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## Identifying the Structural Dimensions of Digital Governance in Large Organizations

### ABSTRACT

This study aimed to explore and identify the core structural dimensions that shape digital governance in large organizations operating within complex institutional and regulatory environments. A qualitative research design was employed using semi-structured, in-depth interviews with 17 professionals from large organizations based in Tehran, all of whom were directly involved in digital transformation or governance roles. Participants were selected through purposive sampling, and data collection continued until theoretical saturation was achieved. Interviews were transcribed verbatim and analyzed thematically using NVivo software. The analysis involved open coding, axial coding, and category formation through constant comparison, with a focus on capturing structural factors affecting digital governance practices. Three primary themes emerged from the analysis: (1) Organizational Architecture, including subthemes such as centralization, leadership structures, formal digital units, and interdepartmental coordination; (2) Regulatory Alignment, encompassing compliance with national digital policies, internal digital policy frameworks, and risk governance mechanisms; and (3) Technological Integration Capacity, reflecting IT infrastructure readiness, interoperability challenges, and digital tool adoption. The findings indicate that effective digital governance depends on the interdependence of these dimensions, with formalized leadership roles, regulatory synchronization, and scalable digital systems acting as critical enablers. The study highlights that successful digital governance in large organizations requires the deliberate structuring of internal systems that align organizational roles, policies, and technologies. Governance is most effective when digital leadership is institutionalized, compliance frameworks are embedded, and technological platforms are interoperable and adaptable. These insights offer a practical roadmap for organizations seeking to build resilient and responsive governance systems in the digital age.

**Keywords:** Digital governance, organizational architecture, regulatory alignment, technological integration, large organizations.

### Introduction

The digitalization of governance structures has emerged as a pivotal concern for large organizations striving to navigate complex technological transformations while preserving administrative coherence and strategic direction. In contemporary governance contexts, digital technologies are no longer peripheral tools; they are integral to organizational control, communication, and policy execution. As digital transformation permeates both public and private sectors, governance models must adapt not only to accommodate technological innovations but also to manage risks, align with external regulatory frameworks, and support cross-functional collaboration [1, 2]. The shift from traditional bureaucratic hierarchies to digitally networked systems signals a profound restructuring of how power, authority, and decision-making are distributed in large organizations. Accordingly, identifying the structural dimensions of digital governance becomes critical for understanding how institutions configure themselves to maintain accountability, agility, and sustainability in digital environments [3].

Digital governance encompasses the frameworks, processes, and institutional arrangements through which organizations deploy and oversee digital technologies to achieve strategic goals. It includes both formal structures—such as digital policy units, IT governance boards, and leadership roles like Chief Digital Officers—and informal practices like cross-unit coordination, agile workflows, and iterative feedback loops [4, 5]. While existing studies have addressed components of e-governance, smart administration, and digital infrastructure, there remains a notable gap in the empirical understanding of how large organizations structure their internal governance systems to effectively harness digital capabilities [6]. This is particularly salient in transitional contexts, such as Iran, where digital transformation is unfolding rapidly amidst institutional, regulatory, and cultural complexities.

The relevance of digital governance is increasingly evident in both state and corporate settings. For public organizations, digital governance supports e-government initiatives, public accountability, and service delivery optimization [7, 8]. For private firms, it enhances competitiveness, innovation diffusion, and risk management in data-driven environments [1, 2]. Yet in both contexts, structural ambiguities persist: Who is responsible for digital decisions? How are digital policies coordinated across departments? What governance mechanisms ensure compliance while fostering innovation? These questions underscore the need for research that dissects governance architectures in practical organizational settings, particularly through qualitative inquiry that captures the lived experiences and strategies of institutional actors [4].

Prior literature has identified several obstacles to effective digital governance, including fragmented authority, low policy coherence, lack of interoperability across systems, and resistance to change [9, 10]. Moreover, digital formalism—where technological adoption is symbolic rather than functional—poses a risk to genuine institutional transformation [9]. These challenges are often exacerbated in large organizations due to their size, bureaucratic inertia, and complexity of interdepartmental dynamics [5]. In response, scholars have called for a shift toward integrated governance models that blend top-down control with bottom-up innovation, supported by collaborative structures and real-time data management systems [11, 12].

