



Strategic Leadership 5.0: Reality or Illusion?

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Abstract

This study initiates an exploration into strategic leadership within the context of the emerging Industry 5.0 (I5.0) era, integrating strategic leadership theory with the principles of Industry 5.0. Unlike Industry 4.0, which primarily focuses on managing technological capabilities, Industry 5.0 seeks to fundamentally transform business operations, societal consumption patterns and environmental protection by emphasizing a sustainable, human-centric and resilient industrial future. This shift is expected to have a significant impact on organisational performance. This conceptual study investigates how strategic leadership might adapt in this new era and explores the potential implications for organisational performance by mapping causal links between leadership and previous industrial epochs. It also identifies areas for future empirical research. Considering the diverse impact of factors such as inspirational vision, cognitive decision-making, strategic management and relationship building and maintenance, the study examines the potential effects of Strategic Leadership 5.0. It offers insights into decision-making and design thinking, proposes research directions and outlines a roadmap for developing Strategic Leadership 5.0 models aimed at enhancing organisational performance, with practical, theoretical, and implementable implications for policy.

Keywords Strategic leadership · Strategic management · Industry 5.0 · Sustainability · Resilience · Human–machine collaboration · Organisational performance

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Introduction

The rise of sustainable digital transformation (SDT) challenges traditional notions of strategic leadership. As organisations strive to navigate technological advances, integrating strategic leadership with Industry 5.0 (I5.0) becomes crucial for achieving competitive advantage in operations and performance (Chaniago, 2023; McCarthy et al., 2022; Mohamed Hashim et al., 2022a, 2022b; Philip et al., 2023). Effectively implementing digital transformation requires leadership across various organisational layers, giving rise to the concept of Strategic Leadership 5.0 (SL5.0), demanding enhanced skills and practices relevant to Industry 5.0 capabilities. I5.0 has demonstrated a substantial, complex and organisational-oriented impact globally (Narayanan, 2023; Haroon et al., 2022; AlNuaimi et al., 2022; Tlemsani et al., 2023; Tlemsani, 2022; Majdalawieh et al., 2017). This impact manifests in three distinct ways:

- **Emerging value propositions:** Organisations now associate value propositions with data/information bundles, balancing benefits for customers, planet and organisation. This shift requires new sensing capabilities for technological development and customer-centric organisational positioning.
- **Strategic drift in focus:** Business strategy is shifting from technology-focused (Industry 4.0 (I4.0)) to ecosystem-focused (I5.0). This transition demands a strategic leadership shift, focusing on ecosystem deployment of SDT, decision-making and integration capabilities.
- **Demand for knowledge workers and process assets:** In I5.0, knowledge workers and process assets are becoming key to competitive advantage. However, they only become relevant when invested in utilizing I5.0 resources, emphasizing the need for new forms of leadership.

While industry 5.0 has embarked on a noteworthy evolution in industrial advancement via the integration of advanced automation, IoT and cyber-physical systems, its focus has been largely on enhancing efficiency, gaining superior productivity and technological optimisation (European Commission, 2021). However, the substantial technology-oriented focus resulted in several deficiencies, such as limited focus on promoting human reasoning, ethical reflection, sustainability and circularity. These gaps have encouraged the industry practitioners to explore a new paradigm—I5.0. The phenomenon of I5.0 is simply not a continuation of I4.0, but it is a transformational shift that emphasises the human element as the centric priority in industrial evolution. By fostering the human-robotic collaboration, the organisation attempts to build resilience, sustainability and circularity as top-order capabilities.

This cognitive shift necessitates conceptualizing leadership as an organisational variable for integration into organisational systems. In the evolving landscape of I5.0, strategic leadership faces increasing complexity and expectations. As organisations grapple with sustainability, resilience and human talent enhancement, strategic leadership's role becomes more critical (Carter & Greer,

2013). SL5.0, characterised by a new aspirational decision mindset, emerges as potentially transformative, redefining organisational operations, societal impacts and environmental considerations, challenges traditional assumptions in two keyways:

- Co-evolution of technologies and operations: Strategic leadership should reimagine itself to lead the co-evolving nature of human-technological teams, resilience and sustainability.
- Human-centric digital advantages: I5.0 places the human element at the centre of cognitive collaboration, viewing human cognitive capabilities as the source of competitive advantage. Assimilating this phenomenon requires new conceptual thinking, hence SL5.0.

The rapid transition from I4.0 to I5.0 highlights the urgency to explore the evolving relationship between manufacturing technology and leadership. A universal definition of strategic leadership, and indeed leadership, remains elusive, but as I5.0 unfolds, understanding its correlation with the evolving landscape of strategic leadership becomes crucial. SL5.0 is not just an adaptation to I5.0 but an aspirational shift, demanding leaders to embrace a new decision mindset to navigate the transformative potential of I5.0 (Fig. 1).

Industry 5.0 aligns closely with the United Nations Sustainable Development Goals, encouraging organisations to integrate environmental, social and economic aspects into their operations to achieve long-term positive outcomes (European Commission, 2021; United Nations, 2021). For example, SDG 9 (Industry, Innovation and Infrastructure) is supported through the advancement of human-centric technologies and resilient production systems; SDG 12 (Responsible Consumption and Production) is addressed by promoting circular economy practices and resource-efficient manufacturing; SDG 8 (Decent Work and Economic Growth) is reinforced by prioritizing meaningful human-machine collaboration that enhances worker well-being and job quality; and SDG 13 (Climate Action) is supported

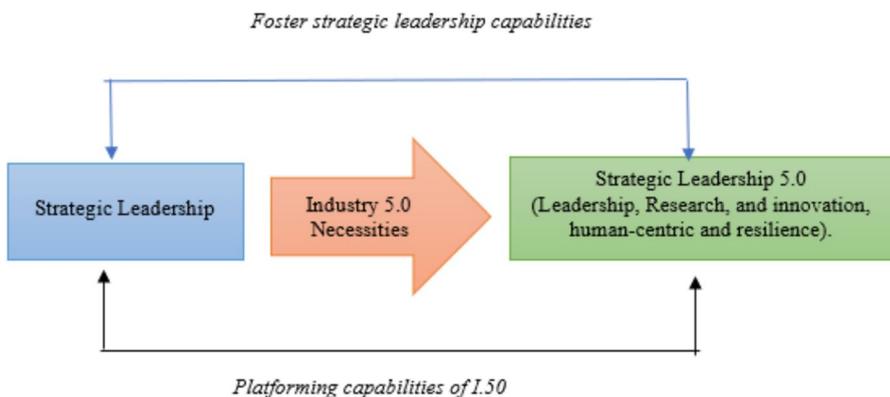


Fig. 1 Converging leadership phenomenon—Strategic Leadership 5.0, source the authors

through the adoption of sustainable energy systems and low-carbon industrial processes (United Nations, 2021). This shift from I4.0 to I5.0 is highlighted by entities such as the European Commission, which underscores the importance of utilizing intelligent systems to create new value beyond the traditional triple bottom line. Key drivers of I5.0's transformation include the growing use of the Internet of Things (IoT) and digital twins, which are virtual simulations that enhance data modelling and operational efficiency (Togo & Gandidzanwa, 2021; Xu et al., 2021a, 2021b).

