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# Looking back to look forward: a systematic review of and research agenda for dynamic managerial capabilities

Tim Heubeck<sup>1</sup> 

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## Abstract

Given the complexities of today's hypercompetitive economy and challenges imposed by recent crises, managerial capabilities have become critical for realizing strategic change. Dynamic managerial capability (DMC) theory offers a useful theoretical lens for analyzing how managers make strategic decisions to build and sustain competitive advantages in dynamic environments. Despite receiving less attention than the broader field of dynamic capabilities, the existing body of research has reached a point where a comprehensive synthesis of the current state of knowledge is warranted. Past reviews of DMCs are either outdated or do not comprehensively examine this multifaceted construct, making a review of research highly necessary and timely. This review systematically synthesizes 54 empirical studies on DMCs. It contributes to the literature by systematically synthesizing DMC research and summarizing these findings into a multi-level framework. This review demonstrates that research on DMCs has significantly progressed over the years, for example, through conceptual expansions, new levels of analysis, or methodological advancements. The developed framework provides an overview of the nomological network surrounding DMCs. A systematic historical analysis of research limitations and recommendations offers a rich research agenda for DMCs. These findings guide scholars and managers by overviewing the foundations of DMCs, demonstrating why strong DMCs are critical for achieving sustainable competitive advantage, and how this theory applies to management practice. Altogether, this review presents an up-to-date review of DMC literature by systematically synthesizing its developments—*looking back*—and pointing to central research opportunities—*looking forward*.

**Keywords** Dynamic managerial capabilities · Human capital · Managerial cognition · Social capital · Strategic change · Systematic literature review

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## 1 Introduction

Dynamic managerial capability (DMC) theory, as an extension of dynamic capability (DC) theory, offers a valuable lens for analyzing how managers from different hierarchical levels affect strategic change in dynamic environments (Adner and Helfat 2003; Helfat and Martin 2015a). DMCs refer to “the capabilities with which managers build, integrate, and reconfigure organizational resources and competences” (Adner and Helfat 2003, p. 1020). The strength of these capabilities is critical for competitive advantages because managers differ in their ability to make strategic decisions and orchestrate the firm’s asset portfolio (Adner and Helfat 2003; Helfat and Martin 2015a). DMCs are a multifaceted construct composed of three interdependent subcomponents: *managerial human capital* (Becker 1983; Castanias and Helfat 1991, 2001), *managerial social capital* (Geletkanycz et al. 2001; Burt 2009), and *managerial cognition* (Hambrick and Mason 1984; Huff 1990; Walsh 1995; Johnson and Hoopes 2003).

While the empirical research on DMCs is growing, the field remains highly fragmented, with various approaches used to study these managerial capabilities. The lack of a systematic synthesis of the theoretical and methodological developments may have hindered the field’s progress. Existing reviews are either outdated (e.g., Helfat and Martin 2015a, covering the studies until 2013), limited in scope (e.g., George et al. 2022, focusing on entrepreneurship), or assess the DMC subcomponents in isolation (e.g., Durán and Aguado 2022a, b; Durán et al. 2022, focusing on human, social, or cognitive capital). However, research has significantly progressed since these reviews, studying DMCs in various settings, assessing their impact on outcomes beyond financial performance, and illuminating the interactions between the underlying managerial resources. Additionally, ongoing digitalization has emerged as a crucial influence on the appropriability and effectiveness of DMCs (Bendig et al. 2022; Heubeck 2023). Due to these developments, the literature lacks a comprehensive and systematic synthesis of the current state of research, which is also integral to guide future research and derive management implications.

This review aims to fill this research gap through a systematic analysis of DMC research. A holistic and multi-level framework is developed based on a systematic literature review (SLR) of 54 empirical studies. Although nonempirical articles may also offer valuable insights, reviewing empirical articles is common practice in literature reviews (e.g., Jasti and Kodali 2014; Hueske and Guenther 2015; Winschel and Stawinoga 2019), as they provide objective evidence for theoretical assumptions, advance current knowledge through systematic and rigorous methods, and help identify critical research gaps (Flynn et al. 1990; Becheikh et al. 2006; Kuckertz and Brändle 2022).

Following previous research (e.g., Schilke et al. 2018; Evers et al. 2023), the selected studies are analyzed by assessing the current state of knowledge along five lines of inquiry: (1) How are DMCs defined, and which theories/concepts are integrated (*theoretical/conceptual background*)? (2) At which level and hierarchical

echelon are DMCs investigated (*level of analysis*)? (3) In which dynamic contexts are DMCs analyzed (*element of dynamism*)? (4) Which research methods, data, and operationalizations are used to study DMCs (*empirical methods*)? (5) Which characteristics, antecedents, outcomes, mechanisms, and contingencies of DMCs are studied (*characteristics/relationships*)? These findings were used to develop a holistic and multi-level DMC framework, which clarifies their underlying characteristics and contextualizes these capabilities. This review also aims to forge pathways for future DMC research, leading to two final research questions (RQs): (6) What are the *limitations* of existing DMC research? (7) Where and how can *future research* advance DMC research?

This review contributes to research by systematically synthesizing what DMC research has achieved since Adner and Helfat's (2003) seminal article. The findings demonstrate that the field is far from uniform, with scholars analyzing DMCs using various methodologies and conceptualizations. Nonetheless, the findings show that DMC theory is a fertile perspective for (1) analyzing the causal chain through which managers impact strategic change; (2) determining which managerial capabilities are needed to cope with competitive pressures and discontinuous change; and (3) assessing the role of managers from various hierarchical levels.

The derived framework can guide future researchers by holistically capturing the conceptualization of DMCs and the nomological network surrounding these capabilities. By looking back at DMC theory through the derived framework, research can now look to the future of DMCs. The subsequent historical analysis of limitations and research recommendations delivers a comprehensive outlook on the field. Besides guiding research, this review offers valuable advice to management practitioners, for example, regarding the staffing of key management positions or the specific managerial capabilities that benefit strategic decision-making. This article presents an up-to-date and holistic review of empirical DMC research by systematically synthesizing its developments and pointing to central research opportunities.

## 2 Theoretical background

### 2.1 From dynamic capabilities to dynamic managerial capabilities

Teece and colleagues' (1997) DC theory builds on the resource-based view (e.g., Wernerfelt 1984; Barney 1991) in conjecturing that firms need to possess DCs to modify their current asset portfolio and processes in response to changing conditions (Di Stefano et al. 2010; Schilke et al. 2018). Specifically, DCs refer to a firm's ability "to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al. 1997, p. 516). They fundamentally differ from operational capabilities (Leemann and Kanbach 2021) that secure the "operational functioning of the firm" (Cepeda and Vera 2007, p. 427). While operational capabilities are required in relatively stable environments to sustain current operations, induce efficiency gains, and reduce process variations (Dosi et al. 2000; Zollo and Winter 2002; O'Reilly and Tushman 2008), DCs are required

for strategic change in dynamic environments because they allow firms to develop, adjust, and build ordinary capabilities (Winter 2003; Schilke 2014; Leemann and Kanbach 2021).

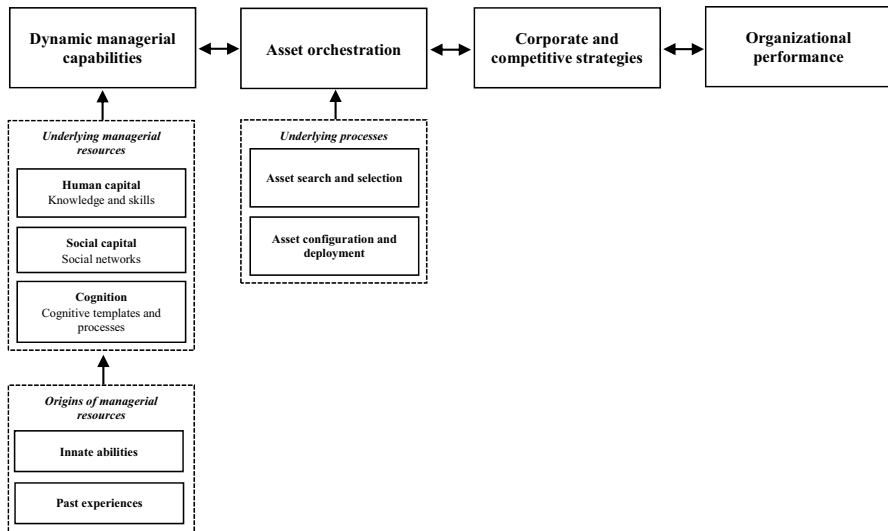
In today's highly globalized digital economy, DCs are critical for firms to respond to environmental changes, address new demand conditions, or cope with technological developments (Helfat et al. 2007; Martin 2011; Teece 2014). As a result, DCs have garnered interest from various management disciplines (Helfat et al. 2007; Schilke et al. 2018). Teece's (2007) refinement of the underlying DC microfoundations, including *sensing* opportunities and threats in the environment, *seizing* those opportunities, and *reconfiguring* the firm's asset portfolio, has continued to shape management research (Teece 2014; Matysiak et al. 2018) and been subject to further refinements (e.g., Leemann and Kanbach 2021).

Although DC theory remains the dominant lens to analyze strategic behavior as the foundation for competitive advantages under changing conditions (Teece 2014; Fainshmidt et al. 2016; Arndt et al. 2022), it fails to explicitly consider the agency of strategic decision-making due to its focus on organizational capabilities (Felin and Foss 2005; Augier and Teece 2009; Aguinis et al. 2022). DC theory also neglects that organizations are essentially social systems composed of individuals that make strategic decisions (Felin and Foss 2005; Felin et al. 2012; Kurtmollaiev 2020).

Adner and Helfat (2003) introduced the DMC theory to complement the coarse-grained DC perspective. DMC theory focalizes the managerial impact on strategic change, extending previous theorizing by explicitly considering the role of individual actors and their capabilities, social interactions, and agency in making strategic decisions. The main difference between managerial and organizational DCs is that the former always involve at least some managerial intent in their development and deployment, while the latter develop largely automatically without specific intention (Martin 2011; Beck and Wiersema 2013). Compared to DCs, DMCs bridge the external environment and individual-level management capabilities with greater deployment flexibility in responding to market dynamics than firm-level capabilities (George et al. 2022).

Central to DMC theory is the managerial role in orchestrating the firm's asset portfolio (Adner and Helfat 2003; Sirmon and Hitt 2009). Following the ideas of contingency theory (e.g., Lawrence and Lorsch 1967; Van De Ven and Drazin 1985), strong DMCs are necessary to achieve a 'fit' between the *search/selection* of resources and their *configuration/deployment* (Helfat et al. 2007; Sirmon et al. 2007; Sirmon and Hitt 2009). Especially in dynamic environments, DMCs are consequently essential for managers to systematically modify the firm's asset portfolio, efficiently pool assets to generate superior value, and mitigate the deterioration of existing assets (Sirmon and Hitt 2009; Dong et al. 2009; Fainshmidt et al. 2017).

DMC theory offers a micro-level perspective on strategic change by focalizing the impact of individual managers on organizational decision-making and behavior (Abell et al. 2008; Kor and Mesko 2013; Helfat and Martin 2015a). It fundamentally argues that the firm's adaptability hinges on the capacity of its management to orchestrate the asset portfolio in response to environmental change (Adner and Helfat 2003; Sirmon and Hitt 2009). Figure 1 provides a visual summary of the preceding arguments as the basis for the subsequent chapters.



