

From Bureaucracy to Digital Ecosystems: Reviewing the Evolutionary Trajectory of Organizational Leadership Models

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Abstract

This study aimed to explain how organizational leadership models have evolved from bureaucratic control systems toward digitally enabled ecosystem-oriented forms of leadership. This qualitative study was conducted using semi-structured interviews with 24 participants selected through purposive sampling from managers, organizational development specialists, digital transformation experts, and management consultants in Tehran. Data collection continued until theoretical saturation was achieved. The interviews focused on participants' experiences of leadership change, organizational hierarchy, digital transformation, network-based collaboration, and ecosystem governance. All interviews were transcribed verbatim and analyzed through thematic analysis using NVivo software. Open coding, axial categorization, constant comparison, memo writing, and peer review were applied to enhance analytical rigor. The analysis generated five main categories describing the evolutionary trajectory of leadership models: rule-based bureaucratic leadership, participative and transformational transition, distributed and networked leadership, data-driven digital leadership, and ecosystem orchestration leadership. Participants described bureaucracy as a necessary historical model for coordination, accountability, and procedural order, but emphasized that digital environments reduce the effectiveness of centralized authority. The findings showed that leadership is increasingly shifting from command, supervision, and formal position toward facilitation, sensemaking, knowledge integration, platform coordination, and boundary-spanning collaboration. Digital ecosystems require leaders who can manage interdependence, enable trust, interpret data ethically, and coordinate actors beyond formal organizational boundaries. The study concludes that the evolution of leadership is not a simple replacement of old models by new ones, but a cumulative transformation in which bureaucratic control, transformational influence, distributed agency, digital coordination, and ecosystem orchestration coexist. Future leadership models should therefore be designed as adaptive, hybrid, and relational systems capable of operating across organizational, technological, and institutional boundaries.

Keywords: Bureaucracy; digital ecosystems; organizational leadership; digital transformation; distributed leadership; ecosystem orchestration; qualitative research.

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1. Introduction

Organizational leadership has never been a static managerial function. It has developed through historical changes in organizational design, technology, work systems, institutional complexity, and social expectations. In the classical industrial organization, leadership was closely connected to hierarchy, formal authority, rational planning, and administrative control. In contemporary digital organizations, however, leadership increasingly operates through platforms, networks, data infrastructures, cross-functional teams, and interorganizational ecosystems. This transformation has created a need to reconsider the conceptual foundations of leadership theory. The movement from bureaucracy to digital ecosystems does not merely indicate a change in managerial tools; it reflects a deeper shift in how authority, coordination, decision-making, knowledge, and value creation are organized.



The bureaucratic model remains one of the most influential foundations of modern organizational leadership. Weber's theory of bureaucracy described legal-rational authority as a system based on formal rules, hierarchical offices, technical competence, written documentation, and impersonal administration (Weber, 1978). In this model, leadership was embedded in position, office, and legitimate authority rather than in personal charisma alone. Bureaucracy provided predictability, continuity, accountability, and procedural fairness, especially for large organizations that required coordination across complex tasks. Its strength was its ability to reduce arbitrary decision-making and stabilize organizational behavior through rules and formal structures. However, the same features that made bureaucracy efficient in stable environments also created limitations in dynamic contexts. Excessive formalization, vertical communication, rigid procedures, and slow decision cycles can weaken organizational responsiveness when environments become uncertain, digitally mediated, and innovation-driven.

Traditional leadership theories were initially developed in organizational contexts where formal authority, individual traits, managerial behavior, and leader–follower influence were dominant analytical concerns. Over time, leadership scholarship moved beyond bureaucratic command and control toward more relational and motivational models. Burns (1978) introduced transformational leadership as a process through which leaders and followers raise one another to higher levels of motivation and morality. Bass (1985) later extended this approach by emphasizing how transformational leaders inspire extraordinary performance through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. These theories shifted attention from authority as position to leadership as influence, meaning-making, and motivation. This was a major turning point because it suggested that effective leadership depends not only on formal hierarchy but also on the capacity to mobilize commitment, develop people, and transform organizational culture.

The rise of knowledge work further challenged the sufficiency of purely hierarchical leadership. As organizations became more dependent on professional expertise, innovation, and collaboration, leadership became increasingly distributed across teams, functions, and communities of practice. Gronn (2002) argued that distributed leadership should be treated as a unit of analysis because leadership is often produced through the concertive action of multiple actors rather than the isolated behavior of a single leader. This view is especially relevant for digital and knowledge-intensive organizations where expertise is dispersed and decision-making must occur close to information. Distributed leadership reframes leadership as an emergent property of interaction, interdependence, and shared responsibility. It also challenges the assumption that leadership must always flow downward from a formal superior to subordinates.

