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Uncovering the impact of digital technologies on strategising: Evidence from a systematic literature review

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Abstract

Adopting digital technologies in different organizations has become a trend over the last decade, yet our understanding regarding impact of digital technologies on strategising needs to be more cohesive. This paper reviews existing research on how digital transformation intersects with strategic management to adress this gap. Specifically, the aim is to explore how the digital context changes strategising. Based on a systematic review of empirical evidence from 163 journal papers, we showcased the manifestation of strategising in the digital age in terms of strategic practitioners, practices and praxis. By consolidating these findings, a typology of strategic actions in the digital age is developed and discussed, highlighting the interplay among changes in strategy-as-practice parameters. This framework clarifies in strategic scenarios of digital transformation and identifies various strategic directions and actions. Overall, we argue that although digital transformation has created additional strategic options, it has yet to change the underlying assumptions of strategising in firms.

INTRODUCTION

Adopting digital technologies is becoming necessary for most organizations (Dąbrowska et al., 2022). This trend impacts multiple organizational activities, such as creating new opportunities and initiatives for digital innovation (Nambisan et al., 2019), smart manufacturing (Frank et al., 2019) and digital marketing (Day & Schoemaker, 2016). Consequently, these new activities influence various organizational facets, enabling additional strategic options in terms of value creation and capturing (Chaudhuri et al., 2023; Sjödin et al., 2021; Zeng & Glaister, 2018). From a strategic management perspective, employing new technologies is often a result of strategic choices, and digital technologies' potential transforming effects are akin to strategic changes. In this vein, grasping the potential of digital technologies in strategy generation, development and implementation could be pivotal for adapting other organizational functions and, ultimately, contribute to the survival of firms in the digital age (Autio et al., 2021; Matt et al., 2015). Hence, studying management strategy in the digital era is timely and essential.

Recognising the new dynamics brought by digital technology advancements, the term 'digital transformation' has emerged and been studied as a phenomenon. Specifically, studies have examined its overall impact on organizations (Rêgo et al., 2022), focused on the antecedents (Hanelt et al., 2021) and outcomes (Vial, 2019). In addition, there are reviews delved into organizational functions, including production (Dieste et al., 2022),

human resources (Strohmeier, 2020) and marketing (Apasrawirote et al., 2022). According to the evidence reported in these studies, not all technology-driven changes appear to hold the same significance as a 'transformation' on an organizational level. A case in point is Verhoef et al. (2021, p. 891), who discussed digital-driven changes according to three levels: (1) digitisation—converting analogue info into digital format, (2) digitalisation—employing technology to modify organizational processes and (3) digital transformation—comprehensive shifts possibly yielding new business models. This typology showed different levels of technology adoption within the organization; however, it does not entirely capture the impact of digital technology, especially for strategising and how organizations can navigate through different strategic scenarios.

We contend that questions remain regarding the manifestation of strategising, that is, strategic management practices, in the digital age, especially concerning to what extent digital technologies have altered these practices of strategising (Ritala et al., 2021; Volberda et al., 2021). Nevertheless, capturing the manifestation of strategising could be complicated. Digital technologies' distinctiveness suggests their effects may involve dynamic interactions among humans, technology materials and practical activities (Hanelt et al., 2021), introducing complexity into strategising processes. Therefore, to fully understand strategising in the digital context, behaviours, actions and perspectives related to strategic management need to be captured.

To this purpose, the strategy-as-practice (SAP) perspective would be a suitable lens as it demystifies the doing aspect of strategy and the situated, interpretive and dynamic nature of strategising in the digital context. Specifically, SAP is concerned with the actors involved in strategising tools used in strategic management and the respective activities; the aim is to unfold detailed interplay among strategic actors, strategic tools and ongoing strategising activities (Johnson et al., 2003; Vaara & Whittington, 2012). Consequently, the SAP perspective (re) defines strategy as '*a situated, socially accomplished activity, while strategising comprises those actions, interactions and negotiations of multiple actors and the situated practices that they draw upon in accomplishing that activity*' (Jarzabkowski, 2008, pp. 7–8). Accordingly, taking the SAP view requires attention to aspects of practices, practitioners and praxis (Jarzabkowski & Paul Spee, 2009).

The value of adopting the SAP perspective in understanding the strategic worth of technologies is embedded in a micro, relational and process-oriented view. This integrated and constructive comprehension is insightful in revealing what technologies are in use, who used them and how (Baptista et al., 2021; Chanias et al., 2019; Kouame & Langley, 2018), leading to a clear picture of the manifestation of strategising after the technology implementation. Reviewing the changes in strategising based on SAP would also pose an opportunity to advance knowledge in SAP-related research in two ways. First, the proliferation of digital technologies applied in strategising extends the existing boundaries of SAP in terms of new actors, actions and tools. Second, adopting new digital technologies within an organization can bring additional interplay between existing and new actors, actions and tools, thus bringing new challenges and paradoxes for strategists and firms in managing the micro-strategising processes (Leonardi & Treem, 2020) and stimulating new paradigms of inquiry. As a result, SAP will be used as an analytical lens for this review.

Accordingly, this review aims to explore whether or to what extent digital technologies have changed the actors, tools and activities related to strategising. Understanding these changes is also a pressing issue in SAP-related research (Kohtamäki et al., 2022). In doing so, our intention is to outline the manifestation of strategising in the 'digital era' and develop a typology that could demonstrate the impact of digital technologies on strategising specifically. This typology would also shed light on different strategic scenarios and directions for organizations to navigate digital transformation. As a result, the following review questions are formulated:

> Research question 1. What is the manifestation of strategising in terms of relevant actors, tools and activities after organizations introduce and adopt digital technologies?
>
> Research question 2. What are the strategic options for organizations navigating through digital transformation?

To address these questions, we systematically reviewed empirical evidence regarding strategic actors, tools and activities in organizations. Through this process, this review offers a two-fold theoretical contribution. First, we add to the discourse of strategising by identifying new or changed strategic-related practices, practitioners and praxis as suggested in SAP literature (Burgelman et al., 2018). The findings shed light on a better understanding of managing digital transformation from the SAP perspective. Second, we propose a typology of strategising in the digital age as an outcome of this review. The typology adds to the current categorisation, such as Verhoef et al. (2021), and reveals the specific impact of digital technologies on strategising. Third, as we also explore how, and to what extent, current findings from empirical studies reported on changes in strategising contribute to the debate on whether digital transformation has transformed the foundations and basic assumptions of strategising; will digital transformation only be a new context for strategising, or

has it created a need for new theoretical grounding for the strategising research community?

The paper is organised as follows: We begin with an overview of SAP literature, followed by the review's methodology, covering keyword selection, multi-phase paper search and analysis. We then present our analysis, discuss research questions and synthesise literature. The paper concludes on its of theoretical and managerial implications and future research areas.

OVERVIEW OF STRATEGY-AS-PRACTICE (SAP)

SAP focuses on the practice inside the process and the interplay between micro-level (individual) actions and meso-level (organizational) processes (Brown & Duguid, 2001). SAP research has '… *an emphasis on the detailed processes and practices which constitute the day-to-day activities of organizational life, and which relate to strategic outcomes*' (Johnson et al., 2003, p. 3). Rather than focusing on strategy as the accomplishment of strategists foreseeing future trends via abstract macro-analysis and as a property of an organization (Jarzabkowski & Paul Spee, 2009), SAP research focuses on the "doing" of actors. Therefore, the SAP perspective broadens the scope of what strategy research explains (Vaara & Whittington, 2012) and provides a comprehensive analysis of how strategy work is done (MacKay et al., 2021), allowing the insights on processual dynamics and concrete micro-actions of strategic issues (Bjerregaard & Jeppesen, 2023). Theoretically, the SAP perspective assumes the social embeddedness of strategising (Seidl & Whittington, 2014). It considers the ongoing strategising activity (i.e., praxis) by strategic actors (i.e., practitioners) who use a variety of tools, norms and rationalised procedures in daily works (i.e., practices) (Vaara & Whittington, 2012).

First, different actors have unique ways of interpreting and engaging with strategy works based on their experience (Balogun & Johnson, 2004). Practitioners are pivotal in strategy formulation, including employees and non-financially dependent actors like media, state institutions and pressure groups (Whittington et al., 2003). Existing studies related to strategic practitioners have shed light on the roles and identities of managers and organizational members, as well as how they create strategic impacts (Burgelman et al., 2018). Behaviours are also of interest; in this vein, some central themes related to practitioners include 'sensemaking' and 'discursive' (Kohtamäki et al., 2022).