The current study responds to this call by exploring the structural dimensions of digital governance as experienced and implemented in large organizations in Tehran. While a growing body of work has emphasized the macro-level impacts of digital transformation—such as policy outcomes or national readiness indices—less attention has been paid to the meso- and micro-level organizational configurations that make digital governance operable on the ground [13, 14]. This study seeks to fill that gap by investigating how leadership roles, decision rights, regulatory alignment, and technological capacities are structured and perceived by professionals at the forefront of digital transformation initiatives.

A core contribution of this research is its focus on organizational architecture as a determinant of digital governance efficacy. Studies have shown that digital leadership, hierarchical integration, and interdepartmental coordination are essential for translating digital strategies into actionable outcomes [4, 15]. In organizations where these structural elements are poorly defined or inconsistently applied, digital initiatives often fail to scale or sustain themselves over time [16]. Conversely, formalizing digital units, establishing governance committees, and adopting flexible structural models have been associated with increased alignment between digital goals and institutional functions [6, 17]. These findings underscore the importance of understanding not just what digital governance is, but how it is structurally embedded in organizational systems.

Equally important is the alignment of internal digital governance mechanisms with external policy and regulatory environments. In countries undergoing rapid digital evolution, national regulations on data privacy, cybersecurity, and digital inclusion play a significant role in shaping organizational practices [7, 18]. Research suggests that organizations that proactively internalize these policies—through compliance units, data governance protocols, and risk management frameworks—are better equipped to navigate uncertainties and establish digital legitimacy [11, 19]. Furthermore, internal digital policies, such as data classification rules and acceptable use standards, contribute to a culture of accountability and operational resilience, especially in high-risk sectors such as finance and government services [3].

Technological capacity also emerged in the literature as a foundational element of digital governance. Without scalable infrastructure, interoperable platforms, and appropriate digital tools, even the most well-designed governance structures cannot function effectively [12, 20]. Recent studies highlight the importance of aligning IT investments with governance needs and ensuring that digital tools are not only available but also adopted and integrated into everyday work processes [1, 5]. The capacity to upgrade systems, automate workflows, and connect platforms across organizational silos is directly tied to how governance decisions are made, monitored, and adjusted [21].

Notably, scholars have also emphasized the role of culture and contextual variation in shaping the contours of digital governance [8, 13]. Governance models that are effective in one institutional or national setting may not translate seamlessly to another. Factors such as organizational norms, historical governance legacies, and cultural values related to hierarchy and innovation deeply influence how digital practices are structured and accepted [14, 15]. For instance, in the Iranian context, a strong centralist legacy coexists with recent decentralization pressures, creating tensions that must be navigated in the design of governance systems. As such, this study also aims to generate context-specific insights that can inform more adaptable and culturally sensitive governance strategies.

## Methods and Materials

### *Study Design and Participants*

This study adopted a qualitative research design with an interpretive approach to explore and identify the structural dimensions of digital governance in large organizations. The focus was on eliciting rich, in-depth perspectives from individuals directly involved in or knowledgeable about digital governance processes. The participants were purposefully selected from a diverse range of large organizations located in Tehran, including both public and private sector institutions that have undergone some form of digital transformation. A total of 17 individuals participated in the study. The selection was based on maximum variation sampling to ensure a comprehensive understanding of digital governance from multiple organizational settings, roles, and technological maturity levels. Participants included senior IT managers, digital transformation officers, strategic planners, and high-level administrators. The inclusion criteria required that participants have at least three years of experience with digital systems management or governance structures in their respective organizations.

### *Data Collection*

Data collection was carried out through semi-structured, in-depth interviews designed to allow participants the flexibility to articulate their experiences while guiding them toward key thematic areas relevant to digital governance. The interview protocol included open-ended questions that explored organizational structures, coordination mechanisms, digital policy

frameworks, and cross-departmental digital practices. Probing questions were used to delve deeper into participant insights and clarify emerging themes. Interviews were conducted face-to-face in Tehran between November 2024 and February 2025 and lasted between 45 to 75 minutes. Theoretical saturation was the guiding principle for determining the final number of interviews, with the 17th interview yielding no substantial new themes, signaling that data saturation had been achieved. All interviews were audio-recorded with participants’ consent and then transcribed verbatim for subsequent analysis.

