

Exploring the DNA of Future Leadership: A Qualitative Study of Competencies for Next-Generation Management Systems

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Abstract

This study aimed to explore the core leadership competencies required for next-generation management systems in digitally transforming, adaptive, and human-centered organizations. This qualitative study was conducted using an interpretive exploratory design. Participants included 22 senior managers, digital transformation leaders, organizational development specialists, and human resource executives working in public and private organizations in Tehran. Participants were selected through purposive sampling based on their direct experience with leadership development, digital transformation, innovation management, or organizational redesign. Data were collected through semi-structured interviews lasting 45 to 75 minutes. Theoretical saturation was reached after the twentieth interview, and two additional interviews were conducted to confirm conceptual adequacy. Interviews were audio-recorded, transcribed verbatim, and analyzed through open, axial, and selective coding using NVivo software. Trustworthiness was enhanced through member checking, peer review, prolonged engagement with the data, and maintaining an audit trail. Analysis of the interviews produced five main categories representing the “DNA” of future leadership: digital–strategic intelligence, adaptive systems thinking, human-centered empowerment, ethical and responsible decision-making, and collaborative innovation orchestration. Participants emphasized that next-generation leaders must move beyond command-and-control models and act as architects of intelligent, participatory, and resilient organizational systems. The findings showed that future leadership is not merely a set of individual traits but a dynamic configuration of cognitive, technological, relational, ethical, and systemic competencies. The study concludes that leadership for next-generation management systems requires an integrated competency model that combines technological literacy with human-centered judgment, adaptability, ethical awareness, and ecosystem-level collaboration. These findings contribute to leadership theory by conceptualizing future leadership as a systemic capability embedded in intelligent organizational architecture rather than as a purely individual managerial attribute.

Keywords: future leadership; next-generation management systems; digital transformation; leadership competencies; qualitative research; intelligent organizations; organizational adaptability

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1. Introduction

Digital transformation has become one of the most consequential forces reshaping contemporary organizations. It is no longer limited to the implementation of new technologies or the automation of existing routines; rather, it refers to a broad organizational transformation in which digital technologies alter value creation, coordination mechanisms, decision-making processes, organizational structures, and relationships with stakeholders (Vial, 2019; Verhoef et al., 2021). Cloud computing, artificial intelligence, data analytics, digital platforms, algorithmic systems, and networked communication infrastructures have transformed the nature of managerial work by increasing speed, transparency, interdependence, and uncertainty. As organizations become more digitally embedded, leadership is increasingly exercised in contexts where information flows rapidly, expertise is distributed across human and non-human actors, and traditional boundaries between strategy, technology, people, and operations become less stable (Cortellazzo et al., 2019; Kane et al., 2019).



The leadership implications of digital transformation are profound. Previous research has shown that digital transformation requires more than technological investment; it depends on leadership capabilities, organizational culture, strategic agility, learning processes, and the ability to mobilize people around uncertain and evolving futures (Warner & Wäger, 2019; Westerman et al., 2014). Leaders are expected to create digital vision, enable innovation, manage resistance, coordinate cross-functional collaboration, interpret data, and build cultures that support experimentation and adaptation. However, these expectations do not simply add new tasks to an unchanged leadership role. They alter the meaning of leadership itself. In digitally transforming organizations, leaders may no longer be recognized primarily as controllers, planners, or holders of superior expertise. Instead, they are increasingly expected to act as facilitators, sensemakers, ecosystem builders, ethical interpreters, and orchestrators of human–technology collaboration (Avolio et al., 2000; Cortellazzo et al., 2019).

This shift raises an important identity-related question: what happens to leaders' understanding of themselves when the foundations of their authority, expertise, and influence are transformed? Leadership identity refers to the extent to which individuals define themselves, and are recognized by others, as leaders (Day & Harrison, 2007; DeRue & Ashford, 2010). It is not a fixed personal trait but a socially constructed, relational, and evolving self-understanding. Individuals come to see themselves as leaders through internal self-definition, social recognition, role expectations, organizational narratives, and repeated interactions in which leadership is claimed and granted (DeRue & Ashford, 2010; Epitropaki et al., 2017). Leadership identity is therefore constructed at the intersection of personal meaning, relational validation, and organizational context.