Second, practices generally refer to social and organizational routinised tools and types of behaviour used in strategy work (MacKay et al., 2021). Strategic practices are embodied explicitly in tools, methods, norms and procedures of strategy work (Jarzabkowski & Paul Spee, 2009; Whittington, 2006), and studies have focused on their impact and effectiveness when it comes to strategising. Some central themes may include 'socio-metrical' and 'institutional' (Kohtamäki et al., 2022). In this review, we regard all activities that contribute to strategic formulation and implementation as relevant strategic practice, no matter which organizational functions they occur.

Third, praxis refers to day-to-day concrete and unfolding activities conducted in strategic work over time that interconnect actions of practitioners at multiple levels in strategy processes (Jarzabkowski & Kaplan, 2015). The concept of strategic praxis implies a two-fold emphasis of studies, namely the temporal and the multi-level dimensions. Over time, Jarzabkowski and Bednarek (2018) underscored strategy-implementing practices' recursive interplay with the competitive arena. Likewise, in a post-acquisition integration study, Vuori et al. (2018) unfolded how emotional reactions and communication practices interacted and led to integration failure. Thus, praxis is an intricate phenomenon connecting practitioners and practices, and interactions between activities or relevant actors in strategising processes constitute strategic praxis in this review.

The SAP perspective is an appropriate theoretical lens to unpack the processual and dynamic intricacies of strategising in the digital age. Digital technology is more likely to shape and stimulate local reflective strategising actions and to act as a sense-giver of strategy (Rouleau, 2005), which entails processual activities where actors engage in micro-level tasks and activities (Kohtamäki et al., 2022). Due to the ubiquitous nature of digital technologies in the process of strategising, a perspective studying from a micro, relational and processual perspective to understand the mutual constitution and entanglement among digital analysis and representation technologies, strategic actors, social materials and possible activities can be imperative and fruitful (Faraj & Leonardi, 2022). As a dedicated lens, SAP represents a promising theoretical anchor and integrative framework to unfold the strategic influence of digital technologies (Chanias et al., 2019; Kouame & Langley, 2018).

At the same time, investigating digital technologies and their influences on strategising can present an opportunity to extend the existing understanding of SAP and identify new avenues for future research for at least two reasons. First, the proliferation of digital technologies in strategising extends the scope of inquiry about practice, practitioner and praxis from SAP research. A broader scope may then contribute to creating new forms of strategising enabled by digital technologies or modifying existing options. Second, digital technologies can bring

new challenges to strategising due to the interplay among new practices, practitioners and praxis and require advancing current SAP understanding. To sum up, adopting the SAP framework can also help us to examine existing empirical papers more comprehensively; meanwhile, the digital context tends to be unique to extend and advance the current understanding of SAP research (Kohtamäki et al., 2022). By doing this, we were also able to collect and process a wide array of empirical works examining the interaction between digital technologies and SAPs, although these terms are not used very differently.

METHODS

This study adopts a systematic approach to appraising the relevant literature, which includes a protocol-driven strategy for searching, screening, reviewing and analysing a sample of peer-reviewed journal papers (Pittaway et al., 2004; Tranfield et al., 2003). The systematic literature review is an appropriate method for synthesising an emerging research field (Cronin et al., 2008; Rialti et al., 2019) that helps to address the two research questions in a balanced and unbiased manner and presents results in a replicable and transparent way. An overview of our review design and protocols is shown in Figure 1.

Searching literature

A broad scope of up-to-date literature is often suggested to ensure a deeper interrogation of research questions and consolidate subject knowledge in a systematic review (Rojon et al., 2021). Considering digital transformation is an emerging field with abundant studies, we combined different search approaches, as Hiebl (2023) suggested, to ensure a broad coverage of relevant sample papers. The combination of multiple approaches in search protocol is commonly applied in recent systematic literature review works, such as Ceipek et al. (2019), Grattarola et al. (2024), Schneider and Spieth (2013), Schätzlein et al. (2023) and Seelos et al. (2023), to name a few. It is worth noting that keyword searches in electronic databases may still miss potentially relevant sample papers. Hence, our review includes snowballing and hand search, useful techniques for constructing a comprehensive review (Webster & Watson, 2002). Consequently, we conducted literature searches using (a) databases, (b) key journals and (c) seminal work. The combined approach capitalises on the strengths of each approach, such as transparency, the rigour of included research items, and broad and comprehensive review coverage, and alleviates most of its disadvantages (Hiebl, 2023). Schätzlein et al. (2023) have also recentrly applied such a combined approach, showin its usefulness. Accordingly, we illustrate the three approaches adopted in the search process.

Database-driven approach

First, we followed a database-driven approach to search for relevant papers. The keywords shown in Figure 1 were applied independently by the first two authors on the team to Scopus, Web of Science and Google Scholar. Using multiple databases is beneficial for including relevant studies, preventing relevant studies from missing out on specific databases (Zhou et al., 2023). These three are the most used databases with the coverage of high-impact and peer-reviewed journals (Podsakoff et al., 2005). For example, the Web of Science includes more than 12 000 high-impact journals in scientific disciplines worldwide (Nguyen et al., 2018). Scopus provides peer-reviewed journals in addition to the most influential ones (Zhou et al., 2024), improving the review's breadth. Apart from Scopus and Web of Science, we applied the searching keywords in Google Scholar to check whether we missed any relevant papers and stopped searching if 50 consecutive papers in the result showed no relevance to the study.

The keyword for the search is developed based on reading and analysing initial search of papers and review papers on digital transformation, such as Gong and Ribiere (2021), Gradillas and Thomas (2023), Hanelt et al. (2021), Li (2020) and Verhoef et al. (2021). The first group consists of different words that cover the broad meaning of digital transformation (e.g., 'digitali*ation', 'digital transformation' and 'digitali*ing'). This group of keywords was commonly used by prior systematic review works of digital transformation (Hanelt et al., 2021; Verhoef et al., 2021) to refer to the phenomenon of digital transformation. To capture studies on digital technologies which make no mention of the term 'digital', the second group includes the specification of a series of digital technologies (e.g., 'information technology', 'communication technology', 'blockchain' and 'social technology'). This group of varied keywords contains a combination of 'information, computing, communication and connectivity technologies' (Bharadwaj et al., 2013, p. 471), SMACIT technologies (social, mobile, analytics, cloud and Internet of things) (Sebastian et al., 2020) and CAMSS (cloud, analytics, mobile, social and security) (Yang et al., 2022). To comprehensively capture transformation, the third group encompasses different spelling variations like 'transformation', 'transfer' and 'implement', as recommended in bibliographic database search (Benders et al., 2007). We utilised Boolean search operators with targeted keywords and incorporated an asterisk (*) as a wildcard to

