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Disruption by design? Classification framework for the archetypes of disruptive business models

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The current scholarly debates highlight the role of business models for understanding the dynamics inherent to disruptive innovations. Additionally, research on business models argues for similarities between business models, as they are shared by multiple competitors and across industries. Despite the recent advancements in both debate streams, a consolidation of the research on the underlying similarities of disruptive business models is lacking. Such a consolidation would allow learning from previous waves of disruption, ultimately informing theory and practice to cope with the increasing pace and impact of disruptive innovations. Consequently, this study systematically identifies 122 disruptive business models that have been discussed in the literature during 2006–2019. Based on qualitative content analysis, we then develop a classification framework and propose five archetypes of disruptive business models: (1) matchmakers, (2) standardizers, (3) service providers, (4) open collaborators, and (5) performance reducers. We make a twofold contribution to the discussions around the hitherto tentatively specified business models underlying disruptive innovations, thus emphasizing the contingency of the phenomenon. First, we discuss how the identified archetypes are inducing disruptive dynamics. Second, we elaborate on how the archetypes are constituting paths towards disruption.

1. Introduction

There is a debate around the characterization of business models, which underlie disruptive innovation. Disruptive innovation captures how new entrants challenge established organizations (henceforth, incumbents) by introducing new offerings, which develop along an alternative performance

trajectory (Christensen, 1997). Christensen et al. (2018, p. 1050) states that ‘no innovation is inherently disruptive. Firms make strategic choices to position an innovation in a disruptive way – most often by targeting non-customers in new markets.’ Recent scholarly contributions theorize business models as the decisive disruption mechanisms (Cozzolino et al., 2018; Hopp et al., 2018; Snihur et al., 2018).

However, the available knowledge about the characteristics of disruptive business models is limited. Based on empirical observations, there exist commonalities of disruptions across industries. Airbnb's platform model is changing the logic of the hotel industry (Guttentag, 2015), while Spotify's disrupted the established model of the music industry (Trabucchi et al., 2019), and low-cost models such as the frequently-cited steel minimill disrupted the business logics of integrated steel mills (Christensen, 1997). Similarly, low-cost carriers are disrupting full-service incumbent airlines (Serio et al., 2018).

Despite these observations, Christensen et al. (2018) conclude that business models underlying disruptive innovation have only been '*tentatively specified*'. This is because available studies are in-depth in nature and focus on the particularities of selected disruptive innovation processes (Cozzolino et al., 2018; Snihur et al., 2018), focus on selected disruptive technologies (Amshoff et al., 2015), or discuss characteristics of selected sub-types of disruptive innovation (Trabucchi et al., 2019). We argue for revisiting previous waves of disruption to overcome this tentative characterization. A comprehensive classification of disruptive business models would back a 'common language and theoretical platform' (Hopp et al., 2018, p. 476), thereby advancing the scholarly discussion.

Consequently, the objective of our study is to distill typical business models ('archetypes') of disruptive innovation. We approach this by reviewing and synthesizing the current state of research from a business model perspective and contributing evidence that there is no 'one size fit all' approach to disruption (Christensen et al., 2018; Hopp et al., 2018). We contribute to the following research question: *what archetypes of business models underlying disruptive innovation can be developed on the basis of the present research base?*

This paper presents five archetypes of business models underlying disruptive innovation. For conceptualization, we understand business models as a construct to capture companies' strategic choices regarding value proposition, value creation, and value capture (Teece, 2010; Clauss, 2017; Spieth et al., 2021). We stress that the presented archetypes are no success formulas for disruption. The involved strategic actors need to perform disruptive innovation through continuous business model innovation, while maneuvering along the disruptive path (Kumaraswamy et al., 2018; Schmidt and Scaringella, 2020).

To deliver our contributions, we first present the systematic selection of disruptive business models in the academic literature during 2006–2019.

Subsequently, we describe the qualitative content analysis for developing a classification framework, which ultimately led to identifying the archetypes. Finally, we draw conclusions and present avenues for further research.

2. Theoretical background

2.1. Disruptive innovations as a business model phenomenon

Disruptive innovation describes the process by which an entrant with fewer resources challenges established incumbents in the mainstream market (Christensen et al., 2018). The concept, initially understood as a technological problem, shows how technologies with relatively lower performances compared to existing mainstream alternatives can be increasingly valued by emerging customer segments (Bower and Christensen, 1995). This technology-focused understanding of disruptive innovation was revised in 2006, when researchers have started to acknowledge that the reason market incumbents are disrupted is a lack of business model innovation (not technology innovation) (Christensen, 2006; Markides, 2006). Recently, scholars argued for widening the disruption understanding to a 'market outcome in which new offerings successfully challenge established ones in the given market' (Ritala et al., 2021, p. 2). Reviews of the Christensenian conceptualization highlight that companies make strategic choices to position an innovation disruptively in relation to existing mainstream alternatives (Christensen et al., 2018; Petzold et al., 2019). Thus, the latest empirical contributions take a business model perspective.

Cozzolino et al.'s (2018) in-depth study on the newspaper industry emphasizes that it is a disruptive business model that spurs the disruptiveness of an innovation. We build on this understanding and refer to evidence that disruptive business models do not require disruptive technologies per se. For instance, both Airbnb's and Spotify's models were initially built on the already established Internet technology (Guttentag, 2015; Trabucchi et al., 2019). In conclusion, disruptive business models are not coherent with the established ways of doing business, thereby creating substantial challenges for industry incumbents (Christensen, 2006; Cozzolino et al., 2018).

Altered business models in the context of disruption were the focus of previous studies on how disruptive business models emerge and dynamically develop (Ansari et al., 2016; Cozzolino et al., 2018; Snihur et al., 2018). Consequently, the existent research predominately adopts an in-depth view of

the dynamic evolvement of disruptive business models and distills the respective generative mechanisms, thereby contributing to the complexity of this phenomenon (Petzold et al., 2019).

We build on Christensen's conceptualization of disruption (Christensen et al., 2018) and follow Hopp et al.'s (2018) call for abstracting and generalizing to advance the disruptive innovation theory. Due to the limited consolidation of the findings of the previous waves of disruption, knowledge can only hardly be transferred to provide a deeper understanding (Christensen et al., 2018; Hopp et al., 2018). Consequently, a synthesis from the business model perspective would add to our understanding of disruptive innovation.

2.2. Understanding the model character of business models

Business models have received considerable interest, especially since the emergence of the Internet in the mid-1990s, which enabled value creation beyond physical products and services (Amit and Zott, 2001; Zott et al., 2011; Schneider and Spieth, 2013; Foss and Saebi, 2017). Hence, scholars have built on the business model concept to develop a deeper understanding of how companies do business, which processes are performed, and how these processes are interlinked (Schneider and Spieth, 2013; Spieth et al., 2014; Foss and Saebi, 2017).

Despite ongoing debates, there is still no common definition of a business model (Spieth et al., 2014; Wirtz et al., 2016). For our study, we conceptualize business models along the key dimensions of value propositions, value creation, and value delivery (Teece, 2010; Spieth et al., 2014; Clauss, 2017). Particularly, a business model depicts which value propositions are delivered to the market. Value creation defines the activities from input factors to customers that result in new market offerings that eventually add value (Chesbrough, 2006). Value capture refers to how revenue sources and pricing capture the created value (Teece, 2018). The reader is referred to Foss and Saebi (2017), Schneider and Spieth (2013), and Wirtz and colleagues (2016), who provide comprehensive reviews of current debates related to the concept of business model (innovation).

Underlining the model character of business models, Teece (2010) argues that business models are to a certain degree “‘shared’ by multiple competitors” (p. 179). Moreover, Baden-Fuller and Morgan (2010) understand business models as recipes. Building on these arguments, the research engages

in discussing business model archetypes (Bocken et al., 2014; Felt, 2014; Gassmann et al., 2014; Ritter & Lettl, 2018). Particularly, Ritter and Lettl (2018, p. 2) describe these archetypes as ‘generic logics of how firms do business’ (p. 2). Examples of business model archetypes are the ‘razor and blade’ model of Gillette or the ‘low-cost carrier model’ of Southwest Airlines (Felt, 2014). Furthermore, Gassmann et al. (2014) review business models across industries and propose ‘business model patterns’ with underlying generative mechanisms.

In the context of disruptive innovation, Amshoff et al. (2015) made a first contribution by presenting business model archetypes based on the particular technology of condition monitoring. Recently, Garbuio and Lin (2019) extended this discussion and proposed business model archetypes based on artificial intelligence technologies within the health-care industry. A further contribution to the discussion about similarities of disruptive business models is made by Trabucchi et al. (2019), who study the business models of big-bang disruptors – a sub-type of disruption characterized by a zero marginal cost structure (Downes and Nunes, 2014).

Consequently, a more complete synthesis is needed to advance theory building. This study considers business models beyond a particular technology or industry, thereby abstracting case-specificities. We respond to the calls for research regarding (1) a systematic consolidation of existing research findings on disruptive innovation (Hopp et al., 2018), (2) the development of a better understanding of business models that cause a change in performance trajectories (Christensen et al., 2018), and (3) guidelines for business model innovation to pursue disruptive opportunities using business models as blueprints (Teece, 2010; Hopp et al., 2018).

3. Methodology

A methodological approach based on qualitative analysis is used to explore our research question. Two independent researchers were involved to ensure reliability.

We systematically collected data on disruptive business models using a highly transparent, systematic and replicable methodological approach to minimize bias (Tranfield et al., 2003). Hence, we follow previous studies, arguing for the quality control underlying academic journal publications and build on systematically collected secondary data from these sources (Hopp et al., 2018; Petzold et al., 2019).

3.1. Constructing the data base

We followed three steps for selecting scientific articles from the Web of Science (Figure 1) as a basis for identifying disruptive business models in academic literature.

In a first step, we approximated the domains of ‘disruptive innovation’ and ‘business model’. We revisited recent reviews (Schneider & Spieth, 2013; Foss & Saebi, 2017; Christensen et al., 2018; Hopp et al., 2018; Petzold et al., 2019) to identify relevant search keywords (Table 1). For operationalization, we applied Web of Science’s topic search: the search keywords had to be present in either the papers’ title, abstract, or associated keywords.

In a second step, we defined inclusion criteria (Table 2). We included peer-reviewed articles and leading practitioner-oriented articles (Harvard Business Review, MIT Sloan Management Review) to ensure the scientific rigor of the data base. We defined the timeframe from 01.01.2006 – 31.12.2019 to only include articles that have been published after the guiding argument that disruptive innovation is a business model problem (Christensen, 2006).

In a third step, we executed the search and followed sub-steps (A) to (D) (Figure 2). (A) The keyword string led to 124 articles. (B) We cleaned the retrieved list and removed one duplicate and one non-English article. (C) To reduce the conceptual noise regarding the terminology ‘disruptive innovation’, articles had to be anchored in the Christensenian conceptualization of disruptive innovation. We examined the abstracts and bodies of the articles and present key quotes to underpin our filtering decision (see Table 3). (D) Finally, we filtered whether the articles discuss instances of disruptive business models. We considered the full ‘spectrum of maturity’ (Christensen, 2006, p. 45) and included instances of disruptive business models from niche to mainstream market entry.

