

Leadership 5.0 and the Future of Management Systems: A Systematic Review and Theory Development Agenda

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Abstract

This study aimed to develop a theory-oriented framework of Leadership 5.0 for future management systems by examining how senior managers and organizational experts interpret the transition from digital, efficiency-oriented leadership toward human-centric, intelligent, sustainable, and resilient leadership. The study used a qualitative, theory-development design informed by systematic review logic and grounded in semi-structured interviews. Twenty-four participants, including senior managers, digital transformation consultants, human resource strategists, and organizational development experts from Tehran, were selected through purposive and theoretical sampling. Interviews continued until theoretical saturation was achieved at the twenty-first interview, followed by three confirmatory interviews. Data were collected through face-to-face and online semi-structured interviews lasting 45–75 minutes. All interviews were transcribed verbatim and analyzed using thematic analysis and inductive coding in NVivo software. Credibility was strengthened through member checking, peer review, constant comparison, and audit-trail documentation. The findings identified five main categories that explain the architecture of Leadership 5.0 in future management systems: human-centric digital intelligence, ethical and responsible technology governance, adaptive ecosystem leadership, resilience-oriented sustainability, and continuous learning for hybrid human–AI collaboration. Participants emphasized that Leadership 5.0 is not merely an extension of digital leadership but a broader paradigm in which leaders integrate technological intelligence with empathy, moral judgment, strategic agility, and systemic responsibility. The emerging model suggests that future management systems will depend on leaders' capacity to redesign decision-making, culture, work processes, and stakeholder relationships around intelligent technologies while preserving human agency and organizational purpose. Leadership 5.0 represents a transition from technology-led transformation to human–technology co-evolution. The proposed framework contributes to leadership theory by positioning future leaders as ethical system architects who balance automation, intelligence, sustainability, resilience, and human well-being in increasingly complex management systems.

Keywords: Leadership 5.0; management systems; digital transformation; Industry 5.0; human-centric leadership; artificial intelligence; qualitative research; theory development.

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1. Introduction

The accelerated transformation of management systems has generated renewed interest in the evolution of leadership theory. During much of the twentieth century, organizational leadership was primarily interpreted through the lenses of efficiency, hierarchy, control, coordination, and rational planning. Bureaucratic and administrative models emphasized stability, role clarity, formal authority, and predictable performance. Later, behavioral, contingency, transformational, strategic, and complexity-oriented approaches expanded this view by recognizing that leadership is not merely a function of command but a relational, cultural, interpretive, and adaptive process. In contemporary organizations, however, the rise of artificial intelligence, platform ecosystems, digital twins, algorithmic decision systems, distributed work, sustainability pressures, and stakeholder accountability has created a new leadership problem: how can organizations remain technologically intelligent



without becoming humanly, ethically, and socially deficient? This question provides the central rationale for studying Leadership 5.0 as an emerging framework for the future of management systems.

The concept of Leadership 5.0 is closely associated with broader debates on Industry 5.0 and Society 5.0. Industry 5.0 has been described by the European Commission as a development beyond Industry 4.0, emphasizing human-centricity, sustainability, and resilience rather than technological efficiency alone (Breque et al., 2021). The European Commission explicitly frames Industry 5.0 as a shift from shareholder value toward stakeholder value and places worker well-being at the center of industrial transformation. Similarly, Society 5.0, first proposed in Japan's Fifth Science and Technology Basic Plan, imagines a human-centered society in which cyberspace and physical space are deeply integrated to support economic development, social problem-solving, resilience, and diverse well-being. These developments indicate that leadership in advanced management systems can no longer be conceptualized only as the ability to implement technology or improve organizational performance. It must also be understood as the ability to align technological transformation with human dignity, social legitimacy, ecological responsibility, and institutional resilience.

Digital transformation literature provides an important foundation for this argument. Vial (2019) defines digital transformation as a process in which digital technologies generate disruptions that require organizations to alter value creation paths while managing structural changes, organizational barriers, and positive and negative outcomes. Bharadwaj et al. (2013) similarly argue that digital business strategy changes the scope, scale, speed, and sources of value creation in organizations. Hanelt et al. (2021), in a systematic review, show that digital transformation moves organizations toward malleable organizational designs and digital business ecosystems, suggesting that transformation is not a narrow technological event but a systemic organizational shift. These studies show that leadership in digital contexts requires more than technical adoption. Leaders must orchestrate strategy, structure, culture, data, capabilities, and stakeholder relations in environments characterized by uncertainty and continuous adaptation.