2. Methods and Materials

This study used a qualitative exploratory design to investigate the competencies required for future leadership in next-generation management systems. A qualitative approach was appropriate because the phenomenon under investigation was complex, multidimensional, and insufficiently understood in the specific organizational context of Tehran. Rather than testing predefined hypotheses, the study sought to generate an interpretive understanding of how experienced managers and organizational experts conceptualize future leadership competencies. The study was informed by inductive thematic analysis and qualitative coding procedures associated with grounded theory logic, particularly open coding, axial coding, and selective integration of categories (Charmaz, 2014; Corbin & Strauss, 2015). This approach enabled the researcher to move from participants' lived managerial interpretations toward a conceptual model of leadership competency categories.

The participants consisted of 22 organizational experts working in Tehran. They included senior managers, human resource executives, digital transformation managers, innovation consultants, organizational development specialists, and university-affiliated management experts with applied experience in leadership development or management system redesign. Participants were selected using purposive sampling. The inclusion criteria were at least seven years of professional experience, direct involvement in leadership development or organizational transformation projects, familiarity with digital or intelligent management systems, and willingness to participate in an in-depth interview. Individuals who lacked direct managerial or advisory experience in organizational transformation were excluded. The final sample size was determined by theoretical saturation. Saturation was reached after the twentieth interview when no substantially new codes or categories emerged. Two additional interviews were conducted to confirm category stability and conceptual adequacy.

Data were collected through semi-structured interviews. The interview protocol was designed around broad guiding questions while allowing flexibility for probing and follow-up questions. The main interview questions included: “What competencies will leaders need in future management systems?”, “How are leadership roles changing in digitally transforming organizations?”, “What distinguishes future leaders from traditional managers?”, “How should leaders manage the relationship between human employees and intelligent technologies?”, and “What ethical, cultural, and strategic capabilities are necessary for next-generation organizations?” Depending on participants’ responses, additional probes were used to clarify examples, experiences, organizational challenges, and competency meanings. Interviews lasted between 45 and 75 minutes and were conducted in Persian. All interviews were audio-recorded with participants’ consent and then transcribed verbatim.

Data analysis was conducted using NVivo software. The analysis began with repeated reading of the interview transcripts to develop familiarity with the data. In the first stage, open coding was used to identify meaningful units related to leadership competencies, future management systems, digital transformation, organizational adaptability, and human-centered leadership. Initial codes included items such as “digital vision,” “ecosystem thinking,” “ethical use of data,” “empowering teams,” “learning agility,” “scenario thinking,” “AI literacy,” “cross-functional collaboration,” and “resilience under uncertainty.” In the second stage, similar codes were compared, merged, and organized into broader subcategories. In the third stage, axial coding was used to identify relationships among subcategories and to construct main categories. Finally, selective coding was used to integrate the findings into five core categories representing the DNA of future leadership.

Several strategies were used to enhance trustworthiness. Credibility was supported through member checking, in which selected participants reviewed summaries of the interpreted findings and confirmed their relevance. Peer review was used by asking two qualitative research experts to review the coding structure and category labels. Dependability was enhanced through maintaining an audit trail that documented sampling decisions, coding steps, category development, and analytic memos. Confirmability was strengthened by preserving raw transcripts, coding notes, and reflexive memos. Transferability was supported by providing detailed descriptions of the participants, organizational context, and data collection procedures. Ethical considerations were also observed. Participants were informed about the purpose of the study, confidentiality of responses, voluntary participation, and their right to withdraw at any stage. Participant names were replaced with codes such as P01, P02, and P03.