Consequently, we selected 70 articles, in which we identified 122 disruptive business models. We complemented our data base with the corresponding sustaining business models (Table 3).

3.2. Qualitative content analysis

Subsequently, we conducted a qualitative content analysis for an in-depth investigation of the disruptive business models. Two independent researchers performed the analysis using MAXQDA18. We controlled for inter-coder reliability and used upcoming coding divergence for enhancing reliability. The analysis followed an abductive approach, from data to theory and vice versa (Saldaña, 2016).

In a first analysis step, we developed a coding strategy aligned with our research question based on the theoretical framework and developed initial coding criteria to identify relevant data segments (Creswell, 2013). In the first coding cycle, we coded segments according to the three dimensions ascribed to a business model: (1) value proposition: how are products/services, customer segments, and customer relationships described; (2) value creation: how are key activities, required resources, partners, and underlying technologies described; (3) value capture: how are revenue and cost structures described.

Table 1. Keyword clouds

Keyword (OR)	AND keyword (OR)
“disruptive innovation*”	Business model
“disruptive technolog*”	Business idea
“disruptive change”	Business concept
“disruptive business model”	Revenue model
	Economic model

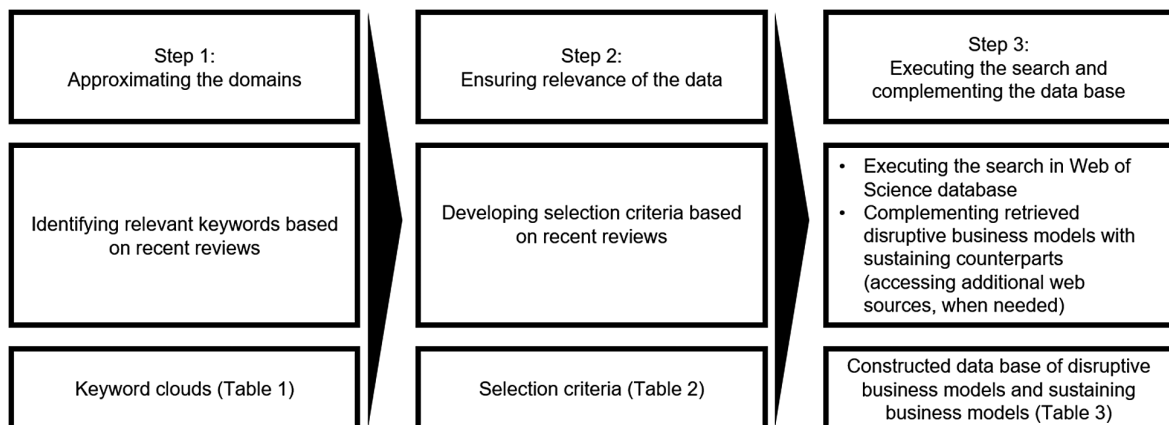


Figure 1. Three-step process for data base construction.

Table 2. Selection criteria

Selection criterion	Expression
Found location of keyword	Title of article, abstract, keywords
Type of article	Peer-reviewed, scientific journal articles, leading practitioner-oriented journal articles
Language	English
Publication date	01-01-2006 until 31-12-2019

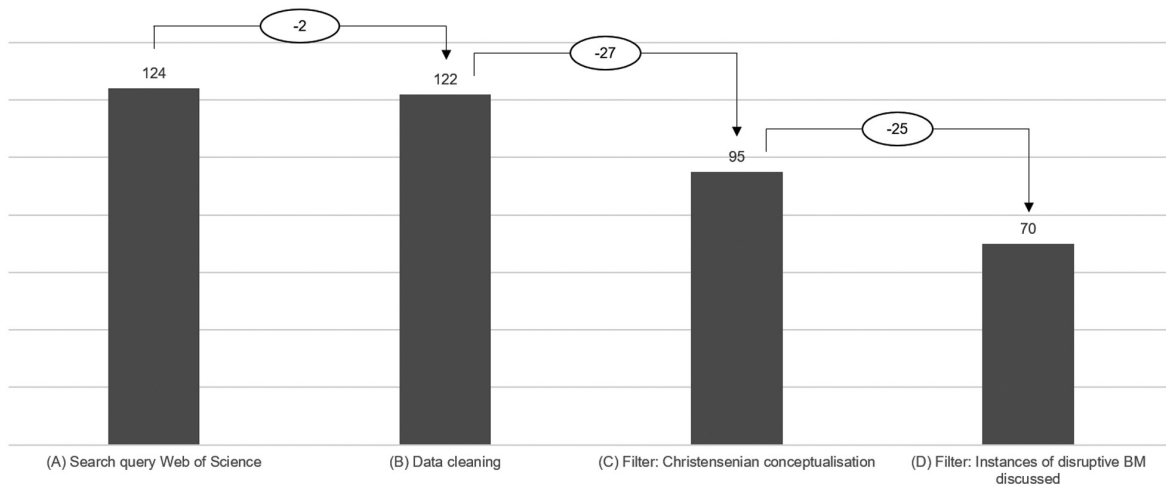


Figure 2. Sub-steps for constructing the databases (*n* articles).

Through further abstraction, the involved researchers independently engaged in pairwise comparisons of the coded business models to classify them while accounting for similarities and differences. In this step, the assignment of business model characteristics to the three business model dimensions facilitated the classification. We followed previous studies on business model archetypes in different contexts and applied the following criteria to guide the classification process (e.g., Bocken et al., 2014). Hence, archetypes needed to be, (a) representative of underlying mechanisms propelling the disruptive innovation, (b) explanatory, (c) mutually exclusive.

In the second coding cycle, we sorted the data into smaller segments and inductively coded them for each classified business model archetype. We departed by taking the in-vivo coding from the first coding cycle. We abstracted the data to the first-order concept and second-order themes to aid the sense-making and identify the underlying generative mechanisms. We mainly used process coding to grasp the actions intertwined with the disruptive innovation dynamics underlying the respective business models (Miles et al., 2014).

We iteratively and independently cycled between the data, concepts, and archetypes to check whether we identified new and sufficiently different

archetypes. Figure 3 provides an overview of the coding cycles and the classification into archetypes.

We discussed our coding results until we reached consensus. This iterative analysis procedure culminated in the data structure, of which we present a part in Figure 4.

4. Findings

4.1. Overview of data

Figure 5 provides an overview of the archetypes along with the classified disruptive business models. We present our findings based on the developed coding structure and the characteristics of the archetype and its underlying generative mechanisms. When we refer to in-vivo codes from the systematically retrieved business models, we use the following label: “document ID (see Table 3) _ archetype character (see Figure 5) and code ID.”

4.2. Matchmakers

This archetype includes business models that match market sides. These business models range mobile payment platforms, which enable users to complete peer-to-peer transactions, to platforms matching

Table 3. Constructed data base of disruptive business models and sustaining business models

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
701	Sainio, LM; Puumalainen, K	Evaluating technology disruptiveness in a strategic corporate context: A case study	Technological Forecasting and Social Change	2007	Flexible provision of IT resources based on grid computing	“This construct enlarges the original concept of disruptive technology put forward by Christensen within the frame of the original definition: the technology enables changes in product characteristics, added value and product-market positions, destroys the existing competences of a firm, and drives or enables changes in the value network.” (pp. 1317–1318)	Provision of in-house server infrastructure
801	Johnson, MW; Christensen, CM; Kagermann, H	Reinventing your business model	Harvard Business Review	2008	Peer-to-peer platform for connecting desktops Standardized, low-cost silicone product	“Established companies should not undertake business-model innovation lightly. They can often create new products that disrupt competitors without fundamentally changing their own business model.” (p. 64)	Conventional, centralized desktops High-end, high quality silicon products
901	Lucas, HC; Goh, JM	Disruptive technology: How Kodak missed the digital photography revolution	Journal of Strategic Information Systems	2009	Digital photography	“investing in disruptive technologies is not a rational financial decision for senior managers to make because, for the most part, disruptive technologies are initially of interest to the least profitable customers in a market (Christensen, 1997).” (p. 47)	Photography solution based on analogue film technology
902	Samavi, R; Yu, E; Topaloglou, T	Strategic reasoning about business models: a conceptual modeling approach	Information Systems and e-Business Management	2009	Mobile telephone services	“A disruptive innovation is a change in technology, product or a process that targets low-end market (those who are usually ignored by incumbents) of an existing business, threatening to replace it.” (p. 178)	Wired voice services
1001	Wu, XB; Ma, RF; Shi, YJ	How do latecomer firms capture value from disruptive technologies? A secondary business-model innovation perspective	IEEE Transactions on Engineering Management	2010	Low-cost wireless communication tool	“for firms that attempted to capture value from disruptive technologies, the business models forged in low-end markets can be profitably applied more widely than the business-models defined in high-end markets.” (pp. 53–54)	Conventional, high quality mobile phone services

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1002	Markides, CC; Oyon, D	What to do against disruptive business models (when and how to play two games at once)	MIT Sloan Management Review	2010	Platform for customer-to-customer trading Internet retail banking	"keep the two business models (and their underlying value chains) separate in two distinct organizations. That is the 'innovator's solution' that Clayton Christensen proposed and that has been supported by others." "Disruptive business model innovations represent a specific form of environmental change described by Markides (2006) as representing a redefinition of product or service attributes in a manner that is generally perceived as inferior to incumbent product or service providers" (p. 199)	Unidirectional (online) retailing Conventional offline banking
1003	Dewald, J; Bowen, F	Storm clouds and silver linings: Responding to disruptive innovations through cognitive resilience	Entrepreneurship Theory and Practice	2010	Discount, unbundled online brokering	"designing a new-growth factory whose intellectual underpinnings would derive from the Harvard Business School professor Clayton Christensen's disruptive-innovation theory. The basic concept of disruption – driving growth through new offerings that are simpler, more convenient, easier to access, or more affordable – was hardly foreign to P&G." (p. 5)	Offline real estate brokering
1101	Brown, B; Anthony, SD	How P&G tripled its innovation success rate	Harvard Business Review	2011	Good enough detergent product		High quality detergent product
1102	Koen, PA; Bertels, HMI; Eisum, IR	The three faces of business model innovation: Challenges for established firms	Research-Technology Management	2011	Good enough dry cleaning service Very-short term car sharing Low-cost hardware microprocessors	"In elaborating their concept of disruptive innovation, Christensen and colleagues (Christensen and Rosenbloom, 1995; Christensen and Raynor, 2003) argue that 'there are two types of disruptive innovations: low end and new market' (Christensen et al., 2004, p. xvii)." (p. 53)	High quality, professional dry cleaning service Conventional, day-based car rentals High power processors