**Fig. 1** Sources and effects of dynamic managerial capabilities (based on Adner and Helfat 2003; Beck and Wiersema 2013)

## 2.2 The underlying components of dynamic managerial capabilities

Three distinct managerial resources underpin DMCs: *human capital*, *social capital*, and *cognition* (Adner and Helfat 2003). Although these capabilities are shaped by managers' innate abilities and past experiences, they fundamentally differ in their characteristics (Castanias and Helfat 1991; Beck and Wiersema 2013). Human capital pertains to the current managerial capabilities, social capital offers access to external resources and capabilities, and cognition captures the managerial capacity to develop new or modify existing capabilities (Helfat and Peteraf 2015; Razmdoost et al. 2020). DMCs are a multifaceted construct that incorporates the interactions between these three resources as a source of heterogeneity between managers and organizations (Helfat and Martin 2015b; Heubeck and Meckl 2022a).

### 2.2.1 Managerial human capital

*Managerial human capital* is the first resource underlying DMCs, which managers acquire through formal training (e.g., investments in education) and informal training (e.g., on-the-job or trial-and-error-learning) (Mintzberg 1973; Becker 1983; Castanias and Helfat 2001). Managers differ in their human capital "both in the types of skills individuals possess and the degree of skillfulness" (Castanias and Helfat 1991, p. 160). In other words, human capital provides the necessary skill set to make and implement strategic decisions based on restructuring the firm's asset portfolio (Bailey and Helfat 2003; Sirmon et al. 2007; Helfat and Martin 2015a).

Managers possess different types of human capital, which can be categorized into four types according to their specificity and transferability: *firm-specific*, *industry-specific*, *related-industry*, and *generic human capital* (Castanias and Helfat 2001). *Generic human capital* from general education has the broadest applicability and greatest transferability, making it valuable across organizations and inferring greater flexibility in unknown or complex situations. Conversely, *firm-specific human capital* is highly specialized knowledge developed, for example, during tenure at a specific firm. Therefore, it represents the most specific and least transmissible type of human capital (Castanias and Helfat 1991, 2001; Bailey and Helfat 2003).

### 2.2.2 Managerial social capital

*Managerial social capital* is the second component of DMCs and refers to the benefits available to managers through their formal and informal relationships with internal and external actors (Adler and Kwon 2002; Adner and Helfat 2003; Burt 2009). Social capital has a structural, relational, and cognitive dimension (Nahapiet and Ghoshal 1998). The *structural dimension* refers to the general characteristics of the network, while the *relational dimension* describes the nature of social relationships, and the *cognitive dimension* depicts the psychological characteristics of the network, such as values or norms (Nahapiet and Ghoshal 1998; Tsai and Ghoshal 1998).

Social capital is critical for the managerial ability to orchestrate assets and access external resources and capabilities (Adler and Kwon 2002; Beck and Wiersema 2013). It can also spur learning processes by facilitating the exchange of complementary and non-redundant assets (Kogut and Zander 1992; Blyler and Coff 2003). Although social capital can reinforce human capital, the former requires repeated interactions and shared experiences, while the latter primarily develops through individual experiences (Beck and Wiersema 2013; Kwon and Adler 2014). Because organizations are social institutions, social capital and its benefits to managers and organizations are critical for realizing strategic change (Granovetter 1985; Blyler and Coff 2003; Burt 2009).

### 2.2.3 Managerial cognition

The final DMC subcomponent, *managerial cognition*, refers to “managerial beliefs and mental models that serve as the basis for decision making” (Adner and Helfat 2003, p. 1021). Managerial cognition differs from human and social capital in that it comprises (1) *mental processes* that determine how managers gather, interpret, categorize, and store information, such as alertness and learning (Walsh 1995; Ashcraft 2006; Colman 2015); and (2) *mental structures* that inform decision-making with abstractions of complex choice situations and serve as a reference for sense-making, such as references frames or heuristics (Neisser 1976; Schneider and Angelmar 1993; Walsh 1995; Durán and Aguado 2022b).

Cognition is an innately ambiguous resource for managers. On the one hand, managers cannot make entirely rational choices due to finite information processing capacities (Walsh 1995; Adner and Helfat 2003; Helfat and Peteraf 2015). Outdated mental models can cause biased outcomes because they inform decision-making

with “impoverished views of the world” (Gioia, 1986, p. 346). On the other hand, cognition also places less strain on information processing capacities and expedites information processing by simplifying decision-making processes. Therefore, managerial cognition is an essential prerequisite for swift decision-making in dynamic environments (Walsh 1995), yet managers must possess considerable cognitive skills to continuously adapt their cognitions to transformed environmental conditions (Walsh 1995; Tripsas and Gavetti 2000).

## 2.2.4 Interactions between dynamic managerial capabilities

DMCs are the conglomerate of managerial human capital, social capital, and cognition (Adner and Helfat 2003). Human and social capital are highly interrelated, as managers can acquire industry-specific or related-industry human capital by serving as directors on a firm’s board in the same or a related industry (Castanias and Helfat 2001). Because social capital increases the exchange of information and knowledge, it can also boost human capital (Coleman 1988; Adner and Helfat 2003). Conversely, high levels of human capital can increase social capital by making managers desirable business partners (Castanias and Helfat 2001). In addition, extensive human capital may provide managers with a broader cognitive skillset, expand their horizons, and update their worldviews (Melone 1994; Beck and Wiersema 2013). In return, greater cognitive skills may facilitate learning processes that benefit human capital (Adner and Helfat 2003; Ployhart and Moliterno 2011; Helfat and Martin 2015a). Finally, managerial social capital and cognition also interact in shaping DMCs. Social capital allows managers to expand their cognitive skillset by gaining experiences in unfamiliar environments. Further, social capital shapes cognition by infusing decision-making processes with socially-constructed worldviews (Fiske and Taylor 1984; Adner and Helfat 2003). Social capital facilitates individual cognitions to grow into shared cognitions—so-called *dominant logics*—that shape strategic decision-making processes (Prahalad and Bettis 1986; Jammulamadaka 2020). Managerial cognition molds the subjective perception of social interactions and relationship partners, influencing the type and nature of social relationships developed over time (Beck and Wiersema 2013; Helfat and Martin 2015a).

While each subcomponent may affect strategic decision-making independently, DMC theory recognizes the importance of aggregating these three distinct yet complementary managerial attributes into a unique resource bundle in dynamic conditions (Adner and Helfat 2003; Beck and Wiersema 2013). Therefore, the interactions between the three subcomponents are central to DMC theory and cause additional heterogeneities in managerial decision-making (Adner and Helfat 2003; Helfat and Martin 2015a).



### 3 Methodology

#### 3.1 Literature search strategy: planning phase

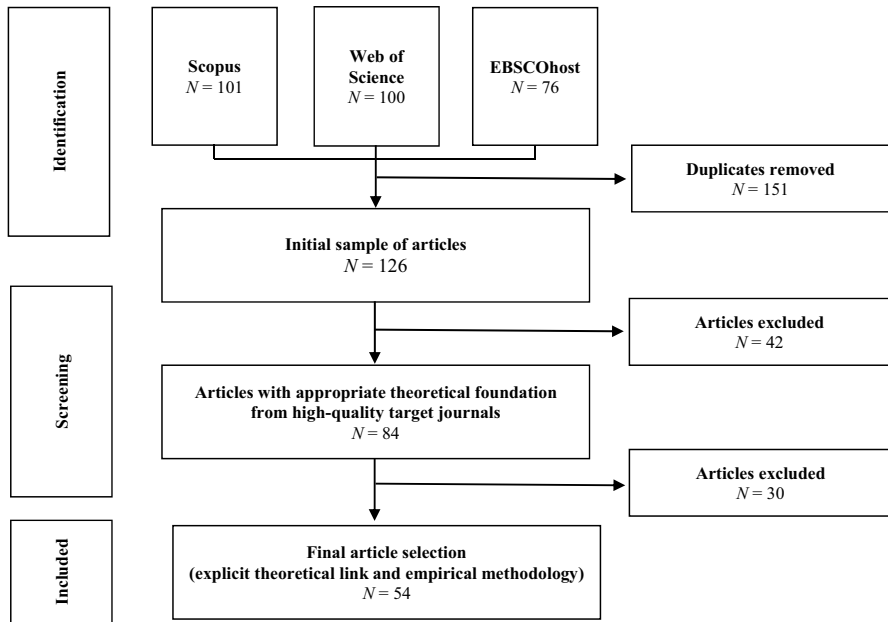
A SLR was conducted to answer the research questions, which typically consists of three phases: *planning*, *executing*, and *reporting* (Tranfield et al. 2003; Post et al. 2020; Kraus et al. 2022). In the planning phase, relevant selection criteria and keywords were determined. The literature search covered 20 years, from the first conceptualization of DMC theory by Adner and Helfat (2003) until the end of 2022. This approach enables a comprehensive assessment of DMC research, unlike reviews that focus on a specific application (e.g., George et al. 2022, who focus on entrepreneurship) or subdimension of DMCs (e.g., Durán and Aguado 2022a, b; Durán et al. 2022, who focus on managerial human capital, social capital, and cognition, respectively).

Business, management, and accounting journals were screened to gain a comprehensive overview of the field (Schilke et al. 2018). The search comprised articles referencing the term “dynamic managerial capability” in their title, abstract, or keywords containing an article’s central topics (Vrontis and Christofi 2021). All articles that do not explicitly mention the term “dynamic managerial capability” in their title, abstract, or keywords were excluded. This criterion was adopted to select articles explicitly linked to DMC theory. This selection procedure aligns with the overarching research goal of synthesizing existing studies that build on and contribute to DMC theory.

#### 3.2 Article selection: execution phase

During the second phase of the SLR, the three largest scientific databases—Scopus, Web of Science, and EBSCOhost—were searched for English-language, peer-reviewed journal articles (Pranckutė 2021; Kraus et al. 2022). This approach aligns with best practices (Vrontis and Christofi 2021; Kraus et al. 2022; Kunisch et al. 2023) and minimizes search bias (Dabić et al. 2021).

After removing duplicates ( $N=151$ ), the remaining articles were filtered based on the journal’s topic area and ratings and the article’s focus. First, only studies published in reputable business, management, or accounting journals ( $ABDC \geq B$ ,  $VHB\ JOURQUAL3 \geq B$ , or  $SJR\ 2021 \geq Q2$ ) were included in the review. This selection procedure ensures that included articles are from high-quality journals and significantly contribute to the field (Widmann et al. 2021; Cartwright et al. 2021; Göcke et al. 2022). Second, the search excluded all articles that did not explicitly relate to DMC theory based on a screening of their title, abstract, and keywords ( $N=42$ ). This search procedure yielded 84 articles. These articles were carefully read and evaluated to ensure their relevance to DMC theory. Articles that insignificantly address DMC theory or are nonempirical were excluded (Brutus et al. 2013). The first criterion was examined by screening whether and how the articles define DMCs. The SLR revealed two dominant references (Adner and Helfat 2003; Helfat



**Fig. 2** Literature search process

and Martin 2015a), consistent with the most cited references of DMCs according to Google Scholar. Thus, articles were required to explicitly define DMCs in their introduction, theoretical background, or hypothesis development using one of these two references to be included in further analysis. Second, to be classified as empirical, articles had to employ quantitative or qualitative empirical research methodologies rather than purely conceptual or theoretical approaches (Flynn et al. 1990; Jasti and Kodali 2014). 30 articles did not meet these two criteria, of which nine tangentially dealt with DMC and 21 were nonempirical. This search procedure resulted in a final sample of 54 articles, which exceeds the recommended minimum of 30 to 50 articles and is consistent with the average sample size in management reviews (Hiebl 2021, 2023). Figure 2 summarizes the literature search process.

### 3.3 Article analysis and synthesis: reporting phase

In order to report the findings, the articles were carefully analyzed and categorized. First, the *current state of knowledge* was assessed by determining how the articles have advanced the academic understanding of DMCs using which types of methods. Second, *research recommendations and limitations* were coded to identify research gaps and future research opportunities (Campion 1993; Schilke et al. 2018).

