

Digital transformation in large established organisations: Four restructuring dilemmas based on dynamic capabilities

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Abstract

This study explores the intricate strategic implications of digital transformation for large established organisations operating within dynamic environments. While digital transformation has garnered substantial attention in the context of startups, large established organisations face unique challenges in balancing existing capabilities with adopting new digital capacities. This research sheds light on how large established organisations navigate the interplay between change and stability during digital transformation by employing a dynamic capabilities framework. Through a systematic literature review of 123 articles from leading journals, the research categorises large established organisations dynamic capabilities into four domains: performance, leadership, governance and structure. The findings reveal that for each domain, large established organisations encounter a range of dilemmas during digital transformation. The study highlights the need for large established organisations to address these dilemmas and operationalise digital transformation effectively. By offering a comprehensive perspective on these challenges, the study provides valuable guidance for researchers and managers seeking to navigate the complexities of digital transformation in established organisations. The paper concludes by outlining potential directions for future research in this evolving field.

INTRODUCTION

While digital transformation often captures the intellectual imagination through the dominance and disruption of born-digital firms or digital start-ups, less attention has been given to large established organisations (LEOs).

These organisations are characterised by extensive legacy operations on a substantial scale and are susceptible to inertial forces that hinder adaptation (Ahuja & Morris Lampert, 2001; Dobrev et al., 2006). The prevailing belief is that these firms will be disrupted, leading to the creation of a new industrial order (Mandviwalla & Flanagan,

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2021; Kraus et al., 2022). However, the digital transformation of LEOs is a more nuanced story (Furr et al., 2022; Svahn et al., 2017). Defined here as a process of leveraging digital technologies to bring about significant organisational change (Bharadwaj et al., 2013; Warner & Wäger, 2019), it has emerged as the foremost crucial strategic imperative for LEOs (Kraus et al., 2022; Mandviwalla & Flanagan, 2021). This need arises from the necessity to safeguard and enhance incumbent advantages in traditional industries, ensuring these firms remain competitive and relevant in a constantly evolving landscape (Kraus et al., 2022). Consequently, LEOs must decide whether to emulate the comprehensive digital transformation strategies of tech giants like Google and Amazon or explore alternative approaches that leverage existing resources and strategic positions (Furr et al., 2022).

However, scholarship focused on the digital transformation of LEOs has received relatively limited attention to date (Svahn et al., 2017). Many of these studies lack a cohesive framework (Fitzgerald et al., 2014; Warner & Wäger, 2019). As a result, the understanding of digital transformation strategies for LEOs remains underdeveloped. What we do know is that the digital transformation journey of LEOs is perplexing (Furr et al., 2022). Some argue that LEOs face a significant challenge in striking a balance between utilising current capabilities and concurrently developing novel digital capacities that align with established historical practices (Svahn et al., 2017; Sebastian et al., 2017). LEOs must overcome inertia, navigate bureaucracy, align with existing investments and address legal concerns, resulting in painfully slow organizational change. This slow pace can intensify challenges for stakeholders, including investors, employees and customers (Haskamp et al., 2021; Schmid et al., 2021). Brown (2021) likened this scenario to weathering a perfect storm: grappling with the disruption brought by digital transformation while striving to meet the mounting expectations of external stakeholders and managing employee frustrations through a stability-oriented strategy. Thus, LEOs are caught between the need to maintain stability and the imperative to embrace digital transformation, a paradoxical tension arising from the persistent and inherent complexity of competing demands within complex systems (Smith & Lewis, 2011).

To illuminate the challenges LEOs face, our study delves into the intricate strategic implications of digital transformation for these organisations (Hess et al., 2016) as they grapple with pressures for change and the imperative for stability. In particular, we highlight the significance of this tension as dynamic capabilities (Helfat et al., 2007; Teece et al., 1997). Past research has demonstrated that emphasising dynamic capabilities is pivotal for effectively addressing the challenges of the digital era (Sousa-Zomer et al., 2020; Warner & Wäger, 2019) and holds crucial impli-

cations for organisational research (Wessel et al., 2021; Schallmo et al., 2017). However, despite being among the most prominent theoretical frameworks in the field of strategic management (Bitencourt et al., 2020; Warner & Wäger, 2019), dynamic capabilities remain a contentious and intricate research subject (Burisch & Wohlgemuth, 2016; Wenzel et al., 2021), lacking a unanimous conceptual consensus (Laaksonen & Peltoniemi, 2018; Pisano, 2017). Nonetheless, scholars believe that it offers a potentially valuable theoretical perspective for comprehending LEOs' digital transformation (Vial, 2021). For instance, it can delineate the routines and pivotal decisions for LEOs when navigating digital transition (Mele et al., 2023). Thus, we employ dynamic capabilities as a lens to refine our understanding of how LEOs strategise for digital transformation. We pose the following research question: *'What are the main organisational challenges for LEOs in their digital transformation from dynamic capabilities perspective'?*

Consequently, a clearer comprehension of the organisational challenges in the digital transformation of LEOs is imperative, which, we contend, can be achieved through synthesising existing studies (Vial, 2021). Thus, to tackle our research question, we employ a systematic literature review (SLR) approach, which encompasses a bibliometric analysis utilising PRISMA to assess the existing studies on this subject. The approach enables us to conduct a transparent, systematic and replicable overview of existing research, generating a comprehensive knowledge map of the research landscape of digital transformation from a dynamic capabilities' perspective. To ground our review, we leverage an inductive approach and render a boundary condition for the review, focusing on large established organisations as opposed to new ventures since they have a legacy resource base in need of adjustment vis-à-vis digital transformation. Our review identified 123 articles published in more than 30 peer-reviewed journals highlighting the association between dynamic capabilities and digital transformation (Table 1). After delineating the digital transformation research domain through PRISMA, we analyse what has been explored thus far in terms of dynamic capabilities. The bibliometric analysis furnishes us with a robust foundation for identifying the key facets of firms' dynamic capabilities and their strategic approach to digital transformation. Thus, to address our research questions, we categorised the reviewed research into four unique themes: (i) performance, (ii) leadership, (iii) governance and (iv) structure. This also enables us to provide methodical and integrated insights into fresh perspectives for future research.

The findings of our review make several key contributions to the field of digital transformation strategy, particularly through the lens of dynamic capabilities. First, despite their value and depth, previous studies on

TABLE 1 Articles included in the systematic review.

Author(s)	Title	Journal	Method	Industry/sector
Ackermann et al. (2021)	How Mercedes-Benz addresses digital transformation using holacracy	Journal of Organizational Change Management	Empirical	Automotive
Bonanomi et al. (2020)	The impact of digital transformation on formal and informal organizational structures of large architecture and engineering firms	Engineering, Construction and Architectural Management	Empirical	Architecture and engineering
DiRomualdo et al. (2018)	HR in the digital age: How digital technology will change HR's organization structure, processes and roles	Strategic HR Review	Empirical	Consultancy
Engesmo and Pateli (2021)	Digital leaders and the transformation of the IT function	Scandinavian Journal of Information Systems	Empirical	Various
Firk et al. (2021)	Chief digital officers: An analysis of the presence of a centralized digital transformation role	Journal of Management	Empirical	Various
Ghosh et al. (2022)	Digital transformation of industrial businesses: A dynamic capability approach	Technovation	Empirical	Technology
Josyula et al. (2021)	How to make intelligent automation projects agile? Identification of success factors and an assessment approach	International Journal of Organizational Analysis	Empirical	IT
Kohli and Johnson (2011)	Digital transformation in latecomer industries: CIO and CEO leadership lessons from Encana oil & gas (USA) Inc	MIS Quarterly Executive	Empirical	Energy
Kretschmer and Khashabi (2020)	Digital transformation and organization design: An integrated approach	California Management Review	Conceptual	n/a
Pessot et al. (2020)	What matters in implementing the factory of the future: Insights from a survey in European manufacturing regions	Journal of Manufacturing Technology Management	Empirical	Manufacturing
Singh et al. (2020)	How do chief digital officers pursue digital transformation activities? The role of organization design parameters	Long Range Planning	Empirical	Various
Thakur et al. (2022)	Digital disruption: A managers' eye view	Journal of Business & Industrial Marketing	Empirical	Various
Urbinati et al. (2020)	The role of digital technologies in open innovation processes: An exploratory multiple case study analysis	R&D Management	Empirical	Various

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Vestues and Rolland (2021)	Platformizing the organization through decoupling and recoupling: A longitudinal case study of a government agency	Scandinavian Journal of Information Systems	Empirical	Public
Forward search				
Culasso et al. (2023)	Empirical identification of the chief digital officer role: A latent Dirichlet allocation approach.	Journal of Business Research	Empirical	All
Dąbrowska et al. (2022)	Digital transformation, for better or worse: a critical multi-level research agenda	R&D Management	Conceptual	Public
Plekhanov et al. (2022)	Digital transformation: A review and research agenda	European Management Journal	Conceptual	All
Xia et al. (2022)	How digital transformation improves corporate environmental management: A review and research agenda	Front. Environ. Sci	Conceptual	All
Fernandez-Vidal et al. (2022)	Managing digital transformation: The view from the top	Journal of Business Research	Conceptual	All
Rêgo et al. (2021)	Digital transformation and strategic management: A systematic review of the literature	Journal of the Knowledge Economy	Conceptual	All
Hadjielias et al. (2021)	How do digital innovation teams function? Understanding the team cognition-process nexus within the context of digital transformation	Journal of Business Research	Empirical	Telecommunications
Neumeyer and Liu (2021)	Managerial competencies and development in the digital age	IEEE Transactions on Engineering Management Review	Conceptual	All
Ma et al. (2022)	Top management team role structure: A vantage point for advancing upper echelons research	Strategic Management Journal	Conceptual	All
Firk et al. (2022)	Top management team characteristics and digital innovation: Exploring digital knowledge and TMT interfaces	Long Range Planning	Empirical	A longitudinal dataset of US industrial firms
Hanelt et al. (2021)	A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change	Journal of Management Studies	Conceptual	All
Zapadka et al. (2022)	Digital at the edge—antecedents and performance effects of boundary resource deployment	The Journal of Strategic Information Systems	Empirical	Various