Yet digital leadership itself is not sufficient to explain the full scope of future management systems. Digital leadership studies have typically emphasized technological vision, digital competence, innovation culture, agile execution, and the ability to lead virtual or digitally enabled organizations. A recent systematic literature review of digital leadership found that the field has grown around themes such as digital transformation, virtual teams, creativity, information technologies, and human-centered competencies. However, Leadership 5.0 extends this discussion by foregrounding the ethical, ecological, cognitive, and social consequences of advanced technology. Warner-Söderholm and Kuoppamäki (2025) describe Leadership 5.0 as a future-ready approach requiring agile and digital mindsets while balancing human and technological needs in Industry 5.0 settings. In this sense, Leadership 5.0 is not simply "digital leadership plus artificial intelligence." It is a broader leadership paradigm that connects human-centered technology, responsible innovation, collaborative intelligence, sustainability, and resilience.

The need for such a framework is especially visible in management systems increasingly shaped by artificial intelligence. AI-enabled systems can support forecasting, decision-making, process optimization, workforce analytics, customer personalization, supply chain resilience, and strategic sensing. However, they also introduce risks related to opacity, bias, surveillance, deskilling, over-automation, accountability gaps, and erosion of trust. Kolbjørnsrud (2024) argues that intelligent organizations must harness the complementary strengths of humans and artificial intelligence and develop principles for human–AI collaboration. Hossain et al. (2025) further connect

AI-driven capabilities with responsible leadership, highlighting the need for future research on the relationship between AI capabilities and leadership responsibility. These studies suggest that the future of management systems depends not merely on whether organizations adopt AI, but on whether leaders can design governance systems that keep human judgment, ethical reflection, and social accountability embedded in technologically mediated decision-making.

Dynamic capabilities theory also contributes to the conceptual foundation of Leadership 5.0. Teece (2007) argues that dynamic capabilities involve sensing, seizing, and reconfiguring capacities that enable organizations to adapt to changing technological and market environments. Warner and Wäger (2019) apply this logic to digital transformation, showing that digital transformation is an ongoing process of strategic renewal involving business model change, collaboration, and cultural transformation. Leadership 5.0 can therefore be interpreted as a leadership capability for sensing technological and societal shifts, seizing opportunities for responsible innovation, and reconfiguring organizational systems toward human-centric and sustainable performance. This perspective moves leadership theory away from static traits or styles and toward a capabilities-based understanding of leaders as system architects.

Complexity leadership theory provides another relevant lens. Uhl-Bien et al. (2007) argue that leadership in knowledge-era organizations should be understood as a complex, adaptive process rather than as the behavior of formal authority alone. This insight is especially relevant for Leadership 5.0 because future management systems are increasingly ecosystemic, networked, and interdependent. Leadership now occurs across human teams, digital platforms, algorithmic systems, external partners, regulators, communities, and non-human intelligent agents. In such contexts, leaders must enable adaptive dynamics rather than merely control organizational behavior. They must create conditions under which people, technologies, routines, and institutions can co-evolve productively.

Despite growing attention to Industry 5.0, Society 5.0, digital transformation, AI governance, and human-centric management, Leadership 5.0 remains theoretically underdeveloped. Existing studies often discuss digital leadership, sustainable leadership, ethical leadership, agile leadership, or AI leadership separately. What remains insufficiently explained is how these dimensions converge into a coherent leadership model for future management systems. In particular, there is limited qualitative evidence on how organizational experts understand the practical meaning of Leadership 5.0, what categories define it, and how it can guide the redesign of management systems. Therefore, this study addresses this gap by developing a qualitative, theory-oriented framework of Leadership 5.0 based on semi-structured interviews with senior managers and experts in Tehran. The aim of this study was to develop a theory-oriented framework of Leadership 5.0 for future management systems by identifying the main categories through which leaders integrate human-centricity, digital intelligence, ethical governance, sustainability, resilience, and adaptive organizational design.

