, 2022; Susilowati, 2025), further supporting this study's conclusions.

The dimension of *stakeholder engagement and cross-sectoral collaboration* was also found to be statistically significant in the model. Notably, stakeholder expectation management and two-way communication received higher ranks compared to interdepartmental coordination. This indicates a growing recognition of the role of internal and external communication in managing resistance and aligning priorities. The findings align with (Afasari & Aghagholzadeh, 2023) and (Agbana et al., 2023), who assert that stakeholder involvement across planning, implementation, and evaluation stages enhances legitimacy and accelerates adoption. Moreover, cross-functional and inter-agency cooperation—although moderately ranked—remains essential for overcoming silos and ensuring system integration (Bhavani & Mahalakshmi, 2023; Nugraha et al., 2022).

Confirmatory factor analysis validated the multidimensional structure of the model, with all sub-factors demonstrating convergent and discriminant validity. The model explains a significant portion of the variance in MIS implementation outcomes and contributes an empirically grounded framework tailored to the unique institutional and technological context of public organizations in Iran. It provides a practical and theoretical contribution by integrating elements from classical change models and contextualizing them within digital governance realities (Chychun et al., 2023; Phillips & Klein, 2022; Waghid, 2023). Moreover, by highlighting the interplay between leadership, culture, infrastructure, training, structure, and stakeholder dynamics, the model offers a comprehensive perspective that responds to the multifaceted challenges of digital transformation in the public sector.

This study, while comprehensive, has several limitations. First, the generalizability of the findings is limited by the focus on government organizations in Rasht, Iran. Organizational culture, legal frameworks, and digital maturity levels may differ in other regions, which could influence the applicability of the model. Second, the cross-sectional nature of the data collection does not allow for longitudinal insights into the evolution of change management effectiveness over time. Third, despite employing mixed methods, the study may still be subject to response biases inherent in self-reported data, particularly regarding perceived organizational readiness or leadership support.

Future research can build on this model by extending it to other cities or national-level institutions to validate its structural robustness across diverse administrative environments. Comparative studies across different sectors—such as healthcare, education, and urban planning—could uncover sector-specific variables that interact with change management practices. Longitudinal studies are also recommended to track changes over time, allowing researchers to capture causal relationships and the dynamic nature of digital transformation. Additionally, incorporating emerging dimensions such as AI readiness, data ethics, and cybersecurity governance could enrich the model further.

For practitioners, the findings underscore the importance of a balanced, multidimensional approach to change management. Governmental organizations should prioritize structural reforms and regulatory updates to accommodate digital initiatives. Leadership development programs should be designed to equip public managers with the tools needed to lead transformation efforts effectively. Continuous staff training, investment in scalable IT infrastructure, and active stakeholder engagement should be institutionalized as core components of digital governance. Finally, aligning cultural values and emotional readiness with technological objectives will help ensure sustainable adoption and performance improvement.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were considered.

References

Afasari, Z., & Aghagholzadeh, G. (2023). An Analysis of Factors Affecting Organizational Change Management and Human Resource Empowerment in Government Organizations. *Journal of Innovative Research Approaches in Management and Accounting*, *7*(26), 797-812. https://majournal.ir/index.php/ma/article/view/2271

Agbana, J., Iyaji, F. I., & Bakare, A. (2023). The Influence of Change Management Practices on Employee Engagement and Organizational Performance in a Competitive Business Environment: A Conceptual Review. *Kuey*. https://doi.org/10.53555/kuey.v29i4.8192

Amin, H. E. (2024). An Integrated Approach to Cyber Risk Management With Cyber Threat Intelligence Framework to Secure Critical Infrastructure. *Journal of Cybersecurity and Privacy*, *4*(2), 357-381. https://doi.org/10.3390/jcp4020018

Amir, M., Cavallari, L., Cavallari, Z., Witjaksono, J., & Seerasarn, N. (2023). Consistency of Public Service Management in Implementing Good Governance in Indonesia: A Case Study in Kendari City. *Academic Journal of Interdisciplinary Studies*, *12*(6), 176. https://doi.org/10.36941/ajis-2023-0162

Bagga, S. K., Gera, S., & Haque, S. N. (2023). The mediating role of organizational culture: Transformational leadership and change management in virtual teams. *Asia Pacific Management Review*, *28*(2), 120-131. https://doi.org/10.1016/j.apmrv.2022.07.003

Basouli, M., & Jabbari, G. (2021). The Relationship between Crisis Management and Community Resilience in Tourism Destination at Corona Crisis Case Study: Hamedan City. *urban tourism*, *8*(1), 33-48. https://doi.org/10.22059/jut.2021.318782.884

Bhavani, G., & Mahalakshmi, M. (2023). Change Management: Strategies for Successful Organizational Transitions. *International Journal for Multidisciplinary Research*, *5*(4). https://doi.org/10.36948/ijfmr.2023.v05i04.3875

Cai, Y. (2024). Electronic Commerce Security and Risk Management: An Important Part of College Curriculum. *Journal of Educational Theory and Management*, *8*(1), 18. https://doi.org/10.26549/jetm.v8i1.15646

Chychun, V., Grechanyk, O., Khliebnikova, T., Temchenko, O., & Kravchenko, H. (2023). Change management models and methods: implementing innovations, ensuring sustainability and engaging staff Modelos e métodos de gestão de mudanças: implementando inovações, garantindo a sustentabilidade e engajando a equipe.

