

Designing a Digital Leadership Maturity Model for Organizational Transformation

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Abstract

This study aimed to design a digital leadership maturity model for explaining how organizational leaders develop the strategic, cultural, technological, and governance capabilities required for successful organizational transformation. This qualitative study was conducted using an interpretive exploratory design. Participants were selected through purposive sampling from senior managers, digital transformation specialists, information technology executives, human resource managers, and organizational development consultants working in Tehran-based public and private organizations. Data were collected through semi-structured interviews until theoretical saturation was achieved. A total of 24 participants were interviewed, and the interviews lasted between 45 and 75 minutes. The interview protocol focused on leadership roles in digital transformation, digital decision-making, cultural readiness, data-driven management, employee capability development, governance mechanisms, and maturity indicators. All interviews were transcribed verbatim and analyzed using thematic analysis supported by NVivo software. To enhance trustworthiness, member checking, peer debriefing, code comparison, prolonged engagement with the data, and an audit trail were used. The analysis produced five main categories: digital strategic orientation, data-driven and AI-enabled decision governance, cultural and capability readiness, agile transformation orchestration, and ecosystem-based value creation. Based on these categories, a five-level maturity model was developed: digital awareness, fragmented experimentation, coordinated digital integration, adaptive digital leadership, and transformative digital ecosystem leadership. The findings showed that mature digital leadership is not limited to technology adoption but involves the alignment of leadership vision, organizational culture, decision architecture, learning systems, ethical governance, and external collaboration. The proposed model provides a qualitative framework for assessing and developing digital leadership maturity in organizations undergoing transformation. It can help managers identify leadership gaps, prioritize capability-building initiatives, and move from isolated digital projects toward integrated, adaptive, and value-oriented organizational transformation.

Keywords: digital leadership; maturity model; organizational transformation; digital transformation; qualitative research; NVivo; leadership capabilities.

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1. Introduction

Digital transformation has become one of the most consequential organizational phenomena of the contemporary business environment. It is no longer understood as the simple implementation of digital tools, automation systems, or information technologies; rather, it refers to a strategic and organization-wide transformation through which digital technologies reshape business models, operational processes, managerial routines, value creation mechanisms, and organizational identities. Vial (2019) conceptualized digital transformation as a process in which digital technologies trigger significant changes in organizational properties through the combined effects of information, computing, communication, and connectivity technologies. This view is important because it shifts attention from technology as an isolated resource to transformation as a systemic organizational process. Similarly, Bharadwaj et al. (2013) argued that digital business strategy has become embedded in corporate strategy, making digital transformation a strategic issue rather than a purely



technical concern. Consequently, organizations seeking sustainable transformation must develop not only digital infrastructure but also new leadership logics, governance arrangements, cultural assumptions, and dynamic capabilities.

Leadership is central to this transformation because digital change requires direction, meaning-making, prioritization, coordination, and capability development. Studies have repeatedly shown that digital maturity depends less on the mere availability of technology and more on the ability of leaders to create a shared vision, mobilize people, redesign processes, enable experimentation, and align digital initiatives with organizational strategy (Kane et al., 2015; Westerman et al., 2014). In digitally transforming organizations, leaders are expected to interpret technological opportunities, reduce uncertainty, balance exploration and exploitation, and create the conditions under which employees can learn, adapt, and collaborate across functional boundaries. El Sawy et al. (2016) described digital leadership as the capability to do the right things for the strategic success of digitalization. This definition emphasizes that digital leadership is not equivalent to technical expertise; rather, it involves strategic judgment, organizational design, and the capacity to connect technological possibilities with business value.

