

Digital Leadership: Shaping the Future of Organizations in the Age of Technology

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ABSTRACT

This study examines the role of digital leadership in guiding organizations through digital transformation and the increasing integration of Artificial Intelligence (AI). A structured literature review with qualitative thematic synthesis was conducted using relevant academic literature published between over the last five years. The analysis focused on digital leadership, digital transformation, AI, human–AI collaboration, organizational agility, and ethical technology use. The findings identify four interconnected competencies as central to effective digital leadership: technological literacy, emotional intelligence, adaptive capability, and ethical awareness. Technological literacy enables leaders to understand and strategically utilize digital technologies, while emotional intelligence supports communication, trust, and employee adjustment. Adaptive capability strengthens organizational responsiveness to technological change, and ethical awareness promotes responsible, transparent, and human-centered AI implementation. The findings indicate that these competencies collectively support organizational readiness, agility, innovation, and responsible human–AI collaboration. The study provides a conceptual framework for understanding digital leadership as an integrated capability that balances technological advancement with human values and responsible organizational transformation.

Keywords: *Artificial Intelligence, Digital Leadership, Leadership Transformation, Organizational Readiness.*

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1. | INTRODUCTION

Digital transformation has become a sustained organizational change process rather than a temporary technology initiative. Recent literature characterizes digital transformation as a broad change in organizational structures, strategies, capabilities, and ways of working, driven by the diffusion of digital technologies and continuous adaptation requirements (Hanelt et al., 2021; Verhoef et al., 2021). In this context, leadership has become increasingly important because digitalization changes not only technological systems but also decision processes, employee roles, collaboration patterns, and organizational culture (Hensellek, 2020; Klus & Müller, 2021). Digital leadership therefore involves more than technical knowledge; it requires leaders to develop a digital mindset, communicate a clear direction, facilitate learning, and coordinate organizational responses to rapid technological change (Shah & Patki, 2020; Weber et al., 2022). The increasing speed of technological development also means that organizations cannot rely solely on existing managerial routines. Leaders are increasingly required to connect technological opportunities with organizational priorities while ensuring that employees are able to adapt to changing work environments.

The growing integration of artificial intelligence (AI) further intensifies these leadership requirements. AI can support automation, analysis, prediction, and decision-making, but its organizational implications depend on how responsibilities are distributed between people and intelligent systems. Raisch and Krakowski (2021) explain that automation and human augmentation are interdependent rather than mutually exclusive, while Puranam (2021) emphasizes that human–AI collaboration should be considered an organizational design issue involving the division of work and decision authority. Consequently, leaders need to develop organizational capabilities that combine technological understanding with strategic judgment, agility, and appropriate human oversight. Research on digital transformation also indicates that digital transformational leadership and organizational agility can reinforce the transformation process, particularly when supported by an appropriate digital strategy (AlNuaimi et al., 2022). Türk (2023) similarly identifies digital leadership as important for aligning business strategy with organizational adaptation during digital transformation. Leadership roles in digital transformation require a combination of strategic vision, innovation, enabling behavior, mentoring, networking, and performance management (Weber et al., 2022). Thus, the strategic value of digital leadership lies not simply in adopting new technologies, but in shaping how technologies are translated into organizational capabilities, new ways of working, and sustainable responses to environmental change.

At the same time, AI adoption introduces important ethical and human challenges. Organizational use of AI raises questions concerning accountability, transparency, fairness, privacy, and the potential effects of algorithmic decisions on employees and other stakeholders (Hunkenschroer & Luetge, 2022; Stahl et al., 2022). Human–AI

collaboration may also be affected by employee perceptions of risk, trust, and the possibility that AI will disrupt established work routines (Zirar et al., 2023). Recent evidence further shows that leadership can influence employees' initial trust in AI, indicating that leaders have an important social role in facilitating responsible technology adoption (Xu et al., 2024). These issues suggest that digital leadership should integrate technological competence with ethical awareness and human-centered decision-making. This human-centered dimension is particularly important because the effectiveness of digital transformation ultimately depends on how organizational members understand, accept, and interact with new technologies rather than on technological implementation alone.

