



Ambidextrous structures paving the way for disruptive business models: a conceptual framework

Kristina Stoiber¹ · Kurt Matzler¹ · Julia Hautz¹

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Abstract

Today companies are facing challenges to survive due to substantial transformations induced by digital technologies, ever-changing consumer demands, and environmental uncertainties. Thus, companies need to be innovative to sustain competitive advantages. Scholars and practitioners have recognized the potential of disruptive innovations as a key factor for a company's competitiveness. Yet, such innovations often challenge established companies due to the tensions between their traditional business model and the newly emerging business model required for disruptive change. The theory of ambidextrous organizations has offered a variety of solutions to tackle these barriers referring to the alignment of exploration and exploitation within an organization's structure. Current literature, however, faces inconsistencies regarding how this can be achieved. With this study, we therefore aim to provide a comprehensive understanding of how ambidextrous structures enable incumbent companies to reduce the barriers to disruptive business models. On the basis of a systematic literature review, we analyze and compare potential structures and their characteristics proposed in the ambidexterity literature. Drawing on our review, we conceptualize a framework linking the different organizational structures to the barriers associated with disruptive business models. Our framework identifies a range of seven structures which can resolve the barriers and thus support managers in their structural decisions on how to align exploration and exploitation to pave the way for disruptive business models.

Keywords Disruptive innovation · Organizational ambidexterity · Disruptive business model · Organizational structure

✉ Kristina Stoiber
kristina.stoiber@student.uibk.ac.at

Kurt Matzler
kurt.matzler@uibk.ac.at

Julia Hautz
julia.hautz@uibk.ac.at

¹ Faculty of Business and Management, University of Innsbruck, Universitätsstraße 15, 6020 Innsbruck, Austria

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1 Introduction

The ongoing digital transformation, ever-changing consumer demands, and environmental uncertainties are driving companies to explore new, innovative ways to sustain competitive advantages over the long run (Christensen et al. 2018; Iranmanesh et al. 2021; Trischler and Li-Ying 2022). While incremental or sustaining innovations are necessary for a company's revenues and market share, disruptive innovations provide companies the best chance of surviving market shifts (Govindarajan and Trimble 2005; de Groote et al. 2021). Harnessing the economic value of disruptive innovations requires new forms of value creation, value proposition, and value capture, and thus a business model as a lever to disrupt markets and industries (Teece 2010; Matzler et al. 2018; Kraus et al. 2020). Yet, research shows that established companies, in particular, are predominantly reluctant to pursue disruptive business models (Anderson and Tushman 1990; Mao et al. 2020; Bouncken et al. 2021). In fact, the market is typically disrupted from below by new entrants, creating a serious dilemma for established companies despite their dominant position (Christensen et al. 2018; Kammerlander et al. 2018; Kumaraswamy et al. 2018; Mao et al. 2020).

Tesla is a case in point: Tesla's disruptive business model poses an existential threat that is fundamentally changing the automotive industry, leaving incumbent automakers struggling to survive in what has become a software-centric industry (Furr and Dyer 2020; Shipley 2020). Accordingly, a McKinsey study claimed that car manufacturers seeking to remain successful through 2030 would need to complement their traditional business by exploring a new, disruptive business model (Kaas et al. 2016). Yet, the issues the automotive industry is experiencing are not one-off occurrences; rather, they reflect a persistent problem in today's business environment—the difficulties encountered by established companies in driving disruptive business models (Schneider 2019; Osiyevskyy et al. 2020).

Christensen (1997) identified this as the innovator's dilemma: The existing business models and core competencies of established companies successfully support sustaining innovations but hinder realizing disruptive change. Specifically, tensions arise between the long-established business model and a new, emerging business model required for disruptive innovations, posing various barriers for established companies (Andriopoulos and Lewis 2009; Chesbrough 2010; Schneider 2019).

To manage these barriers and solve the dilemma, many researchers draw on the framework of ambidexterity (e.g., Govindarajan and Trimble 2005; Markides 2013; Mao et al. 2020). Organizational ambidexterity describes a company's ability to reconcile explorative and exploitative activities within a company (March 1991; Tushman and O'Reilly 1996; Lavie et al. 2010). In the context of disruptive business models, this means that companies are capable of exploiting their established

business while exploring a disruptive business with equal vigor (Markides 2013; Kraus et al. 2022). The extant literature has recognized this potential and introduced a variety of concepts, including well-established concepts of structural, temporal, and contextual ambidexterity to balance exploration and exploitation, thereby enabling companies to embrace disruption (Gibson and Birkinshaw 2004; Markides and Charitou 2004; O'Reilly and Tushman 2004; Mueller et al. 2020). While those concepts overlap in their focus on facilitating the parallel existence of traditional and disruptive business models through structural arrangements, they vary considerably in how this can be achieved. Up until now, those concepts have largely been discussed independently and have not been integrated into a framework which would allow for systematic analysis and comparison of the range of potential structures to support incumbents in successfully leveraging new disruptive business models.

Our study aims to provide the first systematic review of this heterogeneous and often disconnected body of literature. As such, it contributes to the literature in a twofold manner. First, we offer an up-to-date and consolidated overview of the organizational structures proposed in the ambidexterity literature that promote disruptive business models in established companies. In addition to the concepts of structural, temporal, and contextual ambidexterity, we hereby uncover four new approaches to ambidexterity, thus providing a broad spectrum of structural alternatives available for established companies. Second, we conceptualize a framework by linking the potential structures to the barriers associated with disruptive business models. The structures are described by characteristics that indicate how integrated versus separated traditional and disruptive business models are, holding the potential to minimize tensions between them. Building on this, the framework finally serves as the basis for discussing which structures' characteristics are best suited to address the different barriers. By this, our study sheds light on which ambidextrous structures can reduce the barriers and thus support managers in their structural decisions on how to align exploration and exploitation to leverage a company's disruptive potential.

The remainder of the paper is structured as follows. First, we outline the context of disruptive business models and the associated barriers for established companies. We then conduct a systematic literature review based on a transparent and rigorous search strategy recommended by Tranfield et al. (2003). This review identifies 58 peer-reviewed and practitioner-oriented articles dealing with structural arrangements of established companies to resolve the tensions between traditional and disruptive business models. Next, we present the concepts of ambidextrous structures that we identified through a thematic analysis of the review results. Finally, we propose our conceptual framework, discuss the review findings, and suggest limitations and directions for future research.

2 Theoretical background

2.1 Disruptive innovation as a business model problem

Disruptive innovation, as coined by Christensen (1997) in his seminal work *The Innovator's Dilemma*, is a process that significantly transforms the demands on existing industries, disrupts or challenges previous key players, and creates radically new products, processes, or business models (Kammerlander et al. 2018; Kawamoto and Spers 2019). This process starts with the launch of a simpler, more convenient, or more affordable product or service but with inferior performance levels. Disruptive innovations, unlike radical innovations (Bouncken et al. 2018; Tiberius et al. 2021) or other discontinuous innovations (Robertson 1967; Utterback 1994), thus initially target niche markets that are not attractive to established companies. Over time, however, the innovation's performance improves and appeals to an increasing share of mainstream customers. Eventually, customers switch to the more convenient or affordable alternative, driving incumbents out of the market (Christensen et al. 2018; Kumaraswamy et al. 2018; Schmidt and Scaringella 2020).

In line with this, an innovation itself is not inherently disruptive—an innovation's disruptive potential and thus its economic value is achieved by commercialization through a suitable business model (Chesbrough 2007; Cozzolino et al. 2018; Kraus et al. 2020, 2022; de Groote et al. 2021). Consequently, disruptive innovations are “a business model problem” (Christensen 2006, p. 43). Companies seeking to compete at the level of disruptive innovation must explore a new, disruptive business model, adapting previously successful performance metrics, capabilities, and value networks (Ahuja and Lampert 2001; Habtay 2012; Kranz et al. 2016; Reuschl et al. 2022). In particular, they need to assimilate different activities for value creation, proposition, and capture—thus a company's business model—than necessary for incremental innovations, which might conflict with the traditional way of doing business (Amit and Zott 2001; Chesbrough 2010; Teece 2010; Bouncken et al. 2021). This requirement is consistent with March's (1991) organizational learning theory. While exploiting via an existing business model requires refinement and aims at efficiency, exploring via an emerging (disruptive) business model requires experimentation, risk-taking, and innovation (Strobl et al. 2020). Both strategies are essential yet compete for scarce financial, technological, and human resources. As a result, tensions arise between exploiting the prevailing business logic that has been successful in the past and exploring new disruptive opportunities (Govindarajan and Trimble 2005; Chesbrough 2010; Doz and Kosonen 2010). However, those companies that are able to achieve organizational ambidexterity by balancing exploitation and exploration may resolve these tensions (Lavie et al. 2010; O'Reilly and Tushman 2013; Andrade et al. 2021).

2.2 Barriers to disruptive business models

Driving disruption is one of the most challenging issues for incumbents due to the tensions arising from the conflict between traditional and disruptive business

models. In fact, these tensions create barriers for incumbents that hinder them from engaging in disruptive activities (Andriopoulos and Lewis 2009; Chesbrough 2010; Schneider 2019). Towards our research goal of understanding how ambidextrous structures enable incumbents to reduce these barriers to disruptive business models, we screened the literature for the most prevalent factors impeding established companies.