Fatehi, M., & Kiani, S. (2023). Examining Change Management Models and Their Relationship with Organizational Agility. Fourteenth International Conference on Modern Research in Management, Economics, Accounting, and Banking,

Ghadousi, P. (2022). Organizational Change Management During Digital Transformation in the Construction Industry for Sustainable Urban Development. *Scientific-Research Quarterly Journal of Geography and Regional Planning*. https://www.jgeoqeshm.ir/article_164440.html

Hasanzadeh, S. (2023). Investigating the Impact of Transparent Internal Communications on Organizational Change Management and Employee Relations in the Ministry of Cooperatives, Labor and Social Welfare. *Journal of Management and Accounting Inquiry*, *3*(1). https://www.noormags.ir/view/fa/articlepage/2029419/

Izugboekwe, C. S., Joshua, S. S., Gambo, N., Olubodun, S. V., & Ameh, B. O. (2024). Artificial Intelligence and Business Security Among SMEs in Abuja Metropolis. *International Journal of Management Technology*, *11*(3), 17-41. https://doi.org/10.37745/ijmt.2013/vol11n31741

Kang, H., & Na, H. (2024). The Impact of a Company's Management Strategy on Its Profitability, Stability, and Growth: A Focus on the Information Security Industry. *Sustainability*, *16*, 5166. https://doi.org/10.3390/su16125166

Khan, M. I., Naim, A., Khan, M. F., & Balqis, S. N. (2025). Leadership and Change Management for Sustainable Healthcare in the Digital Era. 257-282. https://doi.org/10.4018/979-8-3693-8492-3.ch013

Komariyah, I. (2024). Exploring the Influence of Digital Transformation, Change Management, and Employee Engagement on Organizational Performance of Non Profit Organization in Indonesia. *International Journal of Business*

Law and Education, *5*(2), 2651-2662. https://doi.org/10.56442/ijble.v5i2.919

Koohgivi, S. (2022). Investigating the Impact of Change Management on Organizational Innovation with a Focus on the Mediating Role of Employee Innovative Behavior in Governmental Offices in Khuzestan Province. *New Research Approaches in Management and Accounting*.

Lyria, R. K., S, N. G., & Karanja, K. (2013). Role of talent management on organization performance in companies listed in Nairobi security exchange in Kenya. *Humanities and Social Science*, *3*(21), 285-290. https://www.iprjb.org/journals/index.php/JHRL/article/view/216?srsltid=AfmBOoqI2th_8lR4qHfEN5wiHZ4-tpBit48GlfEh6tDOrHixDyBIQ9Ol

Mehrī, M. H. (2024). An Analysis of Emerging Mystical and Spiritual Movements in Cyberspace and Their Security and Strategic Management Challenges. Proceedings of the 9th International Interdisciplinary Studies Conference in Management and Engineering,

Nugraha, D., Daihani, D. U., & Kusnadi. (2022). Strategic Planning, Organizational Culture, Analysis of Organizational Performance in Strategic Change Management Mediation in State Intelligence Agency. *International Journal of Research -Granthaalayah*, *10*(4), 1-14. https://doi.org/10.29121/granthaalayah.v10.i4.2022.4568

Phillips, J., & Klein, J. D. (2022). Change Management: From Theory to Practice. *TechTrends*, *67*(1), 189-197. https://doi.org/10.1007/s11528-022-00775-0

Psarras, A., Anagnostopoulos, T., Salmon, I., Psaromiligkos, Y., & Vryzidis, L. (2022). A Change Management Approach with the Support of the Balanced Scorecard and the Utilization of Artificial Neural Networks. *Adm. Sci.*, *12*(63). https://doi.org/10.3390/admsci12020063

Sancak, I. E. (2023). Change management in sustainability transformation: A model for business organizations. *Journal of Environmental Management*, *330*, 117165. https://doi.org/10.1016/j.jenvman.2022.117165

Shimels, T., & Lessa, L. (2023). Maturity of information systems' security in Ethiopian banks: case of selected private banks. *International Journal of Industrial Engineering and Operations Management*, *5*(2), 86-103. https://doi.org/10.1108/IJIEOM-10-2021-0014

Susilowati, Y. T. (2025). Optimizing Protocol Performance in the Digital Era: A Study of the Integration of Digital Leadership, Change Management, and Personal Competence in the Protocol Scope. *Proceeding of the International Conference on Economics and Business*, *3*(2), 59-76. https://doi.org/10.55606/iceb.v3i2.448

Teimouri, H., Shahin, A., & Karimi, A. (2022). Providing a Competent-Based Human Resource Management Model with a Succession Approach. *Journal of Applied Sociology*, *33*(2), 69-92. https://doi.org/10.22108/jas.2021.126789.2043

Vojdani, B. (2024). Investigating the Impact of Privacy and Security of Electronic Banking Services on Customer Loyalty with Emphasis on Reliability. 1st International Conference on Management, Industrial Engineering, Accounting, and Economics in Humanities,

Waghid, F. (2023). Crises, Changed Leadership, Change Management and Educational Technology. *South African Journal of Higher Education*, *37*(4). https://doi.org/10.20853/37-4-6011

Yanamandra, R., Abidi, A., Srivastava, R., Kukunuru, S., & Alzoubi, H. (2023, 7-8 March 2023). Approaching Quality 4.0: The Digital Process Management as a Competitive Advantage. 2023 International Conference on Business Analytics for Technology and Security (ICBATS),

Yousefi Zenouz, R., Najafi Esfahani, S. S., & Kolivand, I. (2019). Advantages, Considerations, and Solutions to Ensure the Security of the Information Exchange Gateway of the Islamic Republic of Iran. *Intelligent Business Management Studies*, *9*(34), 215-246. https://doi.org/10.22054/IMS.2020.52669.1735

Мясникова, Т. А., Лобанова, С. А., & Коваленко, М. Г. (2023). Change Management Project as a Tool for Implementing the Municipal Development Strategy. *Вестник Адыгейского Государственного Университета Серия «экономика»*(3(285)), 29-34. https://doi.org/10.53598/2410-3683-2021-3-285-29-34