Another important dimension is the capacity to manage people during continuous digital change. Digital leaders operate in environments characterized by rapid information flows, uncertainty, and changing work arrangements, which require adaptability and relational capabilities (Klus & Müller, 2021; Banks et al., 2022). Emotional intelligence is particularly relevant because digital transformation can generate technostress, uncertainty, and resistance. Ertiö et al. (2024) show that digital leaders' emotional intelligence can support communication, transparency, and trust while helping mitigate employee technostress. Related evidence from non-Western contexts also indicates that digital leadership is associated with emotional intelligence and knowledge-sharing processes (Anwar & Saraih, 2024). These findings reinforce the need to view digital leadership as a human-centered capability rather than a purely technological function. Accordingly, effective digital leaders must balance the pressure for technological innovation with the need to maintain employee engagement, trust, learning, and organizational cohesion.

The issue is also relevant in developing-country contexts. Studies from India and Indonesia indicate that digital leadership must be considered in relation to local organizational conditions, leadership practices, and the capacity of institutions to adapt to technological change (Shah & Patki, 2020; Firmansyah et al., 2024). However, the evidence base remains heterogeneous across sectors and countries, making further synthesis necessary. Differences in institutional environments, organizational maturity, technological infrastructure, and workforce capabilities may influence how digital leadership is practiced and how its effects emerge across organizational settings. This highlights the importance of developing a broader conceptual perspective that does not treat digital leadership as a uniform set of technological skills.

Based on this context, the present study reviews literature on digital leadership, digital transformation, and AI to identify the competencies that enable leaders to guide organizations through technological change. Particular attention is given to technological literacy, emotional intelligence, adaptive capability, and ethical awareness. The study seeks to integrate these dimensions into a conceptual understanding of future digital leadership that balances organizational innovation and technological capability with human values and responsible AI use. By connecting

leadership competencies with organizational readiness, agility, innovation, and human–AI collaboration, this study positions digital leadership as a strategic capability for shaping how organizations respond to the continuing evolution of technology.

2. | LITERATURE REVIEW

The Concept of Digital Leadership in the AI Era

Digital leadership has emerged as an important organizational capability in response to the increasing integration of digital technologies into organizational processes. Unlike conventional leadership, digital leadership involves guiding organizations through continuous technological change while maintaining strategic direction, collaboration, innovation, and employee engagement. Hensellek (2020) conceptualizes digital leadership as a leadership approach that combines digital competencies with the ability to create an environment that supports innovation and organizational adaptation. Similarly, Klus and Müller (2021) emphasize that digital leaders must understand technological developments while managing changing organizational structures, communication patterns, and work practices.

Recent research further indicates that digital leadership consists of interconnected competencies rather than a single leadership characteristic. Weber et al. (2022) identify several leadership roles required in technology-driven environments, including strategic direction, innovation support, employee development, and organizational coordination. Türk (2023) also demonstrates that digital leadership contributes to the alignment between digital transformation and business strategy. More recently, Lin (2024) identifies vision motivation, digital empowerment, innovation, cross-boundary collaboration, and dynamic adaptation as important characteristics of digital leadership.

The growing use of AI expands these requirements because leaders must increasingly coordinate interactions between employees and intelligent technologies. Raisch and Krakowski (2021) argue that AI creates an automation–augmentation relationship in which technology can replace some tasks while simultaneously enhancing human capabilities. Therefore, digital leadership in the AI era requires technological understanding, strategic thinking, adaptability, and the ability to maintain human-centered organizational practices.

Digital Transformation and the Role of AI in Organizations

Digital transformation refers to organizational change enabled by digital technologies and involves substantially more than the adoption of individual technological tools. Hanelt et al. (2021) describe digital transformation as a process that affects organizational strategy, structures, capabilities, and processes. Verhoef et al. (2021) similarly explain that digital transformation changes how organizations create value, interact with stakeholders, and develop new organizational capabilities. Consequently, successful transformation requires alignment between technology, strategy, organizational resources, and human capabilities.

Digital leadership plays an important role in this process because leaders provide strategic direction and coordinate organizational responses to technological change.

AlNuaimi et al. (2022) found that digital transformational leadership and organizational agility positively influence digital transformation, while organizational agility can function as an important mechanism linking leadership and transformation. Türk (2023) further emphasizes that digital leaders contribute to the development of strategies that align technological transformation with organizational objectives.