*Data analysis*

Data analysis followed the principles of thematic content analysis using NVivo software (version 12) to manage and code the textual data. Initially, open coding was performed to generate preliminary codes directly from the text. These codes were then refined and grouped into categories based on conceptual similarity and frequency. The axial coding phase involved identifying connections between these categories to form broader thematic dimensions. Throughout the analysis, constant comparative methods were applied to identify patterns and contrasts across interviews. Memo-writing was used during analysis to track analytical decisions and maintain reflexivity. Credibility of the findings was enhanced through peer debriefing and participant validation, where selected participants were consulted to verify the interpretive accuracy of the themes. The final analytical outcome consisted of clearly defined structural dimensions that collectively captured the essence of digital governance in large organizations.

**Findings and Results**

The participants in this study consisted of 17 professionals working in large organizations across Tehran, selected based on their involvement in digital governance roles. Among them, 11 were male and 6 were female. The age range of participants was between 32 and 58 years, with the majority (n = 9) between the ages of 40 and 49. In terms of job position, 6 participants held senior managerial roles (e.g., Chief Information Officer or Digital Transformation Director), 7 were mid-level managers (e.g., IT operations leads, digital project managers), and 4 were technical experts or advisors involved in the implementation of digital governance systems. The participants represented various sectors, including public administration (n = 7), banking and finance (n = 4), telecommunications (n = 3), and large-scale retail and logistics (n = 3). The average work experience in digital-related positions was approximately 11 years, with a minimum of 5 years and a maximum of 24 years. All participants held at least a bachelor’s degree, and 10 of them possessed postgraduate qualifications in fields such as information systems, public administration, or digital innovation.

**Table 1**

*Themes, Subthemes, and Concepts Related to the Structural Dimensions of Digital Governance*

Category (Main Theme)	Subcategory (Subtheme)	Concepts (Open Codes)
1. Organizational Architecture	Centralization vs. Decentralization	Role-based access, Decision-making tiers, Delegation of authority, Dual reporting lines, Central IT control
	Digital Leadership Structures	Chief digital officer roles, Cross-unit leadership teams, Agile governance boards, Leadership buy-in
	Hierarchical Integration	Digital reporting chain, Integration with traditional structures, Top-down vs. bottom-up alignment
	Formalization of Digital Units	Official digital departments, Permanent vs. ad hoc task forces, Policy-driven mandates
	Interdepartmental Coordination Mechanisms	Task interdependence, Shared digital platforms, Synchronization protocols, Joint digital projects
	Structural Flexibility	Reconfigurable teams, Matrix structures, Role fluidity, Adaptive units
	Governance Committees	Steering groups, Advisory panels, Periodic review boards, Inclusion of stakeholders

2. Policy and Regulatory Alignment	Compliance with National Digital Policies	Adherence to e-government guidelines, Regulatory alignment, Cyber law compliance
	Internal Policy Frameworks	Digital usage policies, Data access rules, Internal regulations, Staff code of conduct
	Risk Management Structures	Cybersecurity protocols, Risk registers, Incident response teams, Risk escalation rules
	Data Governance Regulations	Data classification, Ownership protocols, Data ethics, GDPR compliance
3. Technological Integration Capacity	Change Management Policies	Communication plans, Stakeholder buy-in procedures, Resistance mitigation strategies
	IT Infrastructure Readiness	Cloud migration status, Server architecture, Hardware standardization, Network reliability
	Platform Interoperability	API-based systems, Legacy system integration, Cross-platform access, Standard protocols
	Digital Tool Adoption	Automation tools, Project management software, Communication apps, Usage metrics, Employee training levels
	Scalability and Upgradability	Modular architecture, Future-proofing, Scalability testing, Upgrade cycles
	Integration with Core Business Processes	Workflow digitization, ERP system linkage, Operational continuity, Process automation

The first main theme, Organizational Architecture, revealed several structural elements influencing digital governance in large organizations. The subtheme *Centralization vs. Decentralization* emerged as a key structural tension. Several organizations maintained centralized digital decision-making to ensure coherence and standardization, while others decentralized to encourage innovation at departmental levels. One participant noted, “Our IT unit controls everything centrally to prevent redundancies, but that slows us down when rapid decisions are needed”. Another added, “We’ve moved to a decentralized model where departments decide their digital paths, though it’s harder to maintain alignment”.

