

Rethinking Organizational Leadership in Post-Digital Enterprises: A Qualitative Model of Adaptive Management System Evolution

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Abstract

The objective of this study was to develop a qualitative model explaining how organizational leadership evolves in post-digital enterprises through adaptive management systems, human-machine collaboration, and continuous capability reconfiguration. This qualitative study used an inductive interpretive design based on semi-structured interviews with 24 managers, executives, digital transformation specialists, and organizational development professionals working in post-digital or digitally mature enterprises in Tehran, Iran. Participants were selected through purposive and theoretical sampling to capture diverse managerial experiences across information technology, finance, telecommunications, manufacturing, retail, e-commerce, and service sectors. Data collection continued until theoretical saturation was reached after 22 interviews, followed by two confirmatory interviews to validate category stability. Interviews were recorded, transcribed verbatim, and analyzed using thematic analysis supported by NVivo software. Open coding, category development, constant comparison, memo writing, and iterative theme refinement were used to construct the final qualitative model. The findings revealed five main categories that explain adaptive management system evolution in post-digital enterprises: adaptive orchestration of human-machine judgment, modular and networked governance, continuous organizational sensing and learning, socio-technical trust and ethical alignment, and capability reconfiguration for resilience. The core category was identified as adaptive management system evolution, defined as the continuous recalibration of leadership roles, decision rights, technological infrastructures, learning routines, and ethical controls in response to complex digital-human interactions. Participants emphasized that leadership in post-digital enterprises is no longer limited to individual authority or hierarchical control, but is enacted through distributed sensemaking, data-informed interpretation, collaborative experimentation, and the capacity to align human expertise with intelligent digital systems. This study suggests that leadership in post-digital enterprises should be understood as an adaptive system function rather than a fixed managerial role. The proposed qualitative model shows that effective leadership emerges when organizations integrate digital intelligence, human judgment, ethical governance, and flexible capabilities into a coherent management system. The findings contribute to leadership and digital transformation literature by clarifying how post-digital enterprises move beyond technology adoption toward system-level adaptation, continuous renewal, and responsible human-machine collaboration.

Keywords: Post-digital enterprise; adaptive leadership; management system evolution; digital transformation; human-machine collaboration; qualitative research; organizational learning; dynamic capabilities.

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1. Introduction

Digital transformation has moved from being an episodic technological initiative to becoming a pervasive condition of organizational life. In earlier phases of digitization, organizations often treated digital technologies as tools for automation, operational efficiency, or communication improvement. However, contemporary



enterprises increasingly operate in a post-digital environment in which digital infrastructures are no longer external additions to organizational systems but embedded conditions of work, strategy, coordination, and value creation. The term post-digital does not imply that the digital era has ended; rather, it suggests that digital technologies have become so normalized and entangled with social, managerial, and institutional processes that the distinction between digital and non-digital organizational practices is increasingly unstable (Cramer, 2015; Jandrić et al., 2018). In this context, leadership cannot be understood only through conventional models of command, influence, vision, or formal authority. Instead, it must be reconsidered as a dynamic process through which organizations continuously adapt their management systems, decision structures, learning routines, and socio-technical arrangements.

The post-digital enterprise is characterized by the saturation of organizational life with platforms, artificial intelligence, cloud-based infrastructures, algorithmic analytics, remote and hybrid work systems, digital communication tools, and data-driven decision mechanisms. Digital transformation literature has shown that such technologies do not simply improve existing processes; they disrupt value creation paths, alter organizational structures, reshape relationships with stakeholders, and require strategic responses from firms seeking to remain adaptive and competitive (Vial, 2019). This means that leadership in post-digital enterprises is not merely a matter of encouraging employees to use technology. It involves designing and sustaining adaptive management systems capable of sensing environmental changes, interpreting complex data, coordinating distributed actors, and reconfiguring capabilities under conditions of uncertainty. As Kane et al. (2015) argued, successful digital transformation is driven less by technology itself than by strategy, culture, talent, and leadership capacity. Therefore, leadership must be analyzed not as a separate behavioral variable but as a systemic capability embedded in the architecture of post-digital organizations.