The fourth industrial revolution has empowered firms to demonstrate leadership capabilities by leveraging technological advancements that are closely integrated with their business intelligence systems, platform-based business models and innovations (Xu et al., 2021a, 2021b). This revolution is driven by four key technological capabilities: artificial intelligence, cloud computing, big data and IoT. The combination of these technologies was crucial in facilitating rapid information exchange, a core element of the industry 4.0 landscape (Mohamed Hashim et al., 2021, 2024; Tlemsani & Matthews, 2020; Tlemsani, 2010).

I4.0 is characterised by technology-driven automation processes aimed at enhancing productivity and optimisation. This approach allows firms to significantly reduce the costs of producing goods and services in the short term, positioning cost reduction as a competitive advantage that yields immediate profitability. As these technologies became more accessible, the competitive advantages they offer also became more replicable, prompting firms to seek new sources of differentiation. This search has led to the rise of I5.0, marked by the emerging concept of human–robot cognitive collaboration.

While I4.0 has notably influenced work-life balance in a technology-centric manner, its key features include intelligent automation, smart manufacturing and just-in-time information exchange, which collectively minimise resource usage and positively impact organisational performance (Tlemsani & Matthews, 2010; Zizic et al., 2022).

The differentiation between SL5.0 and traditional strategic leadership is crucial. Organisations must discern, acknowledge and integrate the emerging practices stemming from the adoption of SL5.0. This serves as an emerging checklist for leaders to navigate the SDT process and opportunities for empirical research. In pursuit of the parameters of SL5.0, it becomes important to trace the evolution and chronological connections between industry phenomena 1.0 to 5.0 and strategic leadership, providing insights into the interrelationships between leadership, technology and the business environment. Not least, it is important to remember that business strategy was not a distinct academic discipline until the 1960 s, and strategic leadership adopted the language and theoretical constructs of broader leadership theory.

The research questions are:

1. Is strategic leadership 5.0 an emerging fact or fiction?
2. If so, how can SL5.0 be fostered to regulate desirable organisational performance?

Research Gap

In the age of SDT, aligning strategic leadership functions with organisational goals and technological realities is crucial. This paradox prompts a strategic shift in organisational competitiveness and performance, emphasizing the intelligent utilisation of human-cognitive capabilities over technology-driven productivity gains. This paper hopes to contribute to emerging research by offering a conceptual framework for the systematic integration of strategic leadership into organisational processes, helping to bridge a significant knowledge gap. This paper addresses this challenge by presenting signposts for SL5.0 research that can be standardised across industry sectors. Ultimately, navigating SDT in the information age, as in previous industrial eras, requires leadership adept at seizing strategic opportunities; see Fig. 2.

Literature Review

Leadership Evolution

Our understanding of leadership has evolved significantly since the advent of Industry 1.0 in the late 1700 s. Initially dominated by Great Man Theory rooted in political and military ideals (Bohl, 2019), it focused on the notion of innate leadership abilities. By Industry 2.0, in the late 1800 s, this had morphed into Trait Theory, emphasizing key characteristics of effective leaders (Zaccaro et al., 1991). By the 1940 s, Behavioural Theories had emerged, challenging the idea of inherent leadership qualities and focusing instead on learned behaviour (Rost, 1993). Style Theory followed, suggesting that leadership approaches could be adapted to different situations (Mouton & Blake, 1964). While the 1980 s and 1990 s, during Industry 3.0, saw the need for adaptability in increasingly dynamic environments.

Fig. 2 Existing knowledge gap in the literature, source—authors



Transformational Theory, for example, in contrast to transactional theory, emphasised a leader's ability to inspire change through vision and charisma (Bass, 1990), and subsequent studies have confirmed its continuing relevance (Tlemsani et al., 2020; Tucker & Russell, 2004), encouraging employees to transcend self-interest for the greater good of the organisation and society (Yukl, 2006).

Transformational theory, however, continues to portray leaders in a heroic light. In contrast, post-heroic or plural leadership has emerged. Shifting the focus to leadership as a dynamic, collective, and distributed phenomenon, emphasizing shared leadership, collective leadership and Leadership-As-Practice (L-A-P) (Denis et al., 2012; Gronn, 2002; Pearce & Conger, 2003; Raelin, 2011). Approaches that view leadership as shared and emerging through social interactions (Drath et al., 2008; Fletcher, 2004). At the strategic level, co-leadership (Alvarez & Svejnova, 2005; Tlemsani & Al Suwaidi, 2016) has emerged as a response to the increasing demands on strategic leaders to satisfy triple bottom line measures and deal with growing numbers of stakeholders (Love & Priem, 2007). Critical Leadership Studies (CLS), on the other hand, scrutinise power dynamics, challenging assumptions about empowerment leading to fair leadership distribution. Critical feminist studies, for example, highlight workplace privilege based on gender and advocate for inclusive leadership practices valuing diversity (Ashcraft & Mumby, 2004). The relationship between Industry Revolutions 1.0 to 3.0 and leadership theories are summarised in Table 1.

Strategic Leadership

The emergence of business strategy as an academic discipline is relatively recent, contemporary with the advent of Industry 3.0 in the 1960 s. Scrutiny of strategic leaders' thinking, behaviour and decision-making quickly followed, with research examining the 'upper echelons' of business and board dynamics (Barnard, 1968; Boyd et al., 2011; Hambrick, 2007; Hambrick & Mason, 1984; Mintzberg, 1973). Unsurprisingly, they adopted the language and theoretical constructs of broader leadership theory. Even today, a popular strategic management textbook constructs its examination of strategic leadership around transformational and transactional leadership (Whittington et al., 2019).

Recent academic literature on strategic leadership continues to underscore the critical role that leaders play in shaping organisational strategy and performance, with an emphasis on developing leadership styles and competencies that enable organisations to navigate complexity, drive innovation and maintain ethical standards in an increasingly dynamic environment (for example, Samimi et al., 2022). In this regard, strategic leadership plays a crucial role in developing and deploying dynamic capabilities that enable organisations to respond to environmental changes (Eisenhardt & Martin, 2021; Tlemsani, 2020). Recent studies also highlight the importance of strategic leadership in fostering a culture of innovation and sustainability (Amui et al., 2017; O'Reilly & Tushman, 2013).