2. Methods and Materials

This study adopted a qualitative theory-development design to explore the meaning, dimensions, and implications of Leadership 5.0 for future management systems. Although the article is positioned within the systematic review and theory development discourse, the empirical data collection was limited to semi-structured interviews, as the purpose was to generate an interpretive framework from expert perceptions rather than to test predefined hypotheses. The literature on Industry 5.0, Society 5.0, digital transformation, dynamic capabilities,

responsible AI, and complexity leadership was used as a sensitizing theoretical background, while the empirical categories were developed inductively from interview data. This design was appropriate because Leadership 5.0 is still an emerging and conceptually fluid phenomenon, and qualitative inquiry allows researchers to capture the meanings, tensions, and interpretive patterns through which organizational actors understand new managerial paradigms.

The participants consisted of 24 senior managers and experts from Tehran. They were selected through purposive and theoretical sampling based on their experience with leadership, management systems, digital transformation, strategic planning, human resource development, organizational change, or technology governance. The sample included chief executive officers, middle and senior managers, digital transformation consultants, human resource strategists, organizational development specialists, and university-affiliated management experts. Inclusion criteria were at least seven years of professional experience, direct involvement in organizational transformation or management system design, familiarity with digital or AI-enabled organizational change, and willingness to participate in a recorded semi-structured interview. Participants who lacked direct managerial or advisory experience in organizational transformation were excluded. Theoretical saturation was reached after the twenty-first interview, when no substantially new codes or categories emerged. Three additional interviews were conducted to confirm category stability and refine the emerging theoretical framework.

Data were collected through semi-structured interviews. The interview guide included open-ended questions about the meaning of Leadership 5.0, differences between traditional leadership, digital leadership, and Leadership 5.0, the role of artificial intelligence in future management systems, ethical and human-centered challenges, the relationship between leadership and sustainability, and the capabilities required for leaders in intelligent and adaptive organizations. Follow-up questions were used to clarify meanings and obtain concrete examples. Interviews lasted between 45 and 75 minutes and were conducted either face-to-face or through secure online platforms. All interviews were recorded with participant consent and transcribed verbatim. Participants were assigned anonymous codes from P1 to P24 to protect confidentiality.

Data analysis was conducted using NVivo software. The analysis followed an inductive thematic logic inspired by Braun and Clarke's (2006) thematic analysis and Gioia et al.'s (2013) approach to qualitative rigor in inductive research. Braun and Clarke's thematic analysis is widely used for identifying, analyzing, and reporting patterns across qualitative data, while the Gioia methodology provides a structured approach for moving from first-order concepts to second-order themes and aggregate theoretical dimensions. The analysis began with repeated reading of transcripts to achieve familiarity with the data. Initial codes were then generated line by line. Similar codes were compared and grouped into first-order concepts. These concepts were then organized into second-order themes, and the second-order themes were integrated into broader aggregate categories. Constant comparison was used throughout the analysis to compare participant statements, identify conceptual similarities and differences, and refine the boundaries of each category.

Trustworthiness was strengthened through credibility, transferability, dependability, and confirmability procedures. Credibility was supported through member checking with selected participants and peer debriefing with two management scholars. Transferability was addressed by providing detailed information about participants, context, and data collection procedures. Dependability was supported through systematic documentation of coding decisions, interview procedures, and analytic memos. Confirmability was enhanced by

maintaining an audit trail and distinguishing participant-based interpretations from researcher inference. Ethical considerations included informed consent, voluntary participation, confidentiality, anonymity, secure storage of transcripts, and the right to withdraw from the study.

3. Findings and Results

The demographic characteristics of the participants showed diversity in gender, age, professional background, and organizational role. Among the 24 participants, 15 were male and 9 were female. In terms of age, 5 participants were between 30 and 39 years old, 11 were between 40 and 49 years old, and 8 were 50 years old or above. Regarding educational level, 6 participants held master's degrees and 18 held doctoral degrees or were doctoral candidates in management, industrial engineering, organizational behavior, public administration, information systems, or related fields. In terms of professional role, 7 participants were senior executives, 5 were middle or senior managers, 4 were human resource or organizational development specialists, 5 were digital transformation or technology consultants, and 3 were academic experts with executive advisory experience. Participants represented organizations and advisory projects in banking, information technology, telecommunications, manufacturing, public services, consulting, and higher education. Their professional experience ranged from 8 to 28 years, with an average of approximately 16 years.