The growing literature on digital transformation highlights that leadership roles are changing in at least four major ways. First, leaders are moving from hierarchical command toward distributed orchestration. Digital transformation often involves cross-functional teams, agile structures, platform-based work, and rapid feedback loops, all of which reduce the effectiveness of rigid top-down control. Second, leaders are increasingly expected to use data and analytics in decision-making while maintaining human judgment, ethical responsibility, and contextual awareness. Third, leaders must cultivate digital culture by encouraging experimentation, learning from failure, knowledge sharing, and openness to change. Fourth, leaders must engage with broader ecosystems of customers, suppliers, start-ups, technology partners, regulators, and digital platforms. Warner and Wäger (2019) showed that digital transformation requires dynamic capabilities related to digital sensing, digital seizing, and digital transforming. These capabilities are leadership-dependent because they require organizations to recognize emerging opportunities, mobilize resources, and reconfigure structures and routines.

Despite these developments, many organizations still approach digital transformation through fragmented initiatives. They invest in enterprise systems, data platforms, automation tools, artificial intelligence applications, or customer-facing digital channels without developing the leadership maturity required to integrate these initiatives into coherent transformation programs. As a result, digital projects may remain isolated, symbolic, or technology-driven. This problem is especially visible in organizations where digitalization is delegated to information technology departments while senior leadership remains insufficiently involved in strategic alignment, cultural change, employee readiness, governance, and performance evaluation. Porfirio et al. (2021) found that digital transformation depends on the alignment among digital strategy, corporate strategy, business strategy, and management characteristics. This suggests that leadership maturity is a critical condition for moving from digital adoption to organizational transformation.

A maturity model can help address this gap by providing a structured framework for assessing developmental stages, identifying capability gaps, and guiding improvement. Maturity models have been widely used in information systems, project management, process management, and digital transformation studies because they translate complex organizational capabilities into progressive levels of development. Becker et al. (2009) argued that maturity models should be theoretically grounded, methodologically transparent, and useful for evaluation

and improvement. In this sense, a digital leadership maturity model should not merely list leadership traits; it should describe how leadership capabilities evolve from initial awareness to advanced transformation capacity. Such a model can support organizations in diagnosing their current digital leadership condition, defining desired future states, and designing targeted interventions for leadership development.

However, existing maturity models often focus on technology infrastructure, digital processes, data management, or organizational readiness rather than the leadership capabilities that enable transformation. While digital maturity models usually assess dimensions such as strategy, technology, customer experience, operations, and culture, they may not sufficiently explain how leaders create alignment among these dimensions or how leadership itself matures over time. This limitation creates a theoretical and practical need for a leadership-centered maturity model that captures the developmental path of digital leadership in organizational transformation. Such a model should explain what leaders do at different maturity levels, how they make decisions, how they govern digital initiatives, how they cultivate digital culture, and how they transform organizational systems.

The qualitative approach is particularly appropriate for designing such a model because digital leadership maturity is a socially constructed, context-dependent, and process-oriented phenomenon. Leaders and transformation actors experience digital change through uncertainty, resistance, experimentation, negotiation, and learning. Quantitative measures can capture the extent of certain capabilities, but they may not fully explain how these capabilities emerge, interact, and develop in practice. Qualitative inquiry allows researchers to explore the meanings, experiences, and interpretations of participants who are directly involved in digital transformation. It also enables the identification of categories and relationships that may not yet be sufficiently theorized in existing literature. Gioia et al. (2013) emphasized the value of inductive qualitative research for developing new concepts and theoretical structures from organizational actors' lived experiences.

In the context of Tehran-based organizations, the development of a digital leadership maturity model is especially relevant. Organizations operating in emerging and transitional economies often face simultaneous pressures: technological modernization, resource constraints, regulatory complexity, workforce skill gaps, market volatility, and institutional uncertainty. These conditions make digital transformation not only a technological challenge but also a leadership challenge. Leaders must manage ambiguity, align stakeholders, prioritize investments, overcome cultural resistance, and build capabilities under conditions of limited predictability. Therefore, understanding how digital leadership maturity develops in such organizations can contribute both to local managerial practice and to the broader international literature on digital transformation.