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1103	Zeschky, M; Widenmayer, B; Gassmann, O	Frugal innovation in emerging markets: The case of Mettler Toledo	Research-technology Management	2011	Low-cost music devices Angioplasty catheter for hitherto complex surgeries Standardized, low-cost silicon products Steel minimills Low-cost ballpoint pens	“Christensen (1997) has characterized as disruptive innovation, products that offer superior customer value and low costs” (p. 38)	High performance vacuum-tube radios Complex open heart surgery High-touched, customized silicon products integrated steel mills Expensive fountain pens High-precision scales
1202	Mahama, A	2012 international year for sustainable energy for all: African Frontrunnership in rural electrification	Energy Policy	2012	Electricity supply based on mini-grid community Local partnering for implementing lighting solutions in BOP	“Christensen’s original theory focused on disruptive technologies in the form of products, however, over time, the same theory has been used to explain how radically new business models and business processes can be used to penetrate new markets.” (p. 77)	Established electricity networks unavailable for remote areas High-tech lightning solutions
1203	Habtay, SR	A firm-level analysis on the relative difference between technology-driven and market-driven disruptive business model innovations	Creativity and Innovation Management	2012	Low-cost carrier without frills	“A potentially disruptive innovation originates and grows in a remote or periphery of the incumbent’s radar (Gilbert, 2003). Once the innovation unfolds, a disruptive firm grows through the process of adapting to endogenous and exogenous forces, retaining profitable markets, successful products, investments, processes, routines and values, and discouraging those that do not conform with its current business model.” (p. 4)	Full-service carriers with complex service bundles

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1204	Bucherer, E; Eisert, U; Gassmann, O	Towards systematic business model innovation: Lessons from product innovation management	Creativity and Innovation Management	2012	Low-cost short-term direct insurance for B2C Very-short term car sharing	“Christensen and Bower (1996) point out that established companies find it difficult to serve their original markets with existing products and emerging markets with new products concurrently, within one organization, and that most fail in this pursuit.” (p. 185)	Complex long-term insurances Conventional, day-based car rentals
1301	Pervez, T; Maritz, A; de Waal, A	Innovation and social entrepreneurship at the bottom of the pyramid—a conceptual framework	South African Journal of Economic and Management Sciences	2013	Standardized, low-cost silicone products Micro insurances for emerging markets Low-complexity small scale insurance Community-based microlending services	“A number of case studies of disruptive innovations at the BOP are discussed.” (p. 57)	High-touched, customized silicon products Traditional insurance services Traditional insurance services
1302	Moreau, F	The disruptive nature of digitization: the case of the recorded music industry	International Journal of Arts Management	2013	Unbundled, downloadable digital music	“It is therefore not the technology itself that causes difficulties for the established firm, but the fact that a disruptive innovation renders obsolete the business model on which the firm has based its development.” (p. 22)	Bundled physical music products (i.e., CDs)
1303	DaSilva, CM; Trkman, P; Desouza, K; Lindic, J	Disruptive technologies: a business model perspective on cloud computing	Technology Analysis & Strategic Management	2013	Small scale, cloud-based CRM solution	“Our findings suggest disruptive technology per se is not the reason for the collapse of large corporations, but rather the failure to adapt or create new business models to incorporate novel technology.” (p. 1161)	On-premise CRM systems

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1304	Velu, C; Stiles, P	Managing Decision-Making and Cannibalization for Parallel Business Models	Long Range Planning	2013	Platform for peer-to-peer financial trading	“Herein lies the dilemma for established firms: business model innovations are inevitably disruptive of the existing business model – so the new business model conflicts with the old – making it difficult to run them in parallel.” (p. 445)	Investment banking model based on telephone trading
1305	Bergek, A; Berggren, C; Magnusson, T; Hobday, M	Technological discontinuities and the challenge for incumbent firms: Destruction, disruption or creative accumulation?	Research Policy	2013	Low-cost electric vehicles with limited speed	“disruptive innovations imply a different package of performance attributes than those provided by mainstream technologies and valued by existing customers” (p. 1212)	High performance electric vehicles
1306	Simmons, G; Palmer, M; Truong, Y	Inscribing value on business model innovations: Insights from industrial projects commercializing disruptive digital innovations	Industrial Marketing Management	2013	New advertising platform for the digital media industry	“Johnson et al. (2008) and Christensen and Raynor (2003), suggest that disruptive innovations are best leveraged by combining them with business model innovation. An effective way for challengers to disrupt the leader and create market discontinuities, is to change the rules of the game by introducing business model innovation (Johnson et al., 2008; Markides, 2008).” (p. 746)	Traditional stand-alone advertising model
1401	Hargrave, J	Disruptive conclusions: The future of Australian educational publishing	Journal of Scholarly Publishing	2014	Digital broadcast device, converging data from different devices Document digitization platform as a service 3D digital technologies for home television Individualizing learning units	“Michael Overdorf and Christensen state in their article ‘Meeting the Challenge of Disruptive Change’ that ‘it is very difficult for a company whose cost structure is tailored to compete in high-end markets to be profitable in low-end markets as well.’” (p. 187)	Solitary broadcast device On-premise document storage High-tech 3D video Standardized, printed learning products

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1402	Tongur, S; Engwall, M	The business model dilemma of technology shifts	Technovation	2014	Transportation service based on electric road system	“As concluded by Christensen (2006, p. 48), the fundamental challenge of disruptive technologies is ‘a business model problem, not a technology problem’, meaning that the key challenge of technology shifts lies in the interaction between technological development and business model innovation” (p. 527)	Standard truck-based logistics services
1501	Heikkila, M; Saarni, J; Kaartemo, V; Koponen, A	Viability radar: A practical tool for assessing the viability of transformative service innovations in a healthcare context	Technology Innovation Management Review	2015	Digital health record service	“His theory of disruptive innovations emphasizes that some technologies are able to simplify and routinize such processes, which have previously been more complex or intuitive. Moreover, disruptive innovations also require business model innovations that deliver value to customers profitably and an ecosystem with a commercial infrastructure that supports diffusion.” (p. 19)	Paper-based information record of individual medical information
1502	Nicolai, I; Faucheux, S	Business models and the diffusion of eco-innovations in the eco-mobility sector	Society and Business Review	2015	Standardized, digital medical care Collaboration-based eco-mobility services	“Eco-mobility is thus a major case of ‘disruptive innovation’, in the sense used by Maio and Metcalfe (2002) and by Christensen (2006), in which the innovation process induces major structural changes to supply and to demand conditions.” (p. 208)	Time-consuming personal (telephone) medical consulting Separated enterprises dealing with mobility-related services
1503	Pereira, SD; Imbrizi, FG; de Freitas, ADG; Alvarenga, MA	Business model as an inducer of disruptive innovations: The case of GOL airlines	International Journal of Innovation	2015	Low-cost carrier without frills	“[Disruptive innovation] usually offers a lower performance in the beginning, this type of innovation has lower cost to consumers, making it attractive for less demanding markets and a source of competitiveness for the innovators (Christensen and Bower, 1996). In addition to innovation in products and services, should be given attention to innovation in the business model because companies must revolutionize how to design their business to better compete.” (p. 29)	Full-service carriers with complex service bundles

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1504	Kaltenecker, N; Hess, T; Huesig, S	Managing potentially disruptive innovations in software companies: Transforming from on-premises to the on-demand	Journal of Strategic Information Systems	2015	On-demand cloud software solutions	“Christensen (1997) further characterizes disruptive technologies as initially underperforming in terms of mainstream attributes. However, disruptive technologies have other features that niche-market customers value. Products and services based on new technologies are often commercialized in emerging and less significant markets, mainly because leading companies’ most profitable customers initially do not want them.” (p. 3)	On-premise software solution
1505	Staykova, KS; Damsgaard, J	The race to dominate the mobile payments platform: Entry and expansion strategies	Electronic Commerce Research and Applications	2015	On-demand software solutions On-demand enterprise content management system Software-as-a-service for e-commerce Mobile payment platform	“Numerous digital payment solutions, which rely on new disruptive technologies, are emerging on the payment market, transforming the payment area from being established into a state of flux.” (p. 319)	On-premise software solution On-premise enterprise content management On-premise software for e-commerce Payment transactions via traditional debit cards
1506	Osiyevskyy, O; Dewald, J	Inducements, impediments, and immediacy: Exploring the cognitive drivers of small business managers’ intentions to adopt business model change	Journal of Small Business Management	2015	Discount real estate brokering	“during the last decade we observe emergence of disruptive technology (such as Internet sites listing property for sale) and disruptive business models (discounted brokers, mere posting service, services for FSBO-‘For Sale by Owner’).” (p. 1017)	Traditional real estate brokering through personal brokers
1507	Osiyevskyy, O; Dewald, J	Explorative versus exploitative business model change: The cognitive antecedents of firm-level responses to disruptive innovation	Strategic Entrepreneurship Journal	2015	Discount real estate brokering	“disruptive business model innovations are financially unattractive for the incumbent to pursue, relative to its profit model and relative to other investments that are competing for the organization’s resources.” (Christensen, 2006, p. 49).” (p. 58)	Traditional real estate brokering through personal brokers

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1508	Ghezzi, A; Cortimiglia, MN; Frank, AG	Strategy and business model design in dynamic telecommunications industries: A study on Italian mobile network operators	Technological Forecasting and Social Change	2015	Network orchestrator for telecommunications	“Disruptive changes are normally associated with changes in business model dimensions and, particularly among these dimensions, the value delivery dimension” (p. 4)	Pipeline telecommunication provider
1509	Wan, F; Williamson, PJ; Yin, E	Antecedents and implications of disruptive innovation: Evidence from China	Technovation	2015	Industrialized customization of medical equipment	“First, a disruptive innovation must start out as inferior in terms of the performance that existing customers expect, but be superior in terms of price; Second, it must evolve so as to become ‘good enough’ in performance while at the same time remaining superior in price. These criteria reflect the idea that a disruptive innovation challenges the established value propositions and business models of incumbents.” (p. 3)	Lab-based R&D
1510	Akamavi, RK; Mohamed, E; Pellmann, K; Xu, Y	Key determinants of passenger loyalty in the low-cost airline business	Tourism Management	2015	Low-cost carrier without frills	“Consequently, this innovative strategy has disrupted the existing airline marketplace [...] Southwest’s disruptive business model has become a benchmark that has been successfully popularised and has proliferated across the airline sector worldwide” (p. 530)	Full-service carriers with complex service bundles
1511	Karimi, J; Walter, Z	Corporate entrepreneurship, disruptive business model innovation adoption, and its performance: The case of the newspaper industry	Long Range Planning	2016	Digital publishing	“Since disruptive products and services typically promise lower profit margin than the existing ones, they create a conflict between the business model that is already established for existing technology and the one that may be required to exploit the emerging disruptive technology”	Printed newspaper model
1512	Kim, SK; Min, S	Business model innovation performance: When does adding a new business model benefit an incumbent?	Strategic Entrepreneurship Journal	2015	Online retailing	“An industry often undergoes abrupt and rapid changes with a new business model – a newly integrated business framework to generate revenue and profit by creating, communicating, and delivering value to customer” (p. 34)	Brick-and-mortar retail stores