From a variety of reasons why incumbents struggle to pursue disruptive business models, research on organizational inertia (e.g., Rumelt 1995; Mateu and March-Chorda 2016; Cozzolino et al. 2018) has highlighted five major barriers concerning *asymmetric resource allocation* (e.g., Assink 2006; Chesbrough 2010; Wan et al. 2015; Cozzolino et al. 2018; Chen et al. 2021), *cultural inertia* (e.g., Velu and Stiles 2013; Iranmanesh et al. 2021), *rigid cognitive patterns* (e.g., Rumelt 1995; Ahuja and Lampert 2001; DaSilva et al. 2013; Wan et al. 2015; Kammerlander et al. 2018), *top management disinclination* (e.g., Rumelt 1995; Christensen and Raynor 2003; Yu and Hang 2010), and *structural barriers* (e.g., Christensen and Raynor 2003; Yu and Hang 2010; Wan et al. 2015).

2.2.1 Asymmetric resource allocation

Asymmetric resource allocation challenges the exploration of disruptive business models by incumbents in two ways. On the one hand, structured routines impact resource planning and allocation by evaluating emerging disruptive projects according to the same criteria that apply to the existing business (Yu and Hang 2010; Chen et al. 2021). Thereby, established projects are disproportionately favored at the expense of disruptive business models as companies generally allocate their resources to the most profitable uses (Assink 2006; Chesbrough 2010; Kammerlander et al. 2018). On the other hand, resource dependency affects the resource allocation process, as a company's investments are usually based on the profile of available resources (Cozzolino et al. 2018). Thus, companies are locked into the business in which they have accumulated resources and are unwilling to devote those resources to a more uncertain, lower-margin business (Velu and Stiles 2013; O'Reilly and Binns 2019). As a result, companies typically respond to the emergence of competitively threatening innovations by increasing their investments in conventional technologies valued by their current customers, which hinders the development of potentially disruptive innovations (Christensen and Raynor 2003; Yu and Hang 2010).

2.2.2 Cultural inertia

An organization's culture is an effective means of coordinating and controlling people through certain patterns of beliefs and values that are reflected in the behaviors and practices of organizational members (Tushman and O'Reilly 2002; Iranmanesh et al. 2021). However, while culture can be seen as a driver of innovation (Iranmanesh et al. 2021), an inert culture prevents companies from exploring disruptive opportunities (Yu and Hang 2010). In particular, rigid hierarchical structures favor routine-based processes, which are less suitable for disruptive business models

(DaSilva et al. 2013; Wan et al. 2015; Rohn et al. 2021). Similarly, cultural inertia restrains “out-of-the-box” thinking, stifles creativity, and diminishes risk-taking as incumbents fear cannibalizing their existing, successful business model (Ahuja and Lampert 2001; Velu and Stiles 2013; de Groote et al. 2021). In addition, cultural inertia increases the inability to overcome outdated mental models. Deep-rooted values and habits must be unlearned at both the individual and organizational levels to avoid burdening the development of potentially disruptive business models (Christensen and Raynor 2003; Wan et al. 2015).

2.2.3 Rigid cognitive patterns

Rigid cognitive patterns bear the risk of companies being trapped in their own successful business models (Assink 2006; Kammerlander et al. 2018). Established companies traditionally focus on exploiting their dominant business (Mueller et al. 2020), as the initial low success rate and financial unattractiveness of a nascent disruptive business do not serve their revenue expectations and growth needs. Incumbents are thus locked into mature markets, dependent on mainstream customers, and driven by the fear of cannibalizing the value of their existing business when exploring disruptive business models (Ahuja and Lampert 2001; Henderson 2006; Reinhardt and Gurtner 2011; Cozzolino et al. 2018). Further, rigid cognitive patterns that reinforce inward concentration, the not-invented-here syndrome, and groupthink, as well as a conservative adherence to proven processes, can prevent companies from grasping disruptive business models (Rumelt 1995; Assink 2006; DaSilva et al. 2013; Kammerlander et al. 2018).

2.2.4 Top management disinclination

Top managers’ behaviors are largely shaped by their previous experiences, rigid routines, and obsolete mental models, leading to disinclination towards disruption (Assink 2006; Yu and Hang 2010; DaSilva et al. 2013). Managers are usually trained in conventional business programs to run organizations that serve established markets; therefore, they lack the competencies and innovation expertise to lead a disruptive innovation process (Yu and Hang 2010; Bouncken et al. 2021). Hence, although substitution of the existing business mostly applies in the later stage of disruption, as disruptive innovations initially target small niche markets, lacking innovation expertise makes it difficult to gain management buy-in for potentially cannibalizing business models (Christensen and Raynor 2003; Rohn et al. 2021). Additionally, short-term incentive plans with aggressive revenue expectations discourage managers from investing in initially less profitable businesses that mainstream customers do not yet value (Chesbrough 2010; Yu and Hang 2010; Wan et al. 2015). Instead, rigid incentives encourage managers to focus their innovation efforts on process improvements targeting mature markets, which ultimately hinders established companies from succeeding with disruptive business models (Ahuja and Lampert 2001; Pisano 2015).

2.2.5 Structural barriers

Following Christensen and Raynor (2003), the size of a company correlates negatively with the success of disruptions since inflexibility and inertia in large companies pose structural barriers to disruptive business models (Yu and Hang 2010). As a result, hierarchical structures designed purely to exploit the successful business, as well as insufficient autonomy of business units, impede creative and innovative processes (Domínguez Escrig et al. 2020; Iranmanesh et al. 2021). This ultimately hinders incumbents from exploring new opportunities and thus from developing disruptive business models (Kammerlander et al. 2018; de Groote et al. 2021).

2.3 Ambidextrous structures promoting disruptive business models

Research on ambidextrous organizations has offered a variety of solutions for tackling these barriers, referring to the alignment of exploration and exploitation within an organization's structure (e.g., Govindarajan and Trimble 2005; Csaszar 2013; Markides 2013; Kranz et al. 2016). The organizational structure defines how activities for task allocation, coordination, and monitoring are directed towards achieving organizational goals (Pugh 1990). Consequently, the organizational structure goes beyond mere structural decisions but involves orchestrating the alignment of people and processes, the reconfiguration of resources, and the embracement of an innovative culture (Gibson and Birkinshaw 2004; O'Reilly and Tushman 2008; Kranz et al. 2016; Iranmanesh et al. 2021). In the context of organizational ambidexterity, the literature frequently determines an organization's structure based on the following characteristics: (1) *people and culture* (do exploitative and explorative businesses share a common culture and employee base?); (2) *processes* (do exploitative and explorative businesses share common processes?); (3) *control and rewards* (do exploitative and explorative businesses share the same control and reward systems?); (4) *structural context* (are exploitative and explorative businesses structurally separated or integrated?); (5) *vision and values* (do exploitative and explorative businesses share a common vision and common values?); (6) *leadership* (is the explorative business integrated into the existing hierarchies?); and (7) *resources* (do exploitative and explorative businesses share resources?) (Iansiti et al. 2003; O'Reilly and Tushman 2004; Markides and Oyon 2010; Reficco and Gutiérrez 2016; Sachsenhofer 2016; Chen et al. 2021). These characteristics indicate how integrated versus separated explorative and exploitative business models are within a firm's structure (Siggelkow and Levinthal 2003; O'Reilly and Tushman 2011; Habtay and Holmén 2014). On the one hand, integration allows synergies to be leveraged between traditional and disruptive business models, enabling companies to share unique, long-established competencies and experiences as well as valuable resources (Markides and Charitou 2004; O'Reilly and Tushman 2004; Khanagha et al. 2018; Rohn et al. 2021). On the other hand, separation can prevent the disruptive business from being constrained by the dependencies and inertia of the traditional business (O'Reilly and Tushman 2004; Yu and Hang 2010). Through an idiosyncratic coordination of which characteristics to integrate and which to separate, the tensions

between conflicting business models can be mitigated. Thus, the characteristics of an ambidextrous structure and the favorable condition for balancing explorative and exploitative business models they create may ultimately enable incumbents to reduce barriers to disruptive business models (Velu and Stiles 2013; Snihur and Tarzijan 2018; Domínguez Escrig et al. 2020; Iranmanesh et al. 2021).

A substantial body of literature advances the framework of ambidextrous organizations by elaborating various structural concepts that are distinguished by an individual combination of integrated and separated characteristics (O'Reilly and Tushman 2004; Markides and Oyon 2010). These include the well-established concepts of structural, temporal, and contextual ambidexterity, but several other approaches to ambidexterity have emerged from the literature to date. All these concepts, however, have developed quite independently and are not linked to the barriers to disruptive business models. With this study, we therefore aim to close this research gap by deriving a range of alternative structures that align exploration and exploitation, enabling incumbents to overcome barriers to disruptive business models.

3 Method

In line with previous studies (Cacciotti and Hayton 2015; Bouncken et al. 2015; Gregori and Parastuty 2021), our literature review follows the systematic process recommended by Tranfield et al. (2003) towards our research goal of understanding how ambidextrous structures enable incumbents to reduce these barriers to disruptive business models. Applying this transparent and systematic approach to reviewing relevant literature generates reliable, verifiable, and reproducible findings (Booth et al. 2016; Aguinis et al. 2018; Sageder et al. 2018). This allows us to comprehensively synthesize the review findings and conceptualize which organizational structures enable established companies to promote disruptive business models (Tranfield et al. 2003; Snyder 2019).