AI represents an increasingly important component of digital transformation because it can support automation, data analysis, prediction, and decision-making. However, its implementation also changes how work is organized and how responsibilities are distributed between humans and technological systems. Puranam (2021) therefore conceptualizes human–AI collaboration as an organizational design issue involving the allocation of tasks and decision authority. Raisch and Krakowski (2021) similarly emphasize that organizations need to balance automation with human augmentation. Thus, AI-driven transformation requires more than technological investment. Organizations need leadership capable of integrating digital technologies with organizational strategy, employee capabilities, and appropriate human oversight.

Challenges of Leadership Development in the AI Era

The development of leadership in the AI era involves challenges associated with technological complexity, organizational adaptation, human–AI collaboration, and ethical responsibility. Digital leaders are required to understand emerging technologies while simultaneously managing employees who may experience uncertainty regarding changing work processes and responsibilities. Klus and Müller (2021) emphasize that digitalization changes organizational structures and leadership requirements, making adaptability and technological understanding increasingly important. One major challenge is the gap between technological adoption and leadership capability. Weber et al. (2022) argue that digital transformation requires leaders to perform multiple roles, including strategic leadership, innovation facilitation, employee development, and coordination. Banks et al. (2022) further demonstrate that leadership in digitally mediated environments involves changes in how leaders communicate, coordinate, and maintain relationships across increasingly distributed work settings.

A second challenge concerns human–AI collaboration. Zirar et al. (2023) identify coexistence between workers and AI as an emerging organizational issue involving changing work roles, skills, and employee responses to technological systems. These changes require leaders to develop adaptive approaches rather than treating AI adoption solely as a technical implementation. Ethical responsibility represents another critical challenge. Hunkenschroer and Luetge (2022) identify concerns surrounding fairness, transparency, privacy, and accountability in AI-supported human-resource processes. Stahl et al. (2022) similarly emphasize that organizations need governance mechanisms to address the ethical implications of AI. Therefore, future leadership development must integrate technological literacy with adaptability, communication, ethical awareness, and human-centered decision-making.

Current Research Directions: AI-Driven Leadership Development

Recent research on digital leadership increasingly moves beyond the question of whether organizations should adopt digital technologies toward understanding how leaders can develop organizational capabilities for sustained digital transformation. Lin (2024), based on a systematic review of 53 academic publications, identifies several central characteristics of digital leadership, including digital strategic thinking, digital insight, digital change, digital talent development, innovation, collaboration, and dynamic adaptation. These dimensions indicate that digital leadership research is becoming increasingly concerned with the integration of technological and human capabilities. One important research direction concerns organizational agility. AlNuaimi et al. (2022) demonstrate that digital transformational leadership is positively associated with organizational agility and digital transformation. This suggests that leadership development should not focus exclusively on individual technological skills but should also strengthen the organizational capacity to respond rapidly to technological change.

A second direction concerns human–AI collaboration. Puranam (2021) frames human–AI collaboration as an organizational design problem, while Zirar et al. (2023) emphasize the need to understand how workers and AI systems can coexist as work roles change. Research has also increasingly examined trust in AI. Xu et al. (2024) show that leadership can influence employees' initial trust in AI, highlighting the social role of leaders during technology adoption. Finally, AI ethics has become an important research area. Hunkenschroer and Luetge (2022) and Stahl et al. (2022) emphasize issues of fairness, transparency, accountability, and responsible AI governance. Therefore, contemporary leadership development increasingly requires an integrated framework combining digital competence, strategic vision, adaptability, human–AI collaboration, and ethical awareness.

3. | RESEARCH METHOD

This study employed a structured literature review with qualitative thematic synthesis to examine digital leadership in the context of digital transformation and artificial intelligence (AI). The review focused on how recent literature conceptualizes digital leadership, organizational transformation, human–AI collaboration, leadership competencies, and ethical considerations. A structured review approach was selected because it enables relevant studies to be identified, screened, organized, and synthesized systematically rather than relying on narrative discussion alone. The reporting of the review process was informed by the principles of PRISMA 2020, which emphasize transparent reporting of literature identification, screening, eligibility, and inclusion processes (Page et al., 2021).