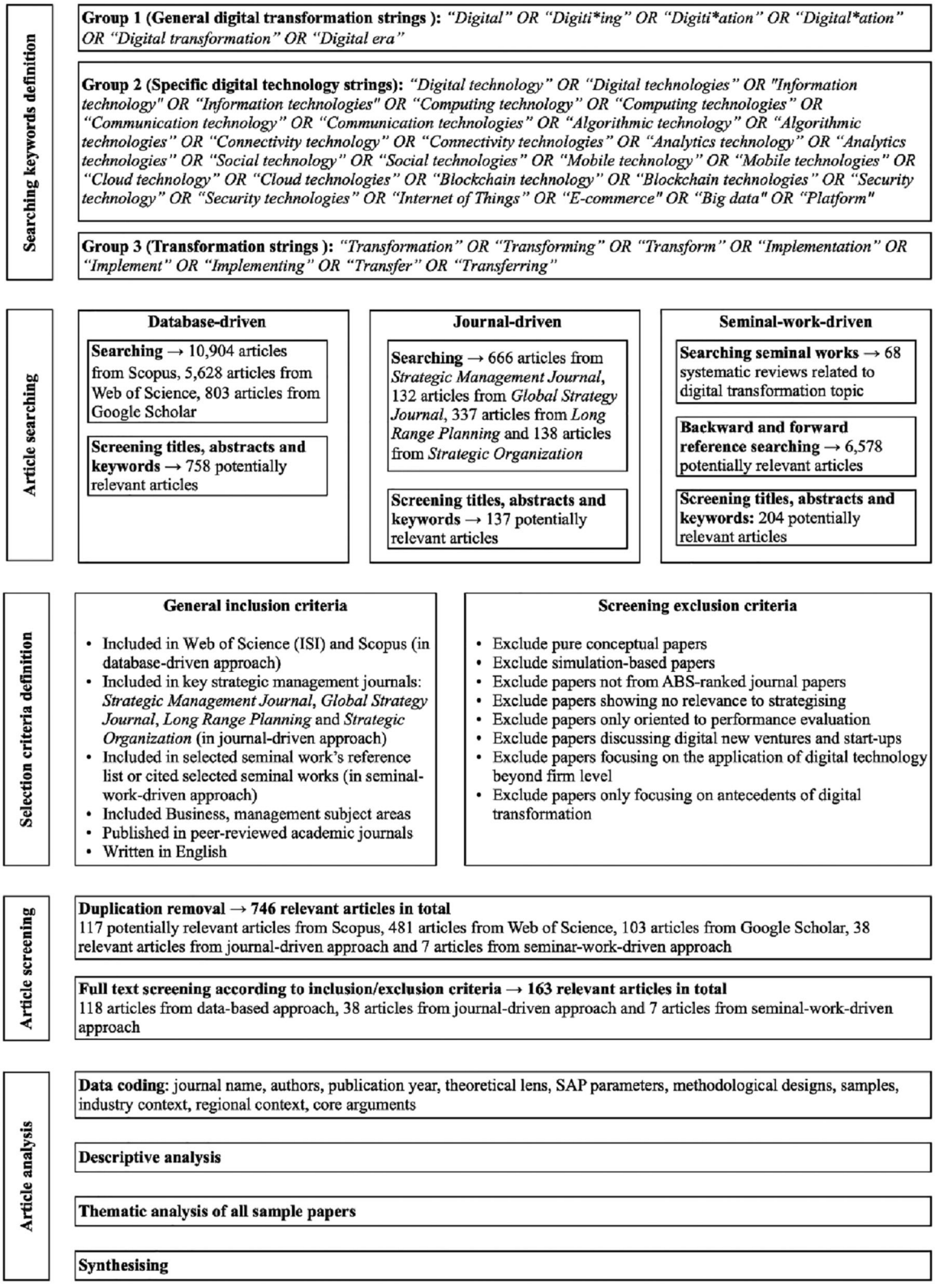

FIGURE 1 Systematic literature review design [*]. *Source:* Adapted from Hiebl (2023) and Schätzlein et al. (2023). [*] The searching process was completed on 30th April 2023.

accommodate term variations. Due to character limits, we employed diverse keyword string combinations for Google Scholar, stopping after 50 consecutive irrelevant results. We limited our search to the 'Business, Management and Accounting' subject area in Scopus and the 'Business' and 'Management' subject areas in Web of Science to make sure that our review was focused and not too broad to manage. Only papers written in English are included. In addition, we only included papers published in peer-reviewed journals to ensure the quality of the data set, following the suggestions of some recent systematic literature reviews (e.g., Zhou et al., 2023). The initial search process was completed in April 2023. A total of 10 904 papers from Scopus, 5628 papers from Web of Science and 803 papers from Google Scholar were returned by April 2023.

Journal-driven approach

The second approach is journal-driven, used by impactful systematic reviews, such as Vaara and Whittington (2012), to capitalice on top-tier journal rigour and quality. Applying the same keyword strings, the authors scanned the titles and abstracts of 1273 papers published in 4 leading journals in the strategic management domain, detailed in Figure 1. After applying the same inclusion/exclusion criteria and duplication check, we identified 11 additional relevant sources.

Seminal-work-driven approach

In addition, a seminal-work-driven approach based on the snowballing logic was conducted to check if any relevant papers were missed. Seminal works are scientifically influential to later development (Schätzlein et al., 2023). Our review regarded preceding systematic reviews from ABS-listed journals in 2021 as seminal for three reasons. First, ABS-ranked journals ensure scientific rigour and heightened influence (Schätzlein et al., 2023). Second, systematic reviews consolidate scattered information, spark new topic synthesis and encourage future research (Anderson & Lemken, 2023). Lastly, the newness of digital transformation research makes original works unclear. We carried out a seminal-work-driven approach by identifying existing systematic reviews related to the digital transformation topic, and backwards searching via snowball screening to reference lists of the systematic reviews (Butler et al., 2017).

To locate systematic review works, we employed search terms in Web of Science and Scopus: 'digital transformation' AND ('systematic' OR 'review'). We narrowed the scope to 'Business' and 'Management' in Web of Science, 'Business, management and accounting' in Scopus and included only English-written literature. This step yielded 55 initial Web of Science records and 126 from Scopus. After removing 34 duplicates, 16 irrelevant papers and 63 not in ABS-listed journals, we identified 68 seminal systematic reviews, collecting 6578 papers from this approach.

Screening retrieved papers

After collecting all the samples via the three approaches, we applied several exclusion criteria to narrow the relevant papers further. Table 1 details the criteria applied with justification and exemplar papers excluded to draw the boundary.

The titles and abstracts of papers are read at first screening stage. This screening has led to a record of 701 papers (117 papers from Scopus, 481 papers from Web of Science and 103 papers from Google Scholar) from the database-driven approach, 38 papers from the journal approach and an additional 7 papers from the seminal-work approach, with duplicates removed. In total, a set of 746 articles are included for full-text scanning. All the articles are downloaded and read in detail for further evaluation and coding. Two authors completed the selection process separately and independently to mitigate the impact of bias. When conflicts regarding the exclusion emerged, these were reconciled in communication that included all authors. Reasonings are provided in the communications, in all cases the author team can agree on the exclusion. As a result, we arrived at a final set of 163 articles, of which 118 were from a database-driven approach, 38 from a journal-driven approach and 7 from a seminal-work-driven approach. The final sample of the articles in the review is presented in Table 2.

Analysing literature

We applied a systematic approach to analyse and code collected sample papers based on the review questions. During reading, close attention was paid to the three aspects mentioned earlier—namely practitioners, (strategic) practices and (strategic) praxis—with relevant information noted and recorded in an Excel spreadsheet database to address the review questions (Rashman et al., 2009). To answer the first research question, we first read and recorded statements related to strategising with thematic analysis, focusing on the empirical evidence in the papers. For example, we gave the codes "global digital champions" as a new practitioner and 'accelerator-based organizational model' as a new practice from the statement "'… *the division built a so-called accelerator-based organisational model. In this model, there are global digital champions,*

TABLE 1 Exclusion criteria.

Exclusion criteria	Justification	Excluded examples
Exclude purely conceptual papers	Our review focused particularly on the empirical evidence regarding strategising in digital age	Van Tonder et al. (2020)
Exclude simulation-based papers	Although simulation-based papers provide some empirical insight, we do not consider it as empirical evidence in the context of this review	Jafari-Sadeghi et al. (2023)
Exclude papers not from an ABS-ranked journal papers	Papers from ABS-listed journals are considered to have relatively high quality in the business and management field, following the approach took by Redgrave et al. (2023), Soundararajan et al. (2018) and Okwir et al. (2018)	Chen et al. (2023)
Exclude papers show no relevance to strategising	The number of studies mentioning digital transformation is large. We adopt a rather broad scope in defining strategy based on the SAP perspective. Papers that have not mentioned actors, tools actions that are related to strategic activities in the organizations are excluded	Mazzucchelli et al. (2021)
Exclude papers only oriented to performance evaluation	Adopting the SAP perspective entitle this review to focus on the 'doing' of strategy; performance evaluation is considered static and does not reflect on activities	Brockhaus et al. (2023)
Exclude papers discussing digital new ventures and startups	Although papers about digital startups may include some insights regarding strategising, they do not show the changes and actual impact of digital technologies on organizations, not capture the 'transformation'. These papers are considered out of the scope of this study	Ghezzi and Cavallo (2020)
Exclude papers focusing on application of digital technology beyond firm level	The scope of this review is to focus on strategising in organizations in the digital age; thus, studies that report on smart cities or regional digital infrastructure are outside of this scope. However, extra attention has been paid on studies that report on, for example, platforms and ecosystems	Nilssen (2019)
Exclude papers that only focused on antecedents of digital transformation	This review is set to understand the actual impact of digital transformation on strategy, and papers that only looked at what is impacting digital transformation tend not to provide insights regarding activities and the 'doing' aspect of the strategy	Ahuja and Thatcher (2005)

Abbreviation: SAP, strategy-as-practice.

one in each region …" (Demeter et al., 2020, p. 829). Then, we analysed each statement relevant to practitioners, practices and praxis. To answer the second research question, we first examine how the empirical evidence of each paper reported changes in digital technologies or digital transformation brought to strategising. These changes are categorised into themes, and strategic options under each theme are identified, leading to an overview of the manifestation of strategising. Finally, practitioners, practices and praxis are linked with this manifestation. An inductive reasoning approach was applied throughout the analysis to identify causal relationships and patterns to build an informative and comprehensive conceptual framework (Cronin & George, 2023).