3.1 Data collection and screening

To collect relevant secondary data, we conducted a formal electronic database search based on our research objectives and conceptual boundaries (see Fig. 1). We used the Web of Science Core Collection (indexes: SCI-EXPANDED, SSCI, A&HCI, and ESCI) and EBSCO Host Business Source Premier (Sageder et al. 2018; Gregori and Parastuty 2021). Both databases offer access to reputable journals dedicated to the topic of disruptive innovation, such as the *Journal of Product Innovation Management*, *Journal of Management Studies*, and *Academy of Management Perspectives* (Kawamoto and Spers 2019). While many systematic reviews typically draw on a wide range of related search terms to include studies that refer to similar concepts such as radical or discontinuous innovation, we limited our literature sample to papers related to the search term “disrupt*” in combination with the search terms “business model*”, “ambidext*”, “organi?ation* structure*”, “explor*” and “exploit*” (see also Bouncken et al. 2015). Since established

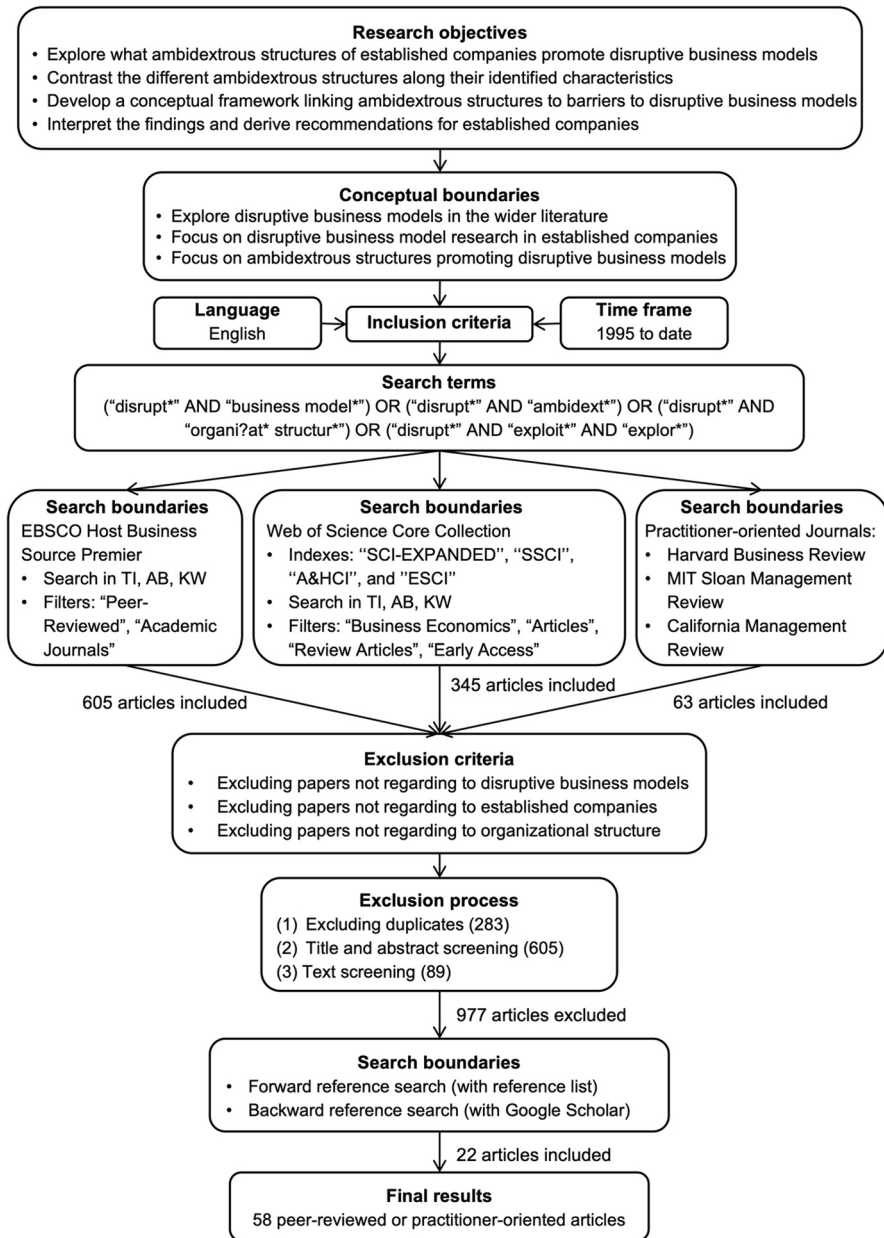


Fig. 1 Systematic review strategy

companies are primarily struggling with disruptive innovation, we seek to provide an overview of ambidextrous structures that promote disruptive business models rather than other forms of innovative business models. The terms are then searched in the title, abstract, and keywords of studies (Sageder et al. 2018; Gregori and

Parastuty 2021). Moreover, we set the filters “peer-reviewed”, “academic journals”, “English language”, and “business economics” as subject areas to ensure the quality of the sample and to further limit the scope to relevant academic studies (Bouncken et al. 2015; Gregori and Parastuty 2021; Fernandes and Ferreira 2022). Following common practice (e.g., Petzold et al. 2019; Mueller et al. 2020), we additionally included articles from the leading practitioner-oriented journals *MIT Sloan Management Review*, *California Management Review*, and *Harvard Business Review* satisfying the above-mentioned inclusion criteria. We set the time limit to 1995, as the concept of disruptive innovation first appeared in the seminal work *Disruptive Technologies: Catching the Wave* by Bower and Christensen (1995). Thus, articles published between 1995 and 2022 are included in the literature review. The data collection yields a total of 1,013 results. The review strategy is explicitly outlined in Fig. 1.

In a first step, we removed 283 duplicates, book reviews, and conference papers from the sample. To identify relevant studies, we then extensively screened the titles and abstracts of the remaining 730 articles. We applied three exclusion criteria to eliminate mismatching articles from the search results: (1) we excluded all papers not relating to disruptive business models according to the definition outlined above; (2) we excluded all papers not relating to established companies; and (3) we excluded all papers that do not focus on organizational structures (see Fig. 1). This step excluded 605 articles. After that, we screened all 125 remaining articles in their entirety, which further excluded 89 articles satisfying the above-mentioned exclusion criteria. Finally, we conducted forward and backward reference searches and identified 22 articles not discovered through the formal database search (Cacciotti and Hayton 2015; Sánchez-Pérez et al. 2021). These are analogously screened to approve their fit with the review scope. The final literature selection comprises 58 articles addressing structural arrangements of established companies that resolve the tensions between traditional and disruptive business models. A detailed list of included literature is available in the appendix.

3.2 Data analysis and synthesis

We synthesized the review findings to provide a comprehensive consolidation of which ambidextrous structures promote disruptive business models in established companies. Therefore, a qualitative data analysis technique is used to identify thematic consensus in the literature (Crossan and Apaydin 2010; Bouncken et al. 2015). We thematically analysed the review findings by examining the proposed organizational structures for gross similarities and discrepancies according to the principle of pattern matching (Yin 1994; Crossan and Apaydin 2010; Klang et al. 2014; Sánchez-Pérez et al. 2021). Specifically, we evaluated the findings to determine whether their patterns align with the following characteristics of an organization's structure: (1) people and culture; (2) processes; (3) control and rewards; (4) structural context; (5) vision and values; (6) leadership; and (7) resources. The ambidexterity literature uses these characteristics to delineate the extent to which explorative

and exploitative business models are integrated or separated within a firm's structure (Siggelkow and Levinthal 2003; O'Reilly and Tushman 2004, 2011; Markides and Oyon 2010; Habtay and Holmén 2014). Along these characteristics, we contrasted the findings and reviewed the extent to which consensus is shared across studies to assess the differences between the proposed ambidextrous structures (Tranfield et al. 2003). Those structures whose patterns match across studies (i.e., which characteristics are described in the same way as being either integrated or separated) are combined into a thematic concept (Klang et al. 2014). This thematic analysis revealed different concepts of ambidextrous structures, which are either introduced, further developed, or supported by the literature. We then synthesized the findings within a framework by linking the concepts to the barriers to disruptive business models. The framework, finally, serves as the basis for discussing which structural characteristics may counteract the barriers incumbents are facing.

4 Results

4.1 Structural, temporal, and contextual alignment

The identified literature offers several concepts on how to resolve the barriers arising from conflicting business models, referring to the alignment of exploration and exploitation within an organization's structure. A considerable amount of research refers to three concepts that are particularly well-known in the domain of ambidexterity: structural, temporal, and contextual ambidexterity (Nickerson and Zenger 2002; Gibson and Birkinshaw 2004; O'Reilly and Tushman 2004). Our thematic analysis of the literature, however, revealed four additional concepts that enable the parallel existence of traditional and disruptive business models: separation, integration, phased integration, and dynamic ambidexterity (Bower and Christensen 1995; Markides and Charitou 2004; Habtay and Holmén 2014). We found that these concepts can be categorized along their form of alignment of the exploitative and explorative business model. In precise, three forms are present in the literature: a *structural alignment* which structurally coordinates the conflicting business models (Tushman and O'Reilly 1996), a *temporal alignment* which dynamically aligns both business models (Nickerson and Zenger 2002; Siggelkow and Levinthal 2003), and a *contextual alignment* which arranges the organizational context so that exploitative and explorative models can be pursued on an individual level (Gibson and Birkinshaw 2004). Table 1 lists the concepts sorted by their form of alignment and demonstrates their theoretical basis.