The literature search was conducted using Scopus, ScienceDirect, SpringerLink, Emerald Insight, and Google Scholar. The main search terms included digital leadership, digital transformation, digital leadership competencies, artificial intelligence and leadership, human–AI collaboration, organizational agility, AI ethics,

and leadership development in the digital era. The search was restricted primarily to publications from 2020 to 2024 to ensure that the synthesis reflected recent developments in digital leadership and AI-related organizational research.

The inclusion criteria consisted of: (1) peer-reviewed journal articles or academically credible research publications; (2) publications dated 2020–2024; (3) studies addressing digital leadership, digital transformation, AI in organizations, human–AI collaboration, organizational agility, leadership competencies, or responsible AI; and (4) studies providing conceptual arguments or empirical findings relevant to the research objectives. Publications were excluded when they were outside the research topic, lacked sufficient academic evidence, were opinion-based, duplicated another record, or did not provide sufficient information for thematic interpretation.

The selected literature was organized according to publication characteristics, research focus, and major conceptual themes. The analysis used thematic synthesis to identify recurring concepts and relationships across the selected studies. Each study was examined in terms of its research focus, principal findings, leadership dimensions, technological context, and implications for organizational transformation. Similar findings were grouped into broader themes, while differences between studies were retained to avoid treating heterogeneous evidence as equivalent.

The synthesis resulted in four major dimensions of digital leadership: technological literacy, emotional intelligence, adaptive capability, and ethical awareness. Technological literacy represents the ability to understand and strategically use digital technologies and AI. Emotional intelligence concerns leaders' capacity to maintain communication, empathy, and trust during technological change. Adaptive capability reflects the ability to respond to uncertainty and continuously adjust strategies and practices. Ethical awareness concerns responsible technology use, including fairness, transparency, accountability, privacy, and human oversight.

The final synthesis connected these four dimensions with organizational readiness, innovation, resilience, and human–AI collaboration. Rather than assuming that technological adoption automatically produces organizational improvement, the analysis examined how leadership capabilities shape the organizational conditions required for responsible and sustainable digital transformation. The resulting conceptual framework was then used to organize the findings and discussion of the study.

4. | RESULTS

The synthesis of the selected literature indicates that digital leadership has evolved from a technology-oriented concept toward a multidimensional leadership capability that integrates technological knowledge, organizational adaptability, human-centered management, and ethical responsibility. Across the reviewed studies, digital leadership is consistently associated with the ability of leaders to guide organizations through technological change while maintaining organizational alignment, employee engagement, and responsible use of digital technologies. Recent research identifies

digital strategic thinking, digital insight, digital change capability, digital talent development, innovation, collaboration, and dynamic adaptation as important dimensions of digital leadership (Lin, 2024; Klus & Müller, 2021).

The thematic synthesis identified four closely related dimensions that characterize effective digital leadership: technological literacy, emotional intelligence, adaptive capability, and ethical awareness. These dimensions should not be interpreted as independent leadership characteristics. Instead, they interact in shaping an organization's ability to respond to technological transformation. Technological literacy provides the basis for understanding digital technologies and AI, emotional intelligence facilitates the management of human responses to technological change, adaptive capability enables leaders and organizations to respond to uncertainty, and ethical awareness provides guidance for responsible technology use.

Technological literacy emerged as the first major dimension. The reviewed literature indicates that digital leaders require sufficient understanding of digital technologies to recognize technological opportunities, evaluate their organizational implications, and connect technological initiatives with strategic objectives. Klus and Müller (2021) found that IT skills, entrepreneurial thinking, flexibility, creativity, and the ability to motivate others are associated with leaders' capacity to cope with challenges arising from digitalization. Lin (2024) similarly identifies digital strategic thinking, digital insight, digital change, and digital talent development as core dimensions of digital leadership. These findings indicate that technological literacy should not be understood merely as technical proficiency. It also involves the capacity to interpret technological developments strategically and determine how digital tools can support organizational objectives.