The present study addresses this gap by designing a digital leadership maturity model for organizational transformation based on qualitative data from managers and digital transformation experts in Tehran. The study seeks to identify the main categories, indicators, and developmental levels of digital leadership maturity. By integrating participant experiences with relevant theoretical insights from digital transformation, digital leadership, dynamic capabilities, and maturity-model research, the study contributes a practical and conceptually grounded framework for assessing and improving leadership maturity in digital transformation contexts. Therefore, the aim of this study was to design a digital leadership maturity model for organizational transformation based on the lived experiences and expert interpretations of managers and digital transformation professionals in Tehran.

2. Methods and Materials

This study employed a qualitative exploratory design to develop a digital leadership maturity model for organizational transformation. The qualitative approach was selected because the purpose of the study was not to test a predefined hypothesis but to identify, interpret, and organize the leadership capabilities, maturity indicators, and transformation mechanisms experienced by organizational actors. The research was conducted in Tehran among managers and experts who had direct experience with digital transformation initiatives in public, private, and semi-public organizations. Participants were selected through purposive sampling based on their knowledge of digital transformation, leadership development, organizational change, information systems, human resource development, strategy, or digital governance.

The final sample consisted of 24 participants. The inclusion criteria were: at least five years of managerial or professional experience, direct involvement in at least one digital transformation or digitalization project, familiarity with organizational leadership processes, and willingness to participate in a recorded semi-structured interview. Participants included chief information officers, digital transformation managers, senior human resource managers, organizational development consultants, strategy managers, operations managers, and executive-level decision-makers. Sampling continued until theoretical saturation was reached, meaning that additional interviews no longer produced substantially new categories or conceptual relationships. Saturation was observed after the twenty-first interview, and three additional interviews were conducted to confirm the stability of the emerging categories. This procedure is consistent with qualitative research guidance suggesting that saturation can often be reached within relatively small but information-rich samples when the participant group is sufficiently focused (Guest et al., 2006; Hennink & Kaiser, 2022).

Data were collected using semi-structured interviews. The interview protocol was developed based on the literature on digital transformation, digital leadership, maturity models, and organizational change. The protocol included open-ended questions such as: “How do you define digital leadership in your organization?”, “What leadership capabilities are necessary for successful digital transformation?”, “How can an organization recognize that its digital leadership has become mature?”, “What barriers prevent leaders from advancing digital transformation?”, “How do leaders use data and digital technologies in decision-making?”, and “What stages do organizations pass through as their digital leadership capabilities develop?” Follow-up questions were used to clarify meanings, obtain examples, and deepen participants’ explanations.

The interviews lasted between 45 and 75 minutes. With participants’ consent, all interviews were audio-recorded and transcribed verbatim. Field notes were also taken after each interview to capture contextual observations, initial analytic impressions, and emerging ideas. The data collection process was iterative; early interviews informed later questions, allowing the researcher to explore emerging categories in greater depth. Participants were assured of confidentiality, and all names and organizational identifiers were removed from the transcripts. Each participant was assigned a code from P1 to P24.

Data were analyzed using thematic analysis supported by NVivo software. The analysis followed a systematic process consisting of familiarization with the data, initial coding, searching for themes, reviewing themes, defining and naming themes, and producing the final analytic narrative, consistent with Braun and Clarke’s (2006) approach. In the first phase, transcripts were read repeatedly to gain an overall understanding of participants’

experiences. In the second phase, meaningful segments of text were coded line by line. Initial codes included expressions such as “digital vision gap,” “fragmented digital projects,” “data-based decision-making,” “resistance to digital change,” “leadership learning,” “AI governance,” “cross-functional collaboration,” “employee digital capability,” and “ecosystem partnership.”

In the third phase, similar codes were grouped into broader categories. NVivo was used to organize codes, compare coding patterns, retrieve excerpts, and develop category structures. Through constant comparison, five main categories were identified: digital strategic orientation, data-driven and AI-enabled decision governance, cultural and capability readiness, agile transformation orchestration, and ecosystem-based value creation. These categories were then used to construct a five-level maturity model: digital awareness, fragmented experimentation, coordinated digital integration, adaptive digital leadership, and transformative digital ecosystem leadership.