4.2 Concepts of ambidextrous structures

As Table 1 shows, our systematic literature review identified seven different concepts of ambidextrous structures. In line with theory, our review findings describe these concepts in terms of specific characteristics, including an organization's structural context, people and culture, control and rewards, processes, resources, leadership, and vision and values (Siggelkow and Levinthal 2003; O'Reilly and Tushman

Table 1 Concepts of ambidextrous structures identified in the literature

Form of alignment	Concept	Ambidextrous structure	Characteristics identified in the literature	Identified studies
Structural	Structural ambidexterity	Separate business units integrated into top management	<p><i>People & Culture: "organizational separation ensures that the new units' distinctive processes, structures, and cultures are not overwhelmed by the forces of 'business as usual'"</i> (O'Reilly and Tushman 2004, p. 76)</p> <p><i>Control & Rewards: "Reward systems are designed to be appropriate to the nature of the business unit and emphasize results and risk taking"</i> (Tushman and O'Reilly 1996, p. 25)</p> <p><i>Leadership: "combining organizational separation with senior team integration"</i> (O'Reilly and Tushman 2004, p. 81)</p> <p><i>Structural Context: "exploration and exploration [are] pursued simultaneously, with separate subunits, business models, and distinct alignments for each"</i> (O'Reilly and Tushman 2008, p. 193)</p> <p><i>Vision & Values: "these separate units are held together by a common strategic intent, an overarching set of values, and targeted linking mechanisms to leverage shared assets"</i> (O'Reilly and Tushman 2013, p. 328)</p> <p><i>Resources: "complete separation is impractical [...] resources are too valuable"</i> (Govindarajan and Trimble 2005, p. 63)</p>	<p>Tushman and O'Reilly (1996), O'Reilly and Tushman (2004), Govindarajan and Trimble (2005), Gupta et al. (2006), Csaszar (2013), O'Reilly and Tushman (2008), O'Reilly and Tushman (2011, 2013), Birkinshaw and Gupta (2013), Markides (2013), Reficco and Gutiérrez (2016), Christensen et al. (2018), Kaulio et al. (2017), Khanagha et al. (2018)</p>

Table 1 (continued)

Form of alignment	Concept	Ambidextrous structure	Characteristics identified in the literature	Identified studies
Structural	Separation	Separation at business unit-level, loosely coupled with top management	<p><i>People & Culture</i>: “[separation] allows the new unit to develop its own strategy, culture and processes without interference from the parent” (Markkides and Oyon 2010, p. 30)</p> <p><i>Control & Rewards</i>: “cooperation between the unit and the parent was encouraged through common incentive and reward systems; and the CEO tended to be transferred from inside the organization to facilitate closer cooperation and active exploitation of synergies” (Markkides and Oyon 2010, p. 31)</p> <p><i>Structural Context</i>: “incumbents may need to establish autonomous teams and keep it loosely coupled with the main organization at the senior executive level” (Patamakul et al. 2012, p. 746)</p> <p><i>Resources</i>: “The primary requirement is that the project not be forced to compete for resources with projects in the mainstream organization” (Christensen and Overdorf 2000, p. 74)</p>	Bower and Christensen (1995), Christensen and Overdorf (2000), Markkides and Charitou (2004), Markkides and Oyon (2010), Patamakul et al. (2012), Christensen et al. (2018)

Table 1 (continued)

Form of alignment	Concept	Ambidextrous structure	Characteristics identified in the literature	Identified studies
Structural	Integration	Integration within existing business units	<p><i>Control & Rewards: "A prerequisite for developing practices that support such a change initiative, is to create shared understanding, knowledge, capabilities, rules, and goals"</i> (Palo et al. 2019, p. 494)</p> <p><i>Processes: "[Integration] implies a change of mental models among all employees about [...] how the company's routines and processes should be updated"</i> (Palo et al. 2019, p. 494)</p> <p><i>Structural Context: "incumbents succeed [by] integrating market-driven disruptive innovation within the same business unit under the same organisational structure"</i> (Habtay and Holmén 2014, p. 302)</p>	Habtay and Holmén (2014), Osiyevskyy and Dewald (2015), Palo et al. (2019)

Table 1 (continued)

Form of alignment	Concept	Ambidextrous structure	Characteristics identified in the literature	Identified studies
Temporal	Temporal ambidexterity	Sequential adoption of exploitation and exploration within the same business units	<p><i>People & Culture</i>: “firms can more easily switch between formal structures than they can change the culture and informal organization” (O’Reilly and Tushman 2013, p. 327)</p> <p><i>Leadership</i>: “sequential allocation of attention to different goals” (Gupta et al. 2006, p. 698)</p> <p><i>Structural Context</i>: “Exploration and stability are not achieved simultaneously through distinct organizational features [...] but sequentially by adopting different organizational structures” (Siggelkow and Levinthal 2003, p. 666)</p> <p><i>Control & Rewards</i>: “A decentralized organization requires different styles and systems of reward, control, resource allocation [...]” (Nickerson and Zenger 2002, p. 552)</p> <p><i>Processes</i>: “organizations resolve the paradox by engaging in only one activity at a time” (Raisch and Birkinshaw 2008, p. 389)</p>	<p>Nickerson and Zenger (2002), Siggelkow and Levinthal (2003), Gupta et al. (2006), Csaszar (2013), Raisch and Birkinshaw (2008), Casadesus-Masanell and Tarzjian (2012), O’Reilly and Tushman (2013), Khanagha et al. (2018)</p>

Table 1 (continued)

Form of alignment	Concept	Ambidextrous structure	Characteristics identified in the literature	Identified studies
Temporal	Phased integration	Phased separation at business unit level with maximum integration to prepare for full integration	<p><i>Control & Rewards: "the phased integration strategy is to keep the new business model protected from the mindsets and policies of the existing business while at the same time trying to exploit synergies between the two businesses"</i> (Markides and Charitou 2004, p. 30)</p> <p><i>Structural Context: "The challenge is to keep the new unit separate but also prepare it for the eventual marriage."</i> (Markides and Charitou 2004, p. 31)</p> <p><i>People & Culture: "[it must be ensured] that the employees developed common values and a common culture"</i> (Markides and Charitou 2004, p. 31)</p> <p><i>Leadership: "Keeping the lines of authority short, from the people on the teams to the few people at the top, is key to ensuring that resources really go where they're needed"</i> (Gilbert et al. 2012, p. 73)</p>	Markides and Charitou (2004), Gilbert et al. (2012), Velu and Stiles (2013), Markides (2013), Kim and Min (2015)

Table 1 (continued)

Form of alignment	Concept	Ambidextrous structure	Characteristics identified in the literature	Identified studies
Temporal	Dynamic ambidexterity	Dynamic adaption to exploitation and exploration with centralized core teams	<p><i>People & Culture: "firms not only [need] to adapt to new organisational structures and processes but also to unlearn deeply rooted principles. [...] firms with an innovation-embracing culture were better prepared for exploration"</i> (Kranz et al. 2016, p. 500)</p> <p><i>Leadership: "Because managers' decisions are often influenced by cognitive biases, a more effective approach might be to establish a core team with direct exposure to markets and technologies and the freedom to experiment with new business models"</i> (Kranz et al. 2016, p. 504)</p> <p><i>Resources: "dynamic ambidexterity allows flexibility in reconfiguring firm resources, which is important in turbulent environments"</i> (Kranz et al. 2016, p. 503)</p>	Raisch and Birkinshaw (2008), Kranz et al. (2016)

Table 1 (continued)

Form of alignment	Concept	Ambidextrous structure	Characteristics identified in the literature	Identified studies
Contextual	Contextual ambidexterity	Simultaneous exploration and exploitation at individual level within business units	<p><i>Leadership: "senior executives play a critical role—because they put in place systems that allow supportive contexts to emerge—that in turn shape individual behaviors"</i> (Gibson and Birkinshaw 2004, p. 223)</p> <p><i>Structural Context: "[contextual ambidexterity] is best achieved not through the creation of dual structures, but by building a set of processes or systems that enable and encourage individuals to make their own judgments about how to divide their time between conflicting demands for alignment and adaptability"</i> (Gibson and Birkinshaw 2004, p. 210)</p> <p><i>Control & Rewards: "in a contextually ambidextrous unit, the context is dynamic and flexible enough to allow individuals to use their own judgment as to how they divide their time between alignment-oriented and adaptation-oriented activities; and both are valued and rewarded"</i> (Gibson and Birkinshaw 2004, p. 211)</p>	Gibson and Birkinshaw (2004), Markides (2013), Birkinshaw and Gupta (2013), O'Reilly and Tushman (2013), Hirte and Roth (2018)