Traditional leadership paradigms were largely developed for organizations in which authority, information, and decision-making were relatively centralized. Bureaucratic and hierarchical systems assumed that leaders could diagnose problems, formulate strategic direction, assign responsibilities, and monitor performance through stable formal structures. Although such approaches remain relevant in some contexts, they are insufficient for enterprises whose operations depend on rapid technological change, cross-functional collaboration, and continuous interaction between human and machine intelligence. Complexity leadership theory provides a useful foundation for rethinking leadership under such conditions because it conceptualizes organizations as complex adaptive systems and emphasizes the interaction among administrative, adaptive, and enabling leadership functions (Uhl-Bien et al., 2007). From this perspective, leadership is not located only in senior executives; it emerges through interaction, learning, conflict, experimentation, and the enabling conditions that allow adaptive responses to develop across the organization.

The concept of adaptive management system evolution extends this logic by focusing on how management systems themselves change in response to digital saturation. In post-digital enterprises, leadership is expressed through the evolution of decision rights, governance mechanisms, data infrastructures, feedback loops, performance metrics, employee roles, and organizational learning processes. This view is consistent with dynamic capabilities theory, which explains how enterprises sustain performance by sensing opportunities and threats, seizing strategic possibilities, and transforming organizational resources and routines (Teece, 2007). Digital transformation research has further shown that firms build dynamic capabilities through ongoing strategic renewal, agile experimentation, and the reconfiguration of organizational processes (Warner & Wäger, 2019).

Accordingly, post-digital leadership can be interpreted as the capacity to guide the organization through continuous capability reconfiguration rather than episodic change management.

A major challenge in post-digital enterprises is the changing nature of managerial judgment. Data analytics, artificial intelligence, and algorithmic systems increasingly participate in decision-making processes, but they do not eliminate the need for human interpretation. Instead, they redistribute cognitive labor across human and technological actors. Managers must learn to interpret algorithmic outputs, question data assumptions, evaluate ethical implications, and integrate quantitative signals with contextual knowledge. This produces a new form of leadership work in which leaders operate as interpreters, translators, and orchestrators of human-machine judgment. The literature on digital innovation emphasizes that digital technologies create new organizing logics because they are generative, recombinable, and continuously evolving (Yoo et al., 2010). Therefore, leadership must become more experimental, reflexive, and distributed, enabling organizations to learn from digital systems while preventing overdependence on technological rationality.

Post-digital leadership also requires a shift from rigid hierarchy toward modular and networked governance. Digital enterprises increasingly rely on cross-functional teams, platform-based coordination, agile project structures, ecosystem partnerships, and distributed expertise. These arrangements require leaders to manage interdependence without relying solely on vertical authority. Organizational control becomes less about direct supervision and more about designing interfaces, standards, feedback mechanisms, and shared meanings. Orlikowski (2007) argued that organizational practices are sociomaterial, meaning that technology and social action are constitutively entangled rather than separate domains. This insight is especially relevant to post-digital enterprises, where leadership must coordinate people, platforms, algorithms, routines, and institutional expectations as part of a single socio-technical system. Leadership effectiveness therefore depends not only on interpersonal influence but also on the design of adaptive organizational infrastructures.

Another important issue is trust. In post-digital enterprises, trust is no longer limited to interpersonal confidence between leaders and followers. It also includes trust in data quality, algorithmic systems, digital platforms, cybersecurity arrangements, privacy protections, and the fairness of technology-mediated decisions. If employees perceive digital systems as opaque, punitive, or misaligned with human values, they may resist or superficially comply with transformation initiatives. Digital leadership therefore requires ethical alignment and transparent governance. The post-digital condition intensifies questions about accountability because decisions may emerge from interactions among managers, automated systems, consultants, vendors, and digital infrastructures. As a result, leaders must ensure that technological integration is accompanied by ethical reflection, participatory implementation, and mechanisms for contesting or revising algorithmic recommendations.