Human-centric digital intelligence. The first main category was human-centric digital intelligence. Participants repeatedly argued that Leadership 5.0 should not be reduced to technological competence or digital literacy. Instead, they described it as the ability to combine data-driven decision-making with human judgment, emotional intelligence, creativity, empathy, and contextual understanding. In their view, future management systems will become increasingly intelligent, but intelligence must be distributed between humans and technologies rather than delegated entirely to algorithms. One participant stated, "The future leader is not the person who knows every technology, but the person who knows where technology should stop and where human judgment should begin" (P6). Another participant explained, "If artificial intelligence only makes us faster but not wiser, then we have not entered Leadership 5.0; we have only automated old mistakes" (P14). This category included codes such as human-centered decision-making, augmented judgment, emotional intelligence in digital systems, algorithmic support rather than replacement, and preservation of human agency.

Ethical and responsible technology governance. The second main category was ethical and responsible technology governance. Participants emphasized that future leaders must develop explicit governance mechanisms for data, algorithms, automation, privacy, transparency, and accountability. They believed that the expansion of AI-enabled management systems creates new ethical risks because decisions about recruitment, evaluation, customer segmentation, resource allocation, and performance monitoring may become increasingly automated. One participant noted, "In traditional management, unethical decisions had a visible decision-maker; in AI-based management, responsibility can disappear inside a system unless leaders design accountability from the beginning" (P3). Another participant observed, "Leadership 5.0 means that ethical governance is not a compliance department; it is part of the architecture of decision-making" (P19). This category included algorithmic accountability, data ethics, privacy-sensitive management, explainability, responsible automation, and ethical review of digital systems.

Adaptive ecosystem leadership. The third main category was adaptive ecosystem leadership. Participants described future management systems as open, networked, platform-based, and ecosystemic. They argued that leaders can no longer manage only internal departments, because value creation increasingly depends on partnerships, suppliers, customers, regulators, digital platforms, start-ups, knowledge networks, and social stakeholders. Leadership 5.0 was therefore interpreted as the capacity to coordinate interdependence across organizational boundaries. One participant stated, “The leader of the future does not manage a chart; the leader manages relationships among systems” (P8). Another participant explained, “Many managers still think transformation is internal, but digital ecosystems have made the border of the organization flexible and sometimes invisible” (P21). This category included ecosystem orchestration, boundary-spanning leadership, platform coordination, stakeholder integration, collaborative innovation, and adaptive governance.

Resilience-oriented sustainability. The fourth main category was resilience-oriented sustainability. Participants argued that future leadership must integrate economic performance with environmental responsibility, social legitimacy, and crisis preparedness. They viewed sustainability not as a symbolic corporate social responsibility activity but as a core element of management system design. Similarly, resilience was described not only as recovery after crisis but as the ability to anticipate shocks, redesign processes, learn continuously, and maintain stakeholder trust under uncertainty. One participant remarked, “A sustainable organization without resilience is fragile, and a resilient organization without sustainability may survive but lose legitimacy” (P11). Another participant stated, “Leadership 5.0 should answer two questions at the same time: how do we remain competitive, and how do we remain responsible?” (P16). This category included sustainable value creation, crisis readiness, social responsibility, ecological awareness, stakeholder legitimacy, and long-term organizational endurance.

Continuous learning and hybrid human–AI collaboration. The fifth main category was continuous learning for hybrid human–AI collaboration. Participants emphasized that future management systems will require leaders who create learning environments where humans and intelligent technologies improve each other. Rather than viewing AI as a substitute for employees, participants described it as a catalyst for reskilling, knowledge sharing, experimentation, and collaborative problem-solving. One participant explained, “The most important competence is not using AI once; it is learning how to learn with AI every day” (P2). Another stated, “In our organization, resistance decreased when people understood that AI was not introduced to eliminate their expertise but to make their expertise more visible and scalable” (P12). This category included lifelong learning, digital reskilling, psychological safety, human–AI teaming, experimentation culture, and knowledge renewal.