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Konopik et al. (2022)	Mastering the digital transformation through organizational capabilities: A conceptual framework	Digital Business	Conceptual	All
Volberda et al. (2021)	Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms	Long Range Planning	Editorial	All
Keller et al. (2022)	Pathways to developing digital capabilities within entrepreneurial initiatives in pre-digital organizations: a single case study	Business & Information Systems Engineering	Empirical	Food
Liu et al. (2023)	Digital innovation and performance of manufacturing firms: An affordance perspective	Technovation	Empirical	Manufacturing
Jöhnk et al. (2022)	Managing the complexity of digital transformation—How multiple concurrent initiatives foster hybrid ambidexterity	Electronic Markets	Empirical	Various
Li et al. (2022)	Path research on the value chain reconfiguration of manufacturing enterprises under digital transformation—A case study of B company	Frontiers in Psychology	Empirical	Steel manufacturing
Nyagadza (2022)	Sustainable digital transformation for ambidextrous digital firms: A systematic literature review and future research directions	Sustainable Technology and Entrepreneurship	Conceptual	All
Appio et al. (2021)	Digital transformation and innovation management: A synthesis of existing research and an agenda for future studies	Journal of Product Innovation Management	Editorial	All
Soto et al. (2023)	Pathways to digital service innovation: The role of digital transformation strategies in established organizations	Information Systems Frontiers	Empirical	Various
Zhou et al. (2021).	Exploring how digitalization influences incumbents in financial services: The role of entrepreneurial orientation, firm assets, and organizational legitimacy	Technological Forecasting and Social Change	Empirical	Banking

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Siachou et al. (2021).	Can traditional organizations be digitally transformed by themselves? The moderating role of absorptive capacity and strategic interdependence	Journal of Business Research	Conceptual	Various
Latilla et al. (2021)	Organizational re-design for business model innovation while exploiting digital technologies: A single case study of an energy company	International Journal of Innovation and Technology Management	Empirical	Energy
Backward search				
Hess et al. (2016)	Options for formulating a digital transformation strategy	MIS Quarterly	Empirical	German media companies
Singh and Hess (2020)	How chief digital officers promote the digital transformation of their companies	Peer-reviewed book chapter	Conceptual	All
Warner and Wäger (2019)	Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal	Long Range Planning	Empirical	All
Verhoef et al. (2021)	Digital transformation: A multidisciplinary reflection and research agenda	Journal of Business Research	Conceptual	All
Vial (2019)	Understanding digital transformation: A review and a research agenda	The Journal of Strategic Information Systems	Conceptual	All
Finkelstein et al. (2009)	Strategic leadership: Theory and research on executives, top management teams, and boards	Peer-reviewed book	Conceptual	All
Yoo (2010)	Computing in everyday life: A call for research on experiential computing	MIS Quarterly	Conceptual	IT
Yoo et al. (2010)	Research commentary—The new organizing logic of digital innovation: An agenda for information systems research	Information Systems Research	Conceptual	IT
Menz (2012)	Functional top management team members: A review, synthesis, and research agenda	Journal of Management	Conceptual	All
Yoo et al. (2012)	Organizing for innovation in the digitized world	Organization Science	Conceptual	IT
Mithas et al. (2013)	How a firm's competitive environment and digital strategic posture influence digital business strategy	MIS Quarterly	Conceptual	IT

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Karimi and Walter (2015)	The role of dynamic capabilities in responding to digital disruption: A factor-based study of the newspaper industry	Journal of Management of Information Systems	Conceptual	All
Schumacher et al. (2016)	A maturity model for assessing industry 4.0 readiness and maturity of manufacturing enterprises	Procedia CIRP	Conceptual	Manufacturing
Nambisan et al. (2017)	Digital innovation management: Reinventing innovation management research in a digital world	MIS Quarterly	Conceptual	All
Monteiro and Birkinshaw (2017)	The external knowledge sourcing process in multinational corporations	Strategic Management Journal	Empirical	Telecommunications
Hansen and Birkinshaw (2007)	The innovation value chain	Harvard Business Review	Empirical	Various
Svahn et al. (2017)	Embracing digital innovation in incumbent firms: How Volvo cars managed competing concerns	MIS Quarterly	Empirical	All
Ben-Daya et al. (2019)	Internet of things and supply chain management: A literature review	International Journal of Production Research	Conceptual	All
Skog et al. (2018)	Digital disruption	Business & Information Systems Engineering	Conceptual	All
Search from 2024				
Gurbaxani and Dunkle (2019)	Gearing up for successful digital transformation	MIS Quarterly Executive	Empirical	Various
Qin (2023)	Overcoming the digital transformation paradoxes: A digital affordance perspective	Management Decision	Empirical	Manufacturing
Annosi et al. (2024)	Managing generational tensions toward digital transformation: A microfoundational perspective	IEEE Transactions on Engineering Management	Empirical	Design furniture
Imran et al. (2021)	Digital transformation of industrial organizations: Toward an integrated framework	Journal of Change Management	Empirical	Manufacturing
Naimi-Sadigh et al. (2022)	Digital transformation in the value chain disruption of banking services	Journal of the Knowledge Economy	Empirical	Banking
Dremel et al. (2017)	How AUDI AG established big data analytics in its digital transformation	MIS Quarterly Executive	Empirical	Automotive
Sousa-Zomer et al. (2020)	Digital transforming capability and performance: A microfoundational perspective	International Journal of Operations & Production Management	Empirical	Various

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Dang-Pham et al. (2022)	Digital kaizen: An approach to digital transformation	Australasian Journal of Information Systems	Empirical	IT
Magistretti et al. (2021)	Enlightening the dynamic capabilities of design thinking in fostering digital transformation	Industrial Marketing Management	Empirical	Consulting
Chatterjee and Mariani (2024)	Exploring the influence of exploitative and explorative digital transformation on organization flexibility and competitiveness	IEEE Transactions on Engineering Management	Empirical	Service, manufacturing
Steiber and Alvarez (2025)	Culture and technology in digital transformations: How large companies could renew and change into ecosystem businesses	European Journal of Innovation Management	Empirical	Manufacturing
Singh et al. (2021)	Modeling the effects of digital transformation in Indian manufacturing industry	Technology in Society	Empirical	Manufacturing
Feliciano-Cestero et al. (2023)	Is digital transformation threatened? A systematic literature review of the factors influencing firms' digital transformation and internationalization	Journal of Business Research	Conceptual	All
Sun et al. (2023)	Getting organizational adaptability in the context of digital transformation	Chinese Management Studies	Empirical	Manufacturing
Delias and Kitsios (2023)	Operational research and business intelligence as drivers for digital transformation	Operational Research	Editorial	All
Mann et al. (2022)	Orchestrating the digital transformation of a business ecosystem	Journal of Strategic Information Systems	Empirical	Security
Bansal et al. (2023)	A study of human resource digital transformation (HRDT): A phenomenon of innovation capability led by digital and individual factors	Journal of Business Research	Empirical	Various
Wohlleber et al. (2024)	Implementing vital dynamic capabilities to succeed in digital transformation: A multiple-case study in maritime container shipping	IEEE Transactions on Engineering Management	Empirical	Maritime
Urbinati et al. (2022)	The digital transformation of the innovation process: orchestration mechanisms and future research directions	Innovation	Conceptual	All

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Feroz et al. (2023)	Identifying organizations' dynamic capabilities for sustainable digital transformation: A mixed methods study	Technology in Society	Empirical	All
Piepponen et al. (2022)	Digital transformation of the value proposition: A single case study in the media industry	Journal of Business Research	Empirical	Media
Noesgaard et al. (2023)	Same but different: Variations in reactions to digital transformation within an organizational field	Journal of the Association for Information Systems	Empirical	Home care
Trenerry et al. (2021)	Preparing workplaces for digital transformation: An integrative review and framework of multi-level factors	Frontiers in Psychology	Conceptual	All
Chen and Tian (2022)	Environmental uncertainty, resource orchestration and digital transformation: A fuzzy-set QCA approach	Journal of Business Research	Empirical	Various
Lukito et al. (2023)	Investigating the relationship of change leadership, knowledge acquisition, and firm performance in digital transformation context	Quality-Access To Success	Empirical	Manufacturing
Leso et al. (2024)	Exploring digital transformation capability via a blended perspective of dynamic capabilities and digital maturity: A pattern matching approach	Review of Managerial Science	Empirical	Various
Liu et al. (2021)	Adaptive capacity configurations for the digital transformation: A fuzzy-set analysis of Chinese manufacturing firms	Journal of Organizational Change Management	Empirical	Manufacturing
Blanka et al. (2022)	The interplay of digital transformation and employee competency: A design science approach	Technological Forecasting and Social Change	Empirical	Various
Caputo et al. (2023)	Building T-shaped professionals for mastering digital transformation	Journal of Business Research	Conceptual	All
Mustafa et al. (2022)	Digitalization trends and organizational structure: Bureaucracy, ambidexterity or post-bureaucracy?	Eurasian Business Review	Empirical	Various
Pihlajamaa et al. (2023)	Competence combination for digital transformation: A study of manufacturing companies in Finland	Technology Analysis & Strategic Management	Empirical	Manufacturing