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1601	Reficco, E; Gutierrez, R	Organizational ambidexterity and the elusive quest for successful implementation of BoP ventures	Organization & Environment	2016	Standardized life insurance without frills	“As Christensen and Overdorf (2000) have argued, this can be problematic when the new BM is disruptive vis-à-vis the established one. This could be the case when the new market ‘is made up of different customers looking for different value attributes. As a result, they require different key success factors and draw on different skills’ (Markides and Oyon, 2010, p. 27).” (p. 463)	Traditional, complex life insurance
1602	Hynes, N; Elwell, AD	The role of inter-organizational networks in enabling or delaying disruptive innovation: A case study of mVoIP	Journal of Business & Industrial Marketing	2016	Co-creating drinking water solutions according to BOP Waste management based on partnering with local collectors Voice over IP solutions through partnerships	High-end technology for drinking water solutions Established waste management (not working in BoP)	Established mobile operators
1603	Dijk, M; Wells, P; Kemp, R	Will the momentum of the electric car last? Testing an hypothesis on disruptive innovation	Technological Forecasting and Social Change	2016	Very-short term car sharing	“Theory building around disruptive technologies or disruptive innovation is fraught with difficulties with data, methods and theory (Christensen, 2006; Sood and Tellis, 2011). Factors identified through existing models suggest the following actors (or groups of actors) are influential in the emergence of a disruptive technology: • incumbent firms; • the ‘supply’ chain; • consumers; • technology; competing/complementary technologies and technical standards; and • inter-organizational networks and collective actions.” (p. 724) “In this paper we study to what extent electric propulsion is disrupting ‘the order’ in the automotive industry with six extensions to Christensen’s notion of disruptive innovation (1997)” (p. 77)	Conventional, day-based car rentals

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1604	Jia, F; Wang, XF; Mustafee, N; Hao, L	Investigating the feasibility of supply chain-centric business models in 3D chocolate printing: A simulation study	Technological Forecasting and Social Change	2016	Customizing chocolate products	“Disruptive innovation is the introduction of new technology, products or services, as well as the efforts to promote, reform and obtain superiority in the competition and mainly includes business-model innovation and technology innovation (Markides, 2006). [...] It is arguable that 3D chocolate printing is a disruptive innovation enabled not only by the 3D print technology but also by the changes in the underlying supply chain configurations that are necessitated through its use.” (p. 204)	Mass-produced standardized chocolate products
1701	Berglund, H; Sandstrom, C	A new perspective on the innovator’s dilemma - exploring the role of entrepreneurial incentives	International Journal of Technology Management	2017	Surveillance services based on digital technology and partnering	“The shift to IP video was arguably competence destroying (Tushman and Anderson, 1986) and also disruptive (Christensen, 1997) in the sense that incumbents had little reason to invest in IP as they were captivated by their existing market which was still growing.” (p. 151)	Surveillance services based on analogue technology
1703	Shin, DI	An exploratory study of innovation strategies of the internet of things SMEs in South Korea	Asia Pacific Journal of Innovation and Entrepreneurship	2017	Internet of things-based services based on collaboration	“Unlike sustaining technology that values the performance improvement of existing products demanded by demanding customers, disruptive technology makes potential consumers easier to use and provides relatively simple low-end products.” (p. 176)	Separation of hardware and software sales
1704	Gonzalez-Padron, TL	Ethics in the sharing economy: Creating a legitimate marketing channel	Journal of Marketing Channels	2017	Platform for accommodation sharing	“Community responsibilities relate to the infancy of the marketing channel and the reaction of traditional business disrupted by the sharing economy. Disruption describes ‘a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses’ (Christensen et al., 2015, p. 46).” (p. 85)	Traditional direct-to-consumer renting of accommodation (e.g., hotels)

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Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1705	Winterhalter, S; Zeschky, MB; Neumann, L; Gassmann, O	Business models for frugal innovation in emerging markets: The case of the medical device and laboratory equipment industry	Technovation	2017	Low-cost ultra sound machine with limited features	“Overall, the cases reinforce the notion that frugal innovations are disruptive innovations as suggested by earlier studies (Christensen and Raynor, 2003; Markides, 2006; Wan et al., 2015)”	Advanced ultrasound machines
					Low-cost portable electrocardiogram for large quantities		High-tech, stationary electrocardiogram
					Portable optometrists device for preventive measures		High-tech, stationary optometrists device
					Portable device for detection of diseases		Advanced infection devices with high throughput
					Small-scale device for detection of diseases		Advanced device for detection of diseases with synchronous high throughput
1706	Ferrell, OC; Ferrell, L; Huggins, K	Seismic shifts in the sharing economy: Shaking up marketing channels and supply chains	Journal of Marketing Channels	2017	Platform for labor brokering	“The use of peer-to-peer disruptive technology is challenging participation in traditional marketing channels.” (p. 3)	Traditional employment contracts for e.g., agency workers
1708	Osiyevskyy, O; Dewald, J	The pressure cooker: When crisis stimulates explorative business model change intentions	Long Range Planning	2017	Discount online brokering	“Market pressures soon created opportunities for out-of-industry entrepreneurs to introduce viable disruptive innovations. Particularly, in the last decade, the emergence of a disruptive technology (Internet sites listing property for sale) led to disruptive business models (discounted brokers, mere posting service, services for FSBO-‘For Sale by Owner’).”	Traditional real estate brokering through personal brokers

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1709	Bohnsack, R; Pinkse, J	Value propositions for disruptive technologies: Reconfiguration tactics in the case of electric vehicles	California Management Review	2017	Digital higher education without frills Electric cars with limited driving range	“Disruption occurs only when these customers also make the switch to the new technology. This happens when product performance on established attributes has improved to an acceptable level, and mainstream customers have also started to value the new attributes.”	Classroom teaching with added overhead and frills High performance electric vehicles
1710	Rheume, L; Gardoni, M	Infocom business models innovation with the development of corporate universities	International Journal of Innovation and Learning	2017	Voice over IP communication services	“A disruptive innovation is an innovation that helps create a new market and value network, and eventually disrupts an existing market and value network, displacing an earlier technology. It is an innovation that improves a product or service in ways that the market does not expect, typically first by designing for a different set of consumers in a new market and later by lowering prices in the existing market.”	Mobile phone/wire-line phone
1801	Serio, L; Tedeschi, P; Ursino, G	Making sense of (ultra) low-cost flights vertical differentiation in two-sided markets	Management Science	2018	Low-cost carrier without frills	“[Authors] argue that low-cost carriers are ‘disruptive innovators’, in line with the theory developed by Bower and Christensen (1995).”	Full-service carriers with complex service bundles
1802	Allahar, H	Is open access publishing a case of disruptive innovation?	International Journal of Business Environment	2018	Open access publishing	“Open access journal publishing is a recent phenomenon that challenges the established system of print journals and viewed by some researchers as a form of disruptive innovation that has implications for stakeholders in both developed and developing countries.” (p. 35)	Licensed access to scientific journals

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1803	Zhang, WY; Daim, T; Zhang, QP	Understanding the disruptive business model innovation of E-business microcredit: A comparative case study in China	Technology Analysis & Strategic Management	2018	E-business microcredits	“The results suggest that the EMF business model has typical disruptive innovation characteristics, shedding new light on the definition and criteria of disruptive business model innovation as little research has done on its systematic analysis.” (p. 1)	Offline provision of micro credits
1805	Cozzolino, A; Verona, G; Rothaermel, FT	Unpacking the disruption process: New technology, business models, and incumbent adaptation	Journal of Management Studies	2018	Digital platform for journalistic co-creation	“We selected an incumbent in the media industry because this sector was historically well protected and now it has been profoundly disrupted by the internet (Forbes, 2015; The Economist, 2011) with a dramatic impact on publishers’ business models (The Wall Street Journal, 2016).” (p. 1167)	Vertically integrated publishing
					Digital platform for externally created journalistic content		Vertically integrated publishing
					Digital news platform for internal and external content		Vertically integrated publishing
					Self-publishing platform		Established book publishing
1808	Laurell, C; Sandstrom, C	Comparing coverage of disruptive change in social and traditional media: Evidence from the sharing economy	Technological Forecasting and Social Change	2018	Platform for ride sharing	“Sharing-economy firms also seem to be disruptive in relation to those institutions that govern established industries. Regulatory ambiguities have been exploited by these firms, often at the expense of generating resistance from vested interest groups.”	Conventional taxi hailing
1901	Breidbach, C; Keating, B; Lim, C	Fintech: research directions to explore the digital transformation of financial service systems	Journal of Service Theory and Practice	2019	Digital B2C banking solution	“Fintech should be conceptualized using characteristics similar to disruptive innovations (Christensen, 2006). Following this perspective, the term Fintech encompasses a ‘new sector in the finance industry’ (Micu and Micu, 2016, p. 380)”	Traditional offline banking services

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Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1902	Bradley, R; Hammett, J; Cooley, K; McIntyre, E	Naturopathy as a model of prevention-oriented, patient-centered primary care: A disruptive innovation in health care	Medicina	2019	Peer-to-peer financial platform Naturopathy-based patient treatment	“The concept of a ‘disruptive innovation’ was introduced to the business community by the Christensen Institute in respect to an emerging technology representing a new market force combined with a new value system that eventually displaces some, or all, of the current leading ‘stakeholders, products and strategic alliances’” (p. 2)	Traditional offline banking services Conventional biomedicine
1903	Alberti-Alhtaybat, LV; Al Htaybat, K; Hutaibat, K	A knowledge management and sharing business model for dealing with disruption: The case of Aramex	Journal of Business Research	2019	Low cost logistic provider	“The current study seeks to illustrate their approach to logistics and their mindset regarding disruptive technologies, which is reflected in their particular business model, in the context of the theory of disruption.”	Full-service, fast delivery logistic provider
1904	Zhang, K; Wang, JF; Feng, LJ; Cheng, Y	The evolution mechanism of latecomer firms value network in disruptive innovation context: A case study of Haier Group	Technology Analysis & Strategic Management	2019	Low cost white goods manufacturer	“Since it is a business model innovation that creates the disruptive impact on incumbents (Christensen, 2003), scholars further point out that, business model innovation requires the development of new value networks which can inform changes of a firm’s business model” (p. 2)	High-tech white goods manufacturer
1905	Valtanen, K; Backman, J; Yrjola, S	Blockchain-powered value creation in the 5G and smart grid use cases	IEEE Access	2019	Local electricity grid including batteries and production Brokering service for individual infrastructure capacity	“Especially, this is emphasized in blockchain use cases, which typically have a wide business ecosystem and possibly disruptive business models.”	Traditional centralized energy production Centralized incumbent network operator
1906	Vergas-Hernandez, JG; Gomez, LVR	Consumption characteristics of the millennial generation and strategies implemented to satisfy them: Airbnb case	International Journal of Management and Information Technology	2019	Platform for accommodation sharing	“A disruptive business model is one that, through the use of technology, breaks with the functioning of industries, jobs, forms of consumption and sale of goods and services, considering in turn the behaviour of individuals and their expectations.”	Traditional direct-to-consumer renting of accommodation (e.g., hotels)