Table 1. Characteristics of the Reviewed Studies

Category	Information to Report
Publication year	2020, 2021, 2022, 2023, 2024
Research approach	Empirical / Review / Conceptual / Mixed
Main context	Business / Public sector / Education / Other
Main technology	Digital transformation / AI / Digital platforms
Main leadership focus	Digital leadership / Digital transformation leadership / AI leadership

The second dimension is emotional intelligence. The literature demonstrates that technological transformation affects employees not only through changes in tasks and processes but also through uncertainty, stress, and changing perceptions of work. Ertiö et al. (2024) specifically identify emotional intelligence as an important competency for digital leaders because it enables leaders to recognize and respond to employees' emotional conditions during digital transformation. Their study highlights communication, transparency, and trust as mechanisms through which digital leaders can help mitigate employee technostress. This finding complements the broader literature indicating that digital transformation requires leaders to maintain effective

relationships while organizations experience rapid technological change. Therefore, emotional intelligence functions as a bridge between technological transformation and employee acceptance of organizational change.

Table 2. Thematic Synthesis of Digital Leadership Competencies

Theme	Core Meaning	Evidence from Literature	Organizational Implication
Technological literacy	Understanding and strategically using digital technology and AI	Klus & Müller (2021); Lin (2024)	Better technology-related decisions
Emotional intelligence	Managing emotions, communication, trust, and employee responses	Ertiö et al. (2024)	Reduced technostress and stronger trust
Adaptive capability	Responding to technological uncertainty and change	AlNuaimi et al. (2022); Klus & Müller (2021)	Greater agility and transformation readiness
Ethical awareness	Responsible, transparent, fair, human-centered technology use	Zirar et al. (2023)	Responsible AI and human–AI coexistence

The third dimension concerns adaptive capability and organizational agility. Digital transformation is characterized by continuous technological development, changing organizational requirements, and uncertainty. Consequently, leaders must be capable of adjusting strategies, structures, priorities, and managerial practices as new technological conditions emerge. AlNuaimi et al. (2022) provide empirical evidence that digital transformational leadership positively influences organizational agility and digital transformation, while organizational agility mediates the relationship between digital transformational leadership and digital transformation. This finding demonstrates that leadership contributes to transformation not simply by initiating technological projects but also by strengthening the organization's capacity to respond effectively to changing circumstances. Organizational agility enables leaders to recognize emerging technological opportunities, respond to external changes, and reconfigure organizational resources when necessary.

Klus and Müller (2021) likewise associate flexibility, creativity, and entrepreneurial thinking with leaders' ability to cope with digitalization-related challenges. These capabilities are particularly important because technological transformation rarely follows a predictable path. Leaders may need to revise strategic priorities, experiment with new approaches, and encourage employees to develop new competencies as technologies and organizational needs evolve. Thus, adaptive capability represents the capacity of leaders to continuously learn, adjust strategic priorities, facilitate organizational learning, and coordinate responses to technological uncertainty. In this sense, digital leadership contributes to organizational resilience by enabling organizations to remain responsive while maintaining strategic direction during periods of technological change.

The fourth dimension is ethical awareness. The increasing use of AI introduces issues that extend beyond efficiency and technological performance. AI-supported organizational processes can affect decision authority, employee roles, privacy,

fairness, accountability, and trust. The literature on human–AI coexistence indicates that employees may distrust AI when they perceive it as a threat to their employment, while effective coexistence requires a combination of technical, human, and conceptual skills as well as continuous reskilling and upskilling (Zirar et al., 2023). These findings demonstrate that AI implementation requires attention to the human consequences of technological change rather than focusing exclusively on technological efficiency.

Ethical awareness therefore involves ensuring that AI-supported decisions remain subject to appropriate human oversight and that technological implementation considers fairness, accountability, transparency, privacy, and employee interests. It also requires leaders to communicate clearly about how AI systems are used and how their outputs affect organizational decisions. Consequently, ethical awareness complements technological literacy and adaptive capability by providing principles for determining how and under what conditions emerging technologies should be implemented. Together, adaptive capability and ethical awareness demonstrate that effective digital leadership requires organizations to remain both responsive to technological change and responsible in managing its consequences.