Following best practices (e.g., Tranfield et al. 2003; Parida et al. 2019; Evers et al. 2023), the current state of knowledge was assessed using a two-step procedure. In gathering and reporting the key aspects of each article, the following categories,

as presented in Appendix 1, were used: (1) *author(s) and publication year*, (2) *journal*, (3) *journal rankings*, (4) *journal subtype(s)*, (5) *key research proposition(s)*, (6) *classification of dynamism*, (7) *DMC definition*, (8) *level of analysis*, (9) *hierarchy*, (10) *theoretical and conceptual connection(s)*, (11) *DMC framework*, and (12) *main findings*. The empirical design of the reviewed articles was analyzed in a separate classification schema as summarized in Appendix 2: (1) *author(s) and publication year*, (2) *empirical design*, (3) *method(s)*, (4) *industry sector(s)*, (5) *organization type(s)*, (6) *countries*, (7) *data structure*, (8) *data source(s)*, and (9) *measurement including (9.1) operationalization, (9.2) dimensionalization, and (9.3) measure*.

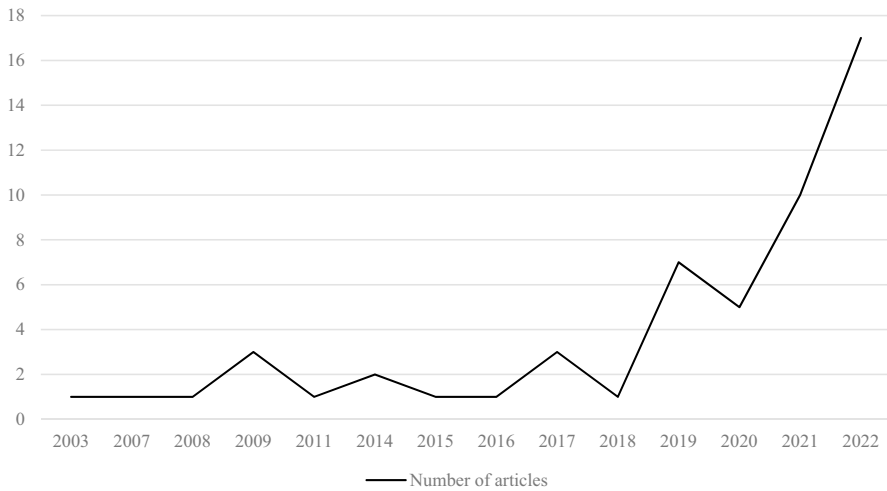
A descriptive analysis was performed from these tables to “compare and assess the overall strength of the selected literature for review” (Evers et al. 2023, p. 4). Then, to systematically synthesize the literature, a thematic content analysis was used to categorize the articles according to the TCCM framework into (1) *theoretical basis*, (2) *research context*, (3) *characteristics/relationships* (i.e., conceptualization, antecedents, outcomes, mechanisms, and contingencies), and (4) *methods* (Paul and Rosado-Serrano 2019; Nelaeva and Nilssen 2022; Evers et al. 2023).

Research limitations were coded into (1) *internal validity*, i.e., impaired cause and effect relationships and alternative explanations; (2) *external validity*, i.e., limited generalizability; (3) *construct validity*, i.e., inadequate of measures; (4) *statistical conclusion validity*, i.e., limited robustness and interpretability of results; and (5) *theory issues*, i.e., problematic theoretical assumptions (Brutus et al. 2010, 2013). The coding schema for the research recommendations comprises five categories from the DMC framework (conceptualization, antecedents, outcomes, mechanisms, and contingencies) and three additional categories from the content analysis (theory, methods, and replication). Research limitations and recommendations were then assessed using a historical review format to trace their development over time (Saunders et al. 2015; Campbell 2023).

## 4 Descriptive analysis

### 4.1 General sample characteristics

DMC theory registers an unprecedented surge of academic interest, with 70.22% of the final sample’s articles published since 2019. This growing interest affirms that DMCs provide a valuable theoretical lens for studying the microfoundations of strategic decision-making in today’s globalized digital economy. As discussed in the following sections, research has continuously developed the theoretical foundations of DMC theory by introducing new dimensions (e.g., Huy and Zott 2019; Tasheva and Nielsen 2022), expanding the level of analysis beyond top managers (e.g., Greven et al. 2022; Heubeck and Meckl 2022b), and applying the theory to new contexts (e.g., Akter et al. 2021; Krause and Pullman 2021). Figure 3 displays the growing interest in DMCs.



**Fig. 3** Number of empirical studies on dynamic managerial capabilities over time

The 54 reviewed articles were published across 39 journals, indicating a fragmented field, with only nine publishing more than two articles. The number of citations ranged from zero to 2,344, with a mean of 109.57 and a median of 16.00 citations per article, as of February 16, 2023, according to Google Scholar. Adner and Helfat's (2003) seminal article was the most cited, with 2,344 citations, followed by Eggers and Kaplan (2009; 754 citations), Sirmon and Hitt (2009; 676 citations), Salvato (2009; 517 citations), Peteraf and Reed (2007; 267 citations), and Martin (2011; 256 citations). The remaining articles received fewer than 200 citations. The reviewed articles were written by 131 authors (counting first and co-authors), with three authors publishing three articles and eleven authors publishing two articles. The remaining 117 authors have published only one article. Table 1 overviews DMC research's most prominent journals and authors.

## 4.2 General article characteristics

The following sections address the five RQs related to the current state of knowledge. For this purpose, the articles were analyzed based on their (1) *theoretical and conceptual background*, (2) *level of analysis*, (3) *element of dynamism*, and (4) *research method, context, and operationalization*. This analysis built the foundation for developing the DMC framework, which provides a holistic understanding of (5) the *characteristics* attributed to DMCs and the *relationships* in which they were analyzed (i.e., antecedents, outcomes, mechanisms, and contingencies). Table 2 overviews the articles' main characteristics; Appendix 1 and 2 comprehensively analyze the article sample.

**Table 1** Prominent journals and authors of DMC research

Number of published articles	Journal	Author
Four	<i>Strategic Management Journal</i>	
	<i>Journal of Business Research</i>	
Three	<i>Management Decision</i>	Goh, S. K
	<i>Organization Science</i>	Mostafiz, M. I
		Sambasivan, M
Two	<i>Cross Cultural and Strategic Management</i>	Aguado, D
	<i>European Journal of Innovation Management</i>	Atlas, F
	<i>International Journal of Operations and Production Management</i>	Durán, W. F
	<i>Journal of Business and Industrial Marketing</i>	Heubeck, T
	<i>Journal of Management Studies</i>	Khan, F
		Khan, K. U
		Meckl, R
		Peteraf, M
		Reed, R
		Roberts, N
		Vijayasarathy, L. R

#### 4.2.1 Theoretical and conceptual background

The theoretical rationale is largely consistent across the field.<sup>1</sup> The majority of articles (88.9%) referenced Adner and Helfat's (2003) original definition of DMCs as "the capabilities with which managers build, integrate, and reconfigure organizational resources and competences" (p. 1020). Helfat and Martin's (2015a) review article that defines DMCs as "the capabilities with which managers create, extend, and modify the ways in which firms make a living" (p. 1282) was referenced by the remaining articles. Both definitions fundamentally coincide as they view DMCs as a theoretical lens that explains heterogeneities in managers' strategic decision-making and their effects on organizational outcomes.

The review also found two other highly-cited articles cited in concert with the ones mentioned above. The first is Kor and Mesko (2013), who link DMC theory to dominant logic, which is "the way in which managers conceptualize the business and make critical resource allocation decisions" (Prahalad and Bettis 1986, p. 490). Dominant logic can complement DMC theory, as both focalize the managerial role in orchestrating assets and making strategic decisions. For example, Khan et al. (2019, 2020) utilize this theoretical integration. The other reference is Helfat and Peteraf (2015), who focus on the cognitive underpinning of DMCs and integrate related theories, such as the upper echelons theory (Hambrick and Mason 1984) and

<sup>1</sup> Following Schilke et al. (2018), references were only counted if they are cited in the article's DMC definition.

**Table 2** Key characteristics of the reviewed articles

		Number of arti- cles	Percentage
Theoretical foundation (multiple mentions possible)	Adner and Helfat (2003)	48	88.9
	Helfat and Martin (2015a)	17	31.5
	Kor and Mesko (2013)	7	13.0
	Helfat and Peteraf (2015)	3	5.6
Theoretical and conceptual connection(s) (multiple mentions possible)	Dynamic capability theory	31	57.4
	Strategy/strategic change	18	33.3
	Entrepreneurship	10	18.5
	International business	9	16.7
	Resource-based view	7	13.0
	Upper echelons theory	6	11.1
	Theories/concepts with less than three mentions	42	
Level of analysis	Individual	39	72.2
	Aggregated	9	16.7
	Multi-level	6	11.1
Hierarchy	Top management	37	68.5
	Middle management	2	3.7
	Mixed hierarchies	15	27.8
	<i>Of which</i>		
	<i>Top, middle, and lower management</i>	5	9.3
	<i>Top and middle management</i>	6	11.1
	<i>Middle and lower management</i>	1	1.8
	<i>Unspecified</i>	3	5.6
Element of dynamism (multiple mentions possible)	General external dynamism	45	83.3
	Strategic reorientation	15	27.8
	Discontinuous change	9	16.7
Empirical design	Quantitative	40	74.1
	Qualitative	14	25.9
Methodology (multiple mentions possible)	Regression analysis (various methods)	25	46.3
	Case study analysis (various methods)	12	25.9
	Structural equation model	11	20.4
	Variance decomposition	3	5.6
	Meta-analysis	2	3.7
	Qualitative comparative analysis	2	3.7
Data source	Primary	29	53.7
	Secondary	17	31.5
	Primary and secondary	8	14.8
Temporal perspective	Cross-sectional	29	53.7
	Longitudinal	25	46.3
Industry	Multiple industries	31	57.4
	Single industries	23	42.6

**Table 2** (continued)

		Number of arti- cles	Percentage
	<i>Of which more than two mentions</i>		
Organization type	<i>Manufacturing</i>	8	14.8
	Large	16	29.6
	Small and medium-sized	16	29.6
	Various	13	24.1
	Unspecified	9	16.7
Countries	U.S	15	27.8
(multiple mentions possible)	China	6	11.1
	Global	5	9.3
	U.K	4	7.4
	Australia	3	5.6
	Bangladesh	3	5.6
	Germany	3	5.6
	Colombia	2	3.7
	India	2	3.7
	Unspecified	2	3.7
	Countries analyzed once	14	25.9
	Capability-based	47	87.0
	Strategy-based	7	13.0
Dimensionalization	Managerial human capital/social capital/cognition	32	59.3
	Context-specific capabilities	8	14.8
	Sensing/seizing/reconfiguring	7	13.0
	Asset orchestration	5	9.3
	Managerial discretion	2	3.7

the resource-based view (Barney 1991). For instance, Tabares et al. (2022) refer to this article in defining DMCs to highlight the cognitive element of DMCs.