In terms of *Digital Leadership Structures*, respondents emphasized the increasing importance of dedicated leadership roles such as Chief Digital Officers and cross-functional digital teams. These roles were seen as crucial for orchestrating digital transformation efforts. As one interviewee put it, “The digital leadership team meets weekly to review progress—it’s our way of keeping things agile but strategic”.

The subtheme of *Hierarchical Integration* focused on how digital governance integrates with traditional organizational hierarchies. Many participants described a dual structure where digital functions operate both independently and through conventional reporting lines. One participant explained, “Although I report to the CIO, I also work closely with operational units—it’s a matrix that works when communication flows well”.

*Formalization of Digital Units* highlighted the extent to which digital governance structures were institutionalized. Some organizations had established permanent digital departments with formal mandates, while others relied on temporary task forces. As expressed by a participant, “Our digital team was initially a project group, but now it’s a full-fledged department with defined responsibilities”.

The subtheme *Interdepartmental Coordination Mechanisms* emphasized the tools and routines used to manage cross-unit digital efforts. Respondents cited joint digital platforms, interdepartmental steering groups, and shared KPIs as coordination tools. One IT manager remarked, “Digital governance doesn’t work unless finance, operations, and HR are all using the same tools and metrics”.

*Structural Flexibility* emerged as another subtheme, referring to the adaptability of teams and structures in response to digital needs. Organizations reported forming reconfigurable teams, often using matrix models. One participant stated, “Our structure changes with every new digital initiative—it keeps us flexible and project-focused”.

Finally, *Governance Committees* were seen as critical platforms for decision-making and accountability. These included steering groups, periodic review boards, and strategic advisory panels. As one leader described, “Our digital governance committee includes people from all major departments, which helps avoid resistance later on”.

The second major theme, Policy and Regulatory Alignment, captured the relationship between internal governance and external policy frameworks. The subtheme *Compliance with National Digital Policies* reflected how organizations align with national regulations. Participants mentioned efforts to adhere to Iran’s e-government guidelines and data protection laws. One interviewee commented, “We constantly monitor national updates—one policy change can alter our entire digital roadmap”.

*Internal Policy Frameworks* referred to organization-specific rules governing digital conduct. These included user access policies, data handling regulations, and behavior codes. One respondent emphasized, “Without strict internal digital policies, people start bending rules—especially in remote work settings”.

The subtheme *Risk Management Structures* focused on cybersecurity and risk mitigation mechanisms. Participants described formal structures such as incident response teams, risk audits, and predefined escalation protocols. A digital officer shared, “We run monthly risk simulations to ensure we’re ready for breaches—digital risk is no longer theoretical”.

*Data Governance Regulations* were another critical subtheme, addressing how data is classified, accessed, and ethically managed. Compliance with GDPR-style standards was noted. One IT executive said, “We now tag and categorize all data—if you don’t know what you’re handling, you can’t govern it properly”.

Lastly, *Change Management Policies* were central to ensuring employee and stakeholder buy-in during transitions. Participants described structured communication strategies and feedback loops. As one participant mentioned, “People don’t fear digital change if you bring them into the process early and communicate clearly”.

The third main theme, Technological Integration Capacity, concerned the technical backbone enabling digital governance. The subtheme *IT Infrastructure Readiness* explored the physical and virtual tools required for implementation. Respondents referenced cloud systems, hardware standards, and network reliability. One manager stated, “You can’t govern digitally if your infrastructure is 10 years old—it’s like trying to stream on dial-up”.

*Platform Interoperability* emerged as a key challenge. Participants discussed the struggle to integrate legacy systems with new platforms, often relying on APIs and middleware. An IT coordinator explained, “Our biggest hurdle is system incompatibility—half our tools don’t talk to each other”.