Table 3. Relationship Between Digital Leadership Competencies and Organizational Outcomes

Digital Leadership Dimension	Immediate Effect	Organizational	Broader Outcome
Technological literacy	Better understanding and evaluation of technology	and	Technology-enabled innovation
Emotional intelligence	Communication, trust, employee adjustment	employee	Employee acceptance of transformation
Adaptive capability	Faster response to technological change	technological	Organizational agility and resilience
Ethical awareness	Responsible AI governance and human oversight	and	Sustainable and trustworthy transformation

The synthesis further demonstrates that the four dimensions are interconnected rather than sequential. Technological literacy enables leaders to understand, evaluate, and strategically utilize digital technologies, while emotional intelligence helps them manage employee responses to technological change. Adaptive capability enables leaders to translate technological opportunities into appropriate organizational responses, whereas ethical awareness establishes boundaries for responsible implementation. These dimensions therefore operate simultaneously and reinforce one another. A leader may possess strong technological knowledge, but without emotional intelligence, technological initiatives may generate uncertainty, resistance, or technostress among employees. Similarly, organizational adaptation without ethical awareness may create risks related to accountability, transparency, fairness, and responsible technology use. The interaction among these dimensions provides a more comprehensive explanation of digital leadership than technological competence alone.

The relationship between digital leadership and organizational transformation is also evident at the organizational level. AlNuaimi et al. (2022) demonstrate that digital

transformational leadership and organizational agility contribute positively to digital transformation. Their findings indicate that leadership plays an important role in enabling organizations to respond to technological changes while maintaining strategic alignment and organizational flexibility. Lin's (2024) systematic review similarly reports that digital leadership is associated with organizational change and innovation, team effectiveness, and employee creativity and innovation behavior. These findings suggest that the contribution of digital leadership extends beyond individual leader competencies and influences broader organizational outcomes. Digital leaders therefore function not only as technology-oriented decision makers but also as facilitators of organizational readiness, innovation, and continuous adaptation.

The literature also indicates that human–AI collaboration is becoming an increasingly important component of digital leadership. Zirar et al. (2023) identify four major issues in worker–AI coexistence: distrust arising from perceived job threats, AI's potential to augment worker capabilities, the importance of technical, human, and conceptual skills, and the need for continuous reskilling and upskilling. These findings highlight that AI adoption changes the relationship between employees, work processes, and organizational systems. Accordingly, leaders have to manage not only the technological implementation of AI but also the organizational and human processes through which employees interact with AI systems. Effective digital leadership therefore requires leaders to create conditions in which AI complements human capabilities while employees are supported in developing the skills required to work with evolving technologies.

The results establish a conceptual pattern in which technological literacy, emotional intelligence, adaptive capability, and ethical awareness jointly contribute to organizational readiness for digital transformation. Technological literacy supports informed adoption and evaluation of digital technologies; emotional intelligence supports communication, trust, and employee adjustment; adaptive capability strengthens organizational responsiveness to technological disruption and emerging opportunities; and ethical awareness supports responsible, transparent, and human-centered AI implementation. These dimensions collectively connect technological change with organizational and human considerations. The findings therefore indicate that digital leadership should be understood as an integrated capability that connects technology, people, organizational change, and responsible governance. In this perspective, digital leaders contribute to shaping the future of organizations by ensuring that technological innovation is accompanied by adaptability, employee support, strategic alignment, and responsible decision-making.

5. | DISCUSSION

The findings of this study indicate that digital leadership should be understood as a multidimensional organizational capability rather than simply the ability to use digital technologies. The thematic synthesis identified four interconnected dimensions: technological literacy, emotional intelligence, adaptive capability, and ethical

awareness which together explain how leaders can facilitate organizational responses to digital transformation and AI adoption. This interpretation is consistent with Lin (2024), who identifies digital strategic thinking, digital insight, digital change, digital talent development, innovation, collaboration, and dynamic adaptation as important dimensions of digital leadership.

The first finding concerns technological literacy. The results indicate that leaders need sufficient understanding of digital technologies to evaluate opportunities, risks, and organizational implications. This does not mean that leaders must become technical specialists; rather, they need enough digital understanding to connect technology with organizational strategy and managerial decisions. Klus and Müller (2021) similarly emphasize the importance of IT skills, flexibility, creativity, entrepreneurial thinking, and motivation in responding to digitalization. This supports the view that technological literacy is most valuable when combined with strategic and organizational capabilities.