Strategic leadership is also required when navigating crises. Leaders who demonstrate agility, resilience and the ability to make rapid, informed decisions are

Table 1 Industry 1.0 to 3.0 and coincident leadership theories (source Bass, 1990; Bohl, 2019; Zaccaro et al., 1991 and the authors)

Industry revolution	Key features	Leadership theories	Key features
Industry 1.0 1784–1870	Mechanical production Water and steam power First mechanical loom	Great Man Theory	Leader as hero Born not made Autocratic and hierarchical
Industry 2.0 1870–1969	Mass production Division of labour Electrical power First assembly line	Motivational Theory Trait Theory Behavioural Theory Leadership styles	Dissatisfaction with formal authority and hierarchy Shift from nature to nurture Who leaders are v. What leaders do
Industry 3.0 1969–2011	Electronics IT systems Automated production First programmable logic controller	Situational approach Contingency Theory Transformational Theory Post-Heroic Theories Plural leadership Critical leadership studies	Leadership is not fixed and depends upon the context Greater connection and communication within organisations Leadership through vision and inspiration Leadership emerges through complex social interaction Leadership is shared and distributed But power dynamics can still determine who leads

better equipped to steer their organisations through turbulent times (Hannah & Parry, 2014). In addition, strategic leaders are increasingly expected to make decisions that are not only profitable but also ethical (Demirtas, et al, 2017). And as organisations have become more global, strategic leaders are expected to develop cross-cultural competencies, with recent studies exploring how leaders can effectively manage diverse teams and lead in multinational contexts (Mendenhall et al., 2012). There is also ongoing research comparing transformational and transactional leadership styles in strategic contexts (Nguyen & Luu, 2022). As well as emerging research exploring the concept of servant leadership in strategic contexts (Saleem & Hamstra, 2022), revealing how those who prioritise the well-being of their team and stakeholders, can influence strategic outcomes by fostering trust and collaboration.

For the purposes of this paper, and in line with Samimi et al., (2022:3), we define strategic leadership as “the functions performed by individuals at the top levels of an organisation (CEOs, Top Management Team (TMT) members, Boards of Directors (BOD), and General Managers) that are intended to have strategic consequences for the firm”. Samimi et al. (2022) further identify eight functions of strategic leaders, which we have combined into four distinct roles (see Table 2).

Table 2 Strategic leadership roles and functions (source: Samimi et al. (2022) adapted by the authors)

Roles of strategic leaders	Functions of strategic leaders (Samimi et al., 2022)
Inspirational vision	Motivating and influencing. Pertains to how strategic leaders' styles influence followers. Leadership behaviours shape organisational culture and inspire pursuit of a strategic vision, extending influence even to lower management levels
Decision making	Making strategic decisions: Strategic leaders wield influence over organisations through decisions on innovation, acquisitions, diversification and other strategic shifts. Unlike lower-level decisions, those made at the top allocate significant resources, impacting firm-level outcomes Managing information. Involves gathering, processing and utilizing information from internal and external sources. Leaders influence the firm's information access, integration and distribution, shaping organisational responses to the environment
Strategic management	Overseeing operations and administration. Focuses on strategic leaders' role in shaping organisational structures, fostering learning and influencing strategy execution. Crucial for adapting to change and achieving strategic initiatives Performing human resource management activities. Strategic leaders make decisions on employee selection, evaluation, compensation and development. The Board of Directors (BOD) influences CEO appointments and compensation, impacting executive behaviour and firm outcomes
Relationship building and maintaining	Managing conflicting demands. Involves reconciling conflicting goals, negotiating disagreements and interpreting stakeholder information. Essential for strategic leaders under stress, emphasizing individual resilience in decision making Engaging with external stakeholders. This function involves building and managing relationships beyond the firm and shaping its external image. Successful external leadership enhances access to resources, fortifies the firm's reputation and aids leaders in navigating crises Managing social and ethical issues. Links leaders' behaviour to outcomes, encompassing fraud, tax avoidance and corporate social responsibility. With increasing stakeholder demands for responsible behaviour, leaders must estimate consequences and deter inappropriate actions

Industry 4.0

Industry 4.0 refers to the fourth industrial revolution, characterised by the integration of advanced digital technologies into manufacturing and industrial processes (Schwab, 2016). It leverages cyber-physical systems to create interconnected, intelligent systems capable of autonomous decision making and real-time optimisation (Lasi et al., 2014), such as the Internet of Things (IoT), big data, artificial intelligence (AI), robotics and smart factories.

In brief, Cyber-Physical Systems (CPS) describe the integration of physical machinery with digital technologies, enabling real-time monitoring and control.

The Internet of Things (IoT) are interconnected devices and sensors that share data across networks. Big Data and Analytics concern the collection and processing of large volumes of data to improve efficiency, predict maintenance needs and enhance production quality. Artificial intelligence (AI) and machine learning are AI-driven systems enabling adaptive processes, predictive maintenance, and advanced decision-making. Automation and robotics entail the use of smart robots that can learn, adapt and collaborate with humans. Smart Factories are facilities in which machines and systems are interconnected with minimal human intervention, allowing production processes that are highly customisable to meet specific customer needs while maintaining efficiency (Hermann, et al., 2016).

The benefits of Industry 4.0 have included gains in both efficiency and effectiveness. Production efficiency has been enhanced through automation and data-driven decision making. Cost reductions have been found through optimised resource utilisation and reduced downtime. Quality improvements are through predictive analytics and precise monitoring. As well as advances in sustainable processes including reduced waste and energy consumption. Challenges, however, include high initial investment costs in technology and training. Data security risks are associated with increased connectivity and data sharing, alongside skills gaps among the workforce in new technologies (Lu, 2017).

Industry 5.0

Industry 5.0 builds upon Industry 4.0 by emphasizing the collaboration between humans and advanced technologies, focusing on human-centric, sustainable and resilient manufacturing systems (Breque et al., 2021, 2021b). While Industry 4.0 is driven by automation and digitalisation, Industry 5.0 brings humans firmly back into the equation, promoting co-working between humans and intelligent systems (Xu et al., 2021a, 2021b).

The key characteristics of Industry 5.0 include human-centricity, sustainability and resilience. In the first place, human well-being is prioritised (Demir et al., 2019; Xu et al., 2018), as well as emphasizing the role of humans as creative problem-solvers in partnership with machines, it focuses on ergonomic work environments, skills development and meaningful employment. Instead of merely replacing human roles, Industry 5.0 aims for harmonious integration, where robots and humans co-create solutions. While Industry 4.0 focuses on mass customisation, Industry 5.0 emphasises hyper-personalisation, delivering tailored products through collaborative efforts between humans and technology. Industry 5.0 also aligns manufacturing with environmental goals, emphasizing resource efficiency, reduced waste and circular economy principles (Nahavandi et al., 2019). Finally, it focuses on enhanced resilience in production systems. Leveraging advanced digital tools to ensure adaptability to disruptions, such as pandemics and supply chain crises (Javaid et al., 2021).

Example technologies in Industry 5.0 include collaborative robots, designed to safely interact with humans; adaptive AI models to assist in decision making and learn from human interactions; Digital Twins, virtual replicas of physical systems used for real-time monitoring and optimisation; advanced additive manufacturing

(i.e. 3D printing) to support on-demand, personalised production; and green technologies, including renewable energy, sustainable materials and energy-efficient systems.