Despite growing research on digital transformation, digital leadership, dynamic capabilities, and agile organizations, there remains a need for qualitative studies that explain how leaders themselves understand the evolution of management systems in post-digital enterprises. Much of the existing literature focuses on technological adoption, strategic outcomes, or firm-level transformation, while less attention has been paid to the lived managerial processes through which leadership is reconfigured in organizations where digital technologies have become ordinary, embedded, and unavoidable. Qualitative inquiry is particularly appropriate for this topic because it can capture the meanings, tensions, interpretations, and emergent categories through which managers make sense of post-digital leadership. The present study addresses this gap by developing a qualitative model of

adaptive management system evolution based on semi-structured interviews with managers and digital transformation professionals in Tehran-based enterprises.

The context of Tehran is significant because enterprises operating in this environment face a combination of technological opportunity, market volatility, institutional uncertainty, workforce transition, and infrastructural constraints. These conditions make adaptive leadership especially important. Managers in such enterprises must respond not only to global technological changes but also to local economic, regulatory, cultural, and organizational realities. Studying leadership in this context can therefore contribute to broader theory by showing how post-digital management systems evolve under conditions of complexity and constraint. Rather than assuming that digital maturity follows a universal path, this study explores how leadership adaptation is locally interpreted and organizationally enacted.

Based on these considerations, the aim of this study was to develop a qualitative model explaining how organizational leadership evolves in post-digital enterprises through adaptive management systems, human-machine collaboration, and continuous capability reconfiguration.

2. Methods and Materials

This study adopted a qualitative interpretive design to explore how organizational leadership is redefined in post-digital enterprises and how adaptive management systems evolve in response to digital saturation, environmental complexity, and human-machine collaboration. A qualitative approach was selected because the purpose of the study was not to test predetermined hypotheses, but to generate an empirically grounded conceptual understanding of leadership evolution from the perspectives of organizational actors directly involved in digital transformation, management redesign, and strategic adaptation. The study was guided by an inductive logic, allowing categories and relationships to emerge from participants' accounts while being sensitized by relevant concepts from complexity leadership theory, dynamic capabilities theory, and digital transformation research. The research setting consisted of medium and large enterprises located in Tehran, Iran, that had implemented substantial digital infrastructures such as enterprise resource planning systems, customer analytics platforms, cloud-based coordination tools, artificial intelligence applications, digital dashboards, agile project management systems, or platform-based business models.

The participants included 24 individuals selected through purposive and theoretical sampling. Inclusion criteria required participants to have at least five years of managerial or professional experience and direct involvement in organizational leadership, digital transformation, strategy implementation, human resource development, innovation management, or management system redesign. Participants were recruited from information technology, financial services, telecommunications, manufacturing, retail and e-commerce, healthcare, and professional service organizations. The final sample consisted of 14 men and 10 women. Regarding organizational roles, 7 participants were senior executives, 8 were middle managers, 5 were digital transformation or innovation managers, and 4 were human resource or organizational development professionals. In terms of educational background, 4 participants held bachelor's degrees, 14 held master's degrees, and 6 held doctoral degrees. Participants' ages ranged from 32 to 58 years, with the largest group falling between 36 and 45 years. Their managerial or professional experience ranged from 6 to 28 years. This composition enabled the study to capture

diverse perspectives across strategic, operational, technological, and human dimensions of post-digital enterprise leadership.