The second finding concerns emotional intelligence. Digital transformation changes work processes and may create uncertainty, stress, and concerns about changing roles. Ertiö et al. (2024) demonstrate that emotional intelligence among digital leaders is relevant to communication, transparency, and trust and can help mitigate employee technostress. This finding extends the technology-centered view of digital leadership by emphasizing that transformation also depends on how employees experience and interpret technological change. Consequently, leaders need to maintain communication and trust while introducing new digital systems.

The third finding relates to adaptive capability and organizational agility. Digital transformation requires organizations to respond continuously to technological and environmental changes rather than implementing technology as a one-time project. AlNuaimi et al. (2022) found that digital transformational leadership is positively associated with organizational agility and digital transformation. This supports the present finding that adaptive leadership can help translate technological change into organizational responses. Adaptability therefore involves continuous learning, adjustment of strategies, and the capacity to respond to uncertainty.

The fourth finding concerns ethical awareness. AI adoption creates organizational questions involving accountability, fairness, transparency, privacy, and human oversight. Hunkenschroer and Luetge (2022) emphasize the ethical challenges associated with AI-supported recruitment and selection, while Stahl et al. (2022) highlight the need for organizational responses to the ethical implications of AI. These findings suggest that digital leadership cannot be evaluated only through efficiency or innovation outcomes. Responsible implementation requires leaders to consider how AI affects employees, decision-making processes, and organizational stakeholders.

The findings also reinforce the importance of human–AI collaboration. Puranam (2021) conceptualizes human–AI collaboration as an organizational design issue involving the allocation of tasks and decision authority, while Zirar et al. (2023) identify technical, human, and conceptual skills as important for worker–AI coexistence. This

indicates that leaders should not treat AI adoption solely as a technological implementation. Instead, they need to consider how responsibilities, skills, communication, and human oversight are reorganized as AI becomes integrated into organizational work.

The discussion confirms that the four dimensions identified in this study are complementary. Technological literacy provides the basis for understanding digital technologies; emotional intelligence supports employee trust and adjustment; adaptive capability strengthens organizational responsiveness; and ethical awareness guides responsible technology use. The contribution of this study is therefore the integration of these dimensions into a human-centered understanding of digital leadership. Rather than replacing conventional leadership principles, digital leadership expands them to address technological complexity, organizational agility, human–AI collaboration, and ethical responsibility.

6. | CONCLUSION

This study examined the role of digital leadership in guiding organizations through digital transformation and the increasing integration of artificial intelligence. The literature synthesis demonstrates that digital leadership should be understood as an integrated organizational capability that combines technological competence with human-centered and adaptive leadership practices. Four interconnected dimensions emerged as the core competencies of digital leadership: technological literacy, emotional intelligence, adaptive capability, and ethical awareness. Technological literacy enables leaders to understand and strategically utilize digital technologies and AI. Emotional intelligence supports communication, trust, and employee adjustment during technological change. Adaptive capability enables leaders and organizations to respond continuously to changing technological and organizational conditions. Ethical awareness ensures that the implementation of digital technologies and AI considers fairness, transparency, accountability, privacy, and appropriate human oversight.

The findings further indicate that these competencies should not be developed independently. Their interaction provides a foundation for organizational readiness, agility, innovation, and responsible human–AI collaboration. Digital leadership therefore extends beyond technological adoption and requires leaders to balance organizational objectives with employee needs and responsible technology governance. This study contributes a conceptual understanding of digital leadership by integrating technological, human, adaptive, and ethical dimensions within the context of digital transformation and AI.

The findings also suggest that organizations should develop leadership programs that combine digital knowledge with emotional and adaptive capabilities while establishing appropriate principles for responsible AI use. However, the findings should be interpreted within the scope of the literature reviewed. The available evidence varies across organizational contexts, sectors, and countries, which limits the generalization of the conceptual framework. Future empirical research should therefore examine these

four dimensions across different organizational and national contexts, particularly in developing economies, to determine how digital leadership competencies influence organizational transformation in practice.

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The authors declare that there is no conflict of interest.

Ethical Approval and Originality Statement

Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

Data Disclosure Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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