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Berbel-Vera et al. (2022)	Key CDO functions for successful digital transformation: Insights from a Delphi study	Technological Forecasting and Social Change	Empirical	Various
Chatterjee et al. (2022)	Digital transformation of organization using AI-CRM: From microfoundational perspective with leadership support	Journal of Business Research	Empirical	Various
Liu et al. (2022)	The dual drivetrain model of digital transformation: Role of industrial big-data-based affordance	Management Decision	Empirical	IT
Liu et al. (2011)	Resource fit in digital transformation Lessons learned from the CBC Bank global e-banking project	Management Decision	Empirical	Banking
Cetindamar Kozanoglu and Abedin (2021)	Understanding the role of employees in digital transformation: Conceptualization of digital literacy of employees as a multi-dimensional organizational affordance	Journal of Enterprise Information Management	Conceptual using some empirical data (pilot interviews)	Various
Wirtz et al. (2022)	Digital disruption and digital transformation: A strategic integrative framework	International Journal of Innovation Management	Conceptual	All
Mazumder and Garg (2022)	Decoding digital transformational outsourcing: The role of service providers' capabilities	International Journal of Information Management	Empirical	Business process outsourcing
Chawla and Goyal (2022)	Emerging trends in digital transformation: A bibliometric analysis	Benchmarking: An International Journal	Conceptual	All
Colli et al. (2022)	Making or breaking the business case of digital transformation initiatives: The key role of learnings	Journal of Manufacturing Technology Management	Empirical	Food
Dwipayana et al. (2022)	Bifurcating the dynamic dominant logic: Technical and evolutionary patterns of action	Management Decision	Empirical	Banking
Erjavec et al. (2024)	How to develop organizational forms for a successful digital transformation? Findings from two case studies	Journal of the Knowledge Economy	Empirical	Insurance and manufacturing
Sergei et al. (2023)	Digital transformation enablers in high-tech and low-tech companies: A comparative analysis	Australian Journal of Management	Conceptual using some empirical data (expert interviews)	Manufacturing

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Mooney et al. (2024)	The paradox of digital savviness: An examination of conditions that mitigate its power	Technology Analysis & Strategic Management	Empirical	Various
Demeter et al. (2021)	Road to digital manufacturing—A longitudinal case-based analysis	Journal of Manufacturing Technology Management	Empirical	Automotive
Moen (2023)	Diversify or doubling down: Choosing a digital growth strategy	International Journal of Innovation Management	Conceptual	All
Jackson and Dunn-Jensen (2021)	Leadership succession planning for today's digital transformation economy: Key factors to build for competency and innovation	Business Horizons	Conceptual	All
Björkdahl (2020)	Strategies for digitalization in manufacturing firms	California Management Review	Conceptual	Manufacturing
Yang et al. (2023)	Digital transformation and low-carbon technology innovation in manufacturing firms: The mediating role of dynamic capabilities	International Journal of Production Economics	Empirical	Manufacturing
Wu et al. (2022)	How do digitalization capabilities enable open innovation in manufacturing enterprises? A multiple case study based on resource integration perspective	Technological Forecasting and Social Change	Empirical	Manufacturing
Konlechner et al. (2018)	A dynamic capabilities perspective on managing technological change: A review, framework and research agenda	International Journal of Technology Management	Conceptual	All
Deist et al. (2023)	Digital units and digital innovation: Balancing fluidity and stability for the creation, conversion, and dissemination of sticky knowledge	Journal of Business Research	Empirical	Various
Felsberger et al. (2022)	The impact of Industry 4.0 on the reconciliation of dynamic capabilities: Evidence from the European manufacturing industries	Production Planning & Control	Empirical	Manufacturing
Hutter et al. (2023)	Scaling organizational agility: Key insights from an incumbent firm's agile transformation	Management Decision	Empirical	Financial services
Ho et al. (2023)	A digital strategy development framework for supply chains	IEEE Transactions on Engineering Management	Empirical	Various

(Continues)

TABLE 1 (Continued)

Author(s)	Title	Journal	Method	Industry/sector
Steiber and Alänge (2021)	Corporate-startup collaboration: Effects on large firms' business transformation	European Journal of Innovation Management	Empirical	Various
Volpentesta et al. (2023)	A survey on incumbent digital transformation: A paradoxical perspective and research agenda	European Journal of Innovation Management	Conceptual	All
Ciampi et al. (2022)	The co-evolutionary relationship between digitalization and organizational agility: Ongoing debates, theoretical developments and future research perspectives	Technological Forecasting and Social Change	Conceptual	All
Utoyo et al. (2020)	The role of entrepreneurial leadership and configuring core innovation capabilities to enhance innovation performance in a disruptive environment	International Journal of Innovation Management	Empirical	Telecommunications and banking
Aghimien et al. (2022)	Dynamic capabilities for digitalisation in the AECO sector—A scientometric review	Engineering Construction and Architectural Management	Conceptual	AECO sector
Gupta et al. (2024)	Digital innovation and transformation capabilities in a large company	Expert Systems	Empirical	All
Chirumalla (2021)	Building digitally-enabled process innovation in the process industries: A dynamic capabilities approach	Technovation	Empirical	Steel manufacturing
Annarelli et al. (2021)	Literature review on digitalization capabilities: Co-citation analysis of antecedents, conceptualization and consequences	Technological Forecasting and Social Change	Conceptual	All
Dias et al. (2023)	Managing historical conditions in information systems strategizing: An imprinting perspective	Journal of Strategic Information Systems	Empirical	Construction
Bendig et al. (2022)	When and why technology leadership enters the C-suite: An antecedents perspective on CIO presence	Journal of Strategic Information Systems	Empirical	Various
Moschko and Blazevic (2023)	Managing digitization of industrial incumbents through innovation-oriented leadership	Industrial Marketing Management	Empirical	Mechanical engineering

dynamic capabilities and digital transformation have predominantly focused on strategic planning in a broad sense, neglecting to explicitly address the tension between stability and change and their implications within the context of digital transformation. Managing this tension involves iterative strategies of acceptance and resolution (Smith & Lewis, 2011). In turn, these strategies often create conditions that foster persistent, interconnected tensions, ultimately giving rise to specific dilemmas. Such dilemmas arise when a choice must be made between two alternatives—each with its own advantages and drawbacks—and are typically resolved only temporarily by selecting one option over the other (e.g., Kohtamäki et al., 2020). By contextualising the derived themes within the identified literature, we found that our sample studies concentrated on a range of dilemmas—a perspective that had not been previously synthesised. Our review enhances the existing understanding of strategic planning for digital transformation in LEOs by exploring how dynamic capabilities address various dilemmas related to adopting digital technologies and innovation.

Second, while previous studies have highlighted various dilemmas, these insights have not been integrated until now. Our study offers a comprehensive perspective on a unified set of dilemmas, helping researchers better understand this field and identify potential avenues for future investigation.

Lastly, our study furnishes practical implications for large established organisations that may be less inclined to alter their structures and continue conventional practices aligned with their identity as sizable, well-established entities—that is, inertial, rigid and conservative (Vergne & Depeyre 2016). We propose that these organisations operationalise digital transformation by resolving four dilemmas. To do so, we outline a framework that could prove valuable for managers within these organisations.

THEORETICAL LENS

To date, a substantial and well-established body of research on digital transformation primarily focuses on start-ups (Loonam et al., 2018) operating in dynamic and uncertain environments (Hanelt et al., 2021) with relatively little attention given to digital transformation of LEOs, despite continuous studies indicating concern from leaders of these organisations (e.g., Hess et al., 2016). LEOs, by their nature, often possess legacy resource bases that require adjustment to align with external environments (Dobrev et al., 2006). Scholars note that many established firms struggle to adopt digital technologies due to their reliance on various systems from different decades (Furr et al., 2022). However, these technologies also offer oppor-

tunities for LEOs to undergo rapid digital transformation with relatively low investment, such as through cloud services like Microsoft Azure and Amazon Web Services. Thus, contrary to the prevailing belief, some large companies may be able to create routines that allow them to embark on digital transformation, reinvent themselves and maintain leadership in their industry (Ahuja and Morris Lampert, 2001). For instance, firms facing challenges in leveraging their data due to legacy IT systems may find partnering with a platform an effective strategy to jumpstart their digital journey without the need for a complete IT infrastructure overhaul. Despite the potential benefits, the transformation of established firms may introduce unfamiliar roles and strategies, puzzling executives and reducing the perceived value of the transformation strategy. Thus, LEOs must explore multiple approaches in their strategic choices, considering the complementarity between traditional and digital transformation strategies (Katila et al., 2022).

Extending this line of thought, Velu (2017) suggests that digital transformation is fundamentally altering our understanding of the behaviours of large established organisations, particularly how they deploy their dynamic capabilities in this endeavour. Other studies have highlighted that dynamic capabilities are crucial for digital transformation, ensuring LEOs' adaptability and effectiveness in a changing environment (Hanelt et al., 2021). For instance, Eggers and Kaplan (2009) highlight management cognition as a dynamic capability that shapes how LEOs adapt to change, significantly influencing how and to what extent these firms renew their strategies. However, it is also claimed that LEOs face many barriers hindering the deployment of dynamic capabilities for digital transformation. Therefore, it is still equivocal whether and how dynamic capabilities matter regarding the strategic choices for digital transformation.

The ambiguity may stem from the fact that dynamic capabilities are a complex and debated research topic, lacking a unified conceptual consensus (Burisch & Wohlge-muth, 2016; Wenzel et al., 2021; Pisano, 2017; Laaksonen & Peltoniemi, 2018). Research on dynamic capabilities emerged in the 1990s to explain how organisations can achieve and maintain a competitive advantage in rapidly changing environments (Ambrosini & Bowman, 2009; Teece et al., 1997). Scholars debate about whether firms use stable routine capabilities in dynamic environments; some argue they do (Zollo & Winter, 2002), while others suggest firms use adaptable, experimental capabilities (Eisenhardt & Martin, 2000). Despite these differing views, dynamic capabilities have become a framework for analysing organisational resources and capacities and their unique ways of navigating fast-changing contexts (Barreto, 2010).

Among various proposed bases, Teece's (2007) conceptualisation of dynamic capabilities, which emphasises sensing, seizing and reconfiguring activities, has gained prominence in the literature. Therefore, we adopt and apply a dynamic capabilities framework that deconstructs organisational capacities into three primary dimensions: (a) sensing opportunities and threats, (b) seizing opportunities and (c) reconfiguring organisational assets and resources to maintain a competitive position (Teece, 2007).