Overall, the findings suggest that Leadership 5.0 is an integrative leadership paradigm in which leaders act as ethical system architects. The proposed framework includes five interrelated dimensions: human-centric digital intelligence, ethical technology governance, adaptive ecosystem leadership, resilience-oriented sustainability, and continuous learning for hybrid collaboration. These categories indicate that future management systems will not be defined only by the sophistication of their technologies but by the quality of leadership through which technology is embedded in organizational purpose, culture, ethics, and stakeholder value.

4. Discussion and Conclusion

The first major finding showed that Leadership 5.0 is grounded in human-centric digital intelligence. Participants emphasized that future leaders must combine technological intelligence with human judgment, empathy, creativity, and contextual awareness. This finding is consistent with Industry 5.0 literature, which argues that the next stage of industrial and organizational development must place human well-being at the center of technological transformation rather than allowing technology to become an end in itself (Breque et al., 2021). It also aligns with Society 5.0, which frames the integration of cyberspace and physical space around human-centered values and diverse well-being. In relation to digital transformation theory, this finding extends Vial's (2019) argument that digital transformation alters value creation paths and requires organizations to manage both structural changes and negative consequences. In Leadership 5.0, the leader's task is not only to accelerate digital transformation but also to ensure that transformation remains meaningful, legitimate, and humanly sustainable.

The emphasis on human-centric digital intelligence also supports recent arguments about intelligent organizations and human–AI collaboration. Kolbjørnsrud (2024) suggests that managers should design organizations that combine the complementary strengths of humans and AI, rather than treating AI as a purely substitutive technology. This study contributes to that discussion by showing that leaders are perceived as mediators between technological capacity and human judgment. Participants did not reject AI; rather, they rejected technology-led management systems in which human agency becomes secondary. This finding suggests that Leadership 5.0 requires a shift from automation-centered leadership to augmentation-centered leadership. In such a model, AI improves sensing, analysis, and operational intelligence, while leaders preserve moral interpretation, contextual judgment, creativity, and meaning-making.

The second finding identified ethical and responsible technology governance as a core dimension of Leadership 5.0. This finding is strongly supported by emerging work on responsible AI and leadership. Hossain et al. (2025) argue that AI-driven capabilities create a need for responsible leadership research because technological capability must be connected to ethical judgment and social accountability. The present study confirms this argument from the perspective of organizational experts, who viewed accountability, transparency, privacy, and explainability as leadership responsibilities rather than technical details. This result also extends digital leadership literature by showing that technological vision alone is insufficient. Leaders must develop governance infrastructures that clarify who is accountable for algorithmic decisions, how data are used, how privacy is protected, and how employees and stakeholders can challenge or understand automated decisions.

This ethical dimension also distinguishes Leadership 5.0 from earlier leadership models. Traditional leadership models often assumed that decision-makers were identifiable individuals or groups. In AI-enabled management systems, however, decision-making may be distributed across software systems, data infrastructures, vendors, analysts, managers, and automated workflows. As participants noted, responsibility can become blurred unless leaders intentionally design accountability into the system. This insight is important for theory development because it suggests that future leadership theory must move beyond leader traits, leader behaviors, or dyadic leader–follower relationships. Leadership 5.0 should be conceptualized as a governance function embedded in sociotechnical systems. Leaders must shape not only human behavior but also the ethical rules, data architectures, technological affordances, and institutional safeguards that structure organizational action.

The third finding showed that Leadership 5.0 requires adaptive ecosystem leadership. Participants described future management systems as increasingly open, networked, and interdependent. This finding aligns with Hanelt et al. (2021), who argue that digital transformation moves organizations toward malleable designs embedded in

digital business ecosystems. It also supports Bharadwaj et al.'s (2013) argument that digital business strategy changes the scope, scale, speed, and sources of value creation. In ecosystemic contexts, leadership cannot be limited to internal coordination. Leaders must manage interdependencies among organizations, platforms, technologies, customers, regulators, and social actors. This requires boundary-spanning capabilities, collaborative governance, and the ability to create shared value across networks.