*Digital Tool Adoption* highlighted the importance of organizational culture in using digital tools effectively. Participants cited varying levels of adoption, training, and tool utilization. One participant noted, “Everyone has access to the same project management tool, but only some teams actually use it”.

The subtheme *Scalability and Upgradability* focused on system architecture’s ability to grow and evolve. Modular systems and future-proofing strategies were emphasized. A respondent remarked, “We design everything to scale—we can’t afford to rebuild from scratch every few years”.

Finally, *Integration with Core Business Processes* referred to the embedding of digital systems within operational workflows. Respondents highlighted ERP integrations and automated reporting tools. One participant concluded, “When digital tools mirror our actual work processes, adoption is immediate and natural”.

## Discussion and Conclusion

The findings of this study identified three core structural dimensions shaping digital governance in large organizations: organizational architecture, regulatory alignment, and technological integration capacity. These themes emerged through

qualitative analysis of semi-structured interviews with professionals directly involved in digital governance processes within large institutions in Tehran. Each dimension revealed internal arrangements, challenges, and enablers that contribute to or hinder effective digital governance. Together, they form a holistic understanding of how large organizations operationalize digital strategies, align with regulatory frameworks, and leverage technological tools to govern in increasingly complex digital ecosystems.

**Organizational architecture** was found to play a foundational role in digital governance. The structure and distribution of digital authority—particularly the balance between centralization and decentralization—were key issues across participants' accounts. While centralized structures allowed for greater standardization and control, decentralized approaches were praised for their responsiveness and flexibility. These findings align with prior work suggesting that digital governance benefits from hybrid structures that combine centralized strategic oversight with decentralized operational execution [3, 4]. Additionally, the formalization of digital leadership roles and units was highlighted as essential for ensuring that digital strategies receive organizational attention and authority. The appointment of Chief Digital Officers and the establishment of dedicated digital departments or governance committees mirror trends reported by Kristensen and Andersen [5], who argue that C-suite leadership is increasingly critical to successful digital transformation.

Participants also emphasized the importance of *interdepartmental coordination mechanisms*, such as joint digital platforms and integrated reporting systems, for fostering organizational cohesion. These mechanisms not only enable collaboration but also reduce friction caused by siloed decision-making. This resonates with findings from Capurro et al. [1], who observed that cross-functional structures enhance organizational capacity to manage digital complexity and align technological changes with broader corporate goals. Structural flexibility—seen in matrix teams and project-based arrangements—further supported digital responsiveness, confirming research by Lan [15], who underscores the value of adaptive governance models in responding to evolving digital demands.

The second major theme, **regulatory alignment**, underscored the influence of both external and internal policy environments on digital governance. Compliance with national digital policies, including cybersecurity frameworks and data protection laws, emerged as a significant concern among participants. Organizations that embedded national standards into their internal operations—through formal risk management systems, data governance protocols, and regulatory compliance units—were better equipped to navigate digital transitions. These insights are consistent with the work of Chen [7], who demonstrated how alignment with digital government policies enhances organizational efficiency and credibility. Similarly, Nasef et al. [11] found that institutional structural reform, including the incorporation of compliance units and legal review mechanisms, is central to sustainable digital governance.

Internal digital policies were equally significant in shaping governance outcomes. Rules governing data access, system usage, and digital ethics were frequently cited as essential to maintaining order and reducing operational risks. This finding aligns with Luciano et al. [4], who emphasized the role of formal internal policies in fostering collaborative digital governance and reducing institutional resistance. The presence of detailed change management protocols further reinforced participants' ability to manage resistance and foster stakeholder buy-in—particularly important in large, hierarchical organizations. These processes mirror the governance strategies identified by Lachana et al. [6], who highlight structured stakeholder engagement as a key component of effective digital governance.