The borrowing of related theories and concepts has a long-standing tradition in organizational research (Whetten et al. 2009). Arndt and colleagues (2022) conjecture that researchers should integrate related theories and concepts into DMC theory because it provides “a platform on which to build theory, rather than a singular theory” (p. 5). This review revealed various theories and concepts incorporated into the study of DMCs (48 in total), with six referenced in more than five articles. First, over half of the articles accommodated DC theory in their conceptual background (57.5%). This is unsurprising given that DMC theory is essentially a subfield of DC theory (Adner and Helfat 2003). Second, one-third of the articles incorporated strategy or strategic change. This is also unsurprising given the inherent linkage of DMC theory with organizational strategy and strategic change (Beck and Wiersema 2013; Helfat and Martin 2015a). The third dominant theme is entrepreneurship (18.5%). While previous literature has alluded to the potential merits of

integrating DMC theory and entrepreneurship (Helfat and Martin 2015b, a), George et al. (2022) highlight this linkage by demonstrating that “the entrepreneurship literature is firmly rooted in the intellectual base of DMC” (p. 18). Fourth, one-eighth of the reviewed articles integrated international business literature. For instance, Tasheva and Nielsen (2022) derive the concept of global DMCs required to address the challenges of international business. This finding shows that DMC theory provides a suitable micro-level lens for studying the origins of competitive advantage in a globalized economy. Fifth, the results show that seven articles incorporated the resource-based view, which is consistent with the focus of DMCs on asset orchestration (Sirmon and Hitt 2009; Beck and Wiersema 2013). Finally, six articles linked DMCs to the upper echelons theory. Although upper echelons theory represents the prevalent theoretical lens to conceptualize how top managers affect firm-level outcomes (Kurzahls et al. 2020) and shares many of the same underlying assumptions, such as bounded rationality (Hambrick and Mason 1984; Adner and Helfat 2003) have not explicitly drawn on this theory. Thus, there remains significant unrealized potential to improve the current understanding of the managerial impact on strategic change. Other notable integrated theories and concepts include contingency theory (5 articles), the knowledge-based view (5 articles), and innovation (4 articles). All remaining theories and concepts have been mentioned less than four times with DMC theory.

In contrast to the larger field of DCs (Schilke et al. 2018; Arndt et al. 2022), these findings showcase a widespread consensus among scholars on defining DMCs, with the original understanding proposed by Adner and Helfat (2003) dominating the research field to this day. The findings also demonstrate that DMCs have been connected to various related theories, indicating that DMC theory offers ample opportunities to extend the current understanding of how managers affect strategic change in dynamic environments.

#### 4.2.2 Level of analysis

DMC theory analyzes “the role of managers, *individually and in teams*” (Helfat and Martin 2015a, p. 1282, emphasis added). The individual-level perspective prevails (72.2%), with articles, for example, studying top managers such as chief executive officers (CEOs) (e.g., Durán and Aguado 2022b; Durán et al. 2022; Guan et al. 2022). One-sixth of the articles adopted an aggregated perspective, analyzing management teams such as top management teams (TMTs) or boards of directors (e.g., Roelandt et al. 2022; Wang et al. 2022). Finally, the remaining articles (11.1%) employed a multi- or cross-level perspective in investigating the interactions between individual-level and aggregated DMCs (e.g., Martin 2011; Harvey 2022).

Although DMC theory initially focused on the role of top managers, and this perspective still dominates (68.5%), it also provides a suitable theoretical basis for studying lower management levels (Helfat and Martin 2015a). The reviewed articles have widened the conceptual boundaries of DMC theory, as evidenced by 31.5% of articles that include lower management levels. For instance, Karadağ and Şahin (2021) and Greven et al. (2022) focus on the role of middle managers, and Harvey (2022) and Heubeck and Meckl (2022b, a) study DMCs at multiple levels.



This expansion of DMC theory is warranted due to the increasing degradation of organizational hierarchies and the mounting importance of middle management for strategy implementation (Rouleau 2005; Rajan and Wulf 2006). Notwithstanding, researchers should include a sound theoretical rationale for studying lower-level managers, as they differ from lower-level managers in their capabilities and personalities (Hitt and Tyler 1991; Wai and Rindermann 2015; Holmes et al. 2021). Studies should not target lower-level managers simply because of difficulties obtaining sufficient responses from high-ranking executives.

DMC research has decisively progressed since Helfat and Martin's (2015a) call for multi- and cross-level investigations. As demonstrated by the findings, scholars have opened the conceptual boundaries of DMC theory by including different perspectives (e.g., aggregated or multi-level) and hierarchies (e.g., middle management).

#### 4.2.3 Element of dynamism

DMC theory focuses on the role of managers in dynamic environments, making it crucial to comprehend the source of dynamism it is analyzed. To achieve this, the descriptions of dynamism were gathered from the articles and then categorized, resulting in two externally-oriented categories and one internally-oriented category. The first externally-oriented category, *general external dynamism*, encompasses predictable and global environmental changes that affect all firms or those in specific industries. This represents the largest share of articles (83.3%) and includes global trends such as increasing globalization and digitalization (e.g., Tasheva and Nielsen 2022; Bendig et al. 2022) or industry dynamics (e.g., Sirmon and Hitt 2009; Martin 2011). The second externally-oriented category, *discontinuous change*, is mentioned by one-eighth of the articles and involves significant and unpredictable changes in the external environment, such as global crises (e.g., Oxtorp 2014; Nikookar and Yanadori 2021) or radical industry transformations (e.g., Peteraf and Reed 2007, 2008). Accounting for just over a quarter of the reviewed articles, the internally-oriented category *strategic reorientation* pertains to internal changes, such as new market entry (e.g., Ener 2019; Holzmayer and Schmidt 2020), organizational transformation (e.g., Salvato 2009; Guenduez and Mergel 2022), or business model innovation (e.g., Akter et al. 2022; Heubeck and Meckl 2022b).

Although the articles contain different sources of dynamism, this review evinces that all authors specified some element of dynamism. These findings substantiate that DMCs are an integral response mechanism that safeguards organizational survival in dynamic environments (Helfat et al. 2007; Martin 2011; Beck and Wiersema 2013) and highlight the importance of understanding the source of dynamism in DMC research.

#### 4.2.4 Research method, context, and operationalization

DMCs have been approached through various empirical methods, with most articles conducting quantitative research (74.1%), such as regression analysis, structural equation models, variance decomposition, and meta-analytical methods. The

remainder of the articles (25.9%) employed qualitative research methods, including case study analysis or qualitative comparative analysis. The research data were mainly obtained from primary sources (e.g., questionnaire or case studies; 53.7%), followed by secondary sources (e.g., database or archival data; 31.5%) or a combination of both (e.g., Martin 2011; Krause and Pullman 2021; 14.8%). The temporal research design did not exhibit a clear pattern, with cross-sectional research (53.7%) and longitudinal research (46.3%) used almost equally.

The diversity of empirical data is demonstrated by the wide range of industries and types of organizations under investigation. The majority of articles collected data from multiple industries (57.4%). The remaining studies focus on single industries (42.6%), with a predominance of manufacturing industries (8 articles). The type of studied organization also varied among the articles, with many articles not containing conclusive information about the specific type of organization under investigation (16.7%). The remaining articles analyzed small and medium-sized enterprises (SMEs) or large firms (29.6% each) or examined firms of various sizes (24.1%).<sup>2</sup> The reviewed articles also significantly differ concerning the countries examined, with a dominance of the U.S. (27.8%), followed by China (11.1%), and global samples comprising various geographical regions (9.3%).

The recent articles reviewed in this study demonstrate that DMCs are primarily operationalized using capability-based measurements (87.0%), whereas earlier studies have often relied on strategy-based measurements (13.0%). This indicates that recent DMC research focuses on capturing DMCs by measuring the capabilities of managers, while early studies have employed strategy-based measurement due to methodological choices (e.g., Adner and Helfat 2003; Peteraf and Reed 2007, 2008, who use variance decomposition methods). In comparison, the dimensionalization of DMC is more heterogeneous. However, operationalizations using the tripartite division of managerial human capital, social capital, and cognition dominate (59.3%). Other prevalent approaches include context-specific capabilities (14.8%), the sensing–seizing–reconfiguration classification (13.0%), and asset orchestration (9.3%). Additionally, two studies operationalize DMC using managerial discretion (3.7%). These results demonstrate that Adner and Helfat’s (2003) original classification has had the largest impact on DMC research. At the same time, researchers have also adopted different measures of DMCs tailored to specific research settings. Regarding context-specific capabilities, articles analyze the role of DMCs in international business (e.g., Oxtorp 2014; Kim and Lim 2022), supply chain management (e.g., Roh et al. 2022), or information technology (Bendig et al. 2022). The sensing–seizing–reconfiguration tripod has been adopted from the DC literature and has influenced large parts of DMC research (e.g., Martin 2011; Haapanen et al. 2020; Kevill et al. 2021). Finally, DMCs have been proxied using asset orchestration and managerial discretion because these strategy-related factors are at the heart of DMC theory (Adner and Helfat 2003; Beck and Wiersema 2013). The former reflects a significant

<sup>2</sup> In case information about sample characteristics was locatable (e.g., from descriptive statistics or appendices), firms with less than 250 employees were categorized as SMEs and those with more than 250 employees as large enterprises (Zhongming et al. 2021).

decision of top managers (Sirmon et al. 2011), while the latter determines the scope of latitude in managerial decision-making (Finkelstein and Boyd 1998). For more detailed insights into how DMCs are measured, refer to Appendix 2.

This review highlights a great research diversity among DMC studies. Although the inconsistent empirical approaches may hinder methodological and theoretical advancements, the broad angle on DMCs might be necessary to capture and examine this elusive construct in different and novel contexts. For example, the recent study of Bendig et al. (2022) adopts the lens of DMC theory to examine the sources and effects of technology leadership. These findings corroborate the initial conjecture that DMC theory is a valuable micro-level lens on firms' strategic decision-making "across a wide range of settings" (Helfat and Martin 2015a, p. 1282).

## 5 Dynamic managerial capability framework

This chapter condenses the current state of research into a comprehensive and multi-level framework. This DMC framework draws on categories from existent research to sort the main research propositions and findings from the sample into (1) *conceptualization*, (2) *antecedents*, (3) *outcomes*, (4) *mechanisms*, and (5) *contingencies* (Schilke et al. 2018; Vrontis and Christofi 2021). The first category is further divided into (1) *hierarchical level*, (2) *unit of analysis*, (3) *subcomponents*, and (4) *characteristics*. The other four categories are sorted into (1) *individual factors*, (2) *team factors*, (3) *organizational factors*, and (4) *environmental factors* when applicable.

### 5.1 Conceptualization

As outlined in Chapter 4.2.2, DMCs have been studied at different hierarchical levels (i.e., top, middle, and lower management) and units of analysis (i.e., individual level, aggregate level, multi- or cross-level). Further, DMCs result from three distinct managerial resources: human capital, social capital, and cognition (Adner and Helfat 2003). These subcomponents have shaped large parts of DMC research, with more than half of the reviewed articles using this dimensionalization (e.g., Razmdoost et al. 2020; Nikookar and Yanadori 2021). The subcomponents' definitions have also been adapted to the specific context in which DMCs were studied, such as entrepreneurship (e.g., Brown et al. 2021; Karadağ and Şahin 2021) or international business (e.g., Guan et al. 2022; Tasheva and Nielsen 2022).

Building on this tripartite classification, scholars have expanded DMC theory by adding new subdimensions, such as emotions (e.g., Huy and Zott 2019), ambidexterity (e.g., Tai et al. 2019), or absorptive capacity (e.g., Nguyen 2021). Scholars have also drawn on DC theory to propose an alternate classification of DMC following Teece (2007) into (1) *sensing* opportunities and threats, (2) *seizing* opportunities, and (3) *reconfiguring* resources (e.g., Martin 2011; Haapanen et al. 2020; Kevill et al. 2021). These findings show that besides the original conceptualization of DMCs, research has also introduced new subdimensions or

adopted Teece's (2007) alternate classification from the larger field of DCs. The theoretical advancement of the DMC subcomponents is driven by two central forces: the *context* in which DMCs are analyzed as the source of new subdimensions and increasing efforts pertaining to *theoretical integration* that lead to alternate classifications.