To enhance the trustworthiness of the study, several strategies were used. Credibility was strengthened through member checking, in which selected participants reviewed summaries of the findings and confirmed the accuracy of interpretations. Dependability was supported through an audit trail documenting sampling decisions, interview procedures, coding steps, and category development. Confirmability was enhanced through peer debriefing with two qualitative research experts who reviewed the coding logic and category structure. Transferability was supported by providing detailed descriptions of participants, context, data collection procedures, and analytic decisions. These procedures are consistent with Lincoln and Guba’s (1985) criteria for qualitative rigor.

3. Findings and Results

The participants included 24 professionals from Tehran-based organizations. Of these, 15 participants were male and 9 were female. In terms of organizational role, 6 participants were senior executives, 5 were digital transformation managers, 4 were information technology managers, 3 were human resource managers, 3 were organizational development consultants, and 3 were strategy or operations managers. Regarding organizational sector, 9 participants worked in private companies, 8 in public or governmental organizations, and 7 in semi-public or large institutional organizations. Participants’ professional experience ranged from 6 to 24 years, with an average of approximately 13 years. In terms of educational background, 5 participants held bachelor’s degrees, 14 held master’s degrees, and 5 held doctoral degrees. This demographic diversity allowed the study to capture multiple perspectives on digital leadership maturity across strategic, technological, cultural, and operational dimensions.

The first main category was **digital strategic orientation**. Participants emphasized that the earliest indicator of digital leadership maturity is the ability of leaders to move beyond technology acquisition and define a clear strategic logic for digital transformation. At lower maturity levels, organizations often treated digital projects as isolated technical upgrades, while mature organizations connected digital initiatives to business model innovation, customer value, operational redesign, and long-term competitiveness. One participant stated, “In many organizations, digital transformation starts with buying software, but mature leadership starts with asking why the organization must become digital and what kind of value it wants to create” (P7). Another participant explained, “When the CEO understands digital transformation as a strategic agenda, departments stop competing for separate systems and begin to work around a shared roadmap” (P12). This category included subthemes such as digital vision, strategic alignment, executive commitment, digital investment prioritization, and transformation roadmap

development. The findings suggest that digital leadership maturity begins when leaders frame digitalization as a strategic transformation rather than a technical project.

The second main category was **data-driven and AI-enabled decision governance**. Participants argued that mature digital leadership requires leaders to redesign decision-making processes around data, analytics, transparency, and ethical accountability. In immature organizations, decisions were often based on hierarchy, intuition, personal experience, or fragmented reports. In more mature organizations, leaders used dashboards, predictive analytics, customer data, operational data, and AI-supported tools to improve decision quality. However, participants also stressed that data-driven leadership does not mean blind reliance on algorithms. One participant noted, “Data helps us see patterns, but leadership is still responsible for judgment, ethics, and consequences” (P3). Another participant added, “The real maturity is not having AI tools; it is knowing who is accountable when AI recommendations affect employees, customers, or budgets” (P18). This category included subthemes such as analytics-based decision-making, AI governance, data quality, accountability, transparency, cybersecurity awareness, and ethical leadership. The findings indicate that digital leadership maturity requires a balance between technological intelligence and human responsibility.

The third main category was **cultural and capability readiness**. Participants consistently described culture and human capability as decisive conditions for digital transformation. Many organizations had digital tools but lacked employees who were willing or able to use them effectively. Participants explained that mature digital leaders create psychological readiness by reducing fear, supporting continuous learning, rewarding experimentation, and communicating the purpose of change. One participant stated, “Employees do not resist technology itself; they resist being ignored, replaced, or blamed during change” (P5). Another participant said, “Digital maturity grows when leaders make learning normal. People should not feel ashamed that they do not know a new system” (P21). This category included subthemes such as employee digital literacy, learning culture, psychological safety, resistance management, empowerment, collaboration, and talent development. The findings show that digital leadership maturity depends heavily on leaders’ ability to develop people, not merely systems.