Descriptive results

Our selected papers reflect a wide range of publications; some descriptive statistics are presented in Table 3. Accordingly, our samples covered journals from different disciplines, echoing the effectiveness of our paper selection approach. Regarding the distribution of papers per year, we note an exponential growth of research interest regarding digital technologies' impact on strategic management in 2015–2023. This distribution indicates that the topic of our review has become timely and has attracted significant attention from multiple disciplines, consistent with a general trend and public interest. Our review sample also shows heterogeneity in terms of methodology, geographical context and industrial contexts.

STRATEGISING IN THE DIGITAL AGE

Based on the retrieval papers, it is well evidenced that digital technologies have transformed many industries in terms of how businesses and organizations are operated (Abebe et al., 2024; Hänninen & Smedlund, 2021; Plotnikova et al., 2021). Irrespective of digital technology use, these changes are anticipated in connectivity, transparency and data access, though these come with heightened

TABLE 2 Final sample papers for analysis.

Approach	Paper
Journal-driven [*n* = 38]	Abebe et al. (2024); Azad and Zablith (2021); Baptista et al. (2017); Benner and Waldfogel (2023); Brock and Wangenheim (2019); Cepa (2021); Correani et al. (2020); Dobusch and Kapeller (2018); Dremel et al. (2017); Firk et al. (2022); Firk et al. (2021); Gallaugher and Ransbotham (2010); Hänninen and Smedlund (2021); Jha et al. (2016); Kammerlander et al. (2018); Khanagha et al. (2022); Kohli and Johnson (2011); Kostis and Ritala (2020); Kronblad (2019); Kunisch et al. (2022); Malhotra et al. (2017); Morton et al. (2018); Pagani (2013); Petzsche et al. (2023); Plotnikova et al. (2021); Schafheitle et al. (2020); Schneider and Sting (2020); Sebastian et al. (2020); Sia et al. (2021); Singh et al. (2020); Solberg et al. (2020); Tong et al. (2021); Vogler and Eisenegger (2021); Wang and Bai (2024); Wang and Miller (2020); Yang et al. (2022); Zeng and Glaister (2018)
Database-driven [*n* = 118]	Ackermann et al. (2021); Antonopoulou et al. (2023); Antonucci et al. (2021); Arias-Pérez and Vélez-Jaramillo (2022); Arias-Pérez et al. (2020); Arthur and Owen (2022); Aversa et al. (2018); Bailey et al. (2012); Baptista et al. (2021); Bendig et al. (2022); Benitez et al. (2022); Benlian & Haffke (2016); Björkdahl (2020); Bloom et al. (2014); Browder et al. (2022); Burstrom et al. (2021); Bygstad and Ovrelid (2020); Canhoto et al. (2021); Cannas (2023); Cao et al. (2022); Carlsson (2023); Cepa and Schildt (2023); Chaudhuri et al. (2023); Chirumalla (2021); Ciampi et al. (2021); Corsaro and D'Amico (2022); Cozzolino et al. (2018); Day and Schoemaker (2016); Deist et al. (2023); Demeter et al. (2020); Denicolai and Previtali (2023); Dong and Yang (2020); Du et al. (2019); Ellström et al. (2022); Faro et al. (2022); Fernandez-Vidal et al. (2022a, 2022b); Fischer et al. (2020); Gaffley and Pelser (2021); Ghosh et al. (2022); Hansen et al. (2011); Heltberg (2022); Hensmans (2021); Hess et al. (2016); Huber et al. (2020); Imran et al. (2021); Jammulamadaka (2020); Jovanovic et al. (2022); Karhu and Ritala (2021); Kindermann et al. (2021); Koch et al. (2021); Koch et al. (2021); Korsen and Ingvaldsen (2022); Krishnamoorthi and Mathew (2018);; Lehrer et al. (2018); Leone et al. (2021); Li et al. (2016); Liu et al. (2011); Liu et al. (2022); Ma et al. (2023); Magistretti et al. (2021); Makkonen et al. (2022); Manfreda and Indihar Štemberger (2019); Manita et al. (2020); Mann et al. (2022); Matarazzo et al. (2021); Mattos and Novais Filho (2023); Mikalef et al. (2019); Mithas et al. (2013); Morton et al. (2020); Muninger et al. (2019); Nauhaus et al. (2021); Oliveira et al. (2022); Orhan et al. (2021); Pachidi et al. (2021); Pagani and Pardo (2017); Paiola and Gebauer (2020); Panourgias (2015); Penco et al. (2023); Piepponen et al. (2022); Pihlajamaa et al. (2023); Plesner and Raviola (2016); Porfírio et al. (2021); Pozzi et al. (2023); Prügl and Spitzley (2021); Pundziene et al. (2022); Rocha et al. (2023); Rozak et al. (2023); Sandberg et al. (2020); Schneckenberg et al. (2021); Schwarzmüeller et al. (2018); Scuotto et al. (2022, 2024); Selander and Jarvenpaa (2016); Sheng et al. (2005); Simsek et al. (2022); Sjödin et al. (2021); Smith and Beretta (2021); Somohano-Rodriguez et al. (2022); Stonig et al. (2022); Thorén et al. (2018); Tian et al. (2022); Urbinati et al. (2020); Do Vale et al. (2021); Van Doorn et al. (2023); Willems and Hafermalz (2021); Wiredu et al. (2021); Woodard et al. (2013); Wu et al. (2022); Wulf et al. (2017); Xiao et al. (2019); Yang et al. (2023); Yoshikuni (2022); Yu et al. (2022); Zabel et al. (2023); Zhao and Canales (2021); Zhao et al. (2024); Zoppelletto et al. (2023)
Semniar-work-driven [*n* = 7]	Cui et al. (2021); Klimkeit & Reihlen (2022); Jöhnk et al. (2022); Lischka (2019); Oliver (2018); Philip et al. (2023); Zimand-Sheiner and Earon (2019)

TABLE 3 Descriptive statistics for paper in analysis.

Journal information	163 papers from 56 journals
	Top 5 sourced journals: Long Range Planning (*n* = 15); Journal of Business Research (*n* = 13); California Management Review (*n* = 10); Journal of Strategic Information Systems (*n* = 10); Technological Forecasting and Social Change (*n* = 10); Journal of Management Studies (*n* = 8)
Methodology	**Quantitative design**: 36
	Qualitative design: 123
	Mixed method design: 4
Empirical context	**Top 5 countries studied**: United States (*n* = 21); Germany (*n* = 17); China (*n* = 14); United Kingdom (*n* = 12); Italy (*n* = 10)
	Top 5 sectors studied: manufacturing (*n* = 35); banking and finance (*n* = 30); ICT and telecommunications (*n* = 29); professional service and consulting (*n* = 29); retail and customer goods (*n* = 22)

complexity. Referring to the SAP perspective, this review shows strategising in the digital age based on the actors, tools and actions reported in empirical studies to answer our first research question. Then, a typology of strategising is reported, and some strategic options are synthesised to address the second research question.