Finally, the conceptualization of DMCs entails their characteristics, which are discussed in two of the reviewed studies. Kevill et al. (2021) argue that DMCs differ in their degree of vulnerability, building on Teece's (2014) discussion centered around the vulnerability of DCs. While Teece (2014) has been mainly concerned about capability vulnerability due to the departure of key individuals (i.e., those within which those valuable capabilities reside), Kevill et al. (2021) show that irregular capability enactment due to temporal conflicts represents another source of capability vulnerability. Kim and Lim (2022) introduce the notion of versatile DMCs by drawing on resource versatility, which conjectures that versatile capabilities are re-deployable for alternative purposes (Nason and Wiklund 2018). This characteristic is critical to ensure the competitiveness of resource-constrained firms in dynamic markets (Mitrega et al. 2021).

These findings showcase significant progress since Adner and Helfat's (2003) original article. Research has adopted a more comprehensive range of perspectives on DMCs, investigated them at and across various hierarchical levels, proposed new or different subdimensions, and has started to grapple with their unique characteristics. The findings also show that DMC theory offers promising future research directions. For example, DMC characteristics are heavily under-researched. Further research recommendations are detailed throughout the following sections.

## 5.2 Antecedents

The reviewed articles offer insights into the origins of DMCs by pointing to several sources at the individual, team, organizational, and environmental levels. At the individual level, research has identified several factors that induce DMCs. Among those are also the DMC subcomponents themselves due to their interdependencies. For instance, Chen et al. (2022) demonstrate that managerial cognition antecedes managerial human and social capital, while Heubeck and Meckl (2022b) find that managers with stronger human and social capital possess more cognitive skills than their lesser-skilled counterparts. Other individual-level antecedents to DMC include ambidextrous capabilities (e.g., Roberts et al. 2021) and strategic human resource capital comprising education, tenure, experience, personality traits, and leadership style (e.g., Durán et al. 2022). The former study shows that ambidexterity is a dual-edged sword to the ability of managers to seize opportunities, while the latter study demonstrates that DMCs benefit from specific strategic human resources of CEOs.

Several team-level antecedents to DMCs were also identified from the review, such as knowledge and information sharing (e.g., Oxtorp 2014), common experiences (e.g., Jammalamadaka 2020), and technological experience (e.g., Bendig et al. 2022). For instance, Martin (2011) introduces the notion of an episodic team as a

“stable group in which group member activities, although largely independent, are on occasion interdependent, collaborative, or both” (p. 120).

The reviewed articles have also proposed various organizational antecedents, such as governance structures (e.g., Oxtorp 2014) or strategic orientation (e.g., Nijhof et al. 2019; Bendig et al. 2022). For example, Nijhof et al. (2019) prove that distinct strategic orientations lead to different DMCs influencing firms’ sustainability performance.

Finally, the review revealed two environmental antecedents, showing that increasing external pressures facilitate the development of DMCs due to industry dynamism (Fainshmidt et al. 2017) or technological intensity (Bendig et al. 2022). This research stream demonstrates that DMCs are an essential response mechanism to external uncertainties, as managers with strong DMCs can quickly react to environmental changes.

This multitude of antecedents demonstrates that DMC theory has significantly progressed over the past decades. The DMC framework integrates previously studied antecedents from all levels into a holistic overview. By categorizing existing research, this framework facilitates an in-depth understanding of the origins of DMCs and helps identify understudied areas.

### 5.3 Outcomes

DMC theory has been the subject of significant academic interest due to its connection to critical organizational outcomes under conditions of change (Helfat and Martin 2015a). Building on the foundation of DC theory, strong DMCs can facilitate organizational performance by providing competitive advantages (Peteraf et al. 2013; Teece 2014; Schilke et al. 2018). Previous studies have established a robust relationship between DMCs and financial performance (e.g., Adner and Helfat 2003; Sirmon and Hitt 2009; Arrfelt et al. 2015). Additionally, recent research has proposed these managerial capabilities as conduits to other organizational outcomes, such as non-financial performance (e.g., Mostafiz et al. 2019a, b, 2021), product ambidexterity (e.g., Greven et al. 2022), innovation performance/ambidexterity (e.g., Khan et al. 2020; Nguyen 2021; Heubeck and Meckl 2022a), or sustainability performance (e.g., Nijhof et al. 2019).

Moreover, DMCs have been linked to strategy-related outcomes, such as strategic change and transformation (e.g., Kale and Huzair 2017; Jammulamadaka 2020; Guenduez and Mergel 2022), strategy alignment (e.g., Tai et al. 2019), and related business diversification (e.g., Holzmayer and Schmidt 2020). DMCs have also been found to benefit capability-related outcomes, such as DCs (e.g., Jiang et al. 2021; Durán and Aguado 2022b; Durán et al. 2022), technical and evolutionary fitness (e.g., Martin 2011), or technological learning and capabilities (e.g., Kale and Huzair 2017).

Studies have also investigated the benefits of DMCs for individuals and teams, although this research stream is much less researched. At the individual level, Karadağ and Şahin (2021) find that managerial human capital from entrepreneurial knowledge instills an entrepreneurial orientation in managers as the basis for

entrepreneurial behavior. At the team level, Harvey (2022) evinces that managers' individual-level cognitions enhance team-level sensing. Roeland et al. (2022) demonstrate that stronger DMCs of directors increase the contribution of the board to opportunity development contingent on the board's and firm's characteristics.

The SLR reveals that DMC research predominantly focuses on organizational outcomes related to performance, strategy, and capabilities. Outcomes of DMCs at other levels of analysis are nearly absent, as evident from scant research on their individual- and team-level outcomes. Thus, there is great potential for exploring potential outcomes of DMCs beyond organizational ones. Relatedly, these findings reveal that DMC theory would benefit from an in-depth study of its possible outcomes on different levels.

## 5.4 Mechanisms

The causal mechanisms represent a critical link between capabilities and outcomes. This conjecture is deeply engrained in DMC theory, as managers indirectly affect firm performance by impacting intermediate outcomes (Adner and Helfat 2003; Beck and Wiersema 2013; Helfat and Martin 2015a). For this reason, understanding the proposed mechanisms through which DMCs manifest in organizational outcomes is of particular interest to avoid potential black box issues.

Two categories of mechanisms stand out from the literature. Following the original conceptualization of DMC theory, researchers have examined the intermediate effects of DMCs on organizational outcomes via organizational mechanisms such as dominant logic (e.g., Khan et al. 2019), asset orchestration (e.g., Tasheva and Nielsen 2022), and research and development investments (e.g., Nguyen 2021). For instance, Khan et al. (2019) evince that DMCs affect firm performance through their intermediate effects on the firm's dominant logic, especially in turbulent environments. Widiyanto et al. (2021) provide further evidence for the intermediate effects of DMCs on firm performance. Their quantitative study reveals that DMCs do not enhance performance if the organization lacks the capacity for change. These findings show that researchers should assess the direct benefits of DMCs for organizational performance and consider their intermediate effects.

The analysis also revealed that research has started incorporating individual-level mechanisms underlying the enactment of DMCs, including opportunity identification (e.g., Mostafiz et al. 2019a), entrepreneurial attitude (e.g., Karadağ and Şahin 2021), and market knowledge (e.g., Mostafiz et al. 2019b; Nguyen 2021). For instance, Mostafiz et al. (2019a) demonstrate that DMCs facilitate opportunity identification integral for firm performance. The study of Karadağ and Şahin (2021) supports the mediating role of two personal factors—entrepreneurial attitude and behavioral control—in the relationship between DMCs and entrepreneurial intention.

These findings attest that researchers have been increasingly interested in understanding the underlying mechanisms through which DMCs manifest in organizational outcomes. They also demonstrate that research has predominantly focused on organizational-level mechanisms, while individual-level mechanisms remain understudied

and team-level ones are absent. The causal mechanisms at and across different levels of analysis thus represent a promising direction for future research.

## 5.5 Contingencies

Context has a potentially significant impact on the value and appropriability of DMCs (Schilke 2014; Schilke et al. 2018), as well as managers' propensity to leverage their DMCs. This review reveals a plethora of contingencies of two relationships within the DMC framework. Existent research focuses on the contingencies between DMCs and their outcomes, while some studies have also examined contextual conditions of the antecedents–DMC relationship.

Contingencies of the DMC–outcome relationship have been the focus of prior research. These fall into four categories. First, research has predominantly studied environmental contingencies related to the dynamics of the competitive environment, including environmental dynamism (e.g., Ener 2019; Razmdoost et al. 2020; Guan et al. 2022), market dynamism (e.g., Wang et al. 2022), demand uncertainty (e.g., Townsend and Busenitz 2015), and technological turbulence (e.g., Chen et al. 2022). This research stream concurs that DMCs are particularly beneficial for firms in more dynamic environments, where managers face more significant difficulties predicting and interpreting changes (Dess and Beard 1984). Therefore, large parts of DMC research have focused on the contingent value of DMCs in emerging or transitioning economies due to their increased dynamics (e.g., Khan et al. 2019; Guan et al. 2022; Wang et al. 2022). The study of Guan et al. (2022) provides evidence that DMCs are also beneficial in low-uncertainty environments and that specific types of DMCs facilitate firm performance more strongly in low- rather than high-uncertainty environments. Research shows that although DMCs might be especially beneficial under high environmental dynamism, they are also integral for firms in low-dynamic environments. This review, therefore, substantiates that environmental dynamism is not necessarily a component of DCs nor a mandatory precondition but rather a critical contingency factor (Helfat and Winter 2011; Schilke 2014; Schilke et al. 2018). Although less represented, this review identified other environmental contingencies, including industry munificence (e.g., Fainshmidt et al. 2017), entrepreneurial labor market (e.g., Brown et al. 2021), and export assistance (e.g., Mostafiz et al. 2021). For instance, Fainshmidt et al. (2017) evince that industry munificence influences the appropriateness of DMCs in responding to discontinuous change, such as global crises. Nevertheless, the dearth of studies with non-dynamism-related contingencies indicates significant potential for future research to explore new contextual conditions.

Second, the review identified a set of organizational contingencies, such as firm size (e.g., Durán and Aguado 2022b), strategic orientation (e.g., Roberts et al. 2016; Symeonidou and Nicolaou 2018), transformation readiness (e.g., Guenduez and Mergel 2022), and diversification degree (e.g., Arrfelt et al. 2015). For instance, Guenduez and Mergel (2022) demonstrate that organizations can only successfully implement transformative processes through DMCs if they are ready for the transformation.



Third, the review determined several individual-level contingencies of DMCs. Among those are the DMC subcomponents themselves (e.g., Jiang et al. 2021), demographic management characteristics (e.g., Durán and Aguado 2022a), organizational tenure (e.g., Harvey 2022), founder startup experience (e.g., Symeonidou and Nicolaou 2018), and negotiation capabilities (e.g., Roh et al. 2022). Jiang et al. (2021) offer several significant implications for DMC theory by evincing that the positive effect of subsidiary managers' global mindset (managerial cognition) on the quality of headquarters–subsidiary relationships (organizational DC) is moderated by managers' cognitive flexibility (managerial cognition), leader-member exchange (managerial social capital), and overseas study experience (managerial human capital).

Finally, the review also identified the contingent role of team-level factors. For instance, Roeland et al. (2022) evince that directors are more likely to leverage their human capital for opportunity development under the contingency of smaller boards and increasing board tenure. Haapanen et al. (2020) demonstrate that a lack of strategic consensus in the TMT is required so that DMCs facilitate international expansion. Thus, these studies show that the enactment of DMCs is highly context-specific, with specific structural board characteristics and TMT factors affecting the ability and motivation of top managers to deploy their capabilities to the firm's benefit.

Further, two articles address the conditions that affect the development of DMCs. Harvey (2022) demonstrates that “cross-unit interdependence can provide conditions in which the benefits of managerial cognition can be realized” (p. 3). This structural feature leads to increased communication and coordination within the firm relevant to managers' sensing capabilities. Roberts et al. (2021) show that effective management support systems can remedy the decline in managers' seizing abilities caused by high ambidextrous capabilities.