Data were collected through semi-structured interviews. The interview protocol was designed to elicit participants' experiences of leadership change, digital transformation, adaptive decision-making, human-machine collaboration, organizational learning, and management system evolution. Core interview questions included: How has leadership changed in your organization as digital technologies have become embedded in daily work? What kinds of management systems are required for adaptation in post-digital enterprises? How do managers combine human judgment with data-driven or algorithmic recommendations? What tensions arise when digital systems reshape decision-making, accountability, and employee coordination? How does your organization learn, reconfigure capabilities, and respond to uncertainty? Follow-up questions were used to clarify meanings, obtain concrete examples, and explore contradictions in participants' narratives. Interviews lasted between 45 and 85 minutes, with an average duration of approximately 62 minutes. All interviews were conducted in Persian, recorded with participants' permission, transcribed verbatim, and then translated into English for manuscript preparation where necessary.

Theoretical saturation guided the final sample size. Initial interviews generated broad categories related to digital coordination, adaptive decision-making, leadership decentralization, and ethical trust. As analysis progressed, theoretical sampling was used to recruit participants who could deepen underdeveloped categories, particularly those related to algorithmic accountability and modular governance. Saturation was reached after 22 interviews, when no substantially new categories emerged and the relationships among core concepts became stable. Two additional interviews were conducted to confirm the adequacy and coherence of the emerging model. These confirmatory interviews supported the conceptual structure and helped refine the wording of the central category, adaptive management system evolution.

Data analysis was conducted using NVivo software. The analytic process began with repeated reading of transcripts to develop familiarity with the data. Open coding was then used to identify meaningful statements related to leadership practices, digital systems, adaptation mechanisms, organizational tensions, and capability development. Codes were kept close to participants' language in the early stage to preserve empirical grounding. Examples of initial codes included "dashboard as managerial compass," "decision rights moving to teams," "AI needs human interpretation," "managers as translators," "fear of algorithmic surveillance," "rapid resource shifting," and "learning through small experiments." In the second stage, related codes were clustered into categories through constant comparison. Memos were written throughout the process to document conceptual decisions, emerging relationships, and interpretive questions. In the third stage, categories were refined into broader themes that explained how leadership and management systems evolve in post-digital enterprises. The final model consisted of five main categories and one core category.

Trustworthiness was enhanced through several procedures. Credibility was supported by prolonged engagement with the data, iterative coding, peer review of emerging categories, and member reflection with selected participants. Transferability was addressed through detailed description of the research context, participant characteristics, and organizational conditions. Dependability was strengthened by maintaining an audit trail of interview protocols, coding decisions, analytic memos, and category revisions. Confirmability was supported through reflexive memo writing, which helped distinguish participants' meanings from the researcher's assumptions. Ethical considerations were observed throughout the study. Participants received information about

the study purpose, voluntary participation, confidentiality, and the right to withdraw. Identifying organizational and personal details were removed from transcripts, and participant quotations were anonymized using codes such as P1, P2, and P3.

3. Findings and Results

The demographic characteristics of the participants indicated that the study included 24 professionals from Tehran-based enterprises who had direct experience with leadership and digital transformation. The sample included 14 men and 10 women. In terms of age, 5 participants were between 30 and 35 years, 9 were between 36 and 45 years, 7 were between 46 and 55 years, and 3 were above 55 years. Regarding educational level, 4 participants held bachelor's degrees, 14 held master's degrees, and 6 held doctoral degrees. In terms of organizational position, 7 participants were senior executives, 8 were middle managers, 5 were digital transformation or innovation managers, and 4 were human resource or organizational development professionals. Participants were drawn from information technology and platform-based firms with 6 participants, financial services with 5 participants, telecommunications with 4 participants, manufacturing with 4 participants, retail and e-commerce with 3 participants, and healthcare or professional services with 2 participants. Their work experience ranged from 6 to 28 years, and all participants had participated in at least one major digital transformation, management redesign, or organizational adaptation initiative.