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Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1907	Sterlin, R; LeRouge, C	On-demand telemedicine as a disruptive health technology: Qualitative study exploring emerging business models and strategies among early adopter organizations in the United States	Journal of Medical Internet Research	2019	Virtual urgent care on on-demand telemedicine	“It is well documented that the success of a disruptive technology is closely tied to its business model [27–32]. The business model provides a framework for an organization to create and capture value out of the disruption [27–29].”	Stationary, personal patient care
1908	Sikos, TT; Kozak, T; Kovacs, A	New retail models in online and offline space	Deturope	2019	E-commerce retailing	“The mostly technology-driven change in production models altering the business models of companies fundamentally is called disruptive – that is, destructive and creative in the same time – innovation.” (p. 10)	Traditional brick and mortar stores
1909	Scott, P	Rethinking business models in the great depression: The failure of America’s vacuum cleaner industry	Business History Review	2019	Direct sales model for good enough vacuum cleaners	“Clayton Christensen, Thomas Bartman, and Derek van Bever identify a tendency toward business-model rigidity, owing to growing interdependencies between the model’s individual elements, which leads to innovations’ – value-adding improvements to existing products for current target markets. This pattern was evident in Hoover, which focused throughout the interwar years on improvements to its upright cleaner format.” (p. 335)	High-tech vacuum cleaner sold via resellers
1910	Salvador, E; Simon, JP; Benghozi, PJ	Facing disruption: The cinema value chain in the digital age	International Journal of Arts Management	2019	Integrated entertainment providers	“The concept can be defined as follows: ‘the term ‘disruption’ delineates a process in which new entrants with generally fewer resources challenge incumbent firms’ (Hopp et al., 2018, p. 446).” (p. 4)	Traditional movie cinemas

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1911	Mendoza-Tello, J; Mora, H; Pujol-Lopez, F	Disruptive innovation of cryptocurrencies in consumer acceptance and trust	Information Systems and e-Business Management	2019	Platform for cryptocurrency-based transactions	“A disruptive technology disturbs the market with a very different value proposal (Christensen, 1997), changing the industry paradigm and creating a new market for a new product. As such a disruptive innovation, cryptocurrencies change the traditional paradigm to one of establishing trust between unknown entities that wish to effect electronic transactions (Giagliis and Kyriotaki 2014).”	Centralized electronic payment methods
1913	Koukkanen, A; Uusitalo, V; Koistinen, K	A framework of disruptive sustainable innovation: an example of the Finnish food system	Technology Analysis & Strategic Management	2019	Convenience food from waste food materials	“an innovation that is based on disruptive technologies, creating completely new markets and replacing incumbents (Christensen, 1997), is developed outside the coerciveness of the incumbent regime (Geels, 2004).” (p. 4)	Conventional convenience food products
1914	Koh, B; Hann, ICH; Raghunathan, S	Digitization of music: Consumer Adoption amidst piracy, unbundling, and rebundling	MIS Quarterly	2019	Online grocery store with volatile assortment Small-scale, sustainable meat production Community gardening for organic food harvesting Online music streaming service	“The new technology is sometimes disruptive in the sense that it fundamentally redefines the characteristics of the industry or the market (Christensen, 1997). One often-cited example of such a disruptive force in the music industry is the Internet along with digital sound recording formats (e.g., MP3) (Cellan-Jones, 2013). It has fundamentally changed the way music is packaged, distributed to, and consumed by consumers.”	Traditional, full assortment grocery store Industrial food production based on large-scale monocultures Industrial production of vegetables Unbundled, downloadable digital music
					Unbundled, downloadable digital music		Bundled physical music CDs (Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1916	Hongdao, Q; Bibi, S; Khan, A; Ardito, L; Khaskheli, MB	Legal technologies in action: The future of the legal market in light of disruptive innovations	Sustainability	2019	Low-cost legal services based on AI	“These characteristics make the legal industry a suitable candidate for developing disruptive-service innovations [35], in line with Christensen’s definition” (p. 4)	Traditional lawyer consultation model
					Commoditized legal services in self-service		Traditional lawyer consultation model
					Online dispute resolution platform		Traditional court proceedings by judges and lawyers
					Multi-sided platform for legal services		Traditional lawyer consultation model
1917	Garbuio, M; Lin, N	Artificial intelligence as a growth engine for health care startups: Emerging business models	California Management Review	2019	Software-as-a-service for patient management	“Health care executives rate AI as the most disruptive technology within the industry, while consumers worldwide are open to receiving AI-enabled health care solutions.”	On-premise software solutions (without broad data access)
					Platform-as-a-service for health record management		On-premise software solutions (without broad data access)
					Specialized diagnostics based on AI		Traditional face-to-face diagnostics through medical experts
					Patient assistance for preliminary self-diagnosis based on AI		Traditional face-to-face doctor’s visit
					Smart disease prevention solution based on AI		Face-to-face consultation with clinicians
					Digital patient record based on aggregating data sources		Conventional silo analysis of available data
					Data sharing platform for clinicians and patients		Individual and protected collection and analysis of health data

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1918	D'Ippolito, B; Petruzzelli, A; Panniello, U	Archetypes of incumbents' strategic responses to digital innovation	Journal of Intellectual Capital	2019	<p>Patient management based on connected devices and data</p> <p>Platform matching patients with health care practitioners</p> <p>Healthcare platform matching patients and care teams</p> <p>Online video streaming service</p>	<p>"These impacts are particularly relevant when referring to firms' business models, in particular on how incumbents have struggled to innovate their business model to react to the disruption triggered by DTs."</p>	<p>Face-to-face patient management based on individual information</p> <p>Manual channeling of patients to healthcare providers</p> <p>Traditional patient care without data analytics</p> <p>Conventional movie rental (delivered via mail)</p>
1922	Tait, J; Wield, D	Policy support for disruptive innovation in the life sciences	Technology Analysis & Strategic Management	2019	<p>Provision of cloud computing applications</p> <p>Open app developer platform</p> <p>Smart TV's combining internet and broadcasting</p> <p>Online writing assistant</p> <p>Synthetic biology and gene editing platform</p>	<p>"Theory of Disruptive Innovation, Clayton Christensen, has described it as starting from two market-related footholds: (i) low end footholds which exist because incumbents try to provide their most demanding customers with ever-improving products, opening the door to disrupters with a 'good enough' product to satisfy low-end customers; and (ii) new-market footholds where disrupters find a way to turn non-consumers into consumers (Christensen et al., 2015)." (p. 4)</p>	<p>Utilizing on-premise computing power</p> <p>Traditional software deployment options (e.g., proprietary development)</p> <p>Individual devices for particular use case (i.e., TV, Internet devices)</p> <p>Traditional human lexicographers</p> <p>Large-scale specialty chemicals manufacturing</p>

(Continues)

Table 3. (Continued)

ID	Authors	Title	Journal	Publication year	Disruptive business model	Quote for DI understanding	Sustaining business models
1923	Skok, W; Baker, S	Evaluating the impact of Uber on London's taxi service: A critical review of the literature	Knowledge and Process Management	2019	Platform for ride sharing	"The seminal work (Christensen, 1997) describes disruption theory as a smaller company with less resources being able to challenge larger, incumbent organisations."	Conventional taxi hailing
1924	De Paula, IC; De Campos, EARD; Pagani, RN; Guarnieri, P; Kavani, MA	Are collaboration and trust sources for innovation in the reverse logistics? Insights from a systematic literature review	Supply Chain Management: An International Journal	2019	Recapturing value through cross-supply chain collaboration	"disruptive business models may arise from the opportunity for third-party service providers, to develop repair and refurbishing firms, renovation, reprocessing, cannibalization/harvesting or recycling services"	Linear supply chain model, without reverse processes

patients with clinicians according to specific treatment needs.

Matchmaking models were found to enable value propositions of short-term transactions, which have relatively low costs compared to existing alternatives. Therefore, when matchmakers enable transactions between users and resource owners, 'an agent or broker quickly connects those that possess a resource, such as a car or a room, with those that need it' [1706_M082].

Furthermore, matchmaking models could be characterized by joint resource use among users and 'focus on access and services that utilize the resources of others' [1706_M093], which means that it is not a single company that owns resources and provides services to a base of users. In fact, the users of matchmaking models own the required resources and share them according to the individual needs of the matched peers. Thereby, 'companies involved in the sharing economy act as avenues ("labor brokers") that connect people in need of certain services with sellers of those services' [1706_M077]. To make this happen and create trust among its users, matchmakers frequently implement a social rating system. Thereby,

[matchmakers] rely on user-based rating systems for quality control, ensuring a level of trust between consumers and service providers who have not previously met. [1704_M061]

Moreover, efficient processes are essential within the value creation logic of these business models and pave the way for relatively low-cost transactions. Consequently, matchmakers create automated processes to match market sides.

Given the flexibility of transaction-based value creation, value capture mechanisms are also flexible. As such, the use of underlying technologies allows the automation of transactions and ensures low operational costs. This is particularly important as matchmaking models generate relatively lower margins per transaction. Therefore, matchmaking models are subscription-based or charge a fee per transaction, which is sometimes linked to the result of a particular transaction. In fact, companies operate on a variable costs structure, resulting in flexible revenue streams. Subsequently, users benefit from relatively low upfront investments and high convenience, which supports acceptance in lower tiers of the market. Furthermore, matchmakers are not involved in the actual value creation. The service provision is performed among the matched peers. Matchmakers are technically not involved in the transaction themselves.