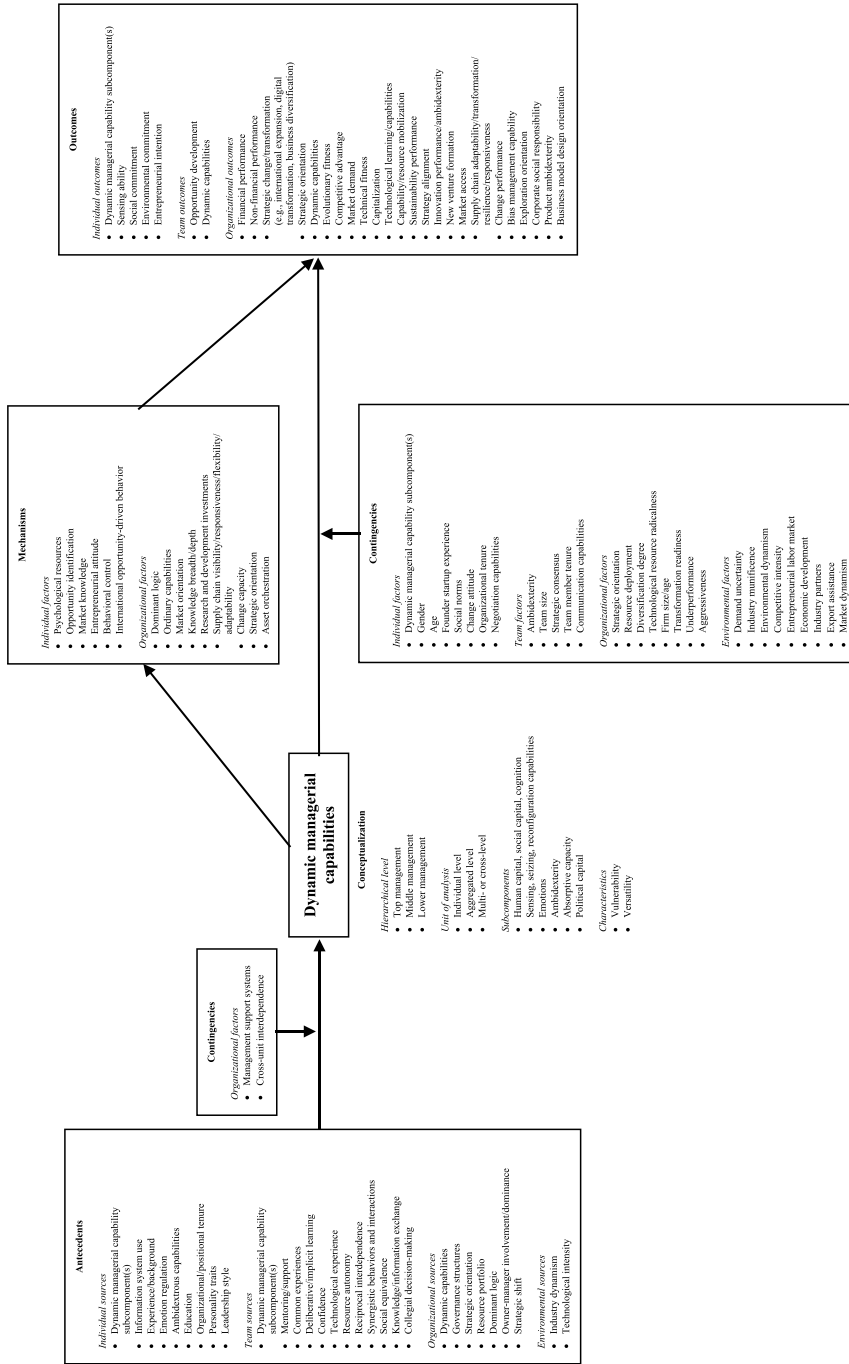
These findings reveal that the contingencies of DMCs offer much-needed insights into the theory's boundary conditions. While the broader DC theory has been repeatedly criticized for failing to clarify its conceptual boundaries (Arend and Bromiley 2009), this review solidifies that much progress has been made in specifying the boundary conditions of DMC theory. At the same time, the findings show that there remain many gaps in the literature that future research must fill. For example, there is a paucity of research on environmental contingencies besides environmental dynamism, individual contingencies that affect the propensity and motivation of managers to leverage their DMCs, and team-level contingencies in general.

## 5.6 Summary of the framework

The DMC framework presented in Fig. 4 synthesizes the existent empirical research to propose an integrative and multi-level perspective on what DMCs are, which characteristics they exhibit, and where they are located (*conceptualization*); where they originate from (*antecedents*); which results they yield (*outcomes*); through which causal mechanisms they are enacted (*mechanisms*); and which factors augment or hinder their development and deployment (*contingencies*).

The DMC framework is highly *integrative* as it synthesizes and categorizes current knowledge, *holistic* as it incorporates the entire operational sequence from the





**Fig. 4** Dynamic managerial capability framework: Conceptualization, antecedents, outcomes, mechanisms, and contingencies

development of DMCs to their application while considering multiple levels and perspectives, *path-creating* as it guides future research, and *dynamic* as it can be continually expanded with new findings. This framework is consequently backward-looking in providing a detailed review of the existing research. It also offers guidance for future research by revealing gaps within the literature while allowing for the integration of future findings.

## 6 Chronological analysis of research limitations and recommendations

### 6.1 Research limitations

DMC research is highly aware of its potential limitations, as most articles (83.3%) reported at least one limitation, and articles reported 2.76 limitations on average. External validity emerged as the most critical limitation of DMC research (77.8%), with authors particularly expressing concern about the generalizability of their findings across different contexts, such as industries, organizations, or management levels (e.g., Buil-Fabregà et al. 2017; Symeonidou and Nicolaou 2018). Other common concerns were *internal validity* (74.1%) and *construct validity* (63.0%). Threats to internal validity primarily arose from the lack of causality or the omission of important variables (e.g., Mostafiz et al. 2019a; Durán and Aguado 2022b), while construct validity was often compromised due to insufficient analytical methods or sample sizes (e.g., Kim and Lim 2022; Bendig et al. 2022). *Theory issues* due to incomplete theorizing, oversimplifying theoretical assumptions, or omitting theoretical elements (e.g., Roberts et al. 2021; Durán et al. 2022) were mentioned by fewer articles (22.2%). Appendix 3 summarizes the limitations mentioned in the articles and provides illustrative statements.

To assess the research limitations over time, a chronological systematic review format (Saunders et al. 2015; Campbell 2023) was used to group the articles into five clusters based on the publication output over time.<sup>3</sup> Detailed information on the respective clusters can be found in Appendix 4. The following paragraphs provide an analysis of each cluster, including the number of articles, their limitations reporting practices, and the dominant limitations, as well as a discussion of these findings in the context of DMC research over time.

#### 6.1.1 Cluster 1 (2003–2009)

The first cluster includes six articles, with 50.0% of them addressing their limitations and an average of one limitation per article. The dominant limitations in this cluster are *external validity* and *statistical conclusion validity*. The former is attributed to the focus on specific industries or organization types that limit the findings'

<sup>3</sup> This analysis was suggested by an anonymous reviewer during the peer-review process and has helped to refine this review.

generalizability (e.g., Eggers and Kaplan 2009), while the latter pertains to methodological limitations (e.g., Peteraf and Reed 2008). Most articles in this cluster use variance decomposition methods (e.g., Adner and Helfat 2003; Peteraf and Reed 2007, 2008), which cannot capture the complexity and interaction between different effects due to methodological limitations. Cluster 1 is the first step to understanding the effects of DMCs, yet its limitations highlight the need to develop more appropriate methods and use different data.

### 6.1.2 Cluster 2 (2011–2018)

This cluster includes nine articles, of which 66.7% address their limitations, with an average of 1.89 limitations per article. The dominant limitations in this cluster are *external validity* and *internal validity*. The former is a concern due to issues with generalizability (e.g., Townsend and Busenitz 2015; Buil-Fabregà et al. 2017; Symeonidou and Nicolaou 2018), while the latter is mentioned due to the omission of critical influences on the research model (e.g., Arrfelt et al. 2015; Townsend and Busenitz 2015; Symeonidou and Nicolaou 2018). Cluster 2 illustrates significant methodological progress, with studies using regression or case study analyses to address the existing limitations. However, external validity remains a significant concern for the research field, and the different methods have also introduced new issues. For instance, Arrfelt et al. (2015) omit other essential variables (*internal validity*) and mention issues of capturing constructs through appropriate measures (*statistical conclusion validity*). Thus, despite notable methodological advancements, various limitations persist, and new ones have emerged.

### 6.1.3 Cluster 3 (2019–2020)

The third cluster consists of twelve articles, most of which (83.3%) identify limitations, with an average of 2.41 per article. The dominant limitations are *internal validity* and *external validity*. The former stems from the lack of causality inherent to cross-sectional research designs (e.g., Mostafiz et al. 2019b; Khan et al. 2020) or the omission of other possible influences (e.g., Ener 2019; Nijhof et al. 2019). The latter arises if findings are not generalizable (e.g., Mostafiz et al. 2019a; Khan et al. 2020) or if there are issues with the data source (e.g., Tai et al. 2019; Haapanen et al. 2020). *Construct validity* emerged as another frequently mentioned limitation, with authors mentioning issues operationalizing the constructs (e.g., Huy and Zott 2019; Tai et al. 2019) or analyzing potentially biased responses (e.g., Huy and Zott 2019; Nijhof et al. 2019). These findings demonstrate that DMC research continues to face internal and external validity issues, but there is an increasing awareness of construct validity issues.

### 6.1.4 Cluster 4 (2021)

This cluster contains ten articles, all acknowledging their limitations and reporting an average of 3.20. The dominant limitations are *external validity* and *construct validity*, with *internal validity* as a further concern. External validity issues

arise due to the limited generalizability of findings (e.g., Nikookar and Yanadori 2021; Widiyanto et al. 2021). For example, Kevill et al. (2021) studied DMCs in the unique context of micro-enterprises, while Krause and Pullman (2021) considered the cannabis industry as an example of a changing industry facing frequent regulatory changes. Construct validity is a nascent limitation in the previous cluster but is increasingly central for DMC research. These issues primarily pertain to the constructs' operationalizations (e.g., Jiang et al. 2021; Roberts et al. 2021). Finally, this cluster is also concerned with internal validity issues, indicating a lack of causality due to a cross-sectional research design (e.g., Brown et al. 2021; Kevill et al. 2021). These findings substantiate the developments already visible in Cluster 3. For one, researchers increasingly utilize cross-sectional survey data to study DMCs (e.g., Jiang et al. 2021; Karadağ and Şahin 2021), thereby introducing potential issues related to the data source, measurement of variables, omission of potential influences on the research model, and the causality of findings. For another, there is a clear trend to both acknowledge limitations and report a higher number of them. While only 50.0% of articles reported limitations in the first cluster, with an average of one limitation per article, this number has risen to 100.0% by 2021, with an average of 3.20.

### 6.1.5 Cluster 5 (2022)

Most of the 17 articles in Cluster 5 contain limitations (94.1%), with an average of 3.82 limitations per article. The most common limitation is *internal validity*, as researchers often note the absence of causality (e.g., Durán et al. 2022; Harvey 2022) and the exclusion of crucial variables (e.g., Durán and Aguado 2022b; Roelandt et al. 2022). After that, *external validity* concerns are mentioned due to limited generalizability (e.g., Greven et al. 2022; Heubeck and Meckl 2022b). Besides these two dominant limitations, researchers in Cluster 5 also report concerns related to *construct validity* (e.g., Greven et al. 2022; Tasheva and Nielsen 2022), *statistical conclusion validity* (e.g., Heubeck and Meckl 2022a; Bendig et al. 2022), and *theory issues* (e.g., Guenduez and Mergel 2022; Roh et al. 2022). These findings indicate that researchers in Cluster 5 take a highly critical perspective on their work, evidenced by the increasing number of reported limitations in all five categories.