The fourth main category was **agile transformation orchestration**. Participants reported that mature digital leaders act as orchestrators who coordinate cross-functional teams, iterative projects, rapid feedback, and continuous improvement. In low-maturity organizations, digital initiatives were described as slow, bureaucratic, and departmentally fragmented. In higher-maturity organizations, leaders used agile governance, pilot projects, experimentation cycles, and flexible resource allocation to accelerate transformation. One participant explained, “Digital transformation cannot be managed with old administrative rhythms. Leaders must create faster loops between decision, testing, feedback, and correction” (P10). Another participant stated, “The mature leader does not control every detail; he creates the conditions for teams to solve problems quickly and transparently” (P16). This category included subthemes such as agile project governance, cross-functional coordination, iterative implementation, resource flexibility, performance monitoring, and learning from failure. The findings suggest that digital leadership maturity involves shifting from command-based management to adaptive orchestration.

The fifth main category was **ecosystem-based value creation**. Participants emphasized that the most advanced level of digital leadership maturity occurs when organizations extend transformation beyond internal processes and create value through digital ecosystems. Mature leaders were described as boundary spanners who collaborate with technology vendors, start-ups, universities, regulators, customers, and platform partners. One participant stated, “No organization can complete digital transformation alone. Mature leadership knows how to build

partnerships and learn from the ecosystem” (P9). Another participant observed, “At the highest level, digital leadership is not only about improving the organization; it is about positioning the organization inside a network of digital value creation” (P23). This category included subthemes such as external collaboration, platform thinking, customer co-creation, innovation networks, regulatory alignment, and ecosystem learning. The findings show that digital leadership maturity progresses from internal digital coordination toward ecosystem-level transformation.

Based on the five categories, the study developed a five-level digital leadership maturity model. **Level 1, digital awareness**, refers to organizations in which leaders recognize the importance of digital transformation but lack a coherent strategy, governance structure, or capability-development plan. **Level 2, fragmented experimentation**, refers to organizations that conduct isolated digital projects without sufficient integration across departments. **Level 3, coordinated digital integration**, refers to organizations in which leaders align digital initiatives with strategy, establish governance mechanisms, and develop shared digital processes. **Level 4, adaptive digital leadership**, refers to organizations in which leaders use data-driven decision-making, agile structures, continuous learning, and cross-functional collaboration to guide transformation. **Level 5, transformative digital ecosystem leadership**, refers to organizations in which leaders use digital capabilities to redesign business models, create ecosystem partnerships, institutionalize ethical AI governance, and generate sustainable value beyond organizational boundaries.

4. Discussion and Conclusion

The purpose of this study was to design a digital leadership maturity model for organizational transformation. The findings produced five main categories: digital strategic orientation, data-driven and AI-enabled decision governance, cultural and capability readiness, agile transformation orchestration, and ecosystem-based value creation. These categories formed the basis of a five-level maturity model moving from digital awareness to transformative digital ecosystem leadership. Overall, the findings indicate that digital leadership maturity is a multidimensional and developmental capability. It does not emerge simply because an organization adopts new technologies; rather, it develops when leaders progressively align strategy, culture, decision-making, governance, learning, and ecosystem collaboration.

The first finding showed that digital strategic orientation is the foundation of digital leadership maturity. Participants emphasized that immature organizations often confuse digital transformation with software acquisition or process automation, whereas mature organizations connect digital initiatives to strategic value creation. This finding is consistent with Vial (2019), who argued that digital transformation involves significant changes in organizational properties rather than isolated technological adoption. It also supports Bharadwaj et al. (2013), who argued that digital business strategy must be integrated with organizational strategy. Similarly, Kane et al. (2015) found that digitally mature organizations are distinguished by strategy, talent, and culture more than by technology alone. The present study extends this literature by showing that strategic orientation is not merely a planning function but a maturity indicator of leadership. At the lowest level, leaders may be aware of digital trends but unable to translate them into a coherent transformation agenda. At higher levels, leaders create shared direction, prioritize digital investments, and align digital transformation with business model renewal.