3. Findings and Results

The participants included 22 experts from organizations located in Tehran. Of these, 14 participants were male and 8 were female. In terms of age, 5 participants were between 30 and 39 years old, 11 were between 40 and 49 years old, and 6 were 50 years old or above. Regarding education, 4 participants held master’s degrees and 18 held doctoral degrees or were doctoral candidates in management, organizational behavior, human resource management, information systems, or related fields. In terms of professional role, 6 participants were senior organizational managers, 5 were human resource or leadership development managers, 4 were digital transformation managers, 4 were organizational development consultants, and 3 were academic experts with executive consulting experience. Participants’ professional experience ranged from 8 to 28 years, with an average of approximately 16 years. Sector distribution included banking and financial services ($n = 5$), technology and

telecommunications (n = 4), public administration (n = 4), manufacturing and industrial organizations (n = 3), higher education and research institutions (n = 3), and management consulting firms (n = 3).

Digital-strategic intelligence emerged as the first main category and referred to the leader's ability to understand technological change, interpret its strategic implications, and translate it into an organizational direction. Participants repeatedly emphasized that future leaders do not need to become technical specialists, but they must understand the logic, risks, and opportunities of digital technologies. This category included subcategories such as digital literacy, strategic foresight, data-informed decision-making, AI awareness, and technology-strategy alignment. One participant stated, "The future leader is not the person who knows every software, but the person who understands what technology can change in the business model" (P07). Another participant explained, "A traditional manager waits for IT to explain the future, but a future leader asks strategic questions about data, automation, and customer experience before the crisis arrives" (P14). This category shows that future leadership requires a cognitive shift from operational supervision to strategic interpretation of technological ecosystems.

Adaptive systems thinking was the second main category and referred to the capacity to understand organizations as dynamic systems rather than fixed hierarchies. Participants argued that next-generation management systems will require leaders who can recognize interdependencies among strategy, structure, culture, technology, employees, customers, and external stakeholders. This category included learning agility, complexity awareness, scenario thinking, resilience, and the ability to manage paradoxes. One participant noted, "In the future, leaders cannot solve problems by looking at one department. Every decision creates a chain reaction in technology, people, finance, and culture" (P03). Another participant stated, "The leader of tomorrow must be comfortable with incomplete information. Waiting for certainty means losing the opportunity to adapt" (P19). Participants also emphasized that adaptive leaders must create flexible structures, encourage experimentation, and tolerate constructive ambiguity. Therefore, this competency category reflects a movement from linear planning toward systemic adaptation.

Human-centered empowerment constituted the third main category and described the ability to develop people, distribute authority, and preserve human agency in technology-intensive organizations. Participants believed that the future of management systems should not be reduced to automation or algorithmic control. Instead, technology should enhance human creativity, judgment, and collaboration. This category included psychological safety, coaching, talent development, inclusive leadership, autonomy support, and emotional intelligence. One participant explained, "If artificial intelligence becomes stronger, the human role must also become stronger; otherwise, the organization becomes technically advanced but socially weak" (P11). Another participant observed, "Future leadership means giving people the confidence to work with uncertainty, not simply giving them instructions" (P05). Participants also linked empowerment to generational change, arguing that younger employees expect participation, feedback, flexibility, and meaningful work. Thus, future leaders must design environments in which people are trusted as contributors to organizational intelligence.

Ethical and responsible decision-making emerged as the fourth category and referred to the leader's ability to make decisions that are transparent, fair, accountable, and socially responsible in complex technological environments. Participants emphasized that the increased use of data, algorithms, surveillance systems, and AI-based decision tools creates new ethical challenges for leaders. This category included data ethics, transparency, privacy protection, fairness, stakeholder responsibility, and moral courage. One participant stated, "The future

leader must ask not only whether a technology is efficient, but whether it is fair and whether people understand how decisions are made” (P16). Another participant said, “A system can be smart and still be harmful if nobody is responsible for its consequences” (P21). Participants stressed that responsible leadership will become increasingly important because intelligent management systems can produce invisible forms of bias, exclusion, or control. Therefore, ethical competence was viewed not as an optional personal virtue but as a core leadership requirement for next-generation organizations.