The first main category was adaptive orchestration of human-machine judgment. Participants repeatedly emphasized that leadership in post-digital enterprises is no longer based on the leader's personal intuition alone, nor is it reduced to automated decision-making. Instead, effective leadership involves orchestrating the relationship between human interpretation and digital intelligence. Managers described dashboards, predictive analytics, artificial intelligence tools, and customer data systems as valuable but incomplete sources of decision support. They argued that digital systems can reveal patterns, anomalies, and risks, but leaders must interpret these signals in light of organizational context, employee knowledge, market conditions, and ethical implications. One participant stated, "The dashboard gives us speed, but it does not give us wisdom. A leader must know when the number is warning us and when the number is misleading us" (P6). Another participant explained, "Before, the manager was expected to know the answer. Now the manager must know how to ask better questions from people and from systems" (P13). This category shows that post-digital leadership is enacted through interpretive mediation. Leaders become translators between data logic and organizational meaning, ensuring that technological outputs are not treated as neutral truths but as inputs into collective sensemaking.

The second main category was modular and networked governance. Participants described a movement away from centralized command structures toward more flexible arrangements based on project teams, digital platforms, cross-functional collaboration, and distributed decision rights. In digitally mature enterprises, work often crosses departmental boundaries, and problems emerge faster than traditional approval chains can respond. As a result, leadership becomes less concerned with controlling every action and more concerned with designing the conditions under which teams can coordinate effectively. One senior executive noted, "If every decision comes to the top, digital transformation dies in meetings. We had to move decision rights closer to the teams that see the problem first" (P2). Participants also emphasized that modular governance does not mean the absence of structure. Rather, it requires clear interfaces, shared standards, transparent metrics, and escalation rules. A digital

transformation manager explained, “Agility without architecture becomes chaos. We need freedom for teams, but also a common language and a common platform” (P17). This category indicates that post-digital leadership requires governance systems that combine decentralization with coherence. The adaptive enterprise does not abandon hierarchy entirely; it redesigns hierarchy so that authority, expertise, and accountability can move across the organization more fluidly.

The third main category was continuous organizational sensing and learning. Participants reported that post-digital enterprises must develop routines for detecting weak signals, experimenting rapidly, and learning from both success and failure. Digital systems expand the organization’s capacity to collect information from customers, employees, competitors, processes, and external environments, but this information becomes valuable only when it is converted into learning. Participants described adaptive organizations as those that institutionalize feedback loops through agile retrospectives, customer analytics, performance dashboards, employee listening systems, pilot projects, and after-action reviews. One participant said, “The most important change was that planning became shorter and learning became longer. We no longer wait for the perfect plan; we test, observe, and adjust” (P9). Another participant observed, “In our old system, failure was hidden because it was dangerous. In the new system, small failure is data, but only if managers do not punish it” (P21). This category highlights the learning dimension of adaptive management system evolution. Leadership in post-digital enterprises depends on the capacity to build psychologically safe learning environments in which digital feedback can be interpreted, discussed, and converted into practical change.

The fourth main category was socio-technical trust and ethical alignment. Participants emphasized that digital transformation often generates anxiety, resistance, and distrust when employees perceive technologies as instruments of surveillance, replacement, or unfair evaluation. Trust was described as a central condition for adaptive leadership because employees are unlikely to engage honestly with digital systems if they fear that data will be used against them. One human resource manager stated, “People did not resist the technology itself; they resisted the feeling that the technology was watching them without listening to them” (P19). Participants also raised concerns about algorithmic bias, privacy, cybersecurity, opaque decision rules, and accountability for technology-mediated decisions. A senior manager noted, “When an algorithm recommends a customer priority or a staff performance score, someone must still be responsible. We cannot say the system decided” (P4). This category shows that post-digital leadership is inherently ethical. Leaders must create trust by explaining why technologies are used, how data are interpreted, who has access to information, and how employees can challenge inaccurate or unfair outputs. Ethical alignment is therefore not an optional supplement to digital transformation; it is part of the management system required for adaptation.