From the user perspective, this disintermediation can be evaluated as beneficial because customers

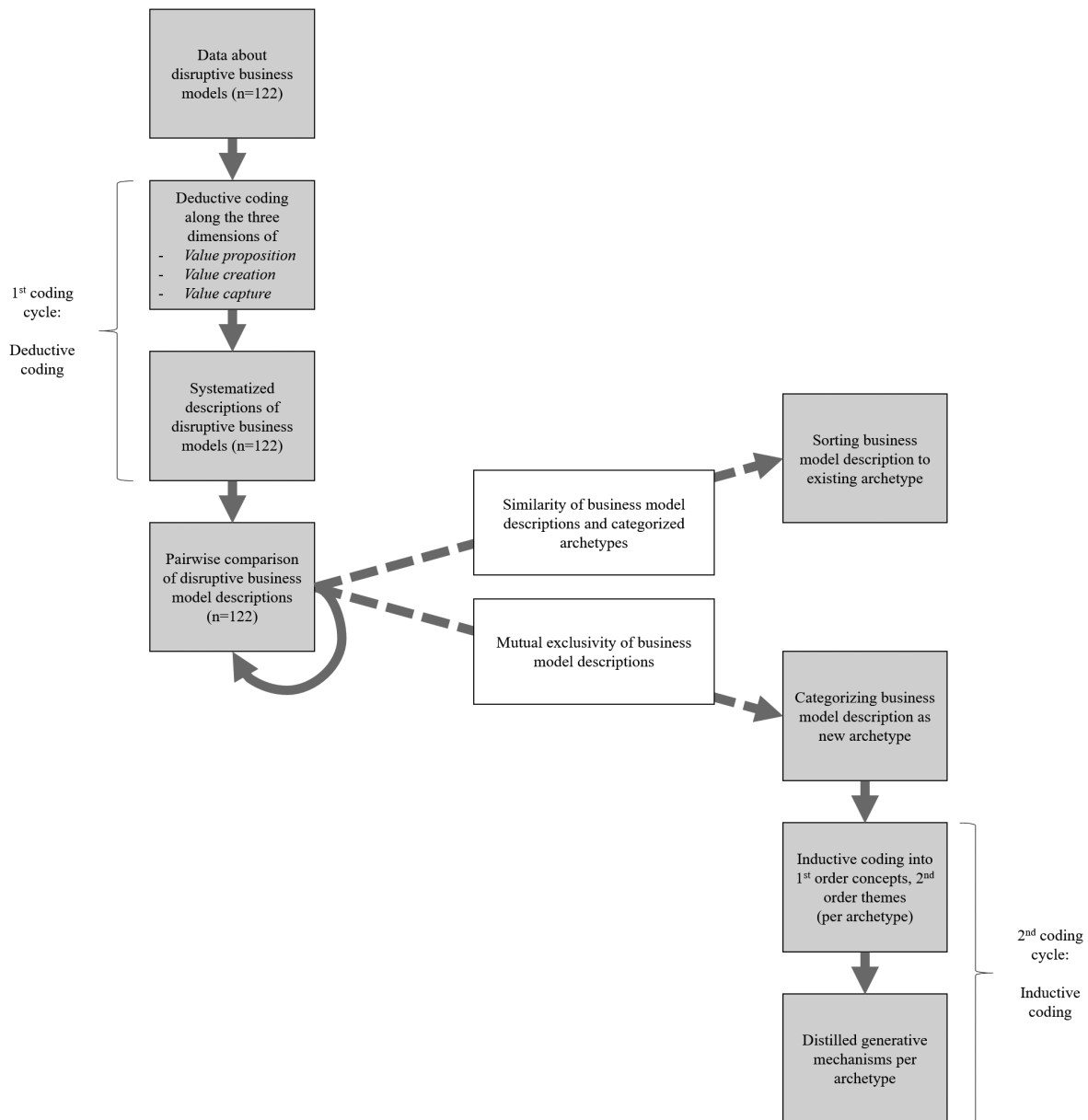


Figure 3. Coding cycles and classification procedure.

perceive a higher value compared to models with intermediaries. Regarding value capture, users no longer pay surcharges for having intermediaries in the process. Users of matchmaking models ‘only’ pay a transaction fee for the matchmaking:

Enabling direct trading between investors provides better value for our clients as it reduces their commission costs considerably and, just as importantly, they feel that they are not paying unnecessarily for the services of an intermediary. [1304_M031]

Matchmakers can be considered as a *facilitator* between the involved users while aligning demand with supply. Thereby, the over- or underserving of

customers is avoided and ‘fewer products are needed when one can pay a fee and have access to cars, clothing, lodging, or tools.’ [1706_M089] Hence, in comparison to owning resources, matchmakers facilitate the exploitation of existing resources through sharing them among a user base. By connecting peers from similar locations, matchmakers frequently benefit from shorter distribution channels, which makes their models relatively efficient.

Ultimately, matchmaking models ‘can be thought of as a vertical disintegration where activities are unbundled’ [1808_M123], which allows for more flexible and nuanced services that better fit user demand. The combination of the efficient exploitation

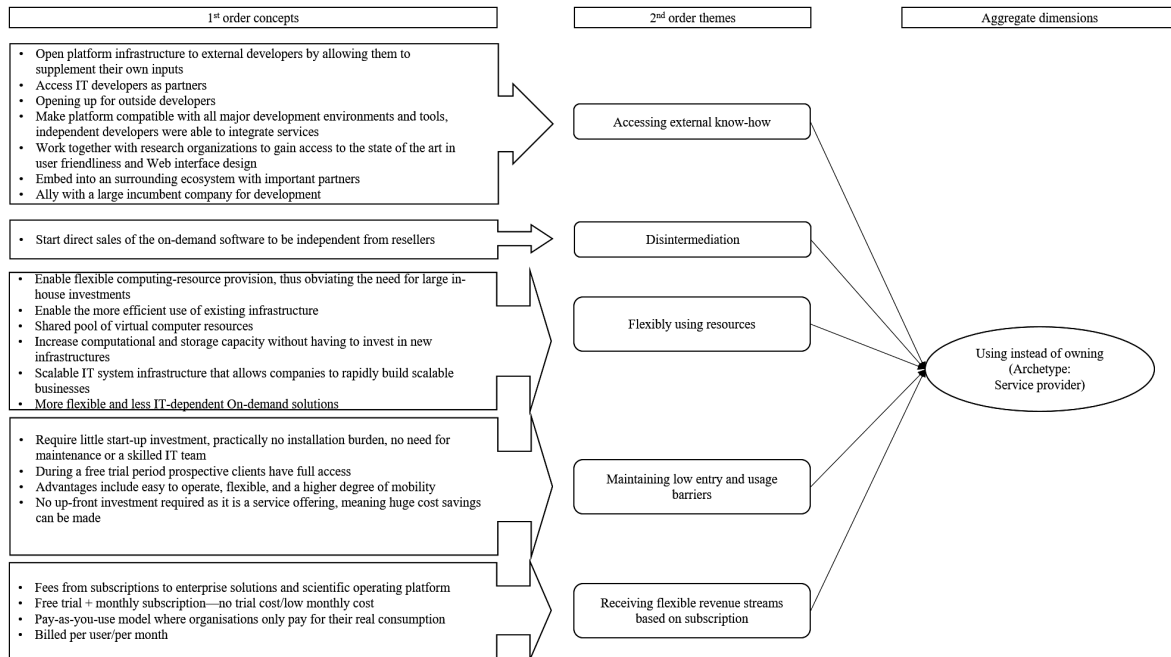


Figure 4. Part of the data structure.

of overall resource bases and the disintegration of value creation activities enables matchmaker models to approach low-end customers.

4.3. Standardizers

Standardizers offer customized value propositions based on modularized value creation. Exemplary business models include the delivery of commoditized legal services via digital channels or standardized digital healthcare solutions.

Core to standardizers is the reduction of complexity in value propositions. By making the value propositions easy to understand, standardizers can offer scaled-down solutions to hitherto unaddressed customer segments. Indeed, for small-scale insurances and financial services, *‘the success [...] is based on the significant reduction of the complexity of the product’* [1204_S034]. Furthermore, the reduction of performance leads to relatively lower access and usage barriers for (potential) customers. Thereby, standardizers achieve a reasonable market acceptance, especially in the lower tiers of the market. For standardized life insurances, the reduction of complexity leads to a *‘purchasing decision [of] low-risk and low-involvement, even for a low-income customer’* [1601_S089]. Consequently, standardizers frequently target small, price-sensitive customers.

Because standardizers frequently build on existing digital technologies, it is possible to establish

relatively cost-efficient direct customer relationships. For instance, for micro-credits, *‘pushing direct marketing messages to target these customers, and thus, enhancing a harmonious relationship with customers’* [1803_S114] was identified. Targeting customers via a digital channel makes hitherto dominant intermediaries in value networks redundant, which in turn positively affects the cost effectiveness.

Regarding value creation, standardizers predominantly focus on efficiency. Thus, the automation of value creation activities is key to realize relatively slim cost structures. The deployment of suitable technologies such as robo-advisors (e.g., financial services), internet platforms (e.g., digital insurances), or artificial intelligence (e.g., digital healthcare services) is relevant, too. Consequently, the value creation logic of standardizers follows a *‘highly industrialized approach’* [1509_S073] based on rules and norms, resulting in faster completion of value creation activities.

This automation focus allows standardizers to increasingly integrate customers into value creation activities, which has two benefits. First, customer integration allows lowering operation costs because part of the service is outsourced to the customer (usually free of charge). Second, customers can better steer the actual creation of value when integrated in the process. In fact, *‘manufacturers [engage] consumers in a way that they can co-create products and re-configure production supply chains’*

[1604_S101] to meet particular customer requirements. Consequently, customers' experiences with standardizers positively increase.

Furthermore, the modularization of value creation processes is a key theme for standardizers. This modularization allows customers to efficiently select from a 'wider choice of [additional] incremental features' [1509_S075]. Standardizers 'chunk down' [1401_S044] information (i.e., bite-sized or modular pieces), enabling customers to branch out. Business models for the production of physical goods rely on 'semi-finished inventory' [1604_S094], which enables a standardized customization of the final value proposition delivered to the customer.

In line with the focus on value creation automation and value proposition standardization, the value capture mechanisms of standardizers are flexibly designed. Revenue streams are generated either on a per-transaction-basis (i.e., 'every dollar spent by the company [is] linked to marginal revenue' [1601_S090]) or are based on an automated individual calculation.

4.4. Service providers

In contrast to delivering a value proposition via the sale of goods, the actual use of products and services is the core of service providers. The majority of identified business models are software-as-service solutions that challenge on-premise alternatives. Very short-term car rental models are another example, as users flexibly benefit from the service but never own value creation assets (i.e., automobiles) to realize value creation independently.

Essential to this archetype is the flexible use of resources. Whereas conventional business models are often based on the sale of goods, service providers design a value proposition that allows customers to make use of the companies' resources. In cloud computing, such a mechanism 'enables flexible computing-resource provision, thus obviating the need for large investments in in-house servers' [701_U004].

Use based-models realize value creation through standardized processes so that the basic value propositions are uniform. Nevertheless, the value creation logic of these models allows adaptation according to specific customer needs. Hence, use based-models frequently build upon collaboration and partnerships with externals. These external knowledge providers can flexibly build upon available value creation logic for further development. Thereby, service providers can overcome limited internal capabilities and develop and grow the technology side of value creation. For the

technology platform of the CRM solution Salesforce, this collaboration is realized as follows:

By making Force.com compatible with all major development environments and tools (i.e., NET, Java, PHP, Ruby on Rails, among others), independent developers (i.e., those outside Salesforce.com) were able to integrate services ranging from simple email to Facebook and Twitter within the platform. [1303_U033]

Hence, customers benefit from a relatively flexible value proposition that better fits their individual needs and preferences. Customers can relatively flexibly up- and downscale their usage behaviors. In addition, service providers more efficiently exploit existing infrastructure. For grid computing, this 'enables the more efficient use of existing computing infrastructure' [701_U007].

The flexibility is reflected in the value capture logic, which is based on flexible revenue streams. Customers 'only pay for their real consumption' [1303_U024]. Hence, value capture follows a pay-per-use logic, realized through subscription fees (i.e., customers are 'billed per user/per month' [1303_U030]).

This flexibility gives customers the freedom to quit easily, making use based-models attractive in uncertain or volatile environments. Customers can, for instance, benefit from 'practically no installation burdens, no need for maintenance or a skilled IT team, no requirement to purchase additional hardware' [1303_U026]. Customers require less specific knowledge, allowing them to benefit from the value proposition ad hoc.