To elaborate, sensing encompasses the ability to perceive and influence opportunities and threats (sensing capability), seizing pertains to a company's capability to capture opportunities (seizing capability) and reconfiguring refers to a company's ability to recombine resources and operational capacities to sustain competitiveness (reconfiguring capability) (Teece, 2007). This conceptualisation allows for the possibility of exploring the concept of dynamic capabilities tailored explicitly for LEOs within the context of digital transformation (Warner & Wäger, 2019). In summary, sensing capabilities encompass LEOs' adeptness in scanning the external landscape to identify unforeseen trends and disruptions. This encompasses activities such as digital scouting, scenario planning and cultivating the right mindset (Warner & Wäger, 2019). Scholars underscore the role of disruptive technologies like artificial intelligence, analytics and IoT platforms in aiding LEOs in comprehending digitalisation (Ross et al., 2017). However, cultivating effective sensing capabilities presents challenges, particularly in prognosticating digitalisation trends (El Sawy et al., 2016). Sensing capabilities extend beyond in-house endeavours and can be orchestrated in collaboration with external parties in the broader business ecosystem (Giudici et al., 2018).

Seizing capabilities are pivotal for LEOs to capitalise on opportunities and mitigate threats in the digital landscape. This encompasses experimentation, decentralised boundaries and embracing new business models. Here, scholars discuss concepts like 'decoupling', 'disintermediation' and 'generativity' as strategies through which digitalization fosters radical business model innovations (Autio et al., 2018). Agility is a crucial aspect of seizing capabilities, allowing organisations to efficiently reallocate resources in response to changing circumstances (Teece et al., 2016). While information technology (IT) infrastructures help promote agility, true agile action often requires a more comprehensive digital transformation (Birkinshaw, 2018; Svahn et al., 2017).

Finally, reconfiguring capabilities are indispensable for executing a digital strategy and fully realising the potential of strategic change for LEOs. These capabilities involve an ongoing strategic rejuvenation of assets and organisational structures to ensure adaptability in rapidly changing con-

texts (Agarwal & Helfat, 2009; Teece, 2014). Here, scholars underscore the significance of fostering an entrepreneurial mindset and establishing external networks for reconfiguring capabilities to maintain a competitive position (Day & Schoemaker, 2016). Reconfiguring capabilities poses further challenges for LEOs embarking on digital transformation, such as addressing collaborative tensions and establishing flexible governance structures (Svahn et al., 2017).

While the existing literature acknowledges the importance of dynamic capabilities for studying how LEOs navigate the challenges and opportunities of digitalization (Warner & Wäger, 2019), there is limited research on the specific processes through which these organisations develop such capabilities with a focus on digital transformation. This gap underscores the need for further exploration into the strategies and processes organisations use to cultivate dynamic capabilities tailored for digital transformation.

We adopt the dimensions of dynamic capabilities—sensing, seizing and transforming—and provide a comprehensive framework to dissect the intricacies of digital transformation in large established firms. This analytical approach offers a deeper understanding of their strategic approaches to digitalization.

METHOD AND DATA

In our exploratory research design, we adhered to the PRISMA reporting guidelines to ensure transparency in article selection and replicability of the systematic review (Moher et al., 2009). PRISMA, widely used in management and organisational research, involves four key stages: (a) identifying potential papers, (b) screening, (c) assessing articles for eligibility and (d) making inclusion/exclusion decisions. We progressively built a theoretical contribution while curating a robust database of research papers. But we note that the literature concerning the impact of digital transformation on organisations is growing, with a potential for newly emerging material to escape researchers' attention due to the rapid evolution of the field. Here is a detailed description of each stage.

Identification stage

We selected relevant keywords and search terms based on prior literature and our research question (Hanelt et al., 2021; Vial, 2021). We conducted the literature search in January 2024, using the Web of Science database and focusing on papers published between 2011 and 2024. Our search string was formulated as follows: ("digital

transform*” OR “digital* disrupt*”) AND (“organi?ation* structure*” OR “dynamic capabilit*”), and was replicated across four databases: Web of Science, Scopus, Business Source Complete and ProQuest One Business. We adopted a balanced approach to identifying relevant papers, navigating between strict criteria that resulted in a limited number of hits and open criteria that led to numerous false positives. We used AND between the keywords due to the large number of papers in each domain (e.g., about 288,000 hits in Google Scholar on 04.03.2024), which made it impossible to screen otherwise. We identified 523 papers, which effectively progressed to the screening stage.

Screening stage

In January 2024, three researchers conducted the initial screening. Each researcher reviewed approximately 175 articles based on titles and abstracts. The eligibility of articles was recorded in a shared MS Excel file, with indicators for eligibility and reasons for exclusion if applicable (e.g., non-English, not peer-reviewed, not relevant). We applied four main criteria to our literature database; namely, we focused on (a) peer-reviewed articles, (b) written in English, (c) published after 2011 until January 2024 and (d) relevant to the research question. In addition, we were only interested in papers (a) focusing on large established firms and (b) having a central discussion around organisational structure/change. In our screening process, we paid attention to the quality of journal outlets, whereby we excluded all papers from non-peer-reviewed open access journals. To explicitly focus on large established organisations in our analysis, we used the employment data as a criterion to distinguish large organisations from small and medium enterprises. The cut-off points for European and US firms were 250 and 500 employees, respectively. Therefore, we only included papers which referred to large organisations. This inevitably created four major considerations. First, the type of organisations and the number of employees had to be clearly stated in papers (i.e., large or big organisations). Second, if types were not clearly specified, organisations had to have at least 250 employees in their workforce. Third, we accepted papers with organisations from the S&P 500 or any other stock market index (rule of thumb criterion). Finally, if the authors did not explicitly mention the types and sizes of the organisations, we followed Rosenbusch et al. (2013) suggestions to distinguish large firms from SMEs by using employment data (>250 employees for European firms or >500 for US firms) or any other information that enables coding a firm size. Disagreements were resolved through discussion or by involving a third researcher.

Eligibility and inclusion/exclusion decisions

After the screening procedure, 81 articles met the quality criteria and were added to our database. To increase our sample size, we conducted a backwards and forward search from the selected articles, whereby we applied the same criteria described in the screening stage. This step helped us identify 42 additional academic papers; effectively, our final sample size comprised 123 academic papers in total. Our process is visualised in the PRISMA flow chart, illustrating the four key phases: identification, screening, eligibility and inclusion/exclusion (Figure 1).

Data analysis

We employed an abductive approach to analyse the data, aiding ‘make sense of puzzling facts’ (Seuring et al., 2020, p. 9). Our sample encompassed both conceptual and empirical papers, revealing anomalies that necessitated harmonising theoretical themes with empirical occurrences. This iterative process involved abductive reasoning, defined as a ‘cyclical method of recognising and confirming anomalies while generating and evaluating hypotheses’ (Sætre & Van de Ven, 2021, p. 686). Our data analysis involved identifying key themes from conceptual papers related to digital transformation in LEOs, supplemented by practical examples and evidence from empirical papers.

Informed by the dynamic capabilities dimensions (Teece, 2007), our coding process comprised two major steps. Initially, we meticulously read the 123 papers to acquaint ourselves with the data. Subsequently, we introduced a coding framework encompassing three central dimensions aligned with our paper’s core focus: sensing, seizing and reconfiguring capabilities. The second-order categories, drawn from the literature and dynamic capabilities dimensions, were as follows. Sensing capabilities encompassed (a) internal R&D direction processes, (b) identification of target market segments, evolving customer needs and customer innovation and (c) leveraging advancements in external science and technology. Seizing capabilities included (a) boundary selection for complement management and control, (b) fostering loyalty and commitment, (c) choosing decision-making protocols and (d) defining the customer solution and business model. Reconfiguring capabilities covered (a) achieving decentralisation and near composability, (b) governance, (c) co-specialisation and (d) knowledge management. Our codebook evolved by adding new codes and label revisions (Locke et al., 2008), with differences resolved through peer review and discussion among co-authors.