Digital transformation has intensified this shift by changing the infrastructure of organizing. Digital technologies do not simply automate existing work processes; they reshape communication, coordination, innovation, and strategic decision-making. Avolio, Kahai, and Dodge (2000) introduced the concept of e-leadership to explain how advanced information technology influences and is influenced by leadership processes. Digital leadership therefore involves more than using technological tools; it requires the ability to guide organizational behavior through digitally mediated environments. Leaders must coordinate virtual teams, interpret digital information, manage algorithmic decision support, sustain engagement across distance, and build trust in technology-enabled work systems. Digital transformation also requires strategic alignment, cultural readiness, and organizational learning rather than technology adoption alone (Kane et al., 2015).

The emergence of digital innovation has further complicated leadership because innovation increasingly occurs across organizational boundaries. Nambisan, Lyytinen, Majchrzak, and Song (2017) argued that digital innovation

changes the nature of innovation management by enabling distributed agency, generativity, convergence, and fluid boundaries. In this context, leaders no longer control all relevant resources inside the organization. Instead, they must mobilize external partners, users, developers, suppliers, communities, and platform participants. Leadership thus becomes an activity of integration and orchestration rather than unilateral direction. The leader's task is increasingly to create enabling conditions for innovation, align diverse actors around shared value, and govern tensions between openness and control.

Complexity leadership theory provides another important foundation for understanding this transition. Uhl-Bien, Marion, and McKelvey (2007) argued that leadership in knowledge-era organizations must enable adaptive, creative, and learning-oriented capacities within complex adaptive systems while still maintaining sufficient administrative coordination. This perspective is valuable because it does not treat bureaucracy and adaptability as mutually exclusive. Instead, it explains that modern organizations require both administrative leadership for formal coordination and adaptive leadership for innovation and emergence. Digital ecosystems intensify this dual requirement because organizations must simultaneously maintain operational reliability and respond rapidly to technological, market, and institutional change.

The ecosystem perspective represents a more recent stage in the evolution of organizational leadership models. Strategic management research increasingly conceptualizes value creation as an ecosystem-level phenomenon involving interdependent actors whose activities must be aligned without full hierarchical control. Jacobides, Cennamo, and Gawer (2018) argued that ecosystems emerge when distinct but complementary organizations coordinate around modular interdependencies. In such settings, no single actor can create value alone. Leadership becomes a matter of ecosystem orchestration, platform governance, boundary spanning, legitimacy building, and coordination among autonomous participants. Helfat and Raubitschek (2018) similarly emphasized that platform leaders require dynamic and integrative capabilities to create and capture value in digital platform-based ecosystems. These arguments show that leadership is increasingly embedded in relational systems that extend beyond the legal boundaries of the firm.

The movement from bureaucracy to digital ecosystems therefore reflects a multi-stage trajectory. Bureaucratic leadership emphasized authority, rules, and procedural order. Transformational leadership emphasized motivation, vision, and cultural change. Distributed leadership emphasized collective agency and shared practice. E-leadership emphasized digitally mediated influence and coordination. Complexity and ecosystem leadership emphasize adaptability, interdependence, and orchestration across boundaries. Each stage responds to a different organizational problem. Bureaucracy responds to the problem of order; transformational leadership responds to the problem of commitment; distributed leadership responds to the problem of dispersed expertise; digital leadership responds to the problem of technological mediation; ecosystem leadership responds to the problem of interorganizational value creation.

Despite extensive theoretical development, there remains a need for qualitative studies that explain how managers and organizational experts experience this transition in practice. Much of the leadership literature discusses models in conceptual or quantitative terms, but fewer studies examine how practitioners interpret the lived shift from hierarchy to digital ecosystems. This is particularly important in metropolitan business environments such as Tehran, where organizations often combine formal bureaucratic traditions with growing digital transformation pressures. Such contexts reveal the coexistence of older and newer leadership logics.

Managers may still rely on hierarchy for accountability while simultaneously needing distributed teams, digital platforms, and ecosystem partnerships to remain competitive.

The present study addresses this gap by exploring how Tehran-based managers, digital transformation experts, organizational development professionals, and consultants understand the evolutionary trajectory of leadership models. Rather than treating leadership evolution as a linear replacement of bureaucracy by digital ecosystems, this study examines how different leadership logics accumulate, overlap, and create tensions. The central argument is that leadership in digital ecosystems requires hybrid capability: the ability to preserve accountability and ethical governance while enabling participation, adaptability, data-informed decision-making, and interorganizational collaboration. Accordingly, this study aimed to explain the evolutionary trajectory of organizational leadership models from bureaucracy to digital ecosystems through a qualitative analysis of expert interviews.