The benefits of Industry 5.0 are judged to include enhanced creativity, with human ingenuity complemented by machine efficiency, enabling innovative solutions. Improved employee satisfaction through a focus on meaningful work and improved ergonomics to enhance worker well-being. Reduced environmental impact is through efficient resource use and circular practices, as well as greater resilience, with systems designed to adapt quickly to unexpected changes or disruptions (Breque et al., 2021a, 2021b). Challenges include the significant investment required to align human and machine workflows. There is a need for specialised training to prepare workers for new collaborative roles. While balancing human and machine responsibilities raises ethical and societal questions, as well as issues around data privacy in which increased data sharing between humans and machines necessitates enhanced cybersecurity measures (Demir et al., 2019).

Thus, while Industry 4.0 is shaping the future of manufacturing by making it more efficient, flexible and responsive. Industry 5.0 represents a further shift that seeks to integrate human creativity and advanced technologies to create sustainable, resilient and personalised production systems. By prioritizing human-centricity, sustainability and resilience Industry 5.0 has the potential to prepare industries for a more inclusive and adaptive future. That said, implementing Industry 5.0 presents several significant challenges of its own.

The first concerns the integration of human-centricity and advanced technologies. One of the core tenets of Industry 5.0 is the seamless collaboration between humans and machines, particularly through technologies like collaborative robots (cobots) and AI. However, integrating these technologies into existing production systems without compromising safety, efficiency or workforce acceptance remains a challenge (Nahavandi, 2019a, 2019b). Second, is workforce skills and digital literacy. The shift to Industry 5.0 demands new skillsets, blending technical competencies with cognitive and social-emotional capabilities. There is a widening gap between the current workforce's skills and those required for human-machine collaboration and decision making in cyber-physical environments (Xu et al., 2021a, 2021b). Third, Industry 5.0 has ethical and social implications. As AI and robotics become more deeply embedded in industrial operations, concerns grow around data privacy, algorithmic bias, job displacement and social inequality. Addressing these requires robust ethical frameworks and inclusive governance models (European Commission 2021). Fourth, there are infrastructure and investment constraints. Implementing Industry 5.0 technologies often requires substantial capital investment in digital infrastructure, cybersecurity and system interoperability. Many SMEs, especially in developing regions, lack the financial and technical capacity for such transformation (Javaid et al., 2020). Fifth, there are regulatory and standardisation issues. Current industrial regulations and standards are still evolving to accommodate the human-centric and ethical priorities of Industry 5.0. There is often a lack of coherent legal frameworks to guide responsible innovation, particularly around AI usage and human-machine collaboration (European Commission 2021).

Strategic Leadership in the Era of Industry 4.0 and 5.0

Strategic leadership has played a pivotal role in addressing the challenges of Industry 4.0 and will continue to be required during the emergence of Industry 5.0, guiding organisations through technological, organisational and societal change. Below is an exploration of how the four strategic leadership roles we describe—strategic vision, decision making, strategic management and relationship building and maintenance—have been critical in effectively navigating these challenges in the transition to Industry 4.0 and subsequently Industry 5.0. A summary is provided in Table 3, illustrating similarities and differences between the two eras, alongside a generic description of the four roles.

Strategic Leadership 4.0

Strategic leadership has been critical in Industry 4.0, creating a clear roadmap for technological integration. Effective strategic leaders articulate and inspire a clear, forward-looking vision for Industry 4.0, using data-driven insights to make balanced, informed choices that align with strategic goals. They ensure resources, systems and people are aligned for effective implementation, mitigating risks and capitalizing on opportunities while fostering trust and collaboration among stakeholders to address resistance and ensure organisations can adapt to technological change.

Strategic Vision Strategic vision serves as a compass for organisations, helping leaders align their workforce and resources with the evolving demands of their environment. It involves crafting a clear, forward-looking direction for organisations that align technological integration with organisational goals, which has been important amidst the transformation to Industry 4.0. It has required leaders to inspire stakeholders by communicating the long-term benefits of embracing digital transformation. As well as fostering a culture of innovation by emphasising adaptability and lifelong learning. For example, Oberer and Erkollar (2018) highlight the need for leaders to articulate a clear vision that integrates digital transformation while inspiring employees to embrace change. Akkaya and Tetik (2021) also discuss the importance of foresight in developing strategies that anticipate Industry 4.0 changes and leverage opportunities for competitive advantage. Müller et al. (2018) identify vision as critical for navigating the uncertainty of technological advancements and ensuring alignment with organisational priorities.

Decision-Making Effective decision making ensures organisations can adapt swiftly to Industry 4.0 challenges. Leaders must navigate the complexities of data-driven environments, leveraging big data and analytics to make informed decisions that prioritise technological benefits, while considering employee well-being and organisational sustainability. Balance risks and opportunities, particularly in investments in emerging technologies, while prioritising cybersecurity and data protection as part of their decision framework. For example, Margherita and Braccini (2021) explore

Table 3 Comparison of strategic leadership, Strategic Leadership 4.0 and Strategic Leadership 5.0 (source: Thomas et al. (2024), Henley Business School Report (2024), and Alshaihani et al. (2024), the authors)

Roles of strategic leaders	Description	Industry 4.0	Industry 5.0
Inspirational vision	Strategic vision involves defining a clear and forward-thinking direction for organisations that inspires employees in pursuit of organisational goals, extending influence even to lower management levels (Bass & Avolio, 1994; Bass & Riggio, 2006)	This requires leaders to articulate a compelling vision of how Industry 4.0 technologies align with the organisation's goals. Inspire stakeholders by communicating the long-term benefits of embracing digital transformation. Foster a culture of innovation by emphasizing adaptability and lifelong learning (Cillo et al., 2021).	This involves emphasizing human-centricity, sustainability and resilience in the organisational mission. Visualizing the long-term benefits of collaborative human-machine ecosystems. Advocating for innovation while addressing societal and environmental responsibilities, while also readying the organisation for environmental shocks
Decision making	Managing information and making strategic decisions. Strategic leaders wield influence over organisations through the integration and distribution of information, as well as shaping organisational responses to the environment. Involving decisions on innovation, acquisitions, diversification and other strategic shifts. Often under situations of uncertainty (Eisenhardt & Zbaracki, 1992; Simon, 1997)	Effective decision making ensures organisations can adapt swiftly to Industry 4.0 challenges. Strategic leaders must leverage big data and analytics to make informed decisions. Balance risks and opportunities, particularly in investments in emerging technologies. Prioritise cybersecurity and data protection as part of their decision framework	Decision making in the context of Industry 5.0 involves addressing complex trade-offs between technology integration, sustainability and workforce dynamics. Strategic leaders must utilise data-driven insights to make informed choices about adopting new technologies like cobots and AI. Prioritise sustainability and ethical considerations in decision making processes. Balance investments in advanced technologies with the need for human workforce development
Strategic management	Overseeing operations and human resource management activities. Focuses on strategic leaders' role in shaping strategy execution, organisational structures and employee selection and development. Crucial for adapting to change and achieving strategic initiatives (Kaplan & Norton, 1996; Mintzberg et al., 1998)	Strategic management focuses on aligning resources, processes and people with Industry 4.0 objectives. Leaders must implement frameworks that integrate Industry 4.0 technologies into existing workflows. Oversee change management strategies to minimise disruptions. Develop policies to upskill employees, addressing the skills gap	Strategic management ensures that resources, operations and technologies are effectively aligned with Industry 5.0 principles. Leaders must manage change by implementing frameworks that balance automation and human creativity. Ensure that sustainability and resilience goals are integrated into operational strategies. Develop workforce capabilities by providing training and fostering a culture of innovation through co-creation