Through a systematic and chronological review of self-reported limitations, this review has demonstrated that DMC research has become increasingly critical of its theoretical and methodological approaches over time. Initially, internal and external validity issues were the concerns. However, with the expansion of research methods and a general increase in self-reported limitations, DMC research has become more reflective in questioning its theoretical assumptions and methodological choices.

## 6.2 Analysis of research recommendations

The articles gave an average of 4.72 recommendations for future research, with only four not mentioning a single research recommendation. The recommendations focused on advancing the conceptualization of DMCs, including integrating other

management levels (e.g., Bendig et al. 2022; Chen et al. 2022) or new subcomponents (e.g., Durán et al. 2022; Greven et al. 2022). Exploring the *antecedents* to DMCs also offers a fruitful pathway for future research, with ten recommendations on where DMCs may originate from (e.g., Harvey 2022; Bendig et al. 2022). The field also concurs that it needs to study other potential *outcomes* of DMCs (e.g., Nikookar and Yanadori 2021; Roh et al. 2022). The reviewed articles included 22 recommendations to offer a broader perspective on the potential benefits of DMCs for individuals, teams, or firms. Future research is also needed to uncover the *mechanisms* through which DMC are enacted (20 recommendations) (e.g., Greven et al. 2022; Tabares et al. 2022). Finally, expanding the *contingencies* of DMCs represents an auspicious development for the field to illuminate the conditions and factors that might augment or diminish the benefits of DMCs (e.g., Adner and Helfat 2003; Khan et al. 2019).

These findings also reveal several research recommendations on theory, methods, or replication. First, the articles included 51 suggestions on where and how to *expand DMC theory*. For instance, studies conjectured that DMC theory would benefit from integrating complementary theories or concepts (e.g., Townsend and Busenitz 2015; Greven et al. 2022). Second, *methodological advancements* are the central area where DMC research can progress, with 57 recommendations identified in the sample (e.g., Huy and Zott 2019; Tasheva and Nielsen 2022). Third, future researchers should *conduct replication studies* in different contexts (37 recommendations) (e.g., Sirmon and Hitt 2009; Mostafiz et al. 2021). Table 3 provides illustrative statements for each category of research recommendations.

Articles can include limitations and future research recommendations of multiple categories, and percentages are calculated in relation to the article sample size (54).

In order to analyze research trends over time, the article sample was divided into two periods: an initial period (Clusters 1–3, comprising 27 articles published between 2003 and 2020) and a current period (Clusters 4–5, comprising 27 articles published between 2021 and 2022). This division resulted in two equal-sized sample parts, allowing for better comparability.

The analysis of the two periods revealed a 26.2% overall increase in research recommendations, suggesting that authors are increasingly aware of their research's limitations and offer potential solutions to address them. Additionally, there have been changes in the distribution of research recommendations over time. The category *conceptualization* has experienced the most significant relative increase (+200.0%) and now represents a share of 12.7% of the total research recommendations, up from 5.3% in the previous period. All other categories, including *mechanisms*, *contingencies*, *theory*, *methods*, and *replication*, have also increased, while *antecedents* have decreased.

These findings suggest that current research is primarily focused on advancing the conceptualization of DMCs, specifically regarding their hierarchical level, unit of analysis, subcomponents, and characteristics. While antecedents have initially been a minor concern, recent research indicated that they had been well-studied and understood, reflected by the extensive list of antecedents in the DMC framework. The share of the remaining research recommendations has mainly remained

**Table 3** Overview of research recommendations and illustrative statements

Research recommendations	Illustrative statements	Mentions (percentage)
Conceptualization	<p>“<i>Second</i>, this study only focused on top managers; however, the concept of DMCs also applies to members of the top management team, business unit general managers and middle managers.” (Chen et al. 2022, “limitations,” para. 6)</p> <p>“However, other individual-level factors, such as emotions (Huy and Zott 2019), might lead to further insights into the underpinnings of MMIs’ [middle managers’] dynamic managerial capabilities.” (Greven et al. 2022, p. 26)</p>	24 (44.4%)
Antecedents	<p>“Future researchers may want to continue to elucidate the sources of dynamic managerial capabilities.” (Bendig et al. 2022, p. 16)</p> <p>“This points to exciting avenues for future research, especially on developing a more comprehensive view of the antecedents of environmental scanning in teams.” (Harvey 2022, p. 20)</p>	10 (18.5%)
Outcomes	<p>“Researchers can use these findings as a springboard to explore further the antecedents, outcomes and contexts associated with organization change initiatives.” (Roh et al. 2022, p. 845)</p> <p>“Our research does not analyse the impact of soft and hard skills on supply chain resilience separately. This constitutes an important research avenue that is yet to be explored.” (Nikookar and Yanadori 2021, p. 79)</p>	22 (40.7%)
Mechanisms	<p>“Third, there are other micro-level mechanisms that we do not examine that may impact product ambidexterity. For instance, experimental learning approaches may mobilize product ambidexterity.” (Greven et al. 2022, p. 27)</p>	20 (37.0%)
Contingencies	<p>“The mediator or moderator role of managerial human capital between managerial cognition/social capital and IP should be examined.” (Tabares et al. 2022, “limitations”, para. 5)</p> <p>“Under what conditions do each of the three managerial attributes and their interactions facilitate or impede strategic change?” (Adner and Helfat 2003, p. 1023)</p> <p>“Gender diversity in the top management team of firms provides different work styles, values, capabilities, experience, and points of view that can further strengthen the influence of dynamic managerial capabilities and dominant logic on firm performance. ... It would be interesting to address this factor in future research.” (Khan et al. 2019, p. 9)</p>	34 (63.0%)
Theory	<p>“By implication, these results suggest that extant theory on the functional value of dynamic managerial capabilities to firms could be augmented with real options logic whereby the value of these managers to the firm is expressed (and captured) over time through a dynamic value creation process.” (Townsend and Busenitz 2015, p. 303)</p>	51 (94.4%)

**Table 3** (continued)

Research recommendations	Illustrative statements	Mentions (percentage)
Methods	<p>“Also, it would be valuable to integrate more research from the area of social psychology to help understand which other psychological foundations underlie the formation of MMs’ [middle managers’] dynamic managerial capabilities.” (Greven et al. <a href="#">2022</a>, p. 26)</p> <p>“Qualitative, inductive, longitudinal process research may complement hypothesis-testing studies and other research methods for illuminating these issues.” (Huy and Zott <a href="#">2019</a>, p. 52)</p> <p>“Nevertheless, future studies may seek to include direct measures of managerial cognitive capabilities.” (Tasheva and Nielsen <a href="#">2022</a>, p. 703)</p>	57 (105.6%)
Replication	<p>“Moreover, it would be valuable for these additional studies to be conducted in other industries and other geographical locations. For example, future research should examine how resources are managed in different formal and informal institutional environments (i.e., different countries).” (Sirmon and Hitt <a href="#">2009</a>, p. 1391)</p> <p>“Therefore, our first call for future research is to replicate the study in a developed economy and provide empirical evidence on how the impact of DMC differs from our findings.” (Mostafiz et al. <a href="#">2021</a>, p. 35)</p>	37 (68.5%)

**Table 4** Cluster analysis of research recommendations

Research recommendations	Clusters 1–3	Clusters 4–5	Relative change over the two periods
	2003–2020	2021–2022	
	Frequency: absolute (relative)	Frequency: absolute (relative)	
Conceptualization	6 (5.3%)	18 (12.7%)	+ 200.00%
Antecedents	6 (5.3%)	4 (2.8%)	– 33.3%
Outcomes	10 (8.8%)	12 (8.5%)	+ 20.00%
Mechanisms	8 (7.1%)	12 (8.5%)	+ 50.00%
Contingencies	15 (13.3%)	19 (13.4%)	+ 26.70%
Theory	23 (20.4%)	28 (19.7%)	+ 21.70%
Methods	27 (23.9%)	30 (21.1%)	+ 11.10%
Replication	18 (15.9%)	19 (13.4%)	+ 5.60%
Recommendations per article	4.2	5.3	+ 26.20%

consistent over time, indicating that the field still needs to address many challenges related to mechanisms, contingencies, theory, methods, and replication. Table 4 provides a summary of the development of research recommendations over time.

To further assess the field's progress, it was assessed whether the reviewed articles had addressed the central research opportunities derived by Helfat and Martin (2015a). These include (1) the joint incorporation of all three DMC subcomponents in studying strategic change; (2) the assessment of the interactions between the DMC subcomponents; (3) the clarification of the conditions under which DMCs facilitate strategic change; and (4) the addressing of multi- and cross-level issues.

Recent studies have addressed the first recommendation (e.g., Greven et al. 2022; Heubeck and Meckl 2022a; Tabares et al. 2022; Tasheva and Nielsen 2022). For instance, Heubeck and Meckl (2022a) demonstrate that DMCs only facilitate digital firms' innovativeness, yet the underlying subcomponents have no effect. Tabares et al. (2022) demonstrate that the DMC subcomponents affect international performance differently. This research stream suggests that DMCs are a multifaceted construct with varying—potentially even harmful—effects on organizational outcomes.

Research has also addressed the second research recommendation by illuminating the interactions between DMCs (e.g., Jiang et al. 2021; Chen et al. 2022; Heubeck and Meckl 2022b). Jiang et al. (2021) show that DMCs interact in affecting organizational DCs and that some interactions are also detrimental to the development of DCs. Heubeck and Meckl (2022b) evince that managers' human and social capital enhance their cognitive skills in assessing potential opportunities for business model innovation. Although this research stream remains understudied, it has enhanced the understanding of DMCs by illuminating the interactions between its subcomponents.



The third research direction constitutes a significant research stream, which examines the contingencies of DMCs (e.g., Buil-Fabregà et al. 2017; Razmdoost et al. 2020; Brown et al. 2021; Guan et al. 2022; Roelandt et al. 2022). For example, Wang et al. (2022) show that the DMC–outcome relationship is contingent on market dynamism (i.e., an environmental contingency). Roelandt et al. (2022) provide evidence for both team and organizational contingencies of DMCs. Buil-Fabregà et al. (2017) demonstrate that DMCs are also contingent on individual factors. As evident from the DMC framework, contingencies of DMCs have been a central concern for DMC research across all levels of analysis.

Research has also taken the fourth research path (e.g., Townsend and Busenitz 2015; Harvey 2022; Roelandt et al. 2022; Tasheva and Nielsen 2022). Haapanen et al. (2020) show that different configurations of DMCs within TMTs are critical for international expansion, especially when they lack strategic consensus. Harvey (2022) sheds light on how managerial cognition influences a manager’s sensing abilities in shaping team-level sensing. These two exemplary studies illustrate that DMC research has grappled with multi- and cross-level issues.

This review shows that empirical research has addressed Helfat and Martin’s (2015a) major concerns. At the same time, this literature review has also revealed many unresolved issues and tensions that future research needs to tackle. Section 7.2 transfers these issues into direct calls for future research.

## 7 Discussion

This review had two intertwined goals: first, *looking back* by synthesizing the current state of empirical DMC research, and second, *looking forward* by identifying critical research gaps that warrant future attention. To achieve these two goals, a SLR identified 54 empirical articles directly related to DMC theory. The selected articles were analyzed using descriptive and thematic content analyses. The research articles were subsequently synthesized by developing a holistic, multi-level DMC framework. Finally, a systematic historical analysis assessed the development of limitations and research recommendations over time.