2. Methods and Materials

This study used a qualitative exploratory design to investigate how organizational leadership models have evolved from bureaucratic systems toward digital ecosystem-oriented forms. A qualitative approach was appropriate because the study sought to understand meanings, interpretations, and lived managerial experiences rather than test predetermined hypotheses. The research was conducted among Tehran-based participants with direct experience in organizational leadership, digital transformation, human resource development, organizational design, and management consulting. Participants were selected through purposive sampling because the study required information-rich cases capable of explaining leadership change across different organizational settings. The final sample consisted of 24 participants, including eight senior managers, six human resource and organizational development specialists, five digital transformation managers, and five management consultants. Inclusion criteria were at least five years of professional experience, direct involvement in organizational leadership or transformation projects, and willingness to participate in a recorded interview. Participants with no direct managerial or advisory experience related to organizational change were excluded. Data collection continued until theoretical saturation was reached; after the twenty-second interview, no substantially new categories emerged, and two additional interviews were conducted to confirm saturation. This sample size was consistent with qualitative saturation logic, according to which saturation depends on the depth, homogeneity, and analytical purpose of the data rather than statistical representativeness (Guest et al., 2006).

Data were collected only through semi-structured interviews. The interview protocol included open-ended questions about participants' experiences with bureaucratic leadership, changes in managerial authority, digital transformation, distributed decision-making, platform-based coordination, interorganizational collaboration, and the competencies required for leadership in digital ecosystems. Examples of guiding questions included: "How has leadership changed in your organization during digital transformation?", "What limitations of bureaucratic leadership have become visible in recent years?", "How do digital technologies affect authority and decision-making?", and "What does leadership mean when value creation depends on external partners or digital platforms?" Each interview lasted between 45 and 75 minutes. Interviews were conducted in person or through secure online communication, depending on participant availability. Before the interviews, participants were informed about the purpose of the study, voluntary participation, confidentiality, and the right to withdraw. With

participant permission, interviews were audio-recorded and transcribed verbatim. Participants were coded as P01 to P24 to protect anonymity.

Data analysis was performed through thematic analysis using NVivo software. Thematic analysis was selected because it provides a flexible and systematic method for identifying patterns of meaning across qualitative data (Braun & Clarke, 2006). The analysis began with repeated reading of transcripts and the preparation of initial analytic memos. In the open coding stage, meaningful units related to leadership evolution, hierarchy, digital coordination, decision-making, ecosystem relationships, and adaptive capability were identified. Similar codes were then compared and grouped into subcategories. In the axial stage, relationships among subcategories were examined to construct broader categories. NVivo was used to organize transcripts, code text segments, compare codes across participant groups, retrieve quotations, and develop category matrices. To strengthen credibility, the coding process included peer review by a second qualitative researcher, member checking with six participants, and continuous comparison between raw data and emerging categories. Dependability was enhanced through an audit trail including interview guides, coding notes, memos, and category definitions. Confirmability was supported by reflexive memo writing to reduce the influence of prior theoretical assumptions on interpretation.

3. Findings and Results

The participants consisted of 24 Tehran-based organizational experts. Fourteen participants were men (58.3%) and ten were women (41.7%). In terms of age, seven participants were between 30 and 39 years old (29.2%), eleven were between 40 and 49 years old (45.8%), and six were 50 years old or above (25.0%). Regarding education, fifteen participants held a master's degree (62.5%) and nine held a doctoral degree (37.5%). In terms of professional role, eight participants were senior managers (33.3%), six were human resource or organizational development specialists (25.0%), five were digital transformation managers (20.8%), and five were management consultants (20.8%). Professional experience ranged from 6 to 24 years; five participants had 6–10 years of experience (20.8%), nine had 11–15 years (37.5%), and ten had more than 15 years (41.7%). Participants came from technology and telecommunications ($n = 7$), banking and finance ($n = 5$), manufacturing ($n = 4$), service organizations ($n = 4$), and public or semi-public organizations ($n = 4$).