Adaptive ecosystem leadership also resonates with complexity leadership theory. Uhl-Bien et al. (2007) argue that leadership in knowledge-era organizations should enable adaptive dynamics rather than merely impose control through hierarchy. The present study extends this logic to Leadership 5.0 by showing that leaders must enable adaptation across sociotechnical ecosystems. In future management systems, innovation may emerge from interactions among employees, AI tools, customers, partners, and digital platforms. Therefore, leaders should not only design formal structures but also cultivate conditions for distributed intelligence, experimentation, and collaborative problem-solving. This suggests that Leadership 5.0 is less about positional authority and more about ecosystem orchestration.

The fourth finding identified resilience-oriented sustainability as a central dimension of Leadership 5.0. Participants emphasized that sustainability and resilience must be integrated rather than treated as separate managerial concerns. This finding is consistent with Industry 5.0 frameworks that position sustainability, resilience, and human-centricity as mutually reinforcing pillars of future industrial systems (Breque et al., 2021; van Erp et al., 2024). Van Erp et al. (2024) describe Industry 5.0 as the integration of sustainability, resilience, and human-centricity into value creation and propose a strategy framework for sustainable, resilient, and human-centered industrial systems. The present study extends this logic to leadership by suggesting that future leaders must translate these principles into management systems, decision routines, performance indicators, and organizational cultures.

This finding has important theoretical implications. Sustainability-oriented leadership has often emphasized values, ethics, stakeholder responsibility, and long-term orientation. Resilience research has emphasized adaptability, recovery, redundancy, flexibility, and crisis preparedness. Leadership 5.0 integrates these two streams by suggesting that future management systems must be both responsible and robust. A system may be technologically advanced but socially fragile; it may be efficient but ecologically unsustainable; it may be resilient in the short term but illegitimate in the long term. Leadership 5.0 therefore requires leaders to balance performance, responsibility, adaptability, and legitimacy. This reinforces the need to expand leadership theory beyond organizational effectiveness toward system-level value creation.

The fifth finding showed that continuous learning and hybrid human–AI collaboration are essential for future management systems. This finding aligns with digital transformation studies that describe transformation as an ongoing process rather than a one-time technological project. Warner and Wäger (2019) argue that digital transformation involves ongoing strategic renewal, including changes in business models, collaboration, and organizational culture. Similarly, Nambisan et al. (2017) suggest that digital innovation changes the assumptions of innovation management by enabling distributed agency and less bounded innovation processes. In the present study, participants emphasized that leaders must create learning cultures in which employees continuously reskill, experiment, and collaborate with intelligent technologies. This suggests that Leadership 5.0 requires a learning architecture capable of supporting human adaptation to technological change.

The emphasis on hybrid collaboration also has implications for employee identity and organizational culture. Participants suggested that resistance to AI decreases when employees understand that intelligent technologies are designed to augment rather than devalue their expertise. This supports the view that technological adoption is fundamentally cultural and strategic. Kane et al. (2015) argue that strategy, not technology alone, drives digital transformation. Leadership 5.0 therefore requires leaders to communicate purpose, reduce fear, develop psychological safety, and create pathways for human capability development. Without such learning systems, AI implementation may produce anxiety, resistance, deskilling, or superficial adoption. With appropriate leadership, however, AI can become a catalyst for creativity, knowledge sharing, and organizational intelligence.

Taken together, the findings support a theory-development agenda in which Leadership 5.0 is conceptualized as an integrative, sociotechnical, and human-centered leadership paradigm. The proposed model includes five interacting dimensions: human-centric digital intelligence, ethical technology governance, adaptive ecosystem leadership, resilience-oriented sustainability, and continuous learning for hybrid collaboration. These dimensions suggest that future management systems will be shaped not only by advanced technologies but by leaders' ability to embed those technologies in ethical, adaptive, and sustainable organizational architectures. Leadership 5.0 therefore contributes to leadership theory by shifting the focus from the leader as decision-maker to the leader as system designer, ethical governor, ecosystem orchestrator, and learning architect.

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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