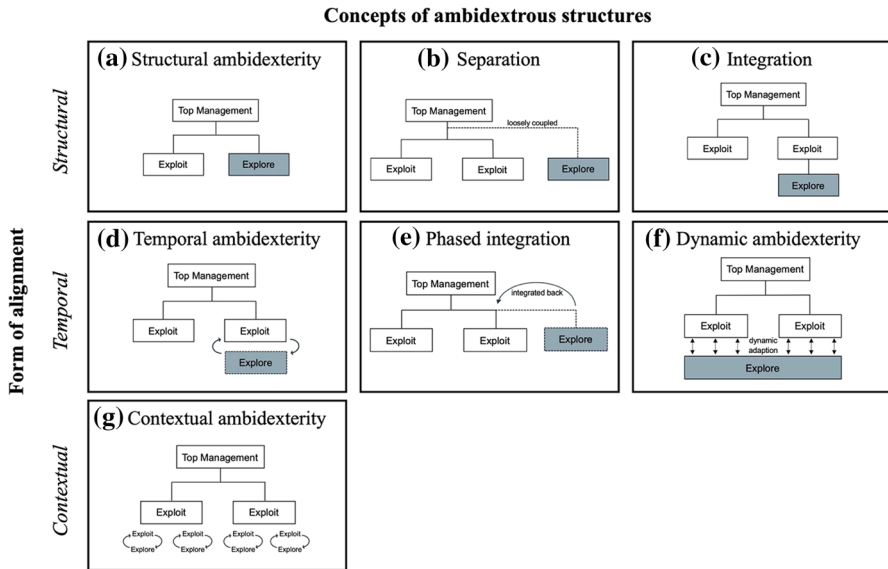


Fig. 2 Ambidextrous structures leveraging disruptive business models

2004, 2011; Markides and Oyon 2010; Habtay and Holmén 2014). What distinguishes the different concepts is how they align exploitation and exploration along the characteristics. Thus, the structural decision of which characteristics to integrate versus separate to minimize tensions between traditional and disruptive business models is critical. By this means, ambidextrous structures have the potential to create a favorable condition for balancing integration and separation of conflicting business models, thereby enabling companies to decrease barriers to disruption. We outline the seven identified concepts and their characteristics in detail in Fig. 2.

4.2.1 Structural ambidexterity

A major stream of literature has elaborated on the concept of structural ambidexterity (Gupta et al. 2006; O’Reilly and Tushman 2008, 2013; Kaulio et al. 2017; Jin and Shin 2020; Carraresi and Bröring 2021). The concept structurally aligns traditional (i.e., exploitative) and disruptive (i.e., explorative) business models with separate business units but integrates them into the existing management hierarchy (see Fig. 2a). By structurally separating exploitative and explorative units, a company can ensure that the explorative unit is not overwhelmed by business as usual. At the same time, by combining organizational separation with top management integration, a company is able to retain the benefits of size to leverage economies of scale and scope (Tushman and O’Reilly 1996; O’Reilly and Tushman 2004; Sachsenhofer 2016). This balance between integration and separation provides structural flexibility without sacrificing synergies (Khanagha et al. 2018). On the one hand, a separated explorative unit encourages an innovative culture of risk-taking, creativity,

and experimentation that could not exist in a large, centralized company (Verhoef et al. 2021; van Oorschot 2021). The explorative unit further requires its own reward system that underlines innovative norms (Tushman and O'Reilly 1996; Markides 2013). In addition, a successful ambidextrous organization requires separate practices, routines, and processes for exploitation and exploration to facilitate flexibility within the explorative unit (Macher and Richman 2004; Urbinati et al. 2019). On the other hand, complete separation has been found to be impractical. Following Govindarajan and Trimble (2005), resources are too valuable not to be shared across units. Similarly, top managers are a “necessarily shared asset” (Reficco and Gutiérrez 2016, p. 478). Only tight coordination and strategic guidance at the managerial level allow exploitative and explorative units to share important resources and to commit resources to explorative projects (Johnson et al. 2008; Schmidt et al. 2021; Chen et al. 2021). Structural ambidextrous companies hence require supportive leaders who continuously reinforce the core values of the company to encourage collaboration between exploitation and exploration units (O'Reilly and Tushman 2004, 2011; Govindarajan and Trimble 2005; Chang et al. 2022).

4.2.2 Separation

Another concept proposed in the literature which reinforces a structural alignment is separation (see Fig. 2b). As with structural ambidexterity, exploitation and exploration are separated at the business unit level (Brunekreeft et al. 2016). In contrast, however, the explorative unit is only loosely coupled with the main organization at the top management level, which allows for collaboration between the unit and the parent company (Bower and Christensen 1995; Markides and Oyon 2010; Patanakul et al. 2012). This concept thus aims to keep traditional and disruptive business models separate enough to avoid conflicts but with minimum integration to exploit synergies (Markides and Oyon 2010). To ensure sufficient separation, the identified literature suggests creating structurally autonomous units that can manage innovations separately from the day-to-day business of the company (Christensen and Overdorf 2000; Patanakul et al. 2012). This allows the unit to establish its own processes and leadership and to create a distinct culture with independent control mechanisms and values (Markides and Charitou 2004; Koen et al. 2011). However, autonomy is not at the expense of synergies. Close monitoring of the unit's strategy and a CEO often coming from within the company's own ranks facilitate closer cooperation to separate the explorative unit without isolating it (Gilbert and Bower 2002). Thus, a loose integration still ensures synergies to be exploited by sharing valuable resources (Markides and Oyon 2010; Patanakul et al. 2012).

4.2.3 Integration

Based on our review, we further identified the concept of integration (see Fig. 2c). This concept likewise structurally aligns exploitation and exploration by integrating the explorative business into the existing business units of an established company (Habtay and Holmén 2014; Palo et al. 2019). The major difference between the concepts of structural ambidexterity and separation, thus, is that exploration is

kept centralized (Osiyevskyy and Dewald 2015). According to the literature, companies can manage both disruptive and traditional business models without creating structurally separate business units (Habtay and Holmén 2014; Palo et al. 2019). However, to ensure successful integration of a disruptive business model, companies need to leverage existing core competencies and establish company-wide practices that promote the parallel existence of two different business models (Habtay and Holmén 2014; Palo et al. 2019). This requires updating shared processes, structures, resources, and values and establishing a common culture to grasp the additional requirements of the explorative business (Palo et al. 2019). As such, the concept of integration implies that business models mutually reinforce each other by fully exploiting the synergies between traditional and disruptive practices (Markides and Charitou 2004; Osiyevskyy and Dewald 2015).

4.2.4 Temporal ambidexterity

Some studies suggest the concept of temporal ambidexterity to leverage a company's disruptive potential (see Fig. 2d). Temporal ambidexterity follows a temporal alignment by sequentially adopting exploitation and exploration within the same business unit (Nickerson and Zenger 2002; Siggelkow and Levinthal 2003; Bell and Hofmeyr 2021). The main idea of temporal ambidexterity is that the same unit can undertake two seemingly incompatible activities—exploitation and exploration—but at different times (Doz and Kosonen 2010; Markides 2013; Clauss et al. 2021). Accordingly, a company temporally cycles through periods of exploitation focusing on the traditional business and exploration focusing on a disruptive business without requiring dual structures (Gupta et al. 2006; Raisch and Birkinshaw 2008; Khanagha et al. 2014). Thus, temporal ambidexterity enables companies to dynamically align exploitation and exploration activities to adapt to changing environmental conditions (O'Reilly and Tushman 2013). In times when (disruptive) innovation is crucial, the company opts for decentralization focusing on the explorative business. At other times, when commercialization of the innovation is needed, the company shifts back to centralization and focuses on exploitation (Nickerson and Zenger 2002; Siggelkow and Levinthal 2003; Cozzolino et al. 2018). This requires a company to establish two temporally separated processes, one for exploitation and the other for exploration, characterized by different control and reward systems and a distinct resource allocation (Nickerson and Zenger 2002; Raisch and Birkinshaw 2008). Consequently, companies can resolve the paradox between exploitation and exploration by focusing on only one activity at a time (Gupta et al. 2006; Casadesus-Masanell and Tarzijan 2012).

4.2.5 Phased integration

Another concept we could identify in the literature which promotes a temporal alignment is phased integration (see Fig. 2e). This concept refers to a phased decentralization of the explorative unit, which is followed by subsequent reintegration into the exploitative business (Iansiti et al. 2003; Markides 2013; Kim and Min 2015). This constitutes the main difference from temporal ambidexterity. While

the latter continuously shifts between phases of exploitation and exploration, phased integration is characterized by a one-time reintegration of the explorative unit (Mao et al. 2020). The initial separation requires a dual structure that allows separating the disruptive business from the existing culture, processes, and control system to minimize internal conflicts and protect the explorative business from the policies and mindsets of the existing business (Markides and Charitou 2004; Gilbert et al. 2012). At the same time, shared resources, common values, and top management integration prepare the separate unit for the eventual reintegration into the core business (Markides and Charitou 2004; Gilbert et al. 2012; Velu and Stiles 2013). The aim of the reintegration is to ultimately scale up the explorative business to become the company's source of future growth (Gilbert et al. 2012; Wallin et al. 2021).

4.2.6 Dynamic ambidexterity

A related concept proposed in the literature to temporally balance exploration and exploitation is dynamic ambidexterity (see Fig. 2f). This concept dynamically aligns traditional and disruptive business models using a centralized specialist team (Raisch and Birkinshaw 2008; Kranz et al. 2016; Karimi and Walter 2016). Contrary to companies pursuing a static alignment or companies shifting between exploitation and exploration, companies that are able to dynamically adapt to a certain point between exploration and exploitation have been most successful in managing the transition of business models, argue Kranz et al. (2016). Dynamic ambidexterity thus refers to a company's ability to dynamically adapt its levels of exploitation and exploration to meet the changing demands in turbulent environmental conditions (Filser et al. 2021). This requires new, adaptive structures and processes and a flexible allocation of resources, all of which are strategically integrated into the company (Brown and Anthony 2011). Achieving such strategic integration involves a shared vision, a common set of values, and comprehensive management. In addition, a centralized specialist team has its own innovative culture, innovation expertise, and decision-making autonomy (Karimi and Walter 2016; Wallin et al. 2021). This allows the team to sense emerging trends and disseminate them into the organization, enabling the corporation to handle exploitation and exploration efforts more dynamically (Christensen et al. 2002; Raisch and Birkinshaw 2008; Kranz et al. 2016; Hock-Doepgen et al. 2021).