The first main category was **bureaucratic leadership as rule-based control and formal legitimacy**. Participants described bureaucracy as the historical foundation of organizational order, particularly in large and formal organizations where stability, predictability, documentation, and accountability were necessary. They noted that bureaucratic leadership made responsibilities clear and reduced ambiguity, but also limited responsiveness and initiative when environmental conditions changed rapidly. A senior manager explained, “In the old model, leadership meant knowing the rules better than everyone else and making sure nobody moved outside the approved path” (P03). Another participant stated, “Bureaucracy protected the organization from chaos, but later it became a wall against learning” (P11). This category included subthemes such as formal authority, vertical decision-making, procedural discipline, risk avoidance, and slow adaptation. Participants did not reject bureaucracy entirely; rather, they argued that bureaucratic mechanisms remain useful for compliance, legal accountability, and operational reliability. However, they emphasized that bureaucracy becomes problematic when it treats control as more important than learning, customer responsiveness, and innovation.

The second main category was **participative and transformational transition**. Participants reported that many organizations began moving beyond bureaucratic leadership when they faced cultural change, competitive pressure, and employee expectations for participation. In this transitional stage, leadership became less dependent on formal command and more dependent on vision, motivation, communication, and trust. Participants associated effective leaders with the ability to create meaning, encourage commitment, and help employees understand why change was necessary. One organizational development specialist said, “When digital projects began, the first challenge was not software; it was convincing people that the future of work had changed” (P07). A consultant added, “The leader had to become a translator of change, not just a controller of tasks” (P19). This category included subthemes such as vision-building, employee empowerment, emotional commitment, cultural readiness, and resistance management. Participants described this stage as an important bridge between hierarchical bureaucracy and more distributed forms of leadership because it prepared employees psychologically and culturally for participation in change.

The third main category was **distributed and networked leadership**. Participants emphasized that digital and knowledge-based work requires decision-making to be closer to expertise. They argued that leadership increasingly occurs through teams, projects, communities, and cross-functional networks rather than only through formal managerial positions. A digital transformation manager explained, “In a digital project, the person with the title is not always the person with the answer. Sometimes the real leadership comes from the data analyst, the product owner, or the customer support team” (P14). Another participant noted, “We learned that centralized approval destroys speed. You need distributed authority if you want digital responsiveness” (P21). This category included subthemes such as shared decision-making, cross-functional coordination, team autonomy, expertise-based influence, and collaborative problem-solving. Participants believed that distributed leadership increases organizational agility because decisions can be made where information is most available. However, they also warned that distributed leadership requires clear boundaries, shared standards, trust, and coordination mechanisms; otherwise, it can create fragmentation and role confusion.

The fourth main category was **data-driven digital leadership**. Participants stated that digital transformation changes leadership by making information more visible, real-time, and analytically complex. Leaders are increasingly expected to use dashboards, performance analytics, customer data, digital workflows, and artificial intelligence-supported tools in decision-making. However, participants emphasized that data-driven leadership should not be reduced to technical expertise. It requires interpretation, ethical judgment, and the ability to combine quantitative evidence with human understanding. One participant said, “Dashboards can show what is happening, but leadership is still needed to decide what it means and what should be done” (P05). Another stated, “The danger is that managers hide behind numbers. Digital leadership means using data responsibly, not blindly” (P16). This category included subthemes such as real-time monitoring, evidence-based decision-making, algorithmic awareness, digital communication, virtual coordination, and ethical data use. Participants viewed digital leadership as a hybrid capability involving technological literacy, strategic thinking, communication skills, and ethical responsibility.

The fifth main category was **ecosystem orchestration leadership**. Participants argued that the most advanced stage of leadership evolution occurs when organizations no longer create value alone but depend on partners, platforms, suppliers, customers, regulators, startups, and knowledge networks. In this context, leadership means orchestrating relationships beyond formal organizational boundaries. A management consultant explained, “The

leader of the future is not only managing employees; he or she is managing a field of relationships around the organization” (P22). A senior manager similarly stated, “Our success now depends on partners we do not own and platforms we do not fully control” (P09). This category included subthemes such as boundary spanning, platform governance, partnership management, co-creation, trust-building, and adaptive ecosystem strategy. Participants emphasized that ecosystem leadership requires the ability to align actors with different goals, design fair rules of collaboration, manage interdependence, and maintain legitimacy. They also noted that ecosystem leadership does not eliminate internal leadership; rather, it extends leadership from internal control to external coordination.