Our analysis suggests that relatively non-technology-savvy customers are likely to prefer this model. These customers are more interested in the outcome of the value proposition than in the underlying technological functionalities. For software-as-a-service solutions, this means:

The traditional buyers of software products were being replaced with non-experts. Thus, preferences changed from comprehensive on-premises solutions to more flexible and less IT-dependent on-demand solutions. [1504_U094]

Furthermore, a free trial period is frequently included, which eases customers' first access by lowering entry barriers. This is particularly relevant for first-time customers having relatively little (technological) experience with the offered value proposition. This can be illustrated by referring to Salesforce:

During the trial period, prospective clients have full access to the Salesforce.com suite of products and user support. [1303_U034]

This free trial period attracts customers because they are not confronted with considerable entry barriers, as is the case with purchasable value propositions (i.e., entry barriers through high upfront investments).

Finally, use based-models deliver the value proposition directly to the customer. This disintermediation circumvents additional players in the value chain, which enables capturing a larger share of the created value. Direct sales make service providers more independent from resellers, thereby increasing flexibility in strategic development and margin calculations. Thus, use based-models offer value propositions to be used by customers according to their specific demands.

4.5. Open collaborators

Collaboration models focus on opening a business model to facilitate access to and for externals (e.g., customers, suppliers, incumbents, media) instead of internalizing knowledge and capabilities. Thereby, collaboration-based business models are dependent on externals for realizing value proposition, value creation, and value capture. Examples are co-creation models for journalistic content or a focused partnering with stakeholders already embedded in low-end target market to launch and grow offerings in base-of-pyramid (BoP) markets.

Collaboration models frequently target the lowest end of the market. Value propositions of these business models are designed to *'target base-of-the-pyramid customers and improve their lives through innovative solutions and inclusive business models'* [1202_C016]. Target customers are those who cannot afford already existing solutions. Hence, collaboration models target non-customers rather than overserved ones. New market segments are addressed, increasing the 'economic pie' and allowing more people to benefit from a certain value proposition. Subsequently:

market development at the base of the pyramid creates an opportunity to enhance the economic situation of deprived people on one hand and to expand the consumer market of companies on the other hand. [1202_C018]

Furthermore, access to external knowledge is a fundamental element in value creation. Digital technologies favor the emergence of externalities and give *'opportunities to create value by massively exploiting external knowledge'* [1805_C142].

Thereby, a certain share of value creation activities is performed outside the company. Customers can perform particular activities through self-service

mechanisms. This increases flexibility on the customer side (e.g., when to use/access the value proposition), whilst reducing related costs and creating relatively low-cost alternatives. Here, participatory journalism can be taken as an example, when companies *'mix [...] many bottom-up bloggers' contributions and less top-down journalistic content'* [1805_C143]. Thus, value is created by orchestrating external sources of knowledge rather than using internal capabilities. Consequently, collaboration models offer value propositions that democratize centralized offerings, enabling more people to actively benefit from a certain value proposition.

Collaboration models also attract (financial) resources from unaffected externals. The financial investors or governmental institutions, not directly affected by the market impact of the disruptive business models, provide resources, thereby nurturing value creation activities. Moreover, collaboration models aid partnering with incumbents to get access to relevant infrastructure or customers. For Voice-over-IP business models, *'by far the most influential of actors [...] are the [incumbent] cellular network providers'* [1602_C095]. Especially in systemic industries with complex (technological) infrastructure, collaboration business models rely on cooperation with infrastructure providers for value creation and value proposition delivery. Furthermore, companies do *'not sell directly to end users [but] work together with many different partners, who integrate systems, act as distributors'* [1701_C107]. The interplay between companies with collaboration models and their incumbent counterparts is a crucial aspect of understanding the development and growth of these models.

Allying with embedded partners represents another approach of collaboration models. These business models follow *'bottom-up approaches'* [1202_C004] to create value in collaboration with partners already embedded in the market. Value creation activities are more closely connected to the specific needs of customers (e.g., regional communities), which potentially increases the market acceptance of the value propositions. Subsequently, open collaborators harness the knowledge and expertise (e.g., regional, social specificities of the target market) of their partners to design value creation activities more adequately. For instance, open collaborators use:

Co-creation with the BoP to tailor distribution and commercialization to community needs [as] part of [their] regular value-chain. [1601_C076]

This close interaction with embedded partners also affects the value capture dimension. Hence,

collaboration models remunerate their partners based on a flexible cost structure (e.g., realized on a commission basis). Additionally, the generated revenue streams are shared among the involved partners. Hence, the collaboration model is based on jointly generating and capturing value in an interplay with externals.

4.6. Performance reducers

Business models that focus on the reduction of performance varieties realize good enough value propositions. These are designed without frills and are attractive for new or hitherto unreached customer segments. Examples include low-cost airlines or portable medical devices with limited features.

A key aspect of these no-frill models is the drastic reduction of performance variety related to value propositions to attract low-end customers and realize relatively lower prices. Value propositions focus on the core offering, thereby reducing additional services through simplification. For low-cost carriers, this implies, for example, *'no frequent flyer programs, limitations to the served routes/destinations'* [1510_R140]. Performance reducers realize the fundamental form of low-end disruptive innovations. For instance, the *'angioplasty catheter [...] replaced the need for open-heart surgery to treat moderate cardiac disease'* [1102_R045]. Thus, even complex value propositions are scaled down to an absolute minimum, which allows targeting fringe customers.

Performance reducers deliver their value propositions directly to customers, thereby eliminating intermediaries and distributors. Through standardized processes, performance reducers are able to build direct and efficient customer relationships based on *'web-based discount channel[s]'* [1102_R050]. Because of the reduction of performance variety and automation of value delivery, customers benefit from relatively low access and use barriers, which propels the adoption of these disruptive value propositions.

To succeed *'in aggressively pursuing manufacturing efficiencies'* [1102_R057], performance reducers design value creation along the automation of activities. This allows for high transaction throughputs. Value creation processes are built on existing technological bases rather than radical technologies. Moreover, available resources are well exploited. For low-cost carriers, this can be illustrated by referring to *'fast-turn-arounds and a maximization of flying time'* [1510_R146]. Relative to expensive mainstream business models, performance reducers transfer their value proposition to the digital world

in a just good enough manner, thereby reducing costs significantly.

Ultimately, performance reducers flexibilize their value capture mechanisms, focusing on the reduction of fixed costs. Non-core value creation processes for the business models are outsourced to externals. Therefore, performance reducers are able to concentrate on core activities, whilst keeping a *'low overhead to accommodate lower margins'* [801_R005], which is typical for no-frill value propositions.

5. Discussion and contributions

We started this paper by asking which archetypes of business models underlie disruptive innovation. Based on the qualitative content analysis of 122 systematically retrieved disruptive business models, we identified five typical business models ('archetypes').

We discuss how the classified archetypes a) are inducing disruptive dynamics, and b) are constituting paths towards disruption.

5.1. Archetypes as inducers of disruptive dynamics

We abstract from the complexity inherent in disruptive innovation and develop an understanding of the inducing forces of disruptive dynamics (Kumaraswamy et al., 2018). While there are studies on how particular business models evolve over time (e.g., Cozzolino et al., 2018; Snihur et al., 2018), the literature still lacks a consolidation of these findings (Hopp et al., 2018). Christensen et al. (2018) conclude that business models underlying disruptive innovation have only been *'tentatively specified.'* We join the ongoing debate by identifying five archetypes inducing disruptive dynamics.

First, *matchmakers* offer platforms and act as agents of labor and assets, allowing small-scale transactions amongst peers. Whereas previous discussions have highlighted the relevance of platform models for disruptive innovations, the inherent zero marginal cost structure is particularly supportive for realizing big-bang disruption models and target fringe customers (Hopp et al., 2018; Trabucchi et al., 2019). Matchmaking platforms are better connectors of demand and supply than established businesses (Van Alstyne et al., 2016). Additionally, platforms enable leveraging network effects, thus accelerating business growth (Katz and Shapiro, 1985). Our analysis shows that the risk of *matchmakers* in overserving customer segments is considerably lower compared to traditional unidirectional

customer relationships. Hence, flexibility allows *matchmakers* to synchronously match demand and supply. This matching is realized individually, on a per-transaction basis, ultimately increasing the relevance of individual transactions for the involved stakeholders. Consequently, *matchmakers* gradually grow their model along the disruptive trajectory. *Matchmakers* exploit existing assets and do not ask for high upfront investments, thereby allowing more people to make use of a particular offering compared to established 'ownership' models. This flexible and individualized matching of supply and demand fuels disruptive dynamics.

Second, *standardizers* focus on the efficient design of value creation, focusing on transaction standardization while also customizing value propositions. Our findings show how the modularization of value creation activities allows standardizers to simultaneously serve multiple customer demands. In fact, standardizers generate enhanced customer experience because the performance attributes of value propositions can be designed according to specific customer demands while keeping the value creation logic lean and highly efficient. Consequently, standardizers significantly reduce the costs of their offering while offering a higher level of customer experience. Technology integration (e.g., 3D-printing technologies) can continuously integrate customer feedback into the value creation logic. This industrialized customization results in relative efficiency compared to established business models and allows for the quick and flexible scaling up along the disruptive trajectory.

Third, *service providers* offer value propositions that can be used by customers for a limited time. Customers can complete a particular job-to-be-done without accessing the required physical assets. We complement argumentations on how business models make services more convenient and cheaper to access compared to established models (Govindarajan and Kopalle, 2006), as use based-models provide quick access to a technological service. Combined with relatively low initial investments, entry hurdles are considerably limited compared to asset-intensive alternatives. Moreover, use based-models usually start with a standardized basic functionality. Service providers actively target customer segments overserved by more advanced alternatives. Thereby, service providers have relatively little risk to overserve (potential) customers in the early stages of the disruptive innovation process. Furthermore, financial burdens are lowered, which makes the access to the offering more flexible. No (little) upfront investments combined with relatively low subscription fees make cost streams plannable for customers. In turn,

customers can use the value proposition only for the period of time they need that particular service.

Fourth, *open collaborators* open their business model to external knowledge and assets. By proposing this archetype, we relate to Ansari et al. (2016), who focus on how disruptors in systemic industries need to access complementary assets. Their study shows how incumbents ultimately included the potential disruptor's technology in the sustaining business model, thereby eliminating disruptive dynamics. Moreover, Snihur et al. (2018) discuss how a back-end platform was opened up to externals to further develop the value creation with external IT capabilities, and ultimately disrupting an established competitor. Against this background, open collaborators is a complex archetype because it involves the strategic management of a multitude of interfaces with externals. Open collaborators need to possess adequate capabilities, which allows them to strategically drive the business model in collaboration with externals while also following the disruptive trajectory.

Nevertheless, collaboration models offer the opportunity to access external knowledge and complementary assets, ultimately realizing value creation activities and overcoming internal limitations. Moreover, collaboration models enable co-creation with stakeholders and potential customers to better fit needs, thereby avoiding potential overshooting such as when customers' demands are not fed back into value creation. The integration of customers and stakeholders allows value creation activities to be externalized. In turn, value can be captured more efficiently and the corresponding costs can be lowered.