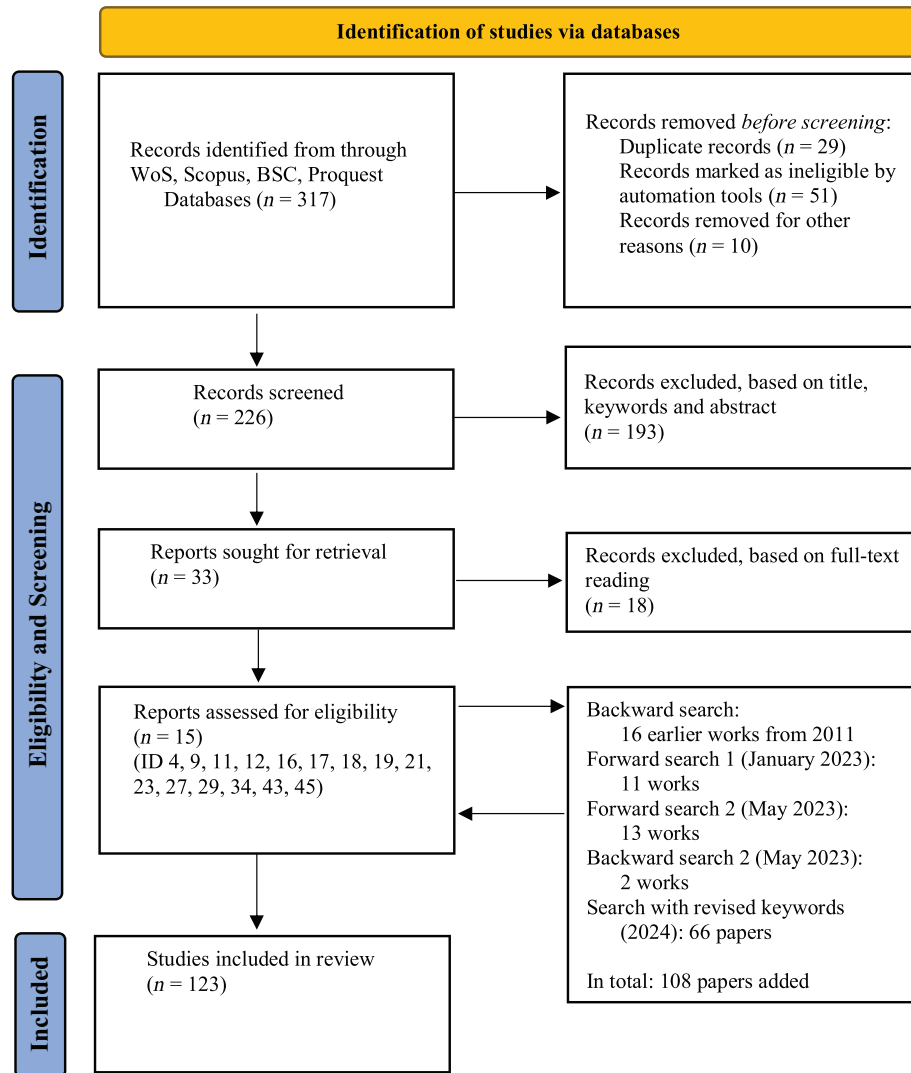


FIGURE 1 Defining dilemmas of an organisational restructuring via dynamic capabilities. BSC, Business Source Complete.

(Kassarjian, 1977). Iterative analysis ensured inter-coder reliability, documented through peer review and reflection (Creswell & Miller, 2000), enhancing study reliability (Miles & Huberman, 1994) (Figure 2).

Additionally, we adopted Dubois and Gadde's (2002) abductive approach, concurrently evolving theoretical understanding, empirical fieldwork and case analysis through in-depth reading and content review. Through this process, we further grouped certain capabilities, from sensing to seizing and transforming, into four domains where dynamic capabilities influence organisational changes: performance, leadership, governance and structure. Detailed information on our coding process for each domain is provided in the Appendix. Lastly, reflecting upon these domains, we identified four dilemmas specific to LEOs, given their tendency towards balancing inertia with change (Figure 2).

FINDINGS

The reviewed research lays the groundwork for an implied distinction in domains concerning strategic planning of digital transformation for LEOs. Throughout the iterative analysis process, four domains were most commonly identified: performance, leadership, governance and organisational structure. The significance of these domains lies in the SLR findings, which describe the manifestation of dynamic capabilities within each domain. We now provide a summary of the findings for each domain.

Performance

The first set of dynamic capabilities highlighted the need for LEOs to consider various digital instruments for better

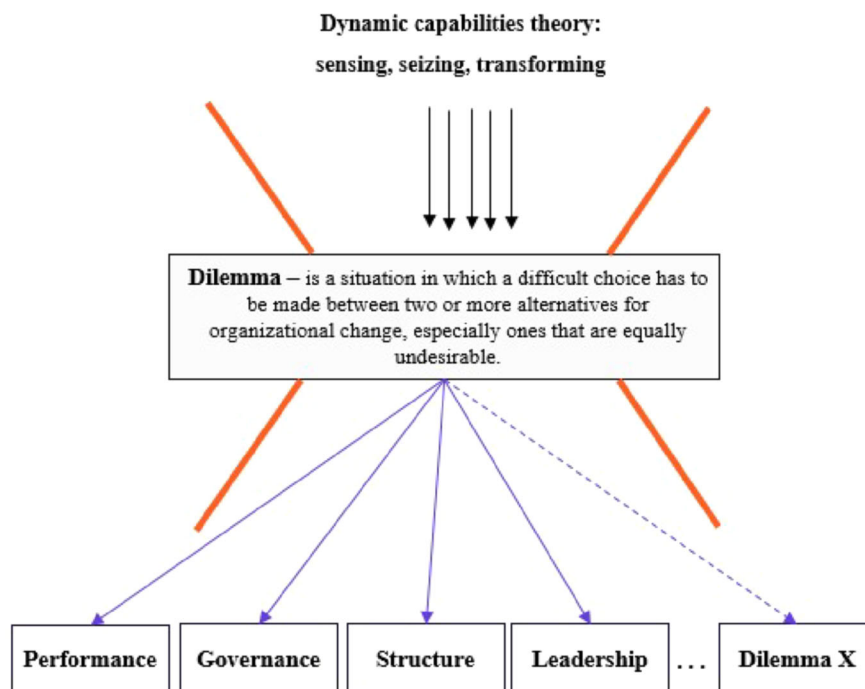


FIGURE 2 The four dilemmas for large established organisations.

performance. For example, the *Internet of Things (IoT)*, *machine learning/artificial intelligence* and *social technologies* were discussed in prior literature as leading enablers of organisational sensing for performance. Sensing capability is influenced by the data generated by *IoT*, which identifies processes to enhance internal positioning. Within organisations, sensors help companies access resources in real-time (Ben-Daya et al., 2019). Josyula et al. (2021) also mentioned their influence on ‘analysing team skills in terms of diversity, experience and expertise in functional and technical domains’. This information helps firms position themselves in the most profitable market segments (Firk et al., 2021; Xia et al., 2022). Sensing capability is further influenced by *machine learning/artificial intelligence (ML/AI)* technologies that can aid in getting the best value from data. Ghosh et al. (2022) mentioned that applying AI to analysing customers, users and business environments enables companies to develop knowledge-based marketing, understand business opportunities and understand threats, which helps to avoid pressure from competitors and new industrial entrants (Firk et al., 2021). Large organisations must constantly use digital infrastructure as an enabler of innovation capability (Bansal et al., 2023).

In terms of seizing, data suggests that developing new *digital skills* is the main pathway to organisational seizing for performance. In addition, digital literacy can be distinguished at the individual and organizational levels (Cetindamar Kozanogly & Abedin, 2021) and can function as a trigger to reach the next level of digital

transformation (Blanka et al., 2022). For example, digital training can enable the seizing capability to exploit the value of generated data. Further, learning is critical for digital collaboration and communication for agile teams (Josyula et al., 2021; Warner & Wäger, 2019). Cross-functional programmes disseminate the required digital topics, such as crowdsourcing or social media, among employees. This training also ‘fosters regular exchanges across teams’ (Singh et al., 2022), which are good examples of team-building activities. Lastly, webinars can inform and educate employees about current topics (Singh et al., 2022).

In reconfiguring, data suggest that developing a *new data-driven culture* is the main pathway to organisational transformation for performance. For instance, adopting a digital culture can raise the impact of digital transformation across organisational levels and enhance the productivity of organisations (Schumacher et al., 2016) and decisions on organisational forms (Erjavec et al., 2024). Four literature sources explored knowledge management practices for this purpose. Kohli and Johnson (2011) claim that ‘these actions strengthen a firm’s agility to respond to price and demand volatility’ and include ‘a data-driven cultural transformation’. Cultural transformation (Ghosh et al., 2022) and a collective mindset change (DiRomualdo et al., 2018) are necessary to develop value from data. For example, cultural transformations include a data-driven decision-making capability of employees and their motivation to explore new digital technologies, which, in turn,

can lead to improving organisational performance (Ghosh et al., 2022).

In sum, a dilemma arises around performance dynamic capabilities for digital transformation and points to a tension between (a) adopting advanced digital tools, such as IoT and ML/AI, for immediate gains in sensing capabilities and (b) prioritising a more meticulous development of digital skills and a data-driven culture for long-term organisational resilience. The dilemma requires organisations to balance investments between cutting-edge technologies and cultural transformation efforts, as both are essential for maximising the benefits of digital transformation and improving overall performance.

Governance

The second set of dynamic capabilities is centred around governance, understood as a system that guides strategic decisions to adapt, integrate and reconfigure organisational skills and resources (Klarner et al., 2022). The findings suggest that sensing for governance is represented by rapid digital responsiveness (Feroz et al., 2023). It can require a focal large established firm to become an orchestrator of digital transformation amongst other interdependent actors in its supply chain or ecosystem (Leso et al., 2024; Mann et al., 2022).

The multidimensional coordination, new managerial practices, and the new contractual framework enable organisational seizing for governance. This is due to the need to avoid intergenerational conflicts between managers and pursue the digital transformation of workplaces (Annosi et al., 2023). The shared vision of a governance paradigm can support this coordination. Particularly, six literature sources indicate the influence of digital transformation on coordination, for example, aligning the digital transformation work of employees horizontally, considering the hierarchy of units at different levels vertically (Singh et al., 2020), including individual, organisational (Firk et al., 2021) and broader environmental perspectives (Dąbrowska et al., 2022; see also Plekhanov et al., 2022). Network transparency and consistency between the formal and informal structure can enable value exploitation (Bonanomi et al., 2020). Seven sources suggest seizing via incorporating new managerial practices, such as distributed governance (Neumeyer and Liu, 2021). Board meetings can be used to report on digital transformation progress and potential actions and discuss the next steps forward (Ma et al., 2022; Singh et al., 2020). In particular, Chief Digital Officer (CDO) is important in enabling a deeper penetration of digital transformation into organisational strategy, consulting with others and engaging other chief board members (Culasso et al., 2023; Singh

et al., 2020). CDO supports coherence within transformation programmes (DiRomualdo et al., 2018) and cascading digital transformation to employees (Singh et al., 2020). Managers may provide incentives for employees to engage in digital transformation and take risks, and this could be done by avoiding punishments or imposing regulations undermining their creative thinking (Svahn et al., 2017; Thakur et al., 2022). Furthermore, seizing includes accountability for digital transformation. Kretschmer and Khashabi (2020) underline the importance of the involvement of teams in the transformation and ‘to make digital everyone’s job’ (see also Hadjielias et al., 2021). Lastly, the contractual framework around digital transformation must be agreed upon by stakeholder alignment, including managerial support, the right team and technology solutions for investment returns (Josyula 2021).