4.2.7 Contextual ambidexterity

Another stream of literature discussed the concept of contextual ambidexterity as an alternative form to structural or temporal ambidexterity (see Fig. 2g). This concept refers to simultaneous exploitation and exploration at the individual level (Mom et al. 2009; O'Reilly and Tushman 2013; Hirte and Roth 2018). According to the literature, contextual ambidexterity is achieved by establishing an organizational context that supports individual employees in balancing their time and attention between exploitative and explorative activities (Gibson and Birkinshaw 2004; Markides 2013; Sadiq et al. 2022). This requires individuals to have the behavioral capacity to decide for themselves how to allocate their time between exploration and exploitation and how best to manage the conflicting demands of both activities (Simon

and Tellier 2011). Gibson and Birkinshaw (2004) recommend contexts characterized by a combination of flexibility, discipline, support, and trust, where both exploitative and explorative activities are valued and rewarded. To create supportive contexts, the top management must establish processes, structures, and values that shape behavior at the individual level (Birkinshaw and Gupta 2013; Markides 2013).

5 Discussion and limitations

This review aimed to provide an up-to-date and consolidated overview of organizational structures proposed in the ambidexterity literature that enable established companies to overcome barriers to disruptive business models. In addition to the well-established concepts of structural, temporal, and contextual ambidexterity, we hereby discovered four new approaches to ambidexterity: separation, integration, phased integration, and dynamic ambidexterity. This section discusses how the seven structural concepts may resolve the barriers and thus support managers in their structural decisions on how to align exploration and exploitation to leverage a company's disruptive potential.

5.1 Disruptive innovation of established companies: a conceptual framework

Our study demonstrates that the integration or separation of the concepts' characteristics determine how the tensions between traditional and disruptive business models are handled, which in turn affects whether the barriers are reduced. The framework in Fig. 3 conceptualizes this relationship by linking the seven concepts of ambidextrous structures and their characteristics to the barriers to disruptive business models identified in the literature. This framework serves as the basis for discussing which characteristics are best suited to decrease the different barriers of asymmetric resource allocation, cultural inertia, rigid cognitive patterns, top management disinclination, and structural barriers.

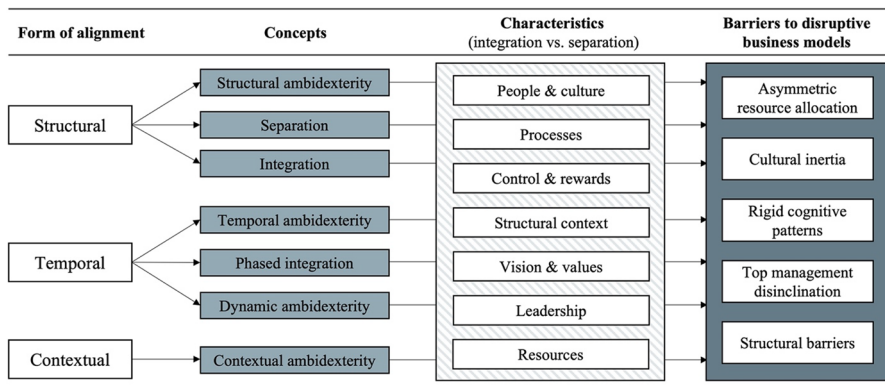


Fig. 3 Conceptual framework linking concepts of ambidextrous structures to barriers to disruptive business models

5.1.1 Asymmetric resource allocation

Our review findings consistently suggest that to solve the asymmetric allocation of resources across business models, resources should be shared to take advantage of possible synergies (Clauss et al. 2021). This is confirmed by the theory, which states that resources are a particularly important competitive advantage of established companies over startups and should therefore be shared (Christensen and Overdorf 2000; Govindarajan and Trimble 2005). Yet, the findings are inconsistent as to the level at which the resource planning authority should be located to facilitate resource sharing. While it appears easier to share important resources and thus avoid an asymmetric allocation if the resource planning authority is assigned to the top management, the findings relating to contextual ambidexterity propose that resource allocation should take place on an individual level (Mom et al. 2009; Felício et al. 2019). However, this is not supported by the theory which claims that such decisions cannot be left to the discretion of individual employees but require managers with the respective expertise to decide on resource allocation (O'Reilly and Tushman 2013). In fact, the majority of findings support a structural or temporal separation of exploitation and exploration across separate units (Doz and Kosonen 2010; Urbinati et al. 2019). This could reduce resource dependencies, as the two units do not have to compete for scarce resources, which in turn might decrease the unwillingness to cannibalize the existing business which already has accumulated resources. Moreover, the separation of business units might avoid structured routines, as the allocation of resources to the explorative unit is not based on the same criteria that apply to the existing business (Yu and Hang 2010; Schmidt et al. 2021). We therefore suggest that ambidextrous structures characterized by structurally or temporally separated units but integrated into the top management may best resolve the barrier of an asymmetric resource allocation. This includes the concepts of *structural ambidexterity*, *separation*, *temporal ambidexterity*, and *phased integration*.

5.1.2 Cultural inertia

Our findings indicate a twofold approach to addressing the barrier of an inert corporate culture. First, our findings recommend setting up a separate unit for the explorative business. The separate unit should be rather small and independent and thus able to develop its own innovative culture (Tushman and O'Reilly 1996; Markides 2013; Rohn et al. 2021). This might promote creativity, experimentation, and a risk-taking mentality as employees are no longer constrained by the fear of cannibalizing the existing, successful business model (Johnson et al. 2008; Verhoef et al. 2021; van Oorschot 2021). Further, because of its autonomy and size, the separate unit might also be far more flexible. Second, our findings suggest generally adjusting the corporate culture. On the one hand, an innovative culture and organizational flexibility may be promoted by adapting the organizational context and balancing exploitation and exploration on an individual level (Gibson and Birkinshaw 2004; Sadiq et al. 2022). On the other hand, creativity and flexibility could be ensured by setting up a specialized core team that dynamically adapts to

exploration and exploitation needs (Kranz et al. 2016; Karimi and Walter 2016). In contrast, the findings advocating a temporary adjustment (i.e., phased integration) or shifts between exploitation and exploration (i.e., temporal ambidexterity) seem rather unfavorable for eliminating cultural inertia. As theory indicates, it is difficult for companies to periodically change their culture or to integrate a contrary culture geared to disruption into an existing culture geared to exploitation (O'Reilly and Tushman 2013). Therefore, we propose that the concepts advocating a separate unit, such as *structural ambidexterity* and *separation*, or concepts calling for a general adaptation of the company's culture, such as *dynamic ambidexterity* and *contextual ambidexterity*, may best reduce the barrier of cultural inertia.

5.1.3 Rigid cognitive patterns

To prevent companies from focusing on the dominant business and from falling into a success trap, our findings suggest establishing a separate control and reward system for the explorative business. This implies that explorative practices are not measured according to the established criteria promoting profit and efficiency but according to their individual criteria rewarding innovation and creativity. Thus, the explorative business might be protected from being dependent on mainstream customers due to higher revenue expectations and growth needs of the existing business (O'Reilly and Binns 2019). Furthermore, our findings imply that long-established routines and obsolete mental models could be circumvented by either introducing new routines or adapting existing routines to not hinder explorative practices (Macher and Richman 2004; Kranz et al. 2016; Palo et al. 2019). However, theory questions whether individuals can develop routines to simultaneously excel in exploitative and explorative activities, as assumed by the findings regarding contextual ambidexterity (Gupta et al. 2006; O'Reilly and Tushman 2013). Interestingly, though, the findings differ as to whether values should be shared or not. Although theory claims that a company's vision and values often determine its future direction and thus make the company dependent on its current path (Christensen and Raynor 2003), only the minority of findings recommend separating or updating organizational values to renew cognitive patterns. In fact, we find that only the concept of *separation* appears to resolve the barrier associated with rigid cognitive patterns.