Strategic practitioners in the digital age

The concept of strategic practitioner captures the actors involved in strategising and their roles. As digital technologies have brought new strategic directions in organizations across different levels, the responsibilities and leadership role in leading the potential changes need to be made clear first (Klos et al., 2023; Zoppelletto et al., 2023). The formulation and execution of digital-related strategic changes are often associated with the centralisation of responsibilities within the organization (e.g., Correani et al., 2020; Dremel et al., 2017; Kunisch et al., 2022), which gives rise to the introduction of digital-specific practitioners into strategy works. A common approach is to have dedicated new positions in the C-suit, such as chief digital officer (CDO), chief information officer (CIO) and chief technology officer. Having these additional members is not a new phenomenon in strategy, as Kunisch et al. (2022) explored that the emergence of CDOs started in 2003 and its prevalence after 2010; they further explained the contingent factors of the likelihood of CDO presence in a firm. Furthermore, Fernandez-Vidal et al. (2022b) revealed the role change of the CIO from an operational function to a more strategic function, indicating an increased emphasis on their role in strategy development. In terms of the impact of these new roles, most studies have reported a positive link between having these and improved organizational performance (e.g., Firk et al., 2022; Hess et al., 2016; Morton et al., 2018; Singh et al., 2020).

Another option discovered from the retrieval studies that could help organizations to navigate strategising in the digital age is for the current senior management team to adapt and remain the leading actor. For example, Zeng and Glaister (2018) emphasised the role of managers instead of data scientists in creating value using digital technologies because they are able to better understand the potential value of the technologies to the specific organizational context. Nevertheless, finding the right personnel to fulfil these roles is challenging as the difficulties lie in the need for both industrial and digital experiences (Jammulamadaka, 2020). Though data scientists and existing IT managers should also be included in strategising, they must develop further knowledge to stay 'relevant' (Manfreda & Indihar Štemberger, 2019). As a strategic priority, digital transformation is often supervised by key organizational figures, and board approval is often necessary (Ghosh et al., 2022); this is akin to other strategic change initiatives. Some studies have also provided insight regarding (e)-leadership (Brock & Wangenheim, 2019; Li et al., 2016; Simsek et al., 2022) and strategic alignment (Morton et al., 2018; Oliveira et al., 2022; Singh et al., 2020), adding evidence regarding the role of new actors in strategising. These discussions have shed light on the cruicial role of current leadership in making sense of the benefits of digital technologies.

Compared to a focus on centralised actors in strategising, some studies discussed re-distributing some of the responsibility through internal empowerment (Firk et al., 2021; Singh et al., 2020). In this vein, different actors outside the TMT are becoming more critical strategic practitioners. One case in point is involving frontline workers in forming and implementing corporate-level strategies, regardless of whether these strategies are specific to digital transformation or not. For example, Azad and Zablith (2021) demonstrated a specific case of digital visualisation usage in a school setting and reported that digital technologies have afforded frontline workers to be involved in strategic implementation, empowering employees to aid strategy enactment. On some occasions, actors contribute implicitly to strategising; for instance, frontline workers in the factories are involved in strategic efforts regarding digital value creation (Demeter et al., 2020). Another example is the use of digital platforms to create new communication channels so that strategising processes include more employee voice; this could be done through social media (Baptista et al., 2017) or a strategic on-line community (Plotnikova et al., 2021).

Similarly, digital technologies, such as social media and ICT platforms, could also enable open strategy and, thus, involve external actors in strategising (Malhotra et al., 2017). In this vein, Dobusch and Kapeller (2018) pointed out that via digital platforms, firms could choose to engage a specific community or the crowd in strategy-making, resulting in different managerial challenges. In addition to using digital platforms for formulating strategy, studies have shown the effects of digitally enabled value co-creation on strategising by including customers and other stakeholders in business model development (e.g., Chaudhuri et al., 2023; Kostis & Ritala, 2020; Sjödin et al., 2021), which is also an integral part of strategising. However, there needs to be more evidence supporting the boost of customer involvement in the actual strategy formulation and implementation besides business model-related activities.

In terms of the role of different practitioners, strategising in the digital age depends on the technology acceptance of practitioners, especially when digital transformation has been recognised as a strategic change plan driven by new

technologies (Stonig et al., 2022). Acceptance of digital technologies is particularly crucial in the implementation of strategies. Schneider and Sting (2020) pointed out that employees will have different reactions and attitudes towards new technologies, so in strategic initiatives that include digital technologies, these attitudes need to be considered. In this vein, Solberg et al. (2020) identified four different digital mindsets that may impact employee engagement in realising digital transformation as a strategic initiative. A specific example was shown by Pachidi et al. (2021), who made various attempts to bridge the differences between the customer relations managers, sales team and account managers for the digital transformation initiative. Arguably, making sense and managing the acceptance of digital transformation initiatives happen at both the management and employee levels (Carlsson, 2023; Hensmans, 2021).

Strategic practices in the digital age

The aspect of strategic practices aims to capture what strategic tools have been used and how effective these tools are. Notably, these tools are routinised and considered formal in organizations. With the developments in digital technologies, organizations can acquire additional information when making strategic decisions. Specifically, the recent development of technologies, such as big data and artificial intelligence (AI)–based analytics, has enabled evidence-based strategising as a practice. This new practice has brought about opportunities for organizations to rely on historical or real-time data with advanced data processing techniques and analytics for decisions, aiming to improve responsiveness, efficiency and accuracy during strategising based on data and real-time evidence, which are usually collected directly from the market (Chirumalla, 2021; Day & Schoemaker, 2016). For example, Willems and Hafermalz (2021) studied a sports betting company and proposed that digital technologies provide a comprehensive overview for decision-making that is superior to the partial and subjective view offered by frontline workers. In addition to acquiring information externally, studies have shown that data analytics in strategising pertains to performance evaluation which may improve the accuracy and effectiveness of monitoring strategy implementation (Oliveira et al., 2022; Tong et al., 2021). A common understanding, however, is that interpretation of this additional information is vital to realising the actual value of datafication technologies.

Other strategic tools that are enabled by digital technologies are related to the realisation of particular strategies (Benner & Waldfogel, 2023; Lehrer et al., 2018). For example, Yang et al. (2022) called for openness as the practice enabled by digital technologies for appropriate value, specifically for open innovation and summarised actions such as open platforms that allow multi-cloud access, digitally enabled collaborations and embracing and contributing to open source. Muninger et al. (2019) highlighted activities like hackathons and viral marketing enabled by digital technologies, as effective methods to implement innovation strategies. Another instance is practices related to open strategy (e.g., Morton et al., 2020; Plotnikova et al., 2021; Vogler & Eisenegger, 2021). Specifically, Dobusch and Kapeller (2018) summarised exclusive, reporting, reviewing and democratic practices that are enabled by digital open strategy-making initiatives. Another group of strategic tools considered by studies is related to gaining value from digital technology advancement. Accordingly, studies have examined practices for value proposition, creation and capturing under the digital context (e.g., Klos et al., 2023; Paiola & Gebauer, 2020; Simsek et al., 2022). In addition, some studies have reported on changes digital technologies may bring to value-related practices. For example, Pagani (2013) discussed the change of value creation and capture logic in the digital context, in this case, calling for adapting different strategic practices in new value networks enabled by digital technologies.

Digital technology has also contributed to improving existing strategic tools. One case in point is visualisations in the strategising processes, which have long been recognised as an essential task in strategising. Unlike traditional visualisation tools and tasks, digital visualisations allow for the participation of a wider audience virtually. During strategising, strategy practitioners have become increasingly concerned with which tools to use and how to digitally visualise to share information accurately, build cognitive rapport and create a shared understanding. Specifically, Azad and Zablith (2021) articulated four digital visualisation tools in mapping strategy work, namely 'Sankey', 'Forced Node', 'Treemap' and 'Mapping Table Diagrams'; these practices were introduced in the context of the implementation of organizational turnaround strategy. Similarly, Kostis and Ritala (2020) showcased virtual reality technologies as an enabling tool for co-creation practices for effective tailor-made solutions in robotics and automation projects. Consequently, digital technologies have provided more advanced visualisation tools to improve effectiveness.

However, it is noted that some traditional strategic practices that are not being heavily impacted may still hold their place in strategising in the digital age. Thus, some studies contributed to assessing the efficacy of current strategic practices in digital strategy implementation. For instance, Fernandez-Vidal et al. (2022a) provided a summary of current strategic tools, reviewed their usage in projects and concluded, based on their empirical evidence,

that there is still room for improvement in strategy, structure and governance of digital transformation initiatives in incumbent organizations. Other studies have also reported the importance of maintaining effective strategic practices but adjusting to the digital context in terms of managing organizational structures (Fernandez-Vidal et al., 2022b), talents (Fernandez-Vidal et al., 2022b; Stonig et al., 2022) and customers (Lischka, 2019; Oliver, 2018; Stonig et al., 2022). In general, studies have reported that traditional strategising practices are still fundamental despite the digital age. For example, Demeter et al. (2020) and Zhao and Canales (2021) both showcased a 'top-down' approach in their case studies, with the organizations still adopting existing practices such as board meetings, all staff meetings, roadmap and value creation workshops as strategising practices. Another common approach reported in the studies is for organizations to establish dedicated units to enable the use of different practices oriented towards digital transformation. Cepa and Schildt (2023) reported on this practice in the case study as the units established are given a clear mandate with less accountability for financial goals. This dedicated unit could also be a corporate venture outside of the firm (Firk et al., 2021; Imran et al., 2021; Lischka, 2019; Smith & Beretta, 2021).