Table 3 (continued)

Roles of strategic leaders	Description	Industry 4.0	Industry 5.0
Relationship building and maintaining	Managing conflicting demands internally and engaging with external stakeholders. Reconciling conflicting goals, negotiating agreements and interpreting stakeholder information, while managing social and ethical issues, encompassing fraud, tax avoidance and corporate social responsibility (Uhl-Bien & Arena, 2018; Yukl, 2012)	Strategic leaders must engage employees and external partners to build a shared commitment to Industry 4.0 initiatives. Develop partnerships with technology providers, research institutions and governments to access resources and expertise. Promote transparency and inclusivity to address resistance to change	In Industry 5.0, relationship building and maintenance extends beyond traditional stakeholder engagement to include encouraging collaboration between humans and machines, fostering trust in new technologies. Building partnerships with technology providers, academic institutions and sustainability advocates. Engaging employees and addressing their concerns to reduce resistance to change

the socio-technical interplay, showing how leaders must make decisions that balance technological efficiency with workforce integration. While Subanidja (2022) demonstrates how strategic decisions regarding innovation and leadership style directly affect an organisation's ability to implement Industry 4.0 successfully. Kohl and Galloj (2020) stress the importance of cognitive skills for strategic decision-making in complex technological environments, emphasizing analytical and problem-solving capabilities.

Strategic Management Strategic management focuses on aligning resources, processes and people with objectives. Leaders must implement frameworks that integrate new technologies into existing workflows, oversee change management strategies to minimise disruptions, while developing policies to upskill employees and address any skills gap. Done effectively in the context of Industry 4.0, it ensures that the adoption of Industry 4.0 technologies is seamless, with minimal disruption to existing processes while maximizing productivity and innovation. Akkaya and Tetik (2021) discuss how strategic leaders must design adaptable management frameworks that integrate new technologies into existing workflows. Kaplan and Norton's Balanced Scorecard (1996), as cited by Subanidja (2022), highlights the importance of aligning operational strategies with technological goals to drive competitive advantage. While Müller et al. (2018) identify challenges such as skill gaps and organisational change, emphasizing the role of strategic management in addressing these through structured upskilling programs and change management strategies.

Relationship Building and Maintenance Building and maintaining relationships is essential for fostering collaboration and trust among employees, technology providers and other stakeholders. Strong relationships ensure smoother transitions by fostering trust and shared commitment to organisational goals during transformations. Strategic leaders have had to engage with employees and external partners to build a shared commitment to Industry 4.0 initiatives, developing partnerships with technology providers, research institutions and governments to access resources and expertise, while promoting transparency and inclusivity to address resistance to change. Oberer and Erkollar (2018), for example, emphasise the need for leaders to foster trust and collaboration across teams, particularly when introducing disruptive technologies. Margherita and Braccini (2021), highlight the importance of engaging employees in the socio-technical transition, ensuring they feel valued in the new digital ecosystem. While Subanidja (2022) stresses the importance of strategic partnerships with technology providers and institutions for innovation and sustainability, Müller et al. (2018) point to the necessity of transparent communication to manage employee resistance to change.

Strategic Leadership 5.0

Strategic leadership is equally pivotal in navigating the transition to Industry 5.0, which emphasises human-centricity, sustainability and resilience in industrial practices. Strategic leaders must adapt to this transformation by fostering collaboration

between humans and technology, addressing ethical and sustainability concerns and managing the integration of innovative practices. Below is an exploration of how the four strategic leadership roles we describe—strategic vision, decision making, strategic management and relationship building and maintenance—have been critical in effectively navigating these challenges in the transition to Industry 5.0.

Strategic Vision Strategic vision in Industry 5.0 involves creating a future-oriented perspective that prioritises human-centricity, sustainability and resilience. Strategic leaders must therefore envision how their organisations can thrive in an Industry 5.0 landscape by balancing technological innovation with human and environmental considerations. The Henley Business School Report (2024), for example, emphasises the importance of future-fit leadership, where leaders craft a clear vision integrating human values, environmental sustainability and technological advancements (Henley Business School, 2024). Thomas et al. (2024) highlight the necessity of visionary leadership in aligning intelligent systems with human creativity, fostering innovation and resilience in organisations. While Rejeb et al. (2024) identify the role of leadership in setting research and development priorities that advance Industry 5.0 principles, such as human–robot collaboration and sustainable production.

Decision Making Decision making in the context of Industry 5.0 involves addressing complex trade-offs between technology integration, sustainability and workforce dynamics. Strategic leaders must utilise data-driven insights to make informed choices about adopting new technologies, while prioritising sustainability and ethical considerations in decision making processes, and balancing investments in advanced technologies with the need for human workforce development. The Henley Business School Report (2024) highlights the role of decision making in navigating inevitable ethical dilemmas, such as data privacy and the equitable deployment of AI technologies. Thomas et al. (2024) discuss the importance of leaders making informed, collaborative decisions that leverage data and AI insights while accounting for human input and creativity. While Alshaibani et al. (2024) focus on how leadership behaviours influence decision making processes, particularly in fostering organisational learning and innovation in AI-driven environments.

Strategic Management Strategic management ensures that resources, operations and technologies are effectively aligned with Industry 5.0 principles. Leaders must manage change by implementing frameworks that balance automation and human creativity, while ensuring that sustainability goals are integrated into operational strategies, as well as developing workforce capabilities by providing training and fostering a culture of innovation. For example, the Henley Business School Report (2024) stresses the need for strategic frameworks that integrate sustainable practices and human-centric design into business operations. Thomas et al. (2024) highlight the importance of managing technological and human resources to co-create innovative solutions, emphasizing the role of collaboration and skill development. While Rejeb et al. (2024) examine strategic management from a research perspective,

outlining how leaders can prioritise areas like human–robot collaboration and AI-driven manufacturing for long-term success.

Relationship Building and Maintenance Strategic leaders in Industry 5.0 must prioritise relationships by fostering and maintaining collaboration, transparency, and trust across all levels of the organisation and with external partners. This building and maintenance extend beyond traditional stakeholder engagement to include encouraging collaboration between humans and machines and fostering trust in new technologies such as AI. As well as building partnerships with technology providers, academic institutions and sustainability advocates. For example, the Henley Business School Report (2024) highlights the importance of building trust among employees, stakeholders and communities by fostering transparency and inclusivity in adopting Industry 5.0 technologies. Thomas et al. (2024) investigate the role of leaders in maintaining strong partnerships with technology providers, research institutions and governments to drive collaborative innovation. While Alshaibani et al. (2024) explore how leadership behaviours can create a culture of trust and collaboration, which is essential for integrating AI and human capabilities.