5.1.4 Top management disinclination

Theory revealed that top management might be discouraged from disruptive initiatives. To tackle this barrier, our findings discuss the extent to which explorative activities should be integrated into the existing hierarchy and whether management requires special competencies or separate incentive systems. The majority of our findings promote the integration of the explorative business into the existing management hierarchies to obtain top management support. Although top management might show resistance to change, tight coordination at the managerial level is said to be necessary to exploit synergies (O'Reilly and Tushman 2004, 2013; Reficco and Gutiérrez 2016; Chen et al. 2021). Further, to tackle top managers' lacking competencies and innovation expertise, two approaches can be derived

from our findings. On the one hand, the findings supporting the concept of dynamic ambidexterity suggest setting up a centralized specialist team that aims at sensing emerging trends and disseminating them to the company (Kranz et al. 2016; Wallin et al. 2021). On the other hand, the findings supporting the concept of separation recommend the explorative business to have its own specialized leadership, but one that often comes from within the company's own ranks to facilitate closer cooperation (Gilbert and Bower 2002; Markides and Oyon 2010). The innovation expertise of a specialized team might help facilitate management buy-in for potentially cannibalizing business models (Hock-Doepgen et al. 2021). Last, our findings propose a separate control and reward system for the explorative business. This could prevent innovative projects from being measured against standardized, efficiency-maximizing criteria that discourage managers from investing in nascent disruptive business models that mainstream customers do not yet value (Christensen and Overdorf 2000; Markides and Charitou 2004). As the concepts vary greatly in their approaches to tackling this barrier, we suggest that *dynamic ambidexterity* and *separation* may best compensate for the lack of competencies, while *structural ambidexterity*, *separation*, *temporal ambidexterity*, and *phased integration* may best counteract rigid incentive systems.

5.1.5 Structural barriers

To decrease structural barriers such as inflexibility or insufficient autonomy, the majority of our findings propose to either structurally or temporally separate the explorative business from the exploitative business (Yu and Hang 2010; O'Reilly and Tushman 2013; Felício et al. 2019). This could reduce dependencies between the two units, resulting in increased flexibility and autonomy for the explorative business. A further possibility for overcoming structural barriers recommended by our findings supporting dynamic ambidexterity is setting up a centralized specialist team. This specialist team operates within the existing hierarchy but is independent in its decisions and operations and can therefore adapt its strategic direction flexibly and dynamically to exploration and exploitation needs (Kranz et al. 2016). Last, an option proposed in the findings referring to contextual ambidexterity is to adapt the whole organizational context. In this sense, the organizational context supports individuals in balancing their time and attention between exploitative and explorative activities and thus might increase their flexibility (Gibson and Birkinshaw 2004). We hence consider the concepts of *structural ambidexterity*, *separation*, *temporal ambidexterity*, *phased integration*, *dynamic ambidexterity*, and *contextual ambidexterity*, which agree that increasing the autonomy and flexibility of the explorative business, to be particularly valuable for solving structural barriers.

5.2 Limitations and future research

Our study has a few shortcomings to be addressed in future research. First, our research goal in this study focuses on decreasing barriers to disruptive business models rather than increasing enablers of disruptive business models. A combined approach, focusing on barriers and enablers, could thus create a more holistic

perspective on how established companies can leverage disruptive business models. Second, the study only considers the most prevalent barriers to disruptive business models identified by the literature. In addition to the five barriers outlined, other factors such as infrastructural constraints (Assink 2006; Chesbrough 2010) and financial expectations (Assink 2006; Velu and Stiles 2013; Vorbach et al. 2017) might prevent established companies from engaging in disruptive opportunities. Future studies could therefore complement our findings by providing a systematic overview of these additional barriers. Third, we recognize that our sample may be limited, with potentially relevant research findings being disregarded due to our quality criterion of “peer-reviewed journal articles” for inclusion in our systematic literature review. Through the additional search strategy of including practitioner-oriented articles as well as backward and forward reference searches, however, our study should comprehensively reflect extant knowledge on ambidextrous structures leveraging disruptive business models in established companies (Bouncken et al. 2015; Gregori and Parastuty 2021). Last, which structure is appropriate for a company depends on a multitude of internal and external factors, such as the heterogeneity of the market (Khanagha et al. 2018) or the “disruptiveness” of the new business model (Markides 2013), that were not investigated in this study. Thus, there is still limited empirical evidence about the optimal conditions for the respective ambidextrous structure to be successful, which offers a promising avenue for future research.

6 Conclusion

This study contributes to a more comprehensive understanding of how ambidextrous structures enable incumbent companies to reduce the barriers to disruptive business models. Our systematic review of the ambidexterity literature reveals seven concepts of ambidextrous structures that enable the parallel existence of traditional and disruptive business models. Drawing on our review, we conceptualize a framework by linking the concepts to the barriers associated with disruptive business models. By this, our framework sheds light on how established companies can resolve the barriers of asymmetric resource allocation, cultural inertia, rigid cognitive patterns, top management disinclination, and structural barriers, and thus pursue conflicting business models. Yet our findings demonstrate that the different ambidextrous structures do not address all barriers equally. Rather, company-specific answers are needed to the question of which structure is of greatest value. Finally, this study offers a range of potential structures supporting managers in their structural decisions on how to align exploration and exploitation to leverage a company’s disruptive potential.

Appendix

See Table 2.

Table 2 Overview of included studies (ordered chronologically)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Bower and Christensen (1995)	<i>Harvard Business Review</i>	Conceptual	Case examples	The key to prospering at points of disruptive change is to build a disruptive new business in an independent organization keeping it away from the mainstream business
Tushman and O'Reilly (1996)	<i>California Management Review</i>	Empirical	Multiple case studies	Ambidextrous organizations enable companies to simultaneously pursue incremental and discontinuous innovation. This requires hosting multiple contradictory structures, processes, and cultures within the same company
Christensen and Overdorf (2000)	<i>Harvard Business Review</i>	Conceptual	Case examples	To ensure success when facing disruptive change, a spinout organization and a heavyweight team helps to tackle the challenge
Christensen et al. (2002)	<i>MIT Sloan Management Review</i>	Conceptual	Case examples	Companies pursue streams of sustainable innovation within business units and disruptive innovation in new units, for which a team responsible for collecting ideas for disruptive innovation will be established at the corporate level
Gilbert and Bower (2002)	<i>Harvard Business Review</i>	Conceptual	Case examples	Separation from the parent organization can be beneficial to both the core organization and the new venture if a leader who acts as an integrator actively manages the tensions between them

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Nickerson and Zenger (2002)	<i>Organization Science</i>	Conceptual	Case examples	Organizations need to combine elements of formal and informal organization. By shifting between discrete phases of either exploration or exploitation, managers dynamically position the informal organization at levels that are close to optimum functionality
Iansiti et al. (2003)	<i>MIT Sloan Management Review</i>	Conceptual	Case examples	A company can create an autonomous unit that is later reintegrated or an internal unit that remains in that form to effectively respond to changes that could upend an industry
Siggelkow and Levinthal (2003)	<i>Organization Science</i>	Empirical	Agent-based simulation	An initial phase of decentralized exploration followed by reintegration is an effective way of exploring and exploiting with long-term benefits. Therefore, exploration and exploitation are achieved not simultaneously but sequentially by adopting different organizational structures

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Gibson and Birkinshaw (2004)	<i>Academy of Management Journal</i>	Empirical	Interviews	Organizational ambidexterity can be achieved by building processes or systems that support individuals in overcoming the tensions associated with ambidexterity. Hence an organization's capacity to simultaneously achieve exploitation and exploration is best achieved through contextual ambidexterity
Macher and Richman (2004)	<i>International Journal of Innovation Management</i>	Empirical	Multiple case studies	The internal venture is a structure characterized by a separate department or project that is organizationally or geographically separate from the organization's core business
Markides and Charitou (2004)	<i>Academy of Management Perspectives</i>	Empirical	Surveys and multiple case study	Simultaneously pursuing two business models that have inherent conflicts and market dissimilarities requires a nuanced contingency approach. This approach enables companies to balance the benefits of keeping the two business models separate while at the same time integrating them enough to exploit synergies

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
O'Reilly and Tushman (2004)	<i>Harvard Business Review</i>	Conceptual	Multiple case examples	Ambidextrous organizations encompass two different types of businesses requiring different strategies, cultures, structures, and processes: exploitative business focusing on exploiting existing capabilities for profit and exploratory business focused on exploring new opportunities for growth
Govindarajan and Trimble (2005)	<i>Harvard Business Review</i>	Conceptual	Case examples	Established companies that set up new businesses with the potential to deliver breakthrough growth must face three challenges: to forget what made the established company successful, to borrow important assets from the established company, and to learn new things from scratch
Gupta et al. (2006)	<i>Academy of Management Journal</i>	Conceptual	Literature review	It depends on the context whether ambidexterity or punctuated equilibrium serves as the more appropriate balancing mechanism between exploitation and exploration
Johnson et al. (2008)	<i>Harvard Business Review</i>	Conceptual	Case examples	Organizations need to set up a separate business unit that operates in an entirely different way to avoid cannibalizing its traditional business

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
O'Reilly and Tushman (2008)	<i>Research in Organizational Behavior</i>	Conceptual	Literature review	Ambidextrous organizations require dynamic capabilities to recombine and integrate the resources to adapt to market and technological changes to simultaneously compete in mature and emerging markets
Raisch and Birkinshaw (2008)	<i>Journal of Management</i>	Conceptual	Literature review	Dynamic alignment to exploitation and exploration is an alternative solution to static ambidexterity configurations
Mom et al. (2009)	<i>Organization Science</i>	Empirical	Survey	Individual level ambidexterity arises from the ability of managers to engage in both high levels of exploratory and exploitative activities
Doz and Kosonen (2010)	<i>Long Range Planning</i>	Conceptual	Case examples	The solution is to switch between different, parallel but separate business models to flexibly allocate products and market segments
Markides and Oyon (2010)	<i>MIT Sloan Management Review</i>	Empirical	Multiple case study	An organization that can compete with dual business models needs to put culture, structures, incentives, and people in place to encourage ambidextrous behaviors
Brown and Anthony (2011)	<i>Harvard Business Review</i>	Conceptual	Case examples	Established companies set up organizational structures to build dedicated teams focused primarily on new-growth initiatives