The emergence of digital technologies has also posed new opportunities for strategising to be extended beyond organizations' boundaries, enabling digital platforms as a strategising practice (Hänninen & Smedlund, 2021; Khanagha et al., 2022; Sebastian et al., 2020). In this regard, studies focusing on platform-based digital strategies are interested in what strategy could help organizations take full advantage of these digital platforms. A case in point is presented in Karhu and Ritala (2021), as strategic practices that firms can use to establish their digital platforms, such as platform exploitation, injection and pacing, are reviewed. Considering the benefits of increasing market reach for using digital platforms, specific practices have been looked at platform development and management side (e.g., Jovanovic et al., 2022; Korsen & Ingvaldsen, 2022; Simsek et al., 2022;) as well as participating in existing digital platforms (e.g., Hänninen & Smedlund, 2021; Wang & Miller, 2020). The case study from Tian et al. (2022) further revealed that a digital platform strategy is a crucial means of realisation for Chinese textile companies by illustrating that, although the means for the digital strategy may be different, the ultimate target is to explore a smart and connected platform (ibid., p. 12).

Strategic praxis in the digital age

Focusing on strategic praxis enables insights regarding dynamic interactions that are, not always formal, and how these develop over time. The landscape of interactions in the digital age has changed, thus creating new interactions and relationships to be managed (Baptista et al., 2017). Some of these changes have resulted from the day-to-day activities, creating additional interactions in strategising and decision-making, especially in terms of human interpretation and data availability (Dong & Yang, 2020; Willems & Hafermalz, 2021) and coordination between business processes and infrastructure (Bygstad & Ovrelid, 2020). With additional practitioners included in strategising, studies have shown an increased complexity in managing the business-IT alignment (Sia et al., 2021; Zhao & Canales, 2021). This complexity could be part of the interactions between the CDO and other members of the TMT that act as a key to the success of digital transformation projects (Kohli & Johnson, 2011). In this vein, Singh et al. (2020) summarised that the purpose of these interactions is for CDOs to increase the importance of digital transformation and push it to be further integrated into the strategic agenda. To achieve this, Fernandez-Vidal et al. (2022b) emphasised the need to deepen the relationship between digital and business leaders. They pointed out the importance of a digital person 'speaking business language'.

However, reflected from the senior management side, Thorén et al. (2018) proposed that with digital technologies, current senior managers may gain and retain more control over strategising but could also lose control due to being digitally incompetent. Similarly Benlian and Haffke (2016) provided a more comprehensive summary as they discovered that the CIO's understanding of the CEO plays a more important role in the interaction and the relationship. Adding to the interactions, Xiao et al. (2019) indicated the importance of learning from initial failures in digital transformation projects, whereas Ghosh et al. (2022) proposed rapid prototyping and modular product development initiatives as actions CDO could make implementing the digital transformation-related strategies successful.

With strategising being considered more 'open' in the digital age, Jha et al. (2016) have showcased different actors engaged in the platform-based ecosystem differently throughout time and called for these activities to be strategically controlled. Other studies have also evidenced this change in the interaction between organizations and external stakeholders e.g., Pagani, 2013; Stonig et al., 2022. Other studies have demonstrated how digital technologies have changed the way firms interact with partners in a platform setting (Khanagha et al., 2022; Korsen & Ingvaldsen, 2022). In this vein, Stonig et al. (2022) demonstrated that their case company is willing to discuss previously confidential details of their strategy with clients to establish a platform-based ecosystem approach for strategy. In summary, Warner and Wäger (2019, p. 339) reported how

digital technologies have renewed the business model, collaborative approach and culture of the seven cases in their study.

In terms of interactions among different functions, empirical evidence on digital transformation highlights its success depending on internal coordination and organizational-level support. Achieving this coordination strategically demands re-evaluating current relationships. In this regard, Lischka (2019) pointed out that operational and strategic renewal does not occur revolutionarily; the news companies in the study implemented a series of incremental changes over time. Some additional examples may include alignment of new digital technologies with existing technology infrastructure (Brock & Wangenheim, 2019; Bygstad & Ovrelid, 2020) and culture and mindset change (Ghosh et al., 2022).

As strategising in the digital age is often entitled to exploration and experimentation in new territory, learning from initial failures is reported as an activity an organization should establish (Brock & Wangenheim, 2019; Cozzolino et al., 2018; Xiao et al., 2019). Regarding other actions that unfold over time, some studies also suggest that successful digital transformation prompts shifts in business models, often towards increased service orientation (Paiola & Gebauer, 2020; Tian et al., 2022). This process is highlighted in detail by the study of Pozzi et al. (2023), which presented the transformation process of 25 manufacturing firms and reported that, because of digital technologies, organizations' business models are changing from product-centred towards service-orientated and conceptualised this as 'digital servitisation'.

A typology of strategising in the digital age

Based on a systematic examination of the empirical evidence relevant to strategising in the digital age, we discovered three main patterns of strategising when digital technologies are introduced into the organization. Considering the extent of the impact the digital technologies may have and the potential value organizations can capture, these patterns are categorised as operational digital transformation, offering-based digital transformation and strategic digital transformation. The typology is developed with reference to existing frameworks such as 'digital reorientation' from Abebe et al. (2024) and three orders of effects of digital transformation from Baptista et al. (2021). Organizations engaged with digital technologies may start and end up in either of the three categories remains a series of strategic choices (Canhoto et al., 2021; Xiao et al., 2019; Yu et al., 2022). This typology is presented in Figure 2. Accordingly, the arrows in the figure illustrate what we consider the 'doing' aspect of strategising, or strategic directions, for organizations positioned in each category, represented by different strategic practitioners, practices and praxis.

Starting with the typology, we first consider functional digital transformation as situations where organizations adopt digital technologies in some day-to-day activities across different functions. Scenarios that fall into this category may include data-assisted decision-making (Willems & Hafermalz, 2021), manufacturing in factories (Pozzi et al., 2023), AI-enabled performance monitoring and prediction (Correani et al., 2020). Digital technologies may also change daily activities and eventually impact the formulation and implementation of strategies (Do Vale et al., 2021; Zoppelletto et al., 2023). However, this does not necessarily mean a fundamental strategic change, and as digital technologies are considered only tools.

Second, offering-based digital transformation describes scenarios where organizations integrate digital-based offerings with their current offerings to capture more value from the market. A case in point would be the emergence of digital platforms that provide additional sales channels for firms in different industries (e.g., Jovanovic et al., 2022; Karhu & Ritala, 2021; Wang & Miller, 2020). The need for integrating a 'digital option' in the offering is mainly evident in traditional industries such as media (Lischka, 2019) and education (Antonopoulou et al., 2023). It appears that because being digital has become the 'context' in which most organizations operate, modifying their offerings is inevitable (Firk et al., 2022; Kammerlander et al., 2018; Paiola & Gebauer, 2020; Warner & Wäger, 2019). Thus, firms in this category could leverage digital-enabled offerings and not commit strategically to a transformation that widely impacts the organization.

Third, few studies discussed digital transformation as an organizational strategic initiative (e.g., Dremel et al., 2017; Schneider & Sting, 2020; Solberg et al., 2020). Accordingly, we define strategic digital transformation as a holistic transformation of an organization, including fundamental changes in identity, culture and business model (e.g., Kammerlander et al., 2018; Kronblad, 2019). In this category, digital transformation is considered a strategic priority because it is expected to generate additional value for organizations and impact their competitive advantages (e.g., Jammulamadaka, 2020; Morton et al., 2018; Yu et al., 2022). As digital technologies can fundamentally change the landscape of many industries, organizations that are expected to be affected the most choose to build digital transformation into their strategic agenda and engage with strategic digital transformation, which has an impact across the organization.