4. Discussion and Conclusion

The findings of this study show that the evolutionary trajectory of organizational leadership models is best understood as a layered transformation rather than a simple chronological replacement. Participants described bureaucratic leadership as both enabling and limiting. This finding is consistent with Weber’s conceptualization of bureaucracy as a rational-legal form of authority designed to create procedural order, technical competence, and administrative predictability (Weber, 1978). In the participants’ accounts, bureaucracy remained valuable for accountability, compliance, and role clarity, especially in large organizations and regulated sectors. However, the same bureaucratic features that support stability were also experienced as barriers to innovation and responsiveness. This supports the broader leadership literature suggesting that formal authority alone is insufficient in environments characterized by uncertainty, knowledge intensity, and rapid change (Yukl, 2013). Therefore, bureaucracy should not be dismissed as obsolete; instead, it should be reinterpreted as one layer of organizational governance that must be balanced with more adaptive leadership capabilities.

The second finding concerned the transitional role of participative and transformational leadership. Participants emphasized that the move away from bureaucracy required leaders to create meaning, communicate vision, and prepare employees for change. This finding aligns with Burns’s (1978) view of transformational leadership as a process that elevates motivation and collective purpose, as well as Bass’s (1985) argument that transformational leaders generate exceptional performance through inspiration, intellectual stimulation, and individualized support. In the context of digital transformation, this result suggests that leadership evolution is not driven by technology alone. Digital tools may create new possibilities, but employees must understand, accept, and participate in the change process. Kane et al. (2015) similarly argued that digital transformation is driven more by strategy and organizational readiness than by technology itself. The participants’ descriptions of leaders as “translators of change” highlight the interpretive function of leadership: leaders help organizational members make sense of why established routines must change and how new practices connect to future survival.

The third finding showed that leadership is increasingly distributed across teams, expertise networks, and project-based structures. Participants repeatedly stated that centralized decision-making reduces speed in digital projects because relevant knowledge is dispersed among specialists. This finding strongly supports Gronn’s (2002) argument that distributed leadership should be analyzed as a collective practice rather than merely as the behavior of individual leaders. It also reflects the reality of contemporary knowledge work, where authority based on formal position may be less effective than influence based on expertise, information access, and collaborative capability. Distributed leadership does not mean the absence of leadership; rather, it means that leadership

functions are shared across actors according to task demands. The findings also show that distributed leadership requires governance mechanisms. Without shared goals, coordination routines, and accountability structures, distributed authority can produce confusion. Thus, the study confirms that leadership evolution requires both decentralization and integration.

The fourth finding concerned data-driven digital leadership. Participants emphasized that digital technologies make organizational information more visible and immediate, but they also create new interpretive and ethical challenges. This finding aligns with Avolio et al.'s (2000) concept of e-leadership, which explains leadership as a process shaped by interaction between advanced information technology and organizational structures. The findings also support Nambisan et al. (2017), who argued that digital technologies transform innovation management by enabling distributed agency and fluid boundaries. In the present study, leaders were expected to use digital data for decision-making while avoiding technological determinism. Participants warned that dashboards, algorithms, and analytics cannot replace judgment. This is important because digital leadership requires not only technological literacy but also critical interpretation, ethical awareness, and relational communication. The implication is that leadership development programs should move beyond technical training and include data ethics, algorithmic accountability, digital collaboration, and evidence-based sensemaking.

The fifth finding identified ecosystem orchestration as the most advanced expression of leadership evolution. Participants described modern organizations as dependent on actors beyond their formal boundaries, including partners, customers, platforms, regulators, suppliers, and startups. This finding is consistent with Jacobides et al. (2018), who conceptualized ecosystems as systems of distinct but interdependent organizations coordinated through complementarities rather than full hierarchical control. It also aligns with Helfat and Raubitschek's (2018) argument that digital platform-based ecosystems require dynamic and integrative capabilities. In ecosystem contexts, leadership is no longer limited to managing employees; it involves shaping relationships, coordinating interdependencies, designing rules of participation, and maintaining trust among actors that cannot be controlled by traditional hierarchy. This expands the meaning of leadership from internal influence to external orchestration. Leaders must therefore become boundary spanners who can connect organizational strategy with ecosystem-level value creation.

Overall, the findings support complexity leadership theory, which argues that knowledge-era organizations require the coexistence of administrative, adaptive, and enabling leadership (Uhl-Bien et al., 2007). Participants did not describe bureaucracy, transformational leadership, distributed leadership, digital leadership, and ecosystem leadership as mutually exclusive. Instead, they described them as coexisting layers. For example, organizations still need bureaucratic controls for compliance, transformational leadership for cultural change, distributed leadership for knowledge-based decisions, digital leadership for technology-mediated coordination, and ecosystem leadership for interorganizational value creation. This suggests that future leadership models should be hybrid rather than purely post-bureaucratic. The main challenge is not choosing between hierarchy and networks, but designing leadership systems that combine accountability with adaptability.

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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