Strategic leadership in Industry 5.0 plays a transformative role by inspiring a human-centric, sustainable future; balancing innovation with ethical and environmental considerations; aligning resources and operations with new paradigms; as well as fostering and maintaining collaboration among stakeholders and technologies; and cultivating trust and collaboration among employees with machine co-workers. These leadership roles ensure organisations not only adapt to Industry 5.0 but thrive by leveraging its principles to create value for stakeholders while contributing to societal well-being.

Discussion

Industry 5.0 heralds a step change from Industry 4.0, entailing a transformation in how we understand strategic leadership and the behaviour of strategic leaders within the four roles we describe. In the first place, the vision is more expansive. SL4.0 focuses internally on aligning technology to organisational goals, without needing to address the nature of a new relationship between humans and machines. SL5.0 adds an appreciation of evolving human–machine collaboration. SL4.0 focus externally on a narrow interpretation of stakeholders, largely related to inputs and outputs, and is focused on technologies support to organisational goals. SL5.0 widens the scope of stakeholders, taking a more expansive approach to the environment and organisational impact while explicitly recognising preparation for environmental shocks.

Decision making is also more expansive in SL5.0, adding the new dimensions of human–machine collaboration, sustainability and resilience while also recognising the reciprocal and unequivocal impact of technology on humanity,

the environment and organisations. Not the least, the evolving capacity of AI is to manage information and support strategic decision making, while at the same time threatening human employment and meaning (García-Muiña et al., 2020).

In a similar vein, strategic management 4.0 focuses on the alignment of new technology into existing organisational goals. The 5.0, however, explicitly recognises that new advances in technology cause and necessitate change. Managing its implementation is not enough. The new industrial era demands a proactive leadership response to address the changing nature of work with increasingly capable machines, mitigate our impact on the natural environment and build the organisational resilience required to navigate natural and man-made disasters.

Finally, strategic leaders' role in relationship building and maintenance requires fundamental adjustment. Again, it is less about adjusting to the integration of technology to existing workflows and more about adapting to new forms of working collaboration internally and externally. Internally, it requires that careful thought be given to developing relationships between humans and machines as co-workers and human-machine teams. Externally, it requires a careful examination of relationships with customers and organisational supply chains, determining the extent of human-human, human-machine and machine-machine interaction which best serves the interests of the organisation, their customers and the planet.

Our exploration underscores that properly constituted strategic leadership exerts a positive influence on organisational performance. It further suggests that to continue to be properly constituted in the era of I5.0, it needs to adapt, hence the notion of SL5.0, which not only unlocks novel strategic opportunities but also holds the potential to enrich research, innovation, collaboration and the human-technology interface. Further, the findings affirm that successfully fostering SL5.0 as an organisational practice involves a multi-dimensional strategic process (Niță & Guțu, 2023), grounded in the dynamic interplay of strategic leadership and SDT (AlNuaimi et al., 2022; Yao et al., 2023).

Inspirational Vision Inspirational vision remains a leadership constant, with an enduring preference for heroic leaders and leadership, emphasizing vision development and inspiration, as critical for organisational success, with positive effects on employee performance, organisational commitment and the alignment of individual and collective interests with the goals of I5.0. The challenge for leaders today is to integrate sustainability and social responsibility into their strategic visions, given their growing importance as strategic priorities. This requires making strategic decisions that balance profitability with the commitment to minimizing environmental impact and ensuring long-term social responsibility (Elkington, 2018). For instance, some organisations are adopting circular economy models, which emphasise reusing and recycling resources to reduce waste and promote sustainability (Ghobakhloo, 2020).

Decision Making Decision making involves the management of information crucial to choices. The ability to navigate uncertainty and imperfect knowledge is central to strategic expertise (Chamorro-Premuzic, 2023). In the business realm, uncertainties abound, from economic fluctuations and political events to consumer preferences

and competition. The challenge for strategists is to use gathered information to predict future events. Unfortunately, strategy often inadequately addresses uncertainty, lacking robust planning for various eventualities. Organisations commonly prepare for a singular version of the future, potentially detached from its likelihood. A tendency to view strategy as an intellectual exercise, akin to chess, rather than a dynamic and unpredictable process, only exacerbates the challenge (Payne, 2018: 38). The digital age's information explosion, coupled with advancements like 5G and the Internet of Things, only adds to the complexity.

As Payne (2018) observes, AI's performance in strategic games and financial markets suggests that it might alleviate these concerns, with its capacity to sort through vast environmental data, identify patterns and offer business solutions and associated probabilities to inform human strategists. However, while machines are very good at making predictions in the tightly constrained universe of board or video games, they are less suited to the real world. Even in gaming, successful strategy requires a combination of humans and machines, merging the potential accuracy of full automation with the critical and emotional skills of human leaders.

In this regard, recent improvements in short-term forecasting (Chang, 2017) have built upon the contributions of complexity theory (Jordan & Mitchell, 2015), which in turn provides the foundation for complexity leadership. Although lacking a clear definition and perspective (Rosenhead et al, 2019), complexity leadership does offer a number of valuable insights applicable to strategic leadership in the era of I5.0, such as reflective learning, bottom-up innovation, dissonant dialogue, the limitations of established tools and techniques for analysis and prediction and a rejection of heroic individual agency.

Strategic Management Strategic management extends beyond operational oversight to include the development and organisation of future capabilities. In the operational or functional domain, strategic leaders play a pivotal role in enabling an environment where middle managers, junior leaders and individual experts can thrive. Empowerment, coupled with proper resourcing, is crucial. Drawing from notions of empowerment and military mission command principles (United State Army, 2003), strategic leaders clarify the mission, available resources, constraints and ethical guidelines. Within this framework, employees are empowered to choose how best to achieve the mission in pursuit of the overarching purpose.

Similarly, personalisation and customer-centric strategies demand that leaders leverage technology to deliver highly customised products and services tailored to individual customer needs (Demir et al., 2019). Strategic leaders are crucial in designing flexible production systems that can quickly adapt to evolving customer demands. Enhancing customer experience also becomes a focal point, requiring leaders to develop strategies that utilise data insights and human creativity to provide personalised solutions that resonate with customers.

Strategic leaders must also exercise restraint, recognizing that not every organisational problem necessitates a technologically optimised solution. The efficacy

of AI is contingent on well-defined outcomes and leaders' ability to determine which operational tasks should be automated. Considerations of scalability are essential, as indiscriminate automation can result in costly experiments. Further, once leaders identify areas for technological improvement, they must address how these changes will be communicated to employees. Whether introducing intelligent systems, new organisational structures or human–machine collaboration processes, resistance is likely, necessitating deliberate action to manage both operational and emotional aspects of change.