The third theme, **technological integration capacity**, dealt with the infrastructural and systemic foundations that support governance. Participants highlighted the necessity of robust IT infrastructure, including cloud-based systems and reliable internal networks, to underpin governance activities. These findings are supported by Zhang et al. [12], who argue that technological maturity is a prerequisite for implementing governance frameworks in digital government environments. In particular, interoperability—defined as the seamless interaction between different digital systems—was repeatedly identified as both a goal and a persistent challenge. Participants noted the difficulties of integrating legacy systems with newer platforms, a challenge also reported by Huang [20], who found that structural incompatibility often impedes digital progress in agricultural and public sectors.

Tool adoption and scalability were additional subthemes that significantly impacted governance outcomes. Even when digital tools were available, their underutilization by staff due to lack of training or organizational support created governance bottlenecks. These findings are echoed by Wang et al. [19], who emphasize that effective governance is as much about usage behavior as it is about tool availability. Furthermore, scalability—the ability to expand or upgrade systems to meet future demands—was frequently described as a strategic imperative. Organizations that planned for future integration needs were more resilient in managing growth, which aligns with the digital sustainability principles outlined by Capurro et al. [1] and the forward-planning strategies suggested by Niu [21] in contexts of evolving digital economies.

A notable insight from this study is the interdependence among the three core dimensions. Organizational architecture, regulatory alignment, and technological capacity are not isolated components but mutually reinforcing domains. For instance, without a formal digital unit or leadership role, regulatory compliance may be sporadic or inconsistent. Similarly, without interoperable systems and staff adoption of tools, even the best-designed digital policies remain unimplemented. This systemic interdependence confirms the model proposed by Lin et al. [2], who view digital governance as a layered structure that requires alignment across organizational, legal, and technological tiers. The findings also support Wang's critique of "digital formalism," where policy implementation exists only symbolically unless reinforced by structural and technical foundations [9].

Another significant implication relates to cultural and contextual specificity. Several participants described tensions between top-down mandates and the need for bottom-up innovation—tensions also noted in the study by Tan and Fong [14], which explored how governance laws shape creative digital sectors. Similarly, Makasarashvili and Giguashvili [10] warned of institutional threats when digital governance is introduced without adapting to local organizational realities. In this study, Tehran-based organizations reflected a hybrid governance culture: rooted in centralized control yet pressured by the complexity of digital transformation to experiment with decentralized and flexible arrangements. These insights reflect broader regional challenges, as discussed in research on grass-roots digital governance and the role of leadership in dynamic environments [8, 15].

Despite its contributions, this study has several limitations. First, the research is based on a relatively small sample size of 17 participants, all located in Tehran, which may limit the generalizability of findings to other geographic regions or organizational cultures. Second, the qualitative design prioritizes depth over breadth and relies heavily on participants' subjective accounts, which may be influenced by positional biases or institutional rhetoric. Third, while the study captures a range of perspectives from various sectors, it does not include external stakeholders such as vendors, regulatory agencies, or end-users who may influence or be affected by digital governance practices. Lastly, the study was conducted within a specific

socio-political and regulatory context, which may differ significantly from environments in other countries undergoing digital transformation.

Future studies should consider expanding the scope of inquiry to include a larger and more diverse set of organizations, both within and outside of Tehran. Comparative studies across sectors—such as education, health, and defense—could help identify domain-specific governance structures and challenges. In addition, mixed-method approaches that combine qualitative interviews with document analysis or system audits could offer a more holistic view of governance practices. Research could also explore the longitudinal impact of digital governance structures on organizational performance, innovation capacity, and stakeholder satisfaction. Finally, future investigations might examine how cultural factors mediate the adoption and success of digital governance models in different national or organizational settings.

To enhance digital governance, organizations should prioritize the formalization of digital leadership roles and cross-functional governance units. Developing clear internal policies aligned with national digital regulations will help standardize practices and reduce legal risk. Investment in scalable, interoperable digital infrastructure must be matched with user training and adoption strategies to ensure that tools are effectively utilized. Finally, organizations should design governance systems that are flexible enough to support innovation while maintaining strategic oversight, thereby creating a balanced structure that can adapt to evolving digital demands.

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### **Authors' Contributions**

All authors equally contributed to this study.

### **Declaration of Interest**

The authors of this article declared no conflict of interest.

### **Ethical Considerations**

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Written consent was obtained from all participants in the study.

### **Transparency of Data**

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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