Regarding reconfiguring, data suggest that role management, automation/augmentation of processes and data governance are essential for organisational transformation for governance. First, it requires chief executives to regroup the new roles, consider the demand for workforce skills and supply trends and separate ownership from control (Urbinati et al., 2020). The objective is to understand better current needs for workforce skills, employee resourcing trends, drivers of employee performance and their impact on business results (DiRomualdo et al., 2018). The new human capital strategy should consider a digital culture and values, talent strategy and employee engagement. Second, new technologies can support transformation using automated/augmented workflows. Know-how integration from within the firm enables automation or augmentation of clerical workers using ‘robotic process automation, chatbots/virtual assistants, AI and outsourcing’ (DiRomualdo et al., 2018). The workers can be further assisted using HR process-as-a-service (PaaS), which improves knowledge networks using the data (DiRomualdo et al., 2018). Vestues and Rolland (2021) explained that transformation minimises agency issues between discontinuing legacy systems and facilitates new ways of working and organising, which requires cyclical interactions between these phases. Twelve sources indicate the need for multidivisional data governance. Particularly, using data for business intelligence (Engesmo & Panteli, 2021) enables digital processes while outsourcing non-core digital functions (Kohli & Johnson, 2011). Finally, managers must deal with different industries simultaneously, converting domain-specific knowledge into ‘solution-centric knowledge’ (Ghosh et al., 2022).

In sum, a governance dilemma concerns the intricate strategic decision-making process required for adapting, integrating and reconfiguring skills and resources. The challenge lies in choosing between (a) achieving rapid digital responsiveness, aligning with new managerial practices

and establishing a contractual framework and (b) navigating the complexities of role management, automation and data governance. Balancing the influence of the CDO, fostering a culture of accountability and managing multidivisional data governance further amplify the strategic challenges. This dilemma highlights the multifaceted decisions organisations face in steering their digital transformation journey, emphasising the need to carefully navigate and balance various factors for successful transformation.

Leadership

The third set of dynamic capabilities is centred around leadership, including roles, skills and leadership styles. Digital leadership is a ‘long arm’ in managing technology-driven change (Brunner et al., 2023). Data suggest that *the vision of the Chief Data Officer (CDO)* is central to organisational sensing for leadership. The key functions of CDO include the ability to scan the external environment for unexpected trends in digitalization (Berbel-Vera et al., 2022). Entrepreneurial leadership is essential for formulating an innovation strategy (Utoyo et al., 2020). Moschko and Blažević (2023) highlight that innovation-oriented leadership is critically important in driving internal and external collaborations, which, in turn, are essential for digitisation’s contribution to innovation activities. Similarly, collaboration with startups improves the firms’ digital transformation. First, the vision of the CDO drives the need for strategic change and ensures stakeholder agreement. Second, CDO can fulfil the role needed for the transformation, that is, an innovation CDO, a holistic strategising CDO and a change agent CDO (Singh et al., 2020). Third, CDO helps to refine specific digital initiatives through regular meetings with an executive board (Firk et al., 2021; Firk et al., 2022). Fourth, a dedicated team is assigned to each strategic initiative (Singh et al., 2020). As such, sensing during cross-programme meetings helps to discuss new trends and technologies and motivates colleagues to join DT activities. Finally, the CDO has a central role in overall coordination as ‘an orchestrator of organisational resources to digitise processes’ (Firk et al., 2021), which is valuable when external parties are concerned. Further, senior executives face a clear change in talent management roles (Fernandez-Vidal et al., 2022) and corresponding business strategies (Rêgo et al., 2021).

In terms of seizing, data suggest that *effective communication practices* are the main pathways to organisational seizing for leadership. First, to strengthen digital transformation initiatives, firms must adopt *distributed leadership*, which implies collaboration along value chains, including ‘manufacturing, engineering and maintenance’ (Badasjane et al., 2022). Particularly, 11 sources indicate that

seizing is reinforced through the appointment of digital leaders locally (also referred to as ‘quiet leadership’) (Badaracco, 2002) that influences the transformation process (Engesmo & Panteli, 2021; Singh & Hess, 2020). Informal roles, such as ‘go-to people for advice and information about digital technologies’ (Bonanomi et al., 2020), comprise an informal social network beyond formal roles and help establish local teams via voluntary assignment based on interest in DT (Badasjane et al., 2022). Also referred to as ‘digital champions’, they act as change agents and as a digital monitoring council to facilitate the dynamic capabilities of the organisation (Gupta et al., 2024).

Distributed leadership allows employees to ‘work on their own terms, promoting collaboration among teammates and management’ (Thakur et al., 2022) and so that ‘each team can deploy and manage their own applications’ (Vestues & Rolland, 2021). To support this vision, the guidelines for team creation should be provided, including ‘what type of competence to take in, for example, maintenance, IT, logistics and operations’ (Badasjane et al., 2022). In addition, distributed leadership can lead to more originality and creative thinking by encouraging employees to take more control of their tasks (Thakur et al., 2022). Third, exploiting and incorporating *effective communication practices* are necessary to disseminate the vision in appropriate documented and verbal forms and how it is converted into goals and objectives (Josyula et al., 2021). It has a major impact on the planning and execution of the organisational structure. Communication enables establishing ‘a new corporate culture and gaining further support in the overall company’ (Pessot et al., 2020).

Regarding reconfiguring, data suggest that *alignment in responsibility* is central to organisational transformation for leadership. First, besides top-down communication on vision and objectives, there is a need for ‘a bottom-up flow of information, knowledge and learnings to drive agile delivery to business units with requisite team autonomy’ (Josyula et al., 2021). Strong leadership is the foundation element that defines success and enables decision-making centrality (Singh et al., 2020). Second, there should be *alignment in responsibilities* for the company’s digital transformation. As such, transformations of old organisational structures into new organisational structures should complement the roles of the CIO and CDO on the Transformation Board (Engesmo & Panteli, 2021; Singh et al., 2020). The Transformation Board is the highest level strategy and decision-making board for transformation topics in general, yet it has a DT focus (Singh et al., 2020; Rêgo et al., 2021). The C-level members discuss the digital solutions, which are then targeted to the company’s marketing or customer solution teams. The responsibility for implementation passes to the line organisation (Singh et al., 2020). The use of digital councils helps to inform

and exchange information between all relevant executives' external and internal conditions, 'favouring centralisation measures when organising for digital transformation' (Singh et al., 2020).

In sum, a leadership dilemma arises around the intricate decisions associated with roles, skills and leadership styles at different phases of digital transformation. In the sensing phase, organisations grapple with defining the role of the CDO, debating whether they should serve as innovation leaders, holistic strategists or change agents. Simultaneously, senior executives encounter challenges adapting talent management roles and business strategies to align with evolving digital landscapes. The seizing phase introduces a dilemma between centralised and distributed leadership models, requiring organisations to choose between fostering collaboration through distributed leadership and centralising decision-making. In the reconfiguring phase, the leadership dilemma extends to responsibility alignment, balancing top-down communication and a bottom-up flow of information. Deciding on the roles of the CIO and CDO on the Transformation Board and determining the level of centralisation versus decentralisation in organising digital transformation poses strategic challenges.

Organizational structures

Our final set of dynamic capabilities is centred around organisational structures. Liu et al. (2021) outlined an environment scanning capacity as a standard basic adaptive capacity for digital transformation. Organisational sensing for structure is enabled by the data-enabled feedback loop mechanism (Chirumalla, 2021). We found that *agility*, *solution-based teams* and *holacracy* are the leading ways to organisational seizing for structure. First, five sources claim the organisational structure needs to be scanned for inflection points in decision-making. Seizing through agility helps to 'digitise fast and with full commitment processes of strategic importance and fairly easy digitisation' (Kretschmer & Khashabi, 2020). For example, strategic agility and the redesign of organisational structures towards innovation ecosystems enabled digital transformation in Maritime Container Shipping (Wohlleber et al., 2024). The related changes also increased the flexibility of organisations (Chatterjee et al., 2022).

Ensuring the best model for agile responses to market changes, organisational leaders can reassess and adjust the overall structure to fit organisational goals (DiRomualdo et al., 2018). Agility can be established initially at the lower organisational level by a centre of competence, which later can be scaled up across the organisation (Hutter et al., 2023). *Seizing* through the alignment of

incentives enables to focus on standardising technological features, budget formalisation for digital investments and developing new and formalised procedures for innovation activities (Urbinati et al., 2020). It allows the move 'from a product-centric approach to a solution-centric approach, recognising its importance for internal and external collaboration' (Ghosh et al., 2022). Instead of assigning people to particular business segments/products, the firms can activate solution-based teams to develop and market solutions faster and secure early customer adoption. Second, 12 sources indicate the need to rearrange the organisational structure to enable teams to plan priorities based on customer feedback (Josyula et al., 2021). Seizing can be further strengthened by embracing the services of third-party entities such as platforms and providers, including business-to-business networks (Hanelt et al., 2021). It can also give access to data collected via digital technologies, 'including smart devices such as wearables, smart badges and sensors' (Kohli & Johnson, 2011; see also Verhoef et al., 2021). Third, *seizing* can be reinforced through a flexible organisational structure co-developed with the strategy (Kretschmer & Khashabi, 2020) that is flat and flexible and is, therefore, critical to driving an agile culture in the team and leading to more decentralisation (Badasjane et al., 2022). As a radical form of such transformations, holacracy represents the organisational form that can emerge during digital transformation. Holacracy is suitable for industries where 'adaptability outweighs the need for reliability' and can lead to increased 'transparency, adaptability and accountability' (Ackermann et al., 2021). Holacracy replaces the traditional hierarchical structure and sets up independent entities that do not follow the traditional management structure but an informal hierarchical development, where 'leading by example is more important than leading by authority' (Ackermann et al., 2021). This type of structure is informed by the Silicon Valley startup culture known for 'rapid prototyping, agile decision-making and flat organisation structure' (Ghosh et al., 2022).