### 7.1 The current state of research

This review highlights a growing interest in the study of DMC, with numerous scholars and journals publishing articles on the topic in recent years. Its findings emphasize that DMC theory provides a unique perspective on how managers from different hierarchical levels can impact strategic change, both individually and in teams. This review corroborates that strong DMCs enable managers to efficiently orchestrate the firm’s asset portfolio, laying the foundation for competitive advantage in dynamic environments (Adner and Helfat 2003; Helfat and Martin 2015a).

This review addressed five RQs related to the current knowledge state. The first RQ pertained to the articles' theoretical and conceptual backgrounds. The findings demonstrated that the fundamental understanding of DMCs is mainly consistent across the field. Additionally, the review corroborated that DMC theory is a fruitful theoretical platform (Arndt et al. 2022) that can benefit from integrating related theories. However, there is still significant potential for integrating complementary theories like the attention-based view (e.g., Ocasio 1997) or knowledge-based theories (e.g., Grant 1996). These theoretical integrations can continually adapt DMC theory to today's ever-changing competitive landscape, in which knowledge has become a critical source of competitive advantage (Elrehail et al. 2023). Overall, this review has answered RQ 1 by demonstrating that Adner and Helfat's (2003) understanding of DMCs continues to shape the research field, while their theory has been continually advanced and adapted through theoretical expansions.

The second RQ addressed the level of analysis employed in DMC research. This review found that individual-level capabilities are the primary focus of DMC studies, while team-level or aggregated perspectives are less common. DMC theory emphasizes the significance of top managers' capabilities in strategic decision-making, which has also been the central concern for research. However, with the flattening of organizational hierarchies and the growing importance of middle managers in strategy implementation, there has been a shift toward analyzing the DMCs of lower-level managers. In answering RQ 2, this review concludes that research has departed from its initial focus on top managers' individual-level capabilities to a more comprehensive perspective on DMCs, for example, by studying the management capabilities of teams or middle managers.

RQ 3 focused on the type of dynamism in which DMCs are studied. This review identified two external sources and one internal source of dynamism. Regarding the former, most studies examined DMCs in the context of general external dynamism, which refers to global changes affecting firms across different industries. A smaller share of studies examined DMCs as a response mechanism to discontinuous change, which causes significant and largely unpredictable changes to the entire economy or specific industries. Regarding the latter, studies were also concerned with the role of DMCs in facilitating strategic reorientation. In answering RQ 3, this review has shown that research is characteristically concerned with the role of DMCs in addressing the challenges of dynamic environments. It corroborates that strong DMCs are essential capabilities that allow firms to cope with external and internal changes.

The fourth RQ focused on the reviewed articles' methodological choices. This review discovered a diverse range of methodological approaches, with researchers utilizing various quantitative and qualitative research methods and drawing data from a variety of different sources (primary vs. secondary), temporal designs (cross-sectional vs. longitudinal), industries (single vs. multiple industries), and organizations (small vs. large firms). The historical review revealed that recent studies primarily operationalize DMCs using capability-based measures, whereas earlier studies primarily used strategy-based measurements. Although there is variation in how DMCs are measured, Adner and Helfat's (2003) dimensionalization of DMCs into managers' human capital, social capital, and cognition remains dominant. Overall, the findings related to RQ 4 demonstrate no universal approach to

empirically examining DMC. However, this methodological richness illustrates that DMC theory can be applied to different contexts. Future research can benefit from this review in selecting the most suitable methodological approach for the specific research context.

Lastly, the fifth RQ aimed to synthesize existent DMC research by systematically analyzing the characteristics of DMCs and the relationships in which they are studied. To achieve this, the articles were condensed into a holistic, multi-level framework that summarizes how DMCs are conceptualized and illustrates the studied antecedents, outcomes, mechanisms, and contingencies. Overall, the DMC framework offers helpful guidance for researchers in understanding the current state of research and bridges the gap to future research.

## 7.2 The future of research

The second overarching goal of this review was to discern pathways for future research, as captured by RQs 6 and 7. The first directions for future research can be derived from the DMC framework, as it bridges the gap between the past and present of DMCs by synthesizing prior research, identifying critical research gaps, and allowing for the integration of future findings. The framework illustrates that DMCs have been investigated at and across different *hierarchical levels and perspectives*, while complementary and alternative *subcomponents* have emerged in the literature. The *characteristics* of DMCs are a highly understudied area that warrants more attention, while the *antecedents* to DMCs have been studied from all perspectives. This framework offers a holistic lens on the individual, team, organizational, and environmental factors from which DMCs may originate. Although DMCs have garnered significant interest due to their linkage to organizational strategy and performance as the two central *firm-level outcomes*, scholars have also started to investigate the effects of DMCs on organizational capabilities and their benefits for individual managers and teams. Exploring non-performance-related outcomes of DMCs represents a significant opportunity for future research. The *mechanisms* through which managerial capabilities materialize are of particular concern to DMC theory, although the findings show that existing research does not often employ a two-staged approach in assessing the effects of DMCs. Thus, future research should holistically probe DMC theory by assessing the impact of DMCs on organizational strategy (intermediate outcome) and examining the performance effects of those strategies (final outcome). Studies have also started to investigate the individual- and team-level mechanisms through which DMCs unveil. Especially the team-level mechanisms offer a fruitful area for future research as they enable the cross-level investigation of DMCs. Finally, large parts of DMC research have been concerned with its *contingencies*—the factors that promote or hinder the enactment of managerial capabilities. Existent studies have predominantly proposed organizational and environmental contingencies, which makes exploring additional individual- and team-level contingencies a promising research endeavor.

Through a systematic historical analysis of research limitations and recommendations, this review also traced and summarized research recommendations from the studies. The findings of Sect. 6 point to five central future research opportunities. First, although DMC theory has been expanded by integrating several related theories and concepts, future research should continue to integrate complementary theories and concepts to advance the theoretical understanding of what DMCs are and how they can impact strategic change, competitive advantage, and firm performance. Second, future studies should examine DMCs of management teams and employ multi- or cross-level perspectives to analyze how DMCs aggregate to affect strategic change. Expanding the research to lower-level management, especially in strategy implementation, is warranted as hierarchies flatten and may offer fresh insights into the relevancy of middle managers for competitive advantage. Third, future research should explore whether DMCs allow firms to deal with and respond proactively to unforeseeable environmental jolts, such as the COVID-19 pandemic. Fourth, future research is encouraged to specify the reasons for focusing on specific research settings and including organizational, industry, and country-specific factors in the research model. Fifth, future research should conduct more longitudinal studies to avoid causality issues, derive more suitable measures for DMCs, and replicate the study in different settings to increase the findings' generalizability.

### 7.3 Managerial recommendations

This review also highlights the significance of DMCs for managerial practice. First, strong DMCs are beneficial for firms, as most studies show a positive association between DMCs and critical firm-level outcomes, such as financial and non-financial performance (e.g., Mostafiz et al. 2019a; Kim and Lim 2022; Tasheva and Nielsen 2022), strategic change/transformation (e.g., Haapanen et al. 2020; Jammulamadaka 2020; Guenduez and Mergel 2022), or innovation (e.g., Khan et al. 2020; Heubeck and Meckl 2022a). DMCs enable firms to tackle both external and internal changes. Therefore, firms should retain highly skilled managers who create flexible and adaptable organizational structures, processes, and strategies. These managers can constantly monitor environmental changes, analyze their impact, and take appropriate actions such as reconfiguring resources, transforming structures and processes, and devising new strategies.

Second, managers should develop strong DMCs because they provide benefits not only to firms but also to individual managers and management teams. On a practical level, this review reduces the complexities of DMC theory by determining which specific skills managers need to develop and points to three critical managerial skills: (1) managerial human capital, which managers can develop formally (e.g., through education or training) and informally (e.g., through learning from experience or on-the-job training); (2) managerial social capital, which managers can enhance by building strong networks within the firm (e.g., across departments) or alliances with external partners (e.g., suppliers, customers, or competitors); and

(3) managerial cognition, which necessitates that managers continually adapt and question their mental models and processes to stay abreast of changes.

Third, the two previous recommendations infer that firms should fill critical management roles with highly skilled individuals. DMC theory provides a valuable framework for assessing the skill levels of managers because it categorizes managerial skills according to their human capital, social capital, and cognition. Managers can use the operationalizations of these capabilities, as summarized in this review, to evaluate their current skill level or those of potential candidates for vacant management positions.

Fourth, the framework derived in Chapter 5 can serve as an essential tool for management practice, shedding light on what DMCs are, their origins, the factors that influence their effects on critical outcomes, the intermediate factors through which they materialize, and the outcomes they produce. The framework emphasizes that DMCs are located at all hierarchical levels, including individual managers and management teams at lower, medium, and top management levels. It also identifies specific individual, team, organizational, and environmental antecedents that contribute to the development of DMCs. Additionally, it summarizes the factors that determine the effectiveness of DMCs and the intermediate mechanisms through which they lead to beneficial outcomes. Lastly, it provides a comprehensive overview of the various outcomes associated with DMCs, including their impact on firm, team, and individual-level performance. Overall, the DMC framework offers practical management recommendations and makes transparent the unique characteristics and key implications of these critical capabilities for management practice.

## 7.4 Limitations

It is important to note that this article, like any literature review, has some limitations. First, it is possible that relevant studies were not included in this review due to the selected databases, keywords, or filter criteria. Second, this review focused on peer-reviewed articles published in highly reputable English-language journals. The selection of this methodology may introduce language bias or result in the devaluation of non-English literature. Third, nonempirical articles may also offer relevant insights into DMCs. Last, this review only considered studies published until the end of 2022. Thus, future research may be needed to assess articles published after this date. The methodology used in this review can also be applied to future reviews of DMC theory.

## 8 Conclusion

DMC theory is critical to strategic management literature because it explains how organizations can adapt to changing business environments and remain competitive. This ability to continually transform organizational strategies depends on the capacity of managers to quickly identify and seize opportunities while effectively reorganizing the firm's resource portfolio to mitigate future risks and uncertainties

(Adner and Helfat 2003; Teece 2007). DMCs are crucial for competitive advantages in dynamic environments (Helfat and Martin 2015a), so they have become a central concern for empirical research. Despite their importance for firms, the existing literature lacks a comprehensive overview and analysis of the current state of research. Therefore, the overarching goal of this review was to systematically synthesize existing studies on DMCs to gain an in-depth understanding of these managerial capabilities in the context of strategic change.

The review's first main contribution is its overview of existing research. Based on a SLR of 54 empirical studies, the current state of empirical research was assessed and synthesized using descriptive and thematic content analyses. Specifically, the studies were evaluated regarding their theoretical and conceptual background (RQ 1); their level of analysis (RQ 2); their element of dynamism (RQ 3); and their research method, context, and operationalization (RQ 4). This review has synthesized the current state of knowledge into a holistic and multi-level DMC framework, which provides the first detailed overview of how DMCs are conceptualized, which factors antecede these capabilities, which outcomes they have, through which mechanisms they materialize, and on which factors their effects are contingent (RQ 5).

This review's second main contribution is identifying critical research gaps and opportunities. Through a systematic historical analysis, this review has traced the development of the field over time and demonstrated that although much progress has been made, there remain many unaddressed avenues for future research. At the same time, these findings show that DMC theory is a fruitful theoretical platform for analyzing organizational behavior in dynamic environments, and there remain many promising pathways for future researchers, as summarized in the direct calls for research.

This review's third main research contribution is the fresh insights and perspective it delivered to the field. By synthesizing prior research into a comprehensive DMC framework and analyzing research limitations and recommendations over time, this review provides a previously missing overview of the current state of research, thereby offering a solid foundation on which future research can build.

For these contributions, this literature review has realized its overarching research goals of delivering a comprehensive synthesis of existent DMC research—*looking back*—and paving the way for future research on DMCs—*looking forward*. This review ultimately guides scholars and underscores the relevancy of DMCs for management practice.

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## Declarations

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