The fifth main category was capability reconfiguration for resilience. Participants described post-digital enterprises as organizations that must repeatedly reconfigure resources, roles, routines, and competencies in response to technological and environmental change. Capability reconfiguration included reskilling employees, redesigning workflows, reallocating budgets to digital initiatives, forming temporary cross-functional teams, integrating external partners, and replacing rigid annual planning with rolling strategic adjustment. One participant explained, “The real capability is not having a digital tool. The real capability is changing the organization when the tool changes the work” (P11). Another participant stated, “Resilience came when we stopped treating transformation as a project and started treating it as a management habit” (P23). Participants emphasized that adaptive enterprises do not simply react to crises; they build internal flexibility before crises occur. This category

indicates that post-digital leadership is closely connected to organizational resilience. Leaders must ensure that the enterprise can absorb shocks, learn from disruption, and redeploy capabilities without losing strategic coherence.

The core category that integrated all findings was adaptive management system evolution. This concept refers to the continuous recalibration of leadership roles, decision rights, governance structures, digital infrastructures, learning routines, trust mechanisms, and organizational capabilities in response to post-digital complexity. The model suggests that leadership in post-digital enterprises does not evolve through a single transformation event. Instead, it evolves through the interaction of five adaptive processes: orchestration of human-machine judgment, modular governance, organizational sensing and learning, socio-technical trust, and capability reconfiguration. These processes mutually reinforce one another. Human-machine judgment improves sensing, sensing supports learning, learning informs capability reconfiguration, modular governance enables distributed adaptation, and ethical trust sustains employee participation in the system. The resulting model presents leadership as a system-level adaptive function rather than a property of individual leaders alone. In this model, leaders matter not because they personally control all decisions, but because they design, protect, and renew the conditions under which the organization can think, learn, decide, and adapt.

4. Discussion and Conclusion

The findings of this study indicate that leadership in post-digital enterprises is best understood as an adaptive system function rather than a fixed individual role. The core category, adaptive management system evolution, shows that leadership emerges through the continuous recalibration of decision processes, governance arrangements, learning routines, technological infrastructures, and ethical controls. This finding is consistent with complexity leadership theory, which argues that leadership in knowledge-intensive and complex environments should enable learning, creativity, and adaptive capacity across organizational systems rather than remain confined to hierarchical command (Uhl-Bien et al., 2007). The participants' accounts suggest that post-digital enterprises require leaders who can create the conditions for distributed adaptation while maintaining strategic coherence. This extends traditional leadership thinking by showing that in digitally saturated organizations, leadership is not only interpersonal influence but also socio-technical system design.

The first main finding, adaptive orchestration of human-machine judgment, supports and extends digital transformation literature. Vial (2019) conceptualized digital transformation as a process in which digital technologies disrupt organizations and trigger strategic responses that reshape value creation paths. The present study shows that one of the most important strategic responses is the redefinition of managerial judgment itself. Participants did not describe digital systems as replacing leaders; rather, they described them as changing the cognitive work of leadership. Leaders must interpret data, question algorithmic recommendations, contextualize digital outputs, and integrate machine-generated signals with human experience. This aligns with Yoo et al. (2010), who argued that digital innovation creates new organizing logics because digital technologies are generative and recombining. In post-digital enterprises, leadership becomes an interpretive capability that mediates between the speed of digital systems and the ambiguity of organizational life.

The second finding, modular and networked governance, reflects the need for organizational structures that can respond to complexity without collapsing into fragmentation. Participants described decentralization, cross-

functional teams, and distributed decision rights as necessary for speed and adaptation, but they also emphasized the need for standards, platforms, and shared accountability. This finding is consistent with Kane et al. (2015), who argued that digital transformation is driven by strategy and organizational maturity rather than technology alone. It also corresponds with Orlikowski's (2007) sociomaterial view of organizations, which suggests that technologies and organizational practices are deeply entangled. In post-digital enterprises, governance must be designed around this entanglement. Leaders cannot simply introduce agile teams or digital platforms; they must create connective tissue among teams, systems, and strategic priorities. Therefore, adaptive governance is not anti-structure. It is a more flexible and modular form of structure.