Relationship Building and Maintaining Positive relationships are essential in any collaborative human endeavour, particularly within Industry 5.0, which emphasises the strategic leader's role in fostering a workplace culture that values human input and creativity. Human-centric innovation prioritises human-centric leadership, where leaders focus on collaboration between humans and technology rather than solely on automation (Nahavandi, 2019a, 2019b; Rogers, 2016). The emphasis shifts from managing technology to enhancing human capabilities, such as creativity and empathy, through technology. Leaders must also consider employee well-being and development, ensuring they are equipped to work alongside advanced technologies. This involves using technology ethically and responsibly, safeguarding employee rights and privacy (Fry & Egel, 2020). Navigating ethical dilemmas related to AI and automation, leaders should ensure technology complements rather than replaces human roles.

Challenges and Opportunities for Strategic Leaders

The emergence of I5.0 presents strategic leaders with several key challenges and opportunities:

- **Balancing technology and humanity:** Strategic leaders must navigate the challenge of integrating technological advancements while preserving human-centric work environments. This balance offers the opportunity to leverage technological innovations while ensuring that the human element remains at the forefront, driving both organisational success and employee well-being.
- **Navigating ethical dilemmas and compliance:** With the rise of AI and automation, leaders are confronted with complex ethical dilemmas, including issues related to data privacy, AI bias and potential job displacement. This presents an opportunity for strategic leaders to set high standards for ethical technology use, positioning their organisations as pioneers in responsible and compliant innovation (Fry & Egel, 2020).
- **Fostering a culture of continuous learning and adaptability:** The rapid evolution of Industry 5.0 demands that leaders build a culture of continuous learning and adaptability within their organisations. This challenge also offers a significant opportunity: by upskilling employees and promoting a mindset of lifelong learning, organisations can enhance their workforce's ability to collaborate effectively with advanced technologies.

New Competencies for Strategic Leaders in Industry 5.0

To effectively address the challenges of Industry 5.0 and capitalise on its opportunities, strategic leaders will need to cultivate four essential competencies:

- **Human–machine collaboration:** Leaders must gain a comprehensive understanding of how to integrate human skills with advanced technologies, creating environments where humans and machines collaborate seamlessly (Westerman, Bonnet & McAfee, 2014). This includes fostering collaborative dynamics that leverage the strengths of both human ingenuity and technological capabilities.
- **Emotional intelligence and empathy:** As the human aspects of digital transformation become more pronounced, emotional intelligence is increasingly critical. Leaders need to understand employee needs, foster engagement and cultivate a positive organisational culture that supports both digital and human-centric transformation.
- **Ethical and inclusive decision making:** Strategic leaders must excel in making ethical decisions that consider the broader social impacts of technology deployment. Inclusivity is also vital, ensuring that all employees are engaged in the digital transition and that diversity is integrated into strategic planning processes.
- **Visionary thinking with a focus on sustainability:** Leaders must adopt a long-term perspective, prioritizing sustainability and social responsibility over short-term gains (Bai & Sarkis, 2020). Visionary thinking involves anticipating future trends in I5.0 and preparing the organisation to adapt and thrive in a sustainable and socially responsible manner.

In summary, strategic leaders in I5.0 must evolve from being technology managers to facilitators of human–machine collaboration, ethical stewards and champions of sustainability. The focus shifts to integrating human creativity, ensuring ethical use of technology and prioritizing sustainability in strategic decisions. The role of strategic leaders will continue to evolve as I5.0 progresses, requiring ongoing adaptability and a commitment to continuous learning. Leaders who embrace these changes will be well-positioned to guide their organisations through the complexities and opportunities of I5.0.

As a value addition, this research offers a four box framework categorizing organisations into four distinct categories concerning the application and development of SL5.0 (see Fig. 3): (a) Strategic Leadership 5.0 (Factual); (b) Strategic Leadership 5.0 (perceived but in fact Illusory); (c) Management-Oriented SDT Strategy; and (d) managing the current situation without transforming. Each distinct position provides unique insights into how both leadership and SDT capabilities are fortified, contributing to an understanding of organisational competitiveness.

- **Strategic Leadership 5.0 (Fact):** Strategic leadership 5.0 is a tangible organisational phenomenon and denotes competitive positioning where strategic lead-

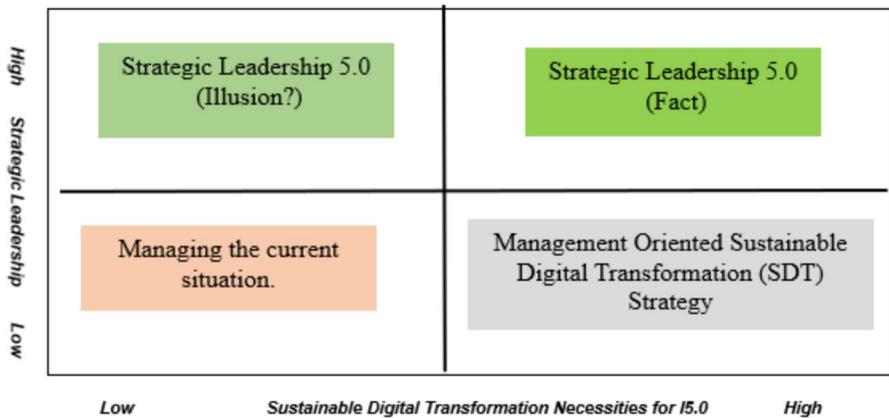


Fig. 3 exhibits four distinct organisational positions of Strategic Leadership 5.0. Source the authors

ership dominates the digital transformation strategy, with both being equally important priorities. There is evident synchronisation as the organisation invests in establishing leadership practices and SDT initiatives as strategic priorities. It is an ideal position where organisations anticipate, estimate and track organisational performance more effectively.

- **Strategic Leadership 5.0 (Illusion?):** Organisations express strategic leadership intent but it lacks significant support from SDT capabilities. The focused investment in I5.0 capabilities is relatively unimportant to the organisation due to its comparative investment or reliance on I4.0 technological advancement. This position is tricky, as organisations may think they are demonstrating SL5.0, but it is not supported by the technological advancement of 5.0, leading to a gap in perception versus the implementation of SL 5.0.
- **Management-Oriented SDT Strategy:** This position substantially focuses on managing I5.0 technological advancement to build organisational competitiveness. Top management does not prioritise fostering strategic leadership at the core of organisational involvement.
- **Managing the current situation:** This is the least favourable position, indicating a clear disconnect in terms of fostering SL5.0. Both strategic leadership and SDT are not priorities for harvesting beneficial performance. This positioning can be characterised as reactive, a “go with the business flow” strategy.