Collaborative innovation orchestration was the fifth main category and referred to the leader’s ability to mobilize diverse actors, connect knowledge across boundaries, and coordinate innovation within and beyond the organization. Participants described future leaders as orchestrators of ecosystems rather than controllers of isolated departments. This category included cross-functional collaboration, network building, knowledge integration, co-creation, partnership management, and innovation facilitation. One participant explained, “No organization can create the future alone. The future leader must connect startups, universities, customers, employees, and technology partners” (P09). Another participant stated, “Innovation is no longer the responsibility of one R&D unit. It is a network process, and leadership means making that network work” (P18). Participants also emphasized that collaboration requires communication skills, trust-building, conflict management, and the ability to translate between different professional languages. This finding suggests that next-generation leadership involves the orchestration of collective intelligence across organizational and ecosystem boundaries.

4. Discussion and Conclusion

The purpose of this study was to explore the core competencies that constitute the DNA of future leadership for next-generation management systems. The findings identified five main competency categories: digital–strategic intelligence, adaptive systems thinking, human-centered empowerment, ethical and responsible decision-making, and collaborative innovation orchestration. Together, these categories show that future leadership is not defined by a single skill set or leadership style. Rather, it is a multidimensional competency architecture that enables leaders to guide organizations through technological complexity, human transformation, ethical uncertainty, and ecosystem-level innovation. The results support the argument that next-generation management systems require leaders who can integrate digital capability with strategic judgment, adaptive learning, human development, moral responsibility, and collaborative value creation.

The first finding, digital–strategic intelligence, aligns with prior research emphasizing the role of digital vision and digital knowledge in transformation leadership. Imran et al. (2020) identified digital vision, digital knowledge, failing fast, empowerment, and managing diverse teams as key competencies for digital transformation leadership. Similarly, Schiuma et al. (2024) argued that transformative leadership in the digital age requires leaders who can guide organizational transformation through competencies such as pragmatic action, communication, facilitation, sustainability orientation, and informed decision-making. The present study extends these findings by showing that digital competence is not simply technical literacy. Participants emphasized that future leaders must interpret technology strategically and connect digital possibilities to business model renewal, organizational culture, and stakeholder value. This supports Müller et al.’s (2024) contingency view that leadership competencies for digital transformation vary according to transformation goals and require balanced portfolios of technical, business, and people-oriented capabilities.

The second finding, adaptive systems thinking, is consistent with complexity leadership theory and research on organizational adaptability. Uhl-Bien and Arena (2018) argued that adaptive leadership requires creating spaces where novel ideas can interact with operational systems and eventually scale into organizational capabilities. This study supports that view by showing that participants associated future leadership with the ability to understand interdependence, manage paradox, and act under uncertainty. The emphasis on adaptive systems thinking also reflects dynamic capabilities theory, which conceptualizes organizational survival and renewal as dependent on the ability to sense, seize, and transform resources in changing environments (Teece et al., 1997; Teece, 2007). However, the findings add a qualitative leadership perspective by showing that these dynamic capabilities depend on leaders' cognitive capacity to think systemically, anticipate indirect consequences, and redesign organizational routines. Future leadership therefore requires a shift from linear problem-solving to systemic sensemaking.

The third finding, human-centered empowerment, confirms that next-generation leadership must preserve and develop human agency in digitally advanced organizations. This finding is strongly aligned with the Industry 5.0 perspective, which emphasizes human-centricity, sustainability, and resilience rather than technology-driven efficiency alone (Breque et al., 2021). Participants repeatedly warned that advanced technologies can weaken organizations if employees lose autonomy, meaning, creativity, or trust. This finding is also consistent with transformational leadership theory, particularly the dimensions of individualized consideration and intellectual stimulation (Bass & Riggio, 2006). However, the present study suggests that empowerment in future management systems is broader than motivational support. It includes enabling employees to work with intelligent technologies, participate in decision-making, learn continuously, and retain dignity in data-driven environments. This supports Kolbjørnsrud's (2024) argument that intelligent organizations require effective human–AI collaboration rather than simple replacement of human work by automation.