The proposed typology indicates that not all organizations need to consider positioning themselves in the strategic digital transformation category and aiming for

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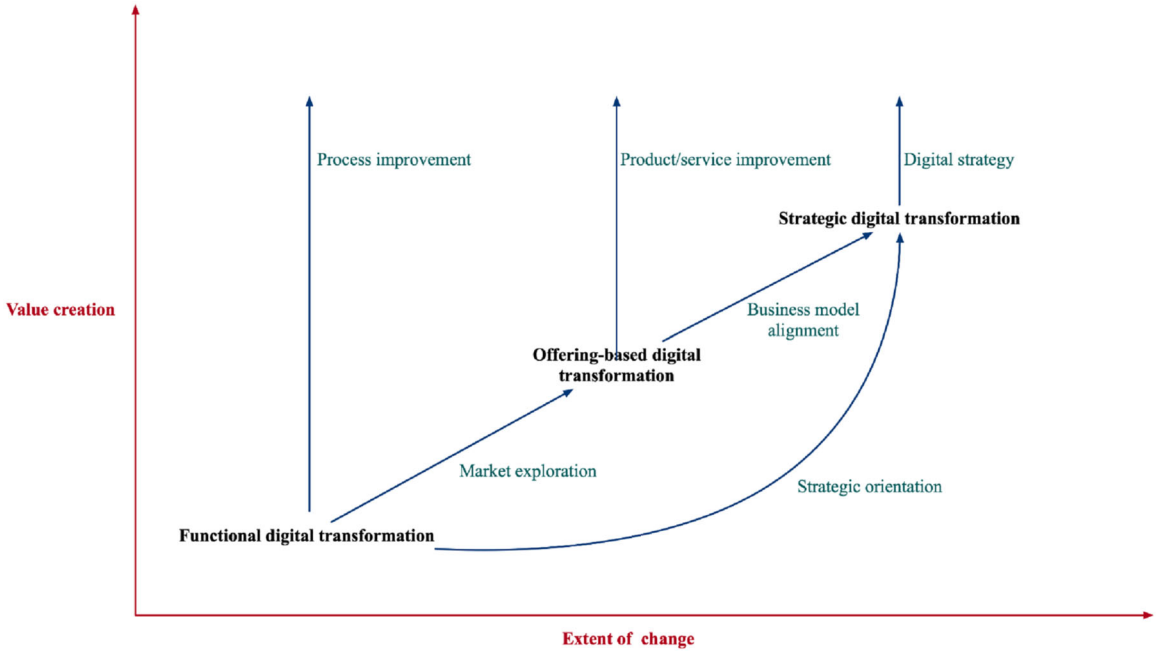

FIGURE 2 A typology of strategising in a digital age.

a digital strategy. For companies that start to consider functionally adopting digital technologies, value can be captured from digital transformation through business process improvements (Chirumalla, 2021). Some of these processes have a direct implication on strategising. For example, the use of digital-enabled tools for activities like open strategy (Dobusch & Kapeller, 2018) or informally collecting feedback from employees regarding strategy formulation and implementation (Plotnikova et al., 2021), as well as from external actors (Malhotra et al., 2017). For example, Schafheitle et al. (2020, p. 479) clearly stated that digital technologies fundamentally change organizational control mechanisms, and the impact would be on organizational goal setting and human oversight in strategising. Here, the prominent strategic practitioners are still the senior managers (Björkdahl, 2020; Bloom et al., 2014), but the emphasis should be placed on interactions among different organizational functions (Yang et al., 2022).

In cases where digital technologies have fundamentally changed the industrial norms, organizations could adjust their offerings accordingly to capture more value from digital transformation (Mithas et al., 2013; Selander & Jarvenpaa, 2016). The value creation and capturing are done through activities akin to what the dynamic capability literature suggested, including acquiring knowledge (Pundziene et al., 2022) and exploring new market options (Oliver, 2018). A common theme reported in the literature is the new dynamics that digital platforms have brought. Strategic decisions need to be made regarding how to select and engage with different platforms (Khanagha et al., 2022). In market exploration, the primary strategic practitioners are still senior managers, but external stakeholders may play more of a role in strategising by bringing in new knowledge and providing more options (Hänninen & Smedlund, 2021; Jha et al., 2016; Yang et al., 2022).

In responding to the external change, some organizations, especially large firms, would explore the potential value of digital transformation by creating a separate business unit. This strategic action would result in realising the value of digital technologies and, eventually, lead to a strategic digital transformation. For example, Lischka (2019) reported that operational and strategic renewal based on digital technologies only occurs gradually; for large newspaper companies, implementing a series of incremental changes is the most feasible way to address the need for digital transformation. For this strategic option, more business unit managers will be involved in strategising, including contributing to creating a digital culture and preparing for more comprehensive transformation plans (Browder et al., 2022). Creating separate business units will also lead to new interactions to be managed within the organization (Deist et al., 2023).

In some industrial contexts, organizations must directly capture value by integrating digital technologies into their offerings. Adopting these digital technologies can often contribute to radical and incremental product and service innovation (e.g., Lehrer et al., 2018; Urbinati et al., 2020). Here, emphasis has been placed on understanding the business value of digital technologies, especially the newly emerged big data analytic-related applications that act as a strategic tool (Mikalef et al., 2019). Hence, the long-lasting business-IT gap has become more important in the

digital era (Manfreda & Indihar Štemberger, 2019). Digital leadership responsibilities will then require business and technology knowledge (Koch et al., 2021).

As the significance of digital technologies may lie in their ability to redefine value (Pagani, 2013), to further sustain the benefit of digital-enabled offerings, organizations need to consider changes on a larger scale, which is often in the form of business model transformation. In this regard, the introduction of digital technologies has promoted value co-creation as a strategic tool in business model development (Chaudhuri et al., 2023). Practicing value co-creation also implies that external actors are more engaged in strategising as practitioners. However, it is noted that typical building blocks in business models, such as value propositions, creation and capturing, remain unchanged as strategising activities (Burstrom et al., 2021; Dong & Yang, 2020; Klos et al., 2023; Yang et al., 2023).

Recognising the strategic value of digital technologies, some organizations, especially large firms, opted for strategic digital transformation initiatives. Emphasising its importance, Correani et al. (2020, p. 38) called for a separate process for the formulation and implementation of strategy, including practices such as defining the scope of the transformation, managing data and developing processes and procedures; they defined digital strategy as '*a guiding policy for the creation and appropriation of value by exploiting digital technologies to achieve long-term objectives*'. In this vein, a more centralised leadership role using traditional strategic practices to manage cross-functional and multi-level interactions that may lead to identity, business model and culture change in the organization could represent an effective approach to 'digital' being built in the strategic agenda (Canhoto et al., 2021; Demeter et al., 2020; Zimand & Earon, 2019).

To sum up, strategising in the digital era is largely dependent on the strategic importance organizations place on digital technologies. Strategising following the path of process improvement or product/service improvement may take digital technologies as a tool rather than a goal. Despite the changing landscape digital technologies may bring, organizations will stick to their original strategic target, such as cost saving (Kohli & Johnson, 2011) or growth with profit (Oliver, 2018), and digital technologies are treated as a means to realising these targets. Existing practices in strategising may also change (for better or worse) because of the introduction of digital technologies. For example, although communication between actors in strategising is necessary, with the addition of digital technologies, on the one side, communication is becoming more convenient, but this could also lead to a negative impact on workers' engagement (Orhan et al., 2021). On this end, strategising may be better suited with the engagement of additional actors in a decentralised fashion, utilising new strategic practices enabled by digital technologies but focusing on dealing with new interactions in day-to-day activities to realise improvements over time.

DISCUSSIONS

Based on the findings presented thus far, evidently, new strategising practitioners, practices and praxis emerged, irrespective of organizations' digital transformation dedication. As clear view of how strategising manifested in the digital age, as seen in the typology presented in Figure 2, adds insights to the current SAP and digital transformation discourse. For the digital transformation literature, especially regarding how digital technologies influence strategising, we argue that although digital technologies have transformed different aspects of organizations, this transformation has not yet resulted in a fundamental change to the core and underlying assumptions in strategising. Digital technologies mainly shift the context of strategising, that have brought changes to the environment organizations operates in. However, theoretical constructs such resource-based view, as dynamic capabilities and business model are recurrent themes discussed in the literature. In this vien, the strategic target of gaining a competitive advantage emphasised, with studies asserting digital technology as a competitive advantage source (e.g., Jammulamadaka, 2020; Morton et al., 2018; Zeng & Glaister, 2018). Despite some criticisms, this classic strategic concept remains central in strategising (works). Having competitive advantages at the heart of strategising implies that digital transformation has not overhauled strategic management's assumptions, as many organizations maintain their unchanged strategic focus.