Regarding reconfiguring, data suggest that decentralisation and defining capability frameworks are the leading ways to organisational transformation for structure (eight sources). First, transforming via team decentralisation includes reconfiguring small pods of capabilities to cater to diverse customer requirements (Josyula et al., 2021; see also Vial, 2021). It calls to embed digital into operational processes while outsourcing non-core IT functions, which allows digital geeks to work alongside business unit managers (Kohli & Johnson, 2011) and co-transform the loosely coupled structures (Urbinati et al., 2020). For example, it can be in the form of a matrix structure with the CDO on the Offer Board and the CTO on the Markets Board (Singh et al., 2020) and the use of steering committees for digital

transformation and omnichannel committees (Singh et al., 2020). It involves defining a framework of capabilities and service design standards to create new digital products, 'so we are building a new technology blueprint informed by digital thinking' (Engesmo & Panteli, 2021). In this case, the CDO/CIO jointly targeted operational processes to embed digital technologies to capture, integrate and deliver information (Kohli & Johnson, 2011).

In sum, a structural dilemma centres around key decisions related to adaptive capacities, seizing opportunities and structural configurations. The dilemma is multi-faceted, involving choices in agility, solution-based teams, holacracy, decentralisation and defining capability frameworks. For agility, organisations must balance the need for rapid digitisation and structural redesign with the necessity for a stable foundation. The dilemma extends to the seizing phase, where aligning incentives for a shift from a product-centric to a solution-centric approach poses a strategic issue and challenges traditional structures. The introduction of holacracy as a radical transformation further adds to the tension between traditional hierarchical structures and more flexible, adaptive approaches. In the reconfiguring phase, the decentralisation dilemma emerges, requiring a careful balance between team decentralisation and centralised structures. Additionally, defining capability frameworks introduces a dilemma regarding the standardisation of digital products and technology blueprints.

In the next section, we discuss the importance of identified dilemmas for organisations and future research and outline potential strategies helping organisations address these dilemmas.

DISCUSSION

This study was driven by the imperative for LEOs operating in complex and dynamic environments to embrace digital transformation by enabling their dynamic capabilities and balancing stability with change. Indeed, existing scholarship mostly adopted a disruptive tone, emphasising the challenge posed by digital startups to established incumbents seen as too inert. Very few studies position LEOs as a central element, allowing an understanding of how these organisations are reshaping their strategies for digital transformation (Furr et al., 2022). These studies underscore the failure of many digital transformation initiatives among large firms to balance inertia with change, highlighting the crucial need to address strategic challenges associated with digital transformation (Kane et al., 2015; Tabrizi et al., 2019). Our study attempts to address this need, and thus, it makes a timely contribution to the existing literature. Building on Smith and Lewis's point

that the rapid pace of technological change requires firms to balance stability with flexibility (Smith & Lewis, 2011), we show managing this tension within the framework of dynamic capabilities is vital for firms undergoing DT.

Using a dynamic capabilities framework, our study highlights the strategic tensions that large established organizations may face during their digital transformation efforts. We build on previous research that has primarily focused on strategic planning within the broader context of dynamic capabilities and digital transformation, often neglecting the specific tensions and dilemmas and their implications in the digital transformation process. Specifically, our work elides with studies showing that tensions are paradoxes that create conditions where dilemmas emerge due to their persistent and interconnected aspects (Smith & Lewis, 2011; Kohtamäki et al., 2020). By situating the identified four domains within the existing literature, we were able to identify and categorise various salient dilemmas due to persistent and interconnected tensions between stability and change that had not been previously integrated. These dilemmas have profound implications for the survival of LEOs in an evolving technological landscape. Each dilemma is elaborated below:

Performance dilemma

Responding to external competitive pressures necessitates generating greater value for customers and stakeholders. LEOs grapple with a performance dilemma: they must choose between conventional productivity measures and embracing novel organisational approaches that align with broader digital transformation objectives. Our findings suggest that organisational sensing capabilities, facilitated by IoT, ML and AI, enable LEOs to monitor employee skills in real time, identify skill gaps and intervene when necessary. These data-driven capabilities can guide key organisational decisions for improved performance and innovation (Furr et al., 2022). They also empower business model innovation through information and knowledge, countering competitive pressures from emerging startups (Firk et al., 2021). For instance, the underperformance of banks during digital transformation (Zachariadis & Ozcan, 2017) may stem from a lack of organisational seizing capabilities, hindering the adoption of new technologies and market entrants. Digital scouting, which involves using digital technologies and tools to identify, analyse and evaluate potential opportunities, trends or threats within the digital landscape, can help to address this dilemma. By actively monitoring and gathering information from various digital sources, digital scouting helps organisations stay informed about emerging technologies, market shifts, consumer behaviours, competitive activities and

other relevant factors that could impact an organisation's digital strategies and initiatives (Warner & Wäger, 2019).

In dealing with stability and change, LEOs must balance traditional performance stability while adopting new models that support digital transformation, fostering change through innovative approaches and the strategic use of digital scouting. The interplay between sensing capabilities enables LEOs to navigate performance challenges effectively, driving both continuity and adaptation in a dynamic environment.

Leadership dilemma

The leadership dilemma confronts large established organisations with a choice: should they persist with existing models adjusted for the digital realm, or should they overhaul leadership approaches to accommodate fundamentally different organisational structures like meritocracy, adhocracy or holacracy? Acknowledging the significance of leadership and the requisite skills for success in a digitally transformed setting (Haffke et al., 2016; Kunisch et al., 2020), we propose that organisational sensing capabilities empower the data-driven vision of the Chief Digital Officer (CDO), fostering effective communication, collaboration and coordination among C-level executives (Benlian & Haffke, 2016; Hess et al., 2016).

Regular interactions between the CDO and the executive board refine digital strategies, decentralise teams and influence IT operations. Our study underscores the value of transformational leadership for dynamic environments and large organisations (Jansen et al., 2009; Vaccaro et al., 2012), facilitated by organisational seizing capabilities that foster distributed leadership along value chains. We advocate for the appointment of local digital leaders who, through informal networks and roles, drive digital success through voluntary assignments, digital communication tools and practices. Effective communication practices disseminate the digital vision and significantly impact organisational structure planning and execution. Furthermore, organisational transformation capabilities enhance team autonomy and responsibility alignment via digital tools, fostering collaboration between marketing, customer solution teams and the transformation board.

In dealing with stability and change, the leadership dilemma highlights the need to balance maintaining effective existing leadership models with the necessity of evolving these models to fit new digital structures. This balance ensures stability while fostering change through transformational leadership and the strategic appointment of local digital leaders. The interplay between sensing, seizing and transformation capabilities facilitates both continu-

ity and adaptation, enabling LEOs to navigate the digital landscape effectively.

Governance dilemma

LEOs grapple with a governance dilemma: should they shape their governance structure or should they rely on established rules and routines? This dilemma involves balancing stability and change within the organisation. Aligning with Klarner et al. (2022) and Struckell et al. (2022), our study underscores the pivotal role of data-driven governance structures in guiding strategic decisions and adapting, integrating and reconfiguring organisational resources. The significance of dedicated governance mechanisms for digital transformation design and implementation has been highlighted (Chanias et al., 2019; Wiesbock & Hess, 2020). We contend that organisational seizing capabilities facilitate multidimensional coordination, with distributed governance supported by the CDO as a conduit for deep digital integration into organisational strategy. Our study advocates for the creation of separate autonomous units to explore digital opportunities, coordinated through multidimensional alignment and transparency to foster value exploitation. By enabling hybrid governance models, digital transformation fosters new forms of coordination and alignment that are well-suited to the digital age (Ozcan & Yakis-Douglas, 2020).

In dealing with stability and change, LEOs must balance established rules and routines with maintaining innovative, data-driven and flexible governance mechanisms. This approach ensures stability through the interplay between seizing and transformation capabilities, allowing LEOs to navigate governance challenges effectively and supporting both continuity and adaptation in a rapidly evolving digital landscape.

Structure dilemma

The structural dilemma compels large established organisations to choose between existing organisational structures or shaping firms based on the new data flows coming from suppliers and customers. Organisational seizing capabilities facilitate teams based on customer feedback, promoting flexibility, open communication and decentralised decision-making. This catalyses shifts from rigid to organic structures (Teece, 2000; Wilden et al., 2013). Third-party services, platforms and providers facilitate access to additional data, aiding in more effective organisational structuring. Adaptive, flexible organisational structures co-developed with strategy can cultivate an agile culture,