The fourth finding, ethical and responsible decision-making, highlights the moral dimension of future leadership. As organizations increasingly rely on data analytics, algorithmic decision systems, and AI-supported management tools, leaders face new challenges related to privacy, transparency, accountability, fairness, and bias. This finding is consistent with ethical leadership theory, which emphasizes fairness, moral communication, and responsible conduct (Brown & Treviño, 2006). It also reflects recent debates on responsible digital transformation, where leaders must evaluate not only whether a technology improves performance but also whether it produces acceptable social and human consequences. In this study, participants described ethical competence as a strategic necessity rather than a peripheral value. In next-generation management systems, unethical or opaque use of technology can damage trust, legitimacy, employee commitment, and stakeholder confidence. Therefore, the future leader must act as a guardian of responsible intelligence.

The fifth finding, collaborative innovation orchestration, supports the view that leadership is increasingly ecosystemic and network-based. Future organizations cannot rely only on internal knowledge or hierarchical coordination. They must collaborate with customers, suppliers, startups, universities, platform partners, regulators, and technology providers. This finding is consistent with open innovation and dynamic capabilities perspectives, which emphasize external knowledge integration and boundary-spanning capabilities as sources of renewal (Teece, 2007). It also aligns with complexity leadership theory, because innovation often emerges through interaction among diverse actors rather than through top-down planning. Participants described future leaders as orchestrators who connect people, ideas, technologies, and institutions. This expands traditional leadership models

by suggesting that leaders must not only influence followers inside organizations but also mobilize multi-actor ecosystems.

Taken together, the findings suggest that the DNA of future leadership is integrative, not fragmented. Digital–strategic intelligence without ethical responsibility may produce efficient but harmful systems. Adaptive systems thinking without empowerment may create flexible structures without employee commitment. Human-centered empowerment without digital intelligence may preserve positive culture but fail to support technological transformation. Ethical decision-making without innovation orchestration may protect values but limit renewal. Collaborative innovation without systems thinking may generate fragmented initiatives that do not scale. Therefore, the competencies identified in this study should be understood as mutually reinforcing dimensions of a future leadership architecture. The value of the proposed model lies in showing how technological, cognitive, human, ethical, and ecosystemic competencies combine to support next-generation management systems.

The findings also have theoretical implications. First, they suggest that leadership competency models should move beyond individualistic trait-based frameworks toward system-level models. Participants did not define future leaders merely as charismatic, decisive, or visionary individuals. Instead, they described leaders as designers of conditions: conditions for learning, collaboration, ethical technology use, adaptation, and innovation. Second, the findings support a transition from leadership as control to leadership as orchestration. In next-generation management systems, leaders must coordinate distributed intelligence rather than concentrate decision-making authority. Third, the study contributes to digital leadership literature by integrating digital competence with human-centered, ethical, and adaptive dimensions. This is important because purely technological definitions of digital leadership risk ignoring the social and moral foundations of organizational transformation.

The findings also have contextual significance. Tehran-based organizations operate in an environment marked by institutional complexity, economic uncertainty, technological aspiration, regulatory constraints, and growing demand for innovation. In such contexts, future leadership cannot simply imitate models developed in highly stable or resource-rich economies. Leaders must be able to adapt global technological trends to local organizational realities. Participants' emphasis on adaptability, ethical judgment, and collaboration may reflect the specific pressures faced by organizations in emerging and transitional contexts. This suggests that future leadership competencies should be examined across different cultural, institutional, and economic settings rather than assumed to be universal.

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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