Shifting from product-centric to ecosystem-focused strategising via digital platforms might break from the basic assumption of solely pursuing competitive advantages. These different focuses have been highlighted in studies (e.g., Jha et al., 2016; Stonig et al., 2022). A similar trend is associated with openness in strategising (e.g., Baptista et al., 2017; Dobusch & Kapeller, 2018; Plotnikova et al., 2021). However, it is noted that neither an ecosystem approach to strategising nor an open strategy is unique and specific to digital technologies. Studies have shown that digital technologies have increased importance and relevance of these concepts in strategising. Nevertheless aditional evidence from studies regarding digital transformation may be needed to showcase these fundamental strategic changes.

For the SAP literature, our findings indicated that strategic practitioners, practices and praxis are similar to the general strategising reported even in the strategic digital transformational category. It is noted that

a centralised leadership role and traditional strategic practices, such as formal meetings and workshops, are still vital to the success of a digital strategy implementation as these are widely reported in the retrieval studies in our sample. Therefore, thinking about digital is not, and should not, be exclusive to thinking about the 'basics' in SAP, or, more broadly, in the value proposition, creation and capturing for business models, echoing the proposition of Kane et al. (2015) that it is the strategy that drives success in capturing actual benefit from digital transformation. To capture the benefits digital technology brings, organizations need to make sure the fundamentals of strategic elements are done right. For SAP studies, it is necessary to further explore how the strategic tool of digital technologies have been used, to explored what different strategic options, and the vital actors involved. Finding an appropriate position based on Figure 2 could be a starting point. The 'doing' aspect of strategising may play a more important role in the digital age. Used effectively, digital technologies will help organizations achieve their strategic target or, whereas blindly targeting for a digital transformation could create bigger troubles. Thus, digital technology, or decisions to start a digital transformation, magnifies the effectiveness of current strategising, both in terms of benefits and challenges.

CONCLUDING REMARKS

This review systematically analysed digital technology's impact on strategising and creating an integrative framework. We anticipate the framework serving as a foundation for future researchers to grasp strategising in the digital age. It outlines future research directions, to stimulate novel insights and propel SAP research into a new theoretical dimension.

Theoretical implications

First, our findings have implications for the, SAP literature especially regarding strategic practitioners, practices and praxis. Regarding practitioners, our findings suggested that although digital technologies have made strategising more 'open', the key actors in strategising are still mainly based in the TMT. Besides some specific focus on the engagement of frontline workers, current evidence still lacks a reach focus on the actual role of different actors in strategising. A recurrent theme is that due to the data collection methods, such as interviews being primarily conducted with actors on the senior management level, less has been reported on the role of other practitioners in strategising. Regarding practices, our findings identified digital-enabled strategic tools as well as revealed that traditional strategic tools, such as board meetings, are still highly relevant in the digital age. Although there are some attempts to compare strategic tools in and before the digital age, more evidence on the effectiveness of strategic tools that are impacted and enabled by digital technologies would be ideal, which may lead to a toolkit for managing strategising in the digital age. As digital technologies fundamentally changed many organizational activities, new challenges in praxis are evident in managing new interactions, especially human-technology interactions. However, these interactions should attract more attention for organizations to navigate the new complexity digital technologies bring that may not be captured by routinised practices. Although some studies have revealed and reported digital transformation as a long process (e.g., Baptista et al., 2021; Lischka, 2019), there is a need to see how these interactions and dynamics change over time. Building on the framework presented in Figure 2, additional actors, activities and tools could be identified for each strategic option to capture this change.

The typology of strategising in the digital age we developed based on a systematic literature review contributes to current digital transformation research. It consolidates and builds on current categories, such as Verhoef et al. (2021) and Abebe et al. (2024), to demonstrate different strategic scenarios of digital transformation. Accordingly, we identified the dimension of offering-based transformation in between functional and strategic transformation. The new dimension differs from existing studies that focused on the general digital transformation phenomenon, clarifying its meaning (Gong & Ribiere, 2021; Vial, 2019), revealing what digital transformation encompasses (Hanelt et al., 2021) and how digital transformation can be implemented (Verhoef et al., 2021). Furthermore, taking an SAP perspective allows this review to draw different strategising actions based on the three scenarios to demonstrate different practitioners, practices and praxis. Consequently, the actual impact of digital technologies on strategising could be drawn. These findings conceptually integrate burgeoning strategic management scholarship, delineate digital-era strategising options and set the stage for future strategising research, as discussed below.

Future research directions

Based on these theoretical implications, avenues for future research can be explored. Table 4 summarises these themes with potential research questions proposed. There are generally three aspects for consideration. The first is the type of digital technologies being studied. With swift technological advancement, new tech emerges. Subsequent research

TABLE 4 Avenues for future research.

Research direction	Potential research questions
Explore the impact of emerging technologies such as AI to understand whether knowledge about digital transformation still holds true	• How will adopting AI affect strategising in organization in terms of practitioners, practices and praxis? • How will organization's digital transformation progress affect the adoption of AI? • What is the impact of adopting AI on the progress of digital transformation in organizations?
Explore the new dynamics between practitioners and practices in the context of automation in decision making	• To what extent, new technologies, such as AI, could be considered a strategic practitioner? • What is the impact of automation in strategic formulation on strategic implementation?
Explore the potential change of the theoretical foundation for managing strategy in the digital age	• To what extent have dynamic capabilities changed in the digital age • What are the differences between digital business model design comparing to general business model design?
Empirically validate the typology to discover more strategic paths and link the framework with antecedents of digital transformation	• What are the paths firms could take to navigate among functional, offering-based and strategic digital transformations? • How will firms react to strategic digital transformation failures? • What are the main drivers for firms to consider digital-enabled offerings? • What are the antecedents for firms to engage in digital business model innovation? • To what extent, the development of digital strategy is different from generic strategy development?

Abbreviation: AI, artificial intelligence.

could delve into emerging practices, practitioners and praxis unique to specific digital technologies. For instance, the Internet, social media and digital visualisation tools are well studied. Nevertheless, emerging tools, like virtual reality, AI, Metauniverse and IoT, are underexplored. Future research could examine these technologies' impact on strategising, applications, new practices and potential shifts in strategising foundations. With the emergence of technologies such as AI, should technologies themselves be regarded as strategic practitioners? Currently, it is being considered a strategic tool. With more automation on decisions, it would thus be interesting for future studies to explore to what extent strategic work would be automatically done, such as the transformation currently happening at, for example, the factory level. Second, we noticed that digital technologies did not significantly change the theoretical foundation of the strategic management; this could be further explored. Particular interest could be paid to dynamic capabilities, business model design and competitive advantages. Third, the typology proposed in this study could be empirically verified to discover additional strategic actions. An area potentially being overlooked is when some strategic actions failed, how organizations could maintain the current outcomes achieved, when some strategic actions fail. Recovery from these failures may lead to exploring a potential 'reverse path' for digital transformation, where organizations change from strategic transformation back to functional transformation (e.g., Yu et al., 2022). This reverse option could also be linked with the contextual factors and antecedents of different strategic paths, which was not the focus of this systematic review.

Practical implications

The first implication we offer to practitioners is that digital technologies should be treated critically in their application on strategising. A critical view on digital technologies should also heighten awareness of evolving strategic practices amidst new dynamics. Showcasing the intricate nature of strategising changes underscores how digital technologies amplify effectiveness, encompassing benefits and challenges. Even in situations where organizations have to adapt to new challenges proposed by digital technologies, digital transformation should not be rushed. Carefully planned initiatives with support and commitment across the organization could be the key to success. Second, our conceptual discussion and typology could be a good starting point for managers to consider when dealing with strategising in the digital age. Managers could first consider what strategic scenarios may be more suitable for the organizations and then decide what strategic directions they should consider. For each potential direction, our study also pointed to factors to consider regarding strategic practitioners, practices and praxis. In sum, our study provides a holistic grasp of digital technology's potential and challenges in strategy generation, development and implementation.

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