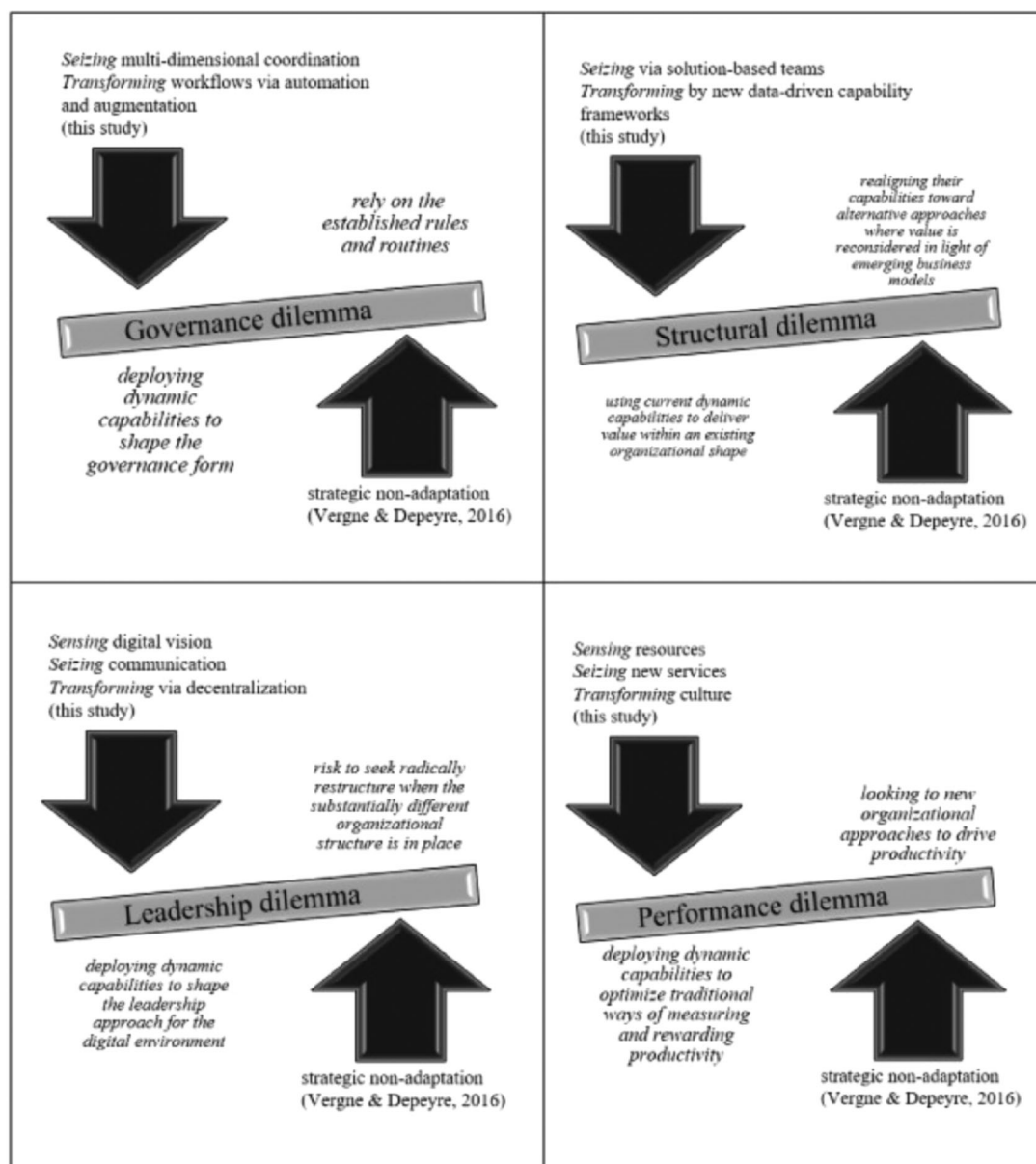


FIGURE 3 The dilemmas faced by large established organisations within our framework.

driving shifts toward decentralised, engaging holacratic models that better suit dynamic environments (Puranam et al., 2014; Verhoef et al., 2021). These shifts enhance customer service personalisation, reshaping the value proposition. Organisational transformation capabilities reinforce these structural shifts by defining capability frameworks and service design standards, breathing life into new organisational structures.

Our study contributes to the current state of knowledge with an integrated framework for digital transformation of LEOs (see Figure 3). While existing studies have shed light on various dilemmas related to digital transformation, these insights have not been holistically integrated. Our study is one of the important initiatives to unify the set

of dilemmas, offering researchers a clearer understanding of this field and facilitating the identification of potential directions for future research. We do so by conceptualising the **framework of digital transformation** for organisational change. The framework considers the current needs of LEOs, which are bounded by extensive legacy operations on a substantial scale and are susceptible to inertial forces that hinder adaptation. It also depicts the four dilemmas focused on performance, leadership, governance and structure and proposes the sequential pathway for LEOs to navigate change. Since the digital transformation of LEOs requires alignment with external environments (Dobrev et al., 2006), we suggest the four-step process to balance the stability of LEOs with necessary changes.

Finally, our study offers practical implications for LEOs that undergo the process of digital transformation. The sequential approach for resolving dilemmas in the context of LEOs (see Figure 3) can serve as a valuable guide for managers from these organisations. The metaphor of an optical lens (Van de Ven and Hargrave, 2004) either ‘zooms in’ and focuses on specific aspects and changes related to dynamic capabilities or ‘zooms out’ in the broader context and can be used to address the agenda for digital transformation and change. Our analysis of dilemmas, seen through a dynamic capabilities lens, can be a useful ‘tool’ for managers leading digital transformation. Although the literature suggests that digital transformation develops a new organisational structure, sometimes from scratch (Badasjane et al., 2022; Urbinati et al., 2020), we claim that the process of organisational change in LEOs involves more careful planning and starts by addressing and resolving dilemmas (in performance, leadership, governance and structure). This notice aligns with earlier evidence highlighting the importance for LEOs to create new formal (CDOs, data scientists, digital consultants) and informal roles (all motivated employees), who are responsible for orchestrating the organisation’s digital transformation in a distributed way (Bonanomi et al., 2020; Rueb and Bahemia 2020). The distribution of power enables the governance needed for organisational agility and timely responses to market opportunities, often leading to structural changes, such as solution-driven teams driven by the new combination of knowledge and skills of a more flexible organisation (Vestues & Rolland, 2021).

LIMITATIONS

First, an explicit limitation is the number of studies included ($N = 123$), explained by the limited number of eligible peer-reviewed journal articles; still, the reviewed literature allowed us to reach the saturation needed for theorising four dilemmas of organisational change. More dilemmas are likely to be constructed in future studies, for example, dilemmas of openness and ethics are intriguing since some LEOs are located in regions where digital transformation would not unfold fully due to political constraints and other barriers. Second, although we tried to minimise subjectivity bias by having three authors who independently reviewed and selected the relevant articles based on predefined inclusion and exclusion criteria, we cannot rule out subjectivity in the selection of the studies. Despite our best efforts to capture all relevant publications, we may have missed or excluded relevant studies during the searching and screening processes. Third, our systematic review may be subject to a language bias, as we only included articles published in English, and thus,

we may have omitted relevant literature published in other languages. However, such language bias is common in reviews for practical and substantial reasons, as it can be cost and time prohibitive (Eisend, 2019). Finally, our findings are missing insights into the accessibility of the resources and whether they need to be treated equally in the context of digital transformation for LEOs. If not, why not, and under which conditions? This represents an important agenda for future examinations and research.

FUTURE RESEARCH

Our study highlights how the persistent and interconnected tension between stability and change faced by LEOs creates conditions under which various dilemmas emerge. However, further research is necessary to provide richer and more detailed illustrations of these dilemmas. By uncovering these dilemmas, we propose a range of empirical research avenues that could advance deeper conceptualisation and theory development regarding the implications of DT. First, future studies could leverage real-world data to explicitly capture the complex interrelations between these dilemmas. Such complexities are particularly well-suited to configurational approaches that enable the modelling of intricate associations using empirical data.

Configurations offer contrasting, thematic and detailed characterisations of how large organisations operate and function (Child, 2002). Collections of such configurations have the potential for equifinality—the idea that different pathways can lead to the same outcome (Doty et al., 1993; Misangyi et al., 2017). For example, during the development of a DT strategy, some organisations may prioritise governance dilemmas—navigating challenges in role management, automation and data governance. Others may emphasise long-term performance through investments in digital skills and the cultivation of a data-driven culture, thereby enhancing capabilities and innovation speed.

Configurational methods, such as fuzzy-set qualitative comparative analysis (fsQCA), are particularly valuable in this context (Fiss, 2011). These approaches allow researchers to examine dynamic capabilities across multiple levels of analysis and to uncover ‘causal recipes’ associated with successful outcomes (Wilhelm et al., 2022). By adopting such methods, scholars can reveal the complexity inherent in DT and offer insights into equifinality. This multidimensional perspective helps address critical questions, such as why some organisations with a particular set of dynamic capabilities adapt and thrive, while others with similar capabilities stagnate and fail. Without such nuanced characterisations of DT,

oversimplified conceptions will persist, leaving fundamental questions unresolved.

Moreover, our dynamic capabilities lens underscores the need for empirical studies to further explore the routines, practices and capabilities required to balance the dual demands of stability and change—a balance that is essential for LEOs to achieve sustainable digital transformation.

Second, the framework we introduce serves as a starting point for investigating the dilemmas experienced by LEOs. However, it does not yet explore the possibility that these dilemmas can evolve into paradoxes. LEOs often face environmental dynamism (Eisenhardt & Marin, 2000), which reinforces dilemmas and amplifies their urgency and potential impact on organisational change. In this regard, Smith and Lewis's (2011) seminal work remains a compelling effort to analyse paradoxes across theoretical perspectives and levels of analysis using a consistent set of constructs. They argue that dilemmas may appear paradoxical when examined over longer time horizons. Similarly, Lüscher and Lewis (2008) found that encouraging managers to reflect on dilemmas often revealed their paradoxical nature. Over time, tensions tend to reemerge, demonstrating their interrelated and enduring characteristics.

Thus, while our study identifies dilemmas rooted in the tension between stability and change, these dilemmas may ultimately reveal deeper paradoxical tensions. What initially appears to be a dilemma could, in the long run, expose the persistent and interconnected nature of paradoxes. This calls for more integrative and longitudinal research to capture the dynamic evolution of these tensions (Smith & Lewis, 2011). Although our framework is not exhaustive, it provides a valuable foundation for future research into the enduring tension between stability and change faced by LEOs as they pursue digital transformation.

Finally, ethical issues inevitably accompany digital transformation. As our study highlights, addressing these ethical concerns is an integral part of sensing capabilities for organisational performance. However, such issues should not become barriers to DT in large firms, especially when developing universal digital solutions that can be adopted across organisations of varying sizes and sectors. Qualitative studies are particularly welcome to explore ethical dilemmas further and validate the moderating impact of data-driven digital technologies across the four dilemmas. By doing so, researchers can provide actionable insights to help organisations navigate ethical challenges without compromising their transformative potential.

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[Correction added on 17 April 2025, after first online publication: An acknowledgement section has been included in this version.]

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