The third finding, continuous organizational sensing and learning, strongly aligns with dynamic capabilities theory. Teece (2007) argued that enterprises maintain competitiveness through sensing, seizing, and transforming capabilities in rapidly changing environments. Participants' narratives showed that post-digital enterprises depend on precisely these capabilities, but with greater emphasis on continuous feedback loops and experimentation. Digital technologies increase the quantity and speed of available information, but information does not automatically produce learning. Leaders must build routines for interpreting signals, testing ideas, discussing failures, and converting insights into action. Warner and Wäger (2019) similarly found that digital transformation involves building dynamic capabilities for ongoing strategic renewal. The current study adds that such renewal depends on leadership practices that normalize learning as a daily management process rather than treating it as a periodic strategic exercise.

The fourth finding, socio-technical trust and ethical alignment, highlights an important but sometimes underdeveloped dimension of post-digital leadership. Participants emphasized that employees may resist digital transformation when they experience technologies as surveillance tools, opaque evaluation systems, or threats to professional identity. This finding suggests that adaptive leadership must address not only efficiency and innovation but also legitimacy, fairness, and human dignity. Post-digital theory is useful here because it rejects simplistic fascination with digital novelty and instead examines how digital technologies become embedded in lived social realities (Cramer, 2015; Jandrić et al., 2018). In organizational terms, this means that leadership must humanize digital systems by making them explainable, accountable, and open to contestation. Trust becomes a management system property, not merely a psychological attitude.

The fifth finding, capability reconfiguration for resilience, confirms that post-digital enterprises must move beyond project-based transformation toward continuous adaptive renewal. Participants repeatedly stated that transformation should not be treated as a temporary initiative with a fixed endpoint. Instead, the organization must build the ability to reconfigure roles, resources, technologies, and routines whenever environmental conditions change. This finding is consistent with Eisenhardt and Martin's (2000) view that dynamic capabilities consist of identifiable processes through which firms integrate, reconfigure, gain, and release resources. It also supports Hanelt et al.'s (2021) argument that digital transformation is intertwined with organizational change and requires shifts in structures, processes, and capabilities. The present study contributes to this literature by showing how leaders in post-digital enterprises interpret reconfiguration as a resilience mechanism. Resilience is not only recovery after disruption; it is the prior development of adaptive capacity.

Collectively, the findings suggest that post-digital leadership differs from earlier digital leadership models in at least three ways. First, it treats digital technology as an embedded condition rather than a separate transformation object. Second, it views leadership as a distributed and system-level process rather than only an

individual competency. Third, it places ethical trust, interpretive judgment, and learning routines at the center of management system evolution. Avolio et al. (2000) introduced the concept of e-leadership to describe leadership mediated by advanced information technology, but the post-digital context requires a broader framework because leadership is no longer merely mediated by technology; it is co-constituted with digital infrastructures, data systems, platforms, and algorithms. Therefore, leadership theory must move from technology-mediated influence toward socio-technical adaptation.

The proposed qualitative model also has implications for the study of management systems. Conventional management systems often emphasize planning, hierarchy, performance measurement, and control. The findings of this study suggest that in post-digital enterprises, management systems must also support sensing, interpretation, experimentation, distributed authority, ethical governance, and capability reconfiguration. This does not mean that planning and control disappear. Rather, they are redesigned to function in more dynamic conditions. Leaders must balance stability and flexibility, standardization and experimentation, human autonomy and algorithmic support, central strategy and local adaptation. This balancing function is central to adaptive management system evolution.

The limitations of this study should be acknowledged. First, the study was based on a qualitative sample of 24 participants from Tehran-based enterprises, which limits statistical generalizability. Second, the findings reflect the perspectives of managers and professionals who were directly involved in digital transformation or organizational adaptation, and the views of frontline employees, customers, technology vendors, and policymakers were not included. Third, because the study focused on digitally mature or transforming enterprises, it may not fully represent organizations at early stages of digitization. Fourth, the findings were based on self-reported interview data, which may be influenced by retrospective interpretation, organizational position, and participants' desire to present transformation efforts positively.

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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