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Koen et al. (2011)	<i>Research Technology Management</i>	Conceptual	Case examples	A company seeking a low-cost model while maintaining its existing business should create two distinct organizations
Simon and Tellier (2011)	<i>Advances in Strategic Management</i>	Empirical	Single case Study	Organizational ambidexterity should be managed through individuals who can choose their time allocation between activities aimed at improving current businesses or developing new businesses
O'Reilly and Tushman (2011)	<i>California Management Review</i>	Empirical	Multiple case study	Ambidexterity is more likely to be successful under five conditions: a compelling strategic intent, common vision and values, senior team owning the unit's strategy, separate but aligned organizational architectures, and a senior leadership that can resolve tensions between units
Casadesus-Masanell and Tarzijan (2012)	<i>Harvard Business Review</i>	Conceptual	Case example	To operate tandem business models requires assessing the extent to which the business models share physical assets and the extent to which resources and capabilities of the company are compatible

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Gilbert et al. (2012)	<i>Harvard Business Review</i>	Conceptual	Case examples	Dual transformation allows companies to harness disruptions and build enterprises that prosper in the long run. A capabilities exchange process enables sharing resources across transformations without interfering with each other's operations
Kim and Min (2015)	<i>Strategic Entrepreneurship Journal</i>	Empirical	Surveys	Incumbent performance improves after a new business model is added when the incumbent firm agilely capitalizes on complementary assets and adaptively manages conflicting assets by setting up an autonomous business unit for the new business
Osiyevskyy and Dewald (2015)	<i>Strategic Entrepreneurship Journal</i>	Empirical	Surveys	Exploratory aims are driven by opportunity perception, risk experience, and perceived performance-reducing threat, while exploitative aims are negatively associated with perceived threat and industry tenure and positively associated with risk experience
Brunekreeft et al. (2016)	<i>Energy Journal</i>	Empirical	Multiple case study	Incumbents in Germany's electricity supply industry are facing disruptive challenges and are responding by splitting their core business into two companies

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Karimi and Walter (2016)	<i>Long Range Planning</i>	Empirical	Survey	The spin-off of an autonomous growth group is essential for supporting large enterprises in the introduction of disruptive business model innovation
Kranz et al. (2016)	<i>Information Systems Journal</i>	Empirical	Multiple case study	Dynamic ambidexterity enables companies to dynamically adjust to a certain point along the exploitation/exploration continuum to cope with changes in the internal and external environment
Reficco and Gutiérrez (2016)	<i>Organization & Environment</i>	Empirical	Multiple case study	Organizational ambidexterity assures the coexistence of the emerging and the established business model in a company only when the business units are strategically and operationally aligned to create synergies between established and emergent businesses
Sachsenhofer (2016)	<i>Journal of Business Models</i>	Empirical	Single case study	A German original equipment manufacturer creates a new business model alongside the old, established business model, effectively operating two business models in parallel
Christensen et al. (2018)	<i>Journal of Management Studies</i>	Conceptual	Literature review	Work on incumbent response strategies to disruptive innovation has enriched the existing discourse by pointing out various potential incumbent reactions beyond the creation of an autonomous organizational unit

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Cozzolino et al. (2018)	<i>Journal of Management Studies</i>	Empirical	Single case study	Temporal separation is possible in phase one of the business model adaptation process while simultaneity is inevitable in phase two, when the more advanced disruption process creates threats and makes new exploration unavoidable
Hirte and Roth (2018)	<i>Journal of Strategic Innovation & Sustainability</i>	Empirical	Interviews and literature review	Requirements of digital transformation and disruptive business model innovation are based on the dimensions of innovation process, organizational structure, resources, hygiene factors/rewards, people and culture, strategy, and the external ecosystem
Patanakul et al. (2012)	<i>Journal of Product Innovation Management</i>	Empirical	Surveys	Autonomous teams possess characteristics that enable organizations to deal with uncertainty and equivocality. With the high degree of autonomy, leadership, independence, and dedication, the team has more freedom and stronger capabilities to be innovative and entrepreneurial
Csaszar (2013)	<i>Organization Science</i>	Empirical	Computational method	Organizational structure is a key determinant of achieving organizational ambidexterity. Hybrid organizations offer mechanisms for achieving a high degree of both exploration and exploitation (i.e., ambidexterity) at the same place and time

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Birkinshaw and Gupta (2013)	<i>Academy of Management Perspectives</i>	Conceptual	Literature review	Ambidexterity is a construct that transpires at multiple levels in the organization simultaneously. It can be managed in many ways and is achieved through managerial capability
Markides (2013)	<i>Academy of Management Perspectives</i>	Conceptual	Literature review	Ambidextrous companies need to achieve the right balance between separation to overcome the challenges of the two business models and integration to exploit synergies between the business models
O'Reilly and Tushman (2013)	<i>Academy of Management Perspectives</i>	Conceptual	Literature review	Organizational ambidexterity represents a complex set of routines and decisions that encourage the company to seize and sense new opportunities through the reallocation of organizational assets
Velu and Stiles (2013)	<i>Long Range Planning</i>	Empirical	Single case study	Aligning the differentiation of the new business model while simultaneously leveraging synergies from the existing business model requires mechanisms such as transcendence, separation, and integration, which facilitate the management of the cannibalization process and the parallel running of different business models

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Habtay and Holmén (2014)	<i>International Journal of Entrepreneurship & Innovation Management</i>	Empirical	Multiple case studies	Incumbents adapting a disruptive technology-driven business model innovation externally acquire disruptive specific competences and separate the disruptive unit structurally from the established company, whereas incumbents embracing a disruptive market-driven business model innovation leverage initial core capabilities and integrate disruptive innovation within the established company's structure
Khanagha et al. (2014)	<i>R&D Management</i>	Empirical	Single case study	Recursive iterations between different forms of separated and integrated structures are necessary for dealing with two competing business models
Kaulio et al. (2017)	<i>Creativity & Innovation Management</i>	Empirical	Single case study	Double ambidexterity enables companies to master business model innovations and technological innovations to survive discontinuous developments and maintain the firm performance
Khanagha et al. (2018)	<i>Journal of Management Studies</i>	Empirical	Single case study	The success of incumbents' responses to disruption depends on their capability for managing internal misalignment. This allows them to handle the inconsistencies in strategic direction, organizational structure, and resource configuration associated with a complex innovation process

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Felicio et al. (2019)	<i>Journal of Business Research</i>	Empirical	Survey	Disruptive innovations evolve in organizational environments with separated, parallel structures or with empowered individuals who can take the initiative and identify opportunities outside their field of activity
Palo et al. (2019)	<i>Journal of Business Research</i>	Empirical	Single case study	Servitization is a business model transformation but an emergent and iterative process for managing parallel business models. Yet, this process involves conflicts between the dominant product-based business model and the emerging service-based business model
Urbinati et al. (2019)	<i>International Journal of Innovation & Technology Management</i>	Empirical	Interviews	In response to the first wave of disruptive innovation, incumbents have established structural ambidextrous organizations with dedicated business units to explore the new potential opportunities
Chen et al. (2021)	<i>Journal of Engineering & Technology Management</i>	Conceptual	Case examples	To deal with disruptive innovation requires companies to achieve simultaneous innovation through both exploratory learning and exploitative learning

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
Jin and Shin (2020)	<i>Business Horizons</i>	Conceptual	Case examples	Established companies can respond effectively to disruptive business models by simultaneously operating two incompatible business models in separate units
Mao et al. (2020)	<i>Journal of Engineering & Technology Management</i>	Empirical	Single case study	Established companies can develop new business models in a two-stage process through separation and subsequent integration
Bell and Hofmeyr (2021)	<i>South African Journal of Business Management</i>	Empirical	Interviews	The organization can be structured as a dual operating system characterized by a temporal and spatial separation of exploration and exploitation priorities to allow for ambidexterity
Carraresi and Bröring (2021)	<i>Journal of Cleaner Production</i>	Empirical	Multiple case study	Incumbents could operate the circular business models in parallel with the current linear business models, developing the capability of ambidexterity at the business model level
Schmidt et al. (2021)	<i>Creativity & Innovation Management</i>	Empirical	Secondary data	The creation of a spin-off allows established companies to successfully circumvent resource and routine rigidities, and at the same time, the spin-off benefits from leveraging the resources and relationships of the established company

Table 2 (continued)

References	Journal	Research type	Research method	Key findings regarding ambidextrous structures
van Oorschot (2021)	<i>Research in Hospitality Management</i>	Empirical	Interviews	Dual structures allow a company to place digitalization outside of the company's core activities in order not to limit innovation
Verhoef et al. (2021)	<i>Journal of Business Research</i>	Conceptual	Literature review	Developing disruptive business models requires specific organizational structures such as autonomous business units that are separate from headquarters to enable experimentation and rapid learning, and to avoid cannibalization risks and conflicts
Wallin et al. (2021)	<i>European Journal of Innovation Management</i>	Empirical	Interviews	Disruptive innovations may be developed within an integrated innovation unit, an autonomous unit that is integrated at a later step, or within innovation teams which are allowed to pursue potential disruptions even when they conflict with current business operations

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Declarations

Conflict of interest The authors have no competing interests to declare that are relevant to the content of this article.

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