Finally, *performance reducers* focus on no-frills value propositions. The concept of low-end disruptive innovations has been core to many scholarly discussions (Bower and Christensen, 1995; Govindarajan and Kopalle, 2006). Performance reducers target low-end, price-sensitive customers consistently using just good enough value propositions compared to the hitherto available alternatives. Efficiency-oriented mechanisms that result in low operational costs lead to relatively lower per-transaction margins compared with sustaining alternatives. These relatively slim margins allow targeting low-profit customer segments to gain a foothold in a low-end market niche. Moreover, performance reducers can realize both relatively low operational costs and customized value propositions. In sum, performance reducers can enter the market from the bottom by considerably lowering access and usage barriers, which constitutes a promising starting position to induce disruptive dynamics. Consequently, we confirm the characteristics of no-frill disruptive business models

Table 4. Overview of archetypes and main characteristics

	Value proposition	Value creation	Value capture	Disruptive mechanisms
Matchmakers	<ul style="list-style-type: none"> • Agent or broker connecting those that possess a resource (e.g., car, room) with those that need it • Enabling short-term and relatively low-cost transactions • Customers benefitting from relatively low upfront investments and high convenience 	<ul style="list-style-type: none"> • Installing automated processes to efficiently connect market sides • Disintegrating and unbundling activities to allow for flexible and more nuanced services • Frequently implementing a social rating system to create trust among users 	<ul style="list-style-type: none"> • Automating transactions and ensuring low operational costs • Operating on a variable cost structure, which results in flexible revenue streams • Generating relatively lower margins per transaction based on, for example, subscription logics 	<ul style="list-style-type: none"> • Realizing relatively lower prices: exploiting resources through an optimized and automated supply-demand matching • Gaining foothold in low-end markets: reducing uncertainty for customers through social rating • Gaining foothold in low-end markets: reducing the need for upfront investments • Avoiding over- or underserving of customers: individually creating value through matched market sides
Standardizers	<ul style="list-style-type: none"> • Reducing the complexity of offerings • Scaling down solutions to address new customer segments • Establishing direct customer relationships through digital technologies 	<ul style="list-style-type: none"> • Following a highly industrialized and automated approach based on rules and norms to allow for quick completion of transactions • Integrating customers for a) outsourcing parts of value creation and b) facilitating customers to steer value creation according to individual needs • Modularizing value creation activities to allow customers selecting from a wide choice of incremental features 	<ul style="list-style-type: none"> • Designing flexible value capture mechanisms • Generating revenue streams on a per-transaction basis • Following marginal cost structure, that is, making marginal costs dependent on marginal revenue 	<ul style="list-style-type: none"> • Gaining foothold in low-end markets: reducing the complexity of value propositions through modularization • Realizing relatively lower prices: automating value creation processes • Continuously improving the business model's performance: integrating customers in the value creation • Gaining foothold in low-end markets: designing a "pay per transaction"-value capture logic
Service providers	<ul style="list-style-type: none"> • Offering a service (not selling an actual product or asset) • Allowing customers to make use of the companies' resources and capabilities, thereby obviating the need for large investments and specific (technological) knowledge • Allowing customers to relatively flexibly up- and down-scale their usage behaviors 	<ul style="list-style-type: none"> • Creating value through standardized processes leads to likewise uniform basic configurations of value propositions • Building on collaboration with externals to adapt standardized value creation to specific customer needs and offer specific variations of the value proposition • More efficiently exploiting already existing (technological) infrastructure when creating value 	<ul style="list-style-type: none"> • Flexibilizing revenue streams, that is, allowing customers to only pay for their real consumption • Providing customers the freedom to quit easily, making it attractive for them in uncertain environments • Circumventing additional intermediaries in the value chain enables to capture a larger share of created value 	<ul style="list-style-type: none"> • Gaining foothold in low-end markets: offering flexible services instead of (high) investment assets • Continuous improvement of business model's performance: collaborating with externals to overcome limitations in value creation • Attracting price-sensitive customers: offering services, which can be individually up- or down-scaled • Gaining foothold in low-end market: offering flexible termination options and/or free trials to reduce uncertainty

(Continues)

Table 4. (Continued)

	Value proposition	Value creation	Value capture	Disruptive mechanisms
Open collaborators	<ul style="list-style-type: none"> Democratizing hitherto centralized offerings Opening the business model to facilitate access to and for externals (e.g., customers, suppliers, incumbents, media) Increasing the “economic pie” and allowing more people to benefit from a certain value proposition by addressing predominately non-customers 	<ul style="list-style-type: none"> Accessing and orchestrating external sources of knowledge rather than creating value using internal capabilities Enabling customers to perform particular value creation activities through self-service-mechanisms Relying on cooperation with infrastructure providers for value creation (especially in systemic industries with complex (technological) infrastructure) 	<ul style="list-style-type: none"> Remunerating external partners based on a flexible structure (e.g., commission basis) Sharing generated revenues among the involved partners Lowering costs through collaborating with externals (e.g., outsourcing value creation activities to customers) 	<ul style="list-style-type: none"> Gaining foothold in low-end markets: collaborating with externals who are embedded in target markets for increasing legitimacy Attracting non-customers: democratizing offerings through orchestrating value creation processes performed by externals Realizing relatively lower process: offering self-service value creation processes to reduce costs Continuous improvement of business model’s performance: collaboration with crucial externals, i.e., infrastructure providers
Performance reducers	<ul style="list-style-type: none"> Reducing performance varieties to realize good enough value propositions Simplifying hitherto complex value propositions Building direct and efficient customer relationships based on digital technologies 	<ul style="list-style-type: none"> Automating value creation activities allows for relative high throughputs of transactions Building on available technological bases, rather than bringing about radical new technologies Exploiting available resources for maximizing value creation 	<ul style="list-style-type: none"> Flexibilizing value capture and reducing fixed costs Outsourcing value creation activities non-core to externals, thereby reducing fixed costs Keeping a low overhead to accommodate for relative lower margins 	<ul style="list-style-type: none"> Realizing relatively lower process: offering value propositions with limited performance variety, allowing high throughputs Gaining foothold in low-end market: introducing good enough value propositions with low access and use barriers Targeting price-sensitive customers: designing slim value creation processes and low overhead costs to realize low-margin pricing Continuously attracting mainstream customers: designing cost-efficient and digital customer relationships

while positing that these business models represent “only” one alternative to perform disruptive innovation.

5.2. Archetypes as paths towards disruption

Recent debates discuss the merits of consolidating available research to advance the theory of disruptive innovation (Christensen et al., 2018; Hopp et al., 2018). Research is increasingly diverging, thereby limiting the impact of previous academic achievements (Hopp et al., 2018). Hence, we systematically consolidate waves of disruption in the scientific debates from 2006 to 2019. The proposed archetypes present paths towards disruption and update the accepted criteria of the phenomenon (Govindarajan and Kopalle, 2006).

Departing from the understanding of disruptive innovations as new business models relative to established (i.e., sustaining) ones, we extend the current scientific debates by proposing a classification of disruptive innovations beyond the criterion of just good enough innovations (e.g., Govindarajan and Kopalle, 2006). Specifically, we build on the recent arguments highlighting the contingency related to disruptive innovation (Christensen et al., 2018).

We extend the discussion on ‘business models as models’ (Baden-Fuller and Morgan, 2010) and how business models can be seen as blueprints of how organizations do business (Teece, 2010; Gassmann et al., 2014; Spieth et al., 2014). We complement recent attempts to characterize disruptive business models (Amshoff et al., 2015; Trabucchi et al., 2019) and provide a more complete and robust approach to classifying business models and how the underlying mechanisms spur the disruptiveness of innovation (Spieth et al., 2016; Christensen et al., 2018). We emphasize that the proposed archetypes are a form of abstraction and do not represent a particular business “en detail.”

Although the classification might infer predictability (Klenner et al., 2013), we follow Kumaraswamy et al. (2018) in that disruptive innovation is a performative phenomenon. We present paths towards disruption, and argue that every ‘disruption journey’ is shaped by a complex set of (contextual) factors and multiple actors. Additionally, we agree that disruptive innovation is a phenomenon that evolves over time (Ansari et al., 2016; Petzold et al., 2019). Therefore, we argue that our archetypes contribute by providing orientation frameworks for (potentially) disruptive innovations as the involved actors perform activities and strategic maneuvers contingent on the respective archetype. While we strengthen the

argument on the relativity of disruption (Christensen et al., 2018), there is the need to investigate the relationships between disruptors and incumbents (and even other actors beyond this dyadic setting) to better grasp the complexity of the evolving business model of a particular archetype.

6. Conclusions, implications, and limitations

We are joining debates, which argue that disruptive innovation is a question of competitive positioning rather than a matter of technological innovation. We propose typical business models (‘archetypes’) of disruptive innovation, which are summarized in Table 4. From a theoretical perspective, we make a twofold contribution.

First, the identification of five archetypes contributes to further understanding the inducers of disruptive innovation. Our consolidation of academic findings present a suitable means to learn from previous waves of disruption (Hopp et al., 2018), while developing the theory of disruption. Second, we extend the scientific debate on the criteria-based understanding of disruptive innovation (e.g., Govindarajan and Kopalle, 2006; Hopp et al., 2018). The proposed archetypes present paths towards disruption, thereby underlining the contingency of the phenomenon. We complement the discussion on business models as blueprints in the context of disruption (Amshoff et al., 2015; Trabucchi et al., 2019).

Our findings have implications for the managers of incumbent organizations, as well as entrepreneurs striving to launch their businesses. The proposed archetypes can assist both groups in guiding strategic decisions in the face of disruption. Practitioners may refer to the archetypes when seeking potential paths to commercialize (disruptive) technologies by designing adequate business models. By linking the archetypes to familiar disruptive business model examples, we support the theoretical relevance of the classification and provide reference points for business strategies. From a practitioner’s perspective, the archetypes may be used as guiding principles in performing disruptive innovation instead of predicting the phenomenon (Kumaraswamy et al., 2018); hence, they can help with brainstorming for new business model design or creating response strategies for potentially disruptive dynamics.

This study is not without limitations: it relies on systematically collected data from academic sources, thereby limiting the access to historical data. Our classification needs to be revisited

on a continuous basis, especially because current debates emphasize an ‘era of continual disruption’ (Kumaraswamy et al., 2018) bringing about new business model archetypes with potentially new inducers. Referring to current debates about widening the concept of disruption (Ritala et al., 2021), future research could include a broader data base. However, we argue that the focal study represents a cornerstone in the discussion. We aimed to reduce the conceptual noise through transparently constructing a data base, which is anchored in the Christensenian understanding.

Future studies should join debates about the multiple levels of disruption. For instance, longitudinal inter- and intra-industry studies could discuss how far the distilled archetypes enable waves of disruption over time. While we acknowledge Snihur et al.’s (2018) concerns regarding the difficulty of tracking disruptive business models in real time, we encourage scholars in R&D management to accept this challenge and contribute to the performative perspective.

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