The second finding highlighted data-driven and AI-enabled decision governance as a core dimension of digital leadership maturity. Participants described mature leaders as those who use data, analytics, and AI-supported systems to improve decision-making while also maintaining accountability, ethical judgment, and transparency. This finding aligns with the broader literature on digital transformation, which emphasizes the role of data as a strategic asset and analytics as a source of organizational intelligence. However, the findings also show that data-driven leadership cannot be reduced to technical analytics capability. Leaders must design governance mechanisms that clarify who owns data, who interprets algorithmic outputs, how risks are controlled, and how ethical consequences are evaluated. This is consistent with Westerman et al. (2014), who emphasized that digital transformation requires strong leadership capabilities to turn digital investments into organizational advantage. The present study contributes to this discussion by positioning AI governance and accountability as advanced maturity indicators of digital leadership.

The third finding showed that cultural and capability readiness is essential for digital leadership maturity. Participants repeatedly stated that digital transformation fails when employees experience fear, confusion, skill gaps, or exclusion from decision-making. Mature leaders were described as those who build learning cultures, normalize experimentation, support digital literacy, and reduce resistance through communication and participation. This result is consistent with Warner and Wäger's (2019) view that digital transformation requires dynamic capabilities that allow organizations to sense, seize, and transform in response to technological change. Such capabilities depend on people's willingness and ability to learn. The finding also aligns with Porfirio et al. (2021), who emphasized the importance of management characteristics and strategic alignment in digital transformation. The present study extends these findings by showing that leadership maturity is expressed through the ability to create psychological safety and capability development, especially in contexts where employees may perceive digitalization as a threat to job security or professional identity.

The fourth finding identified agile transformation orchestration as a major category of digital leadership maturity. Participants explained that mature leaders do not manage digital transformation through rigid bureaucratic control; instead, they coordinate teams, accelerate feedback loops, support experimentation, and create adaptive governance structures. This finding supports the argument that digital transformation requires organizational agility and continuous reconfiguration. Warner and Wäger (2019) similarly showed that digital transformation involves dynamic capabilities that enable firms to reconfigure resources and routines. The present study adds that such reconfiguration is strongly dependent on leadership orchestration. Leaders must connect strategy with implementation, remove barriers between departments, allocate resources flexibly, and support iterative learning. In this sense, mature digital leadership is neither purely top-down nor fully decentralized; it is an orchestration capability that balances direction with autonomy.

The fifth finding showed that ecosystem-based value creation represents the most advanced level of digital leadership maturity. Participants explained that mature digital leaders look beyond internal transformation and position the organization within broader digital ecosystems. This includes collaboration with technology partners, customers, start-ups, universities, regulators, and platform actors. This finding is consistent with digital transformation research showing that value creation increasingly occurs across networks, platforms, and ecosystems rather than within isolated organizational boundaries. El Sawy et al. (2016) showed that digital leadership involves enterprise-level capabilities that connect digital foundations with strategic transformation. The present study extends this idea by suggesting that the highest level of maturity is reached when leaders use digital

capabilities to participate in ecosystem-level innovation and value creation. This finding is particularly important for organizations operating in uncertain environments, where external collaboration can compensate for internal resource limitations and accelerate organizational learning.

The proposed five-level maturity model contributes to the literature by integrating leadership, maturity, and transformation perspectives. Previous maturity models have often focused on technological infrastructure, process optimization, or organizational readiness. While these dimensions are important, they do not fully capture the leadership mechanisms through which organizations move from fragmented digital projects to integrated transformation. Becker et al. (2009) emphasized that maturity models should provide theoretically grounded and practically useful pathways for development. The model developed in this study responds to that requirement by describing how digital leadership capabilities evolve across five levels. At Level 1, leaders are aware of digital transformation but lack coherent action. At Level 2, organizations experiment with digital tools in fragmented ways. At Level 3, leaders coordinate digital integration through strategy and governance. At Level 4, leaders develop adaptive capabilities through data, agility, and learning. At Level 5, leaders create ecosystem value through digital platforms, partnerships, and ethical governance.

Ethical Considerations

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

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Conflict of Interest

The authors report no conflict of interest.

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