Conclusion

Our SL5.0 frameworks are developed to provide grounding for further empirical research, with the aim of fostering competitive, yet human-centred, sustainable digital advantage in the era I5.0. It aligns SDT capabilities with organisational strategic realities, encompassing economic, social, environmental, technology, organisational and managerial indicators. The exogenous variables of the framework are

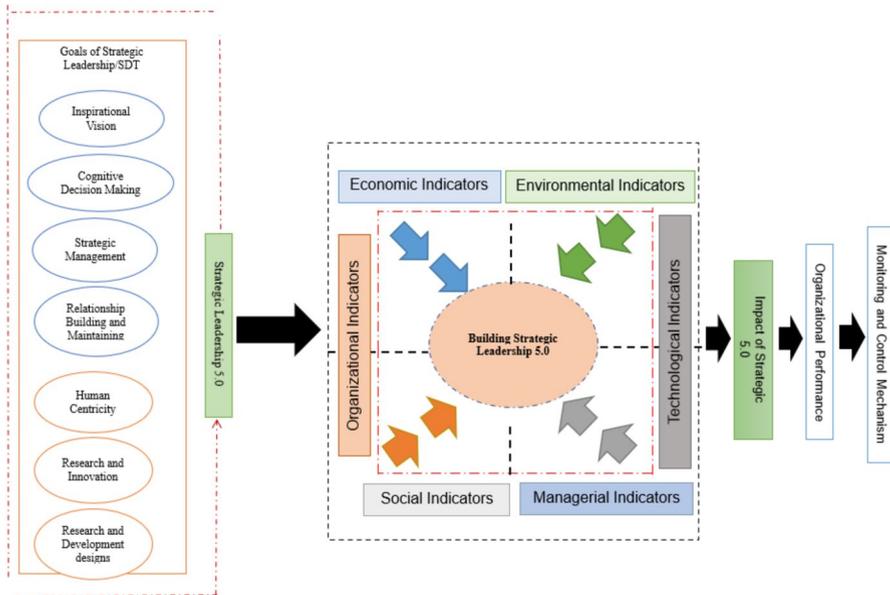


Fig. 4 Framework of Strategic Leadership 5.0

selectively integrated from the critical literature review as stated in the literature. The framework emphasises the shift from technological advances to smart utilisation of human-cognitive collaboration to enhance competitiveness and build sustainable competitive advantage (see Fig. 4).

The proposed SL 5.0 framework bring certain critical elements into its core building block such as human cognition (e.g. key decision and personalisation), sustainable technologies (e.g. ethical and renewable technologies), sustainability (e.g. renewable energy, hardware and operating systems) and social impact (e.g. inclusion and lifelong learning) for knowledge workers.

The connection between strategic leadership and I5.0 is pivotal. Leaders play a crucial role in promoting the advantages of I5.0, significantly impacting organisational performance. The contextual evidence of this impact is acknowledged in the academic literature (Sacolick, 2022). As SDT becomes integral to organisational functions, it presents challenges to leadership, which require a shift to a mode that we term Strategic Leadership 5.0. The successful establishment of a properly constituted SL5.0 depends on how organisations blend strategic leadership and I5.0 SDT practices in their value creation process.

A blueprint for SL5.0 is essential, serving as a research framework for future empirical research into human-machine collaboration and sustainable development. We suggest that the proposed framework, once tested for empirical robustness, can evolve into a strategic leadership information system, integrating I5.0 capabilities in the digital era. Technological innovation, driven by strategic leadership and SDT, has significantly influenced cultural-social evolution. In the era of Strategic Leadership 5.0, there is a shift towards human-robotic cognitive collaboration for

sustainable competitive advantages. This shift is expected to become an organisational capability, transforming how I5.0 innovations contribute to organisational value and performance.

The proposed framework fosters the organisational mindset for SL5.0, viewed as a human process of SDT. It emphasises the need for cultural change and leadership-driven technological progress. Organisations must be prepared to experiment, learn and unlearn to effectively unlock SL5.0. Determining its scope and vision, integrating it with the business nature, transforming capabilities into an SDT action plan, and implementing monitoring and control mechanisms are crucial steps for future organisational success with SL5.0.

Future empirical research might consider the following areas:

- **Mindset development:** How organisations train managers in seven key aspects—inspirational vision, cognitive decision making, strategic management, relationship building, human centricity, business innovation, and research and development—to foster a new SL5.0 mindset.
- **Integration of SDT:** How SDT can be robustly integrated across and between all business functions, enabling leaders to create superior value.
- **Human-centric approach:** How organisations prioritize the human element in digital advancements to leverage cognitive capabilities, maintain diversity and ensure employee morale for successful digital initiative rollouts.
- **Performance measurement:** How organisations establish, monitor and streamline the impact of strategic leadership on performance using tangible and intangible metrics that consistently measure the essential role of strategic leadership in the digital economy.

Overall, leaders can use the proposed model to enhance organisational dynamics, promote digital adoption and reduce communication barriers in aligning strategic leadership with I5.0.

Implications This research carries significant implications for SMEs, multinationals and policymakers. The novelty of this study extends the understanding of Strategic Leadership 5.0 beyond theoretical discussions by offering best practices, practical recommendations and fresh insights for policy development. We recommend that policymakers prioritise the establishment of SL5.0 frameworks and their link to organisational performance. We also anticipate that enabling SL 5.0 will contribute to sustainable development, including the cultivation of an Industry 5.0 workforce, the creation of triple bottom line-oriented products and services.

Limitations This research introduces a three-dimensional fundamental model for adopting Strategic Leadership 5.0, encompassing theoretical, practical and application dimensions. However, the model requires empirical testing to validate its effectiveness and robustness in predicting organisational performance. When contextualizing this SL5.0 model, it is crucial to address evolving limitations. Researchers need to selectively adapt key elements of strategic leadership and I5.0 to effectively implement SL5.0 practices, with an emphasis on achieving an external balance.

Awareness of I5.0 is still in its infancy, particularly within the service industry, highlighting the need for further efforts to advance relevant SL 5.0 theories.

Recommendations We encourage future researchers to engage in critical dialogue that integrates organisational variables related to strategic leadership and I5.0. Although this study advocates for the use of grounded theory due to the nascent stage of SL5.0 variables, alternative methodologies such as structural equation modelling, confirmatory factor analysis, analytical hierarchical process and the double helix method may also be employed to develop more complex models tailored to industry-specific needs. We propose that future researchers utilise cross-sectional and longitudinal datasets to generate new syntheses by integrating SL and I5.0. Specifically, employing quantitative cross-sectional data can enable researchers to assess the impact and role of SL 5.0 on organisational performance through a systems approach. We recommend using a formal quantitative grounded theory approach for this purpose (Corbin and Strauss, 2015; Knigge & Cope, 2006; Oxhandler, 2017). Additionally, using longitudinal data may reveal how the adoption of SL 5.0 evolves over time in response to changes in organisational structures and information technology.

These approaches, along with our own, could benefit both SMEs and large corporations, as well as enhancing and systemising the application of SL5.0, by highlighting the similarities and differences in implementing SL5.0 across diverse organisational contexts. Comparative research conducted by large multinationals could further refine the application of SL5.0, solidifying its unique contribution to strategic leadership theory. It is our hope that the innovative contributions of this research paper will inspire further studies and foster robust discussions on SL 5.0 across global industries, enhancing the understanding and evolving application of strategic leadership.

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Data Availability No new data were created and analysed during this study. Data sharing is not applicable to this article.

Declarations

Human Ethics and Consent to Participate Not applicable.

Conflict of Interest The authors declare no competing interests.

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