

Digital platforms' business models: a literature review and research agenda

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45

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Abstract

Purpose – This article aims to assess the state of the art of research on digital platforms' business models (DPBMs).

Design/methodology/approach – The study follows a grounded theory literature review of 246 studies on the intersection of digital platforms and business models.

Findings – The findings reveal that research in this domain is fragmented across several inter-related fields. Publications are also scattered across a multitude of journals, and many of them do not provide a clear definition of the main concepts used or use different concepts interchangeably. The study synthesized a framework with key themes from the literature. The authors then developed an integrated definition of DPBM. Finally, the authors propose a research agenda to analyzing the alignment between value creation and capture for hybrid DPBM, developing artifacts for hybrid DPBM and studying the unintended consequences of DPBM.

Research limitations/implications – The study presents a comprehensive and updated literature review on DPBMs. Furthermore, using an integrative approach, it develops a definition of DPBM. Finally, it proposes a research agenda for the field. Database choices, as well as inclusion and exclusion criteria, represent a limitation of this study.

Originality/value – This paper highlights a rich body of literature that contributes to understanding of how this research field is organized and proposes an integrative definition of DPBM. Further, it presents avenues for advancing knowledge in this field.

Keywords Literature review, Research agenda, Business model, Social impact

Paper type Literature review

Introduction

Digital platforms are not only reshaping industries but also significantly impacting society (Clausse *et al.*, 2018). The most valuable firms on the planet are indeed digital platforms. Together, Microsoft, Apple, Amazon, Alphabet, Facebook, Alibaba and Tencent represented more than \$10 trillion in market value in late 2021. These companies' success and the rapid development of many new digital platform-based companies such as Airbnb, Netflix and Uber encouraged entrepreneurs, investors and researchers to seek an understanding of how the business models (BM) of the digital platforms are structured.

Digital platforms have been widely studied by scholars in strategy, technology management, information systems, economics, entrepreneurship and innovation management. However, much of the literature is not convergent, and there are significant differences within and across these disciplines in relation to how they define digital platforms, their focus of research, as well as the supporting theories they use (Bonina *et al.*, 2021). The different perspectives and the absence of converged concepts have produced a highly fragmented and imprecise literature (Mallon, 2021).



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Täuscher and Laudien (2018) demonstrated the value of BMs as a unit of analysis for classifying and exploring digital platforms. The authors argue that understanding the BM's core elements makes it easier to transcend differences in terminology. While the literature on digital platforms is vast, including complete literature reviews (e.g., Thomas *et al.*, 2014; Liu *et al.*, 2021), there is a limited body of research focusing on understanding the actual BMs supporting these platforms. Furthermore, an analysis of this research stream reveals that it is fragmented, lacks a strong theoretical underpinning, and, consequently, is not conducive to the systematic development of knowledge.

As a result, this article aims to assess the state of the art of research on DPBMs. To achieve this goal, we followed Wolfswinkel *et al.* (2013) and Suddaby (2010)'s literature review guidelines. Our study offers three main contributions. First, we present a comprehensive and updated literature review on DPBMs. Second, using an integrative approach, we develop a definition of DPBM. Finally, we propose a research agenda for the field.

The remainder of the article is structured as follows. In the next section, we outline the background of platforms and BMs. This is followed by a description of our methodological approach. In the subsequent section, we present the findings to address our research questions. Finally, we highlight our theoretical contributions, practical implications, as well as limitations and areas for future research.

Background and definitions

In order to develop a robust literature review, it is necessary to have clarity on the phenomena being investigated as well as the boundaries of the study (Kitchenham, 2004; Chauhan *et al.*, 2022). Therefore, this section focuses on briefly explaining and defining the extant literature on digital platforms and BMs.

Digital platforms

Digital platform literature has its theoretical foundations in platform and information systems research. Consequently, it reflects two distinct theoretical perspectives: one inspired by economic theory and the other influenced by engineering design (Gawer, 2014). The economic approach goes back to the works of Rochet and Tirole (2003, 2006), which conceptualize platforms as types of markets. Here, "platforms enable interactions between end-users and try to get the two (or multiple) sides on board by appropriately charging each side" (Rochet and Tirole, 2006, p. 245). The two-sided platform provides a common meeting place to facilitate interactions between members of two distinct customer groups. They play an essential role throughout the economy by minimizing transaction costs between entities and creating a mutually beneficial arrangement for the parties involved (Evans and Schmalensee, 2011).

The engineering design approach conceptualizes platforms as modular technological architectures. This research stream has its foundations in innovation, product development and echoes the resource-based logic of advantage creation (Thomas *et al.*, 2014). As a result, it is highly focused on innovation, and it presents a supply-side perspective. Based on this approach, digital platforms are understood as the "extensible codebase of a software-based system that provides core functionality shared by the modules that interoperate with it and the interfaces through which they interoperate" (Tiwana *et al.*, 2010, p. 675).

Because these two perspectives have developed separately, the term digital platform is used in different ways. For example, while De Reuver *et al.* (2018, p. 127) argue that "platforms that merely mediate between different user groups but offer no extensible codebase should not be considered digital platforms in the IS discourse," other researchers consider digital platforms any platform that uses digital technology to mediate two or more user groups (Bonina *et al.*, 2021; Sutherland and Jarrahi, 2018). Furthermore, the different perspectives and distinct units of analysis used across studies restrain the comparability between findings in the literature (De Reuver *et al.*, 2018). Consequently, there is some degree of specificity and idiosyncrasy in this

theme, undermining the coherence and cumulativeness of the results of this research stream (Thomas *et al.*, 2014).

There have been some attempts to propose a more integrated definition of digital platforms – e.g. Gawer (2014) and Baldwin and Woodard (2009). While these studies provide a step toward a more integrated definition of digital platforms by analyzing different research streams, they are still heavily focused on technological aspects and do not consider important economic elements of digital platforms such as intermediation.

A recent article suggests the digital platform ecosystem as a paradigm to integrate these different perspectives on platforms (Hein *et al.*, 2019). This approach applies the product family logic of modularity, standards and product differentiation to a product or service system broader than an internal or supply-chain-level product family. Thus, it incorporates theoretical elements of the economic stream, such as network externalities and market power (Thomas *et al.*, 2014). As a result, in this approach, “a digital platform ecosystem comprises a platform owner that implements governance mechanisms to facilitate value-creating mechanisms on a digital platform between the platform owner and an ecosystem of autonomous complementors and consumers” (Hein *et al.*, 2019, p. 4). However, while this definition emphasizes the creation of value between owners and complementors, this research stream has a gap in how value is captured and distributed for the ecosystem actors (Hein *et al.*, 2019). Due to this gap, we argue that the digital platform construct needs to also contemplate the delivery and value capture dimensions.

Bonina *et al.* (2021) and Cusumano *et al.* (2019) define a digital platform (2019) according to its principal purpose. Thus, there are two main types of digital platforms: innovation platforms and transaction platforms. In the innovation platform, value comes mainly from enabling third parties to build their products or services that utilize and improve the platform. On the other hand, value comes mostly from allowing different sides of a market to interact in the transaction platform. Even though this definition reflects the primary mechanisms for creating value, it does not capture the platforms’ complexity and differences in capture and delivery value mechanisms. Furthermore, the authors analyze platform function at an industry level (or ecosystem). Still, we argue that two-sidedness (or multi-sidedness) is a firm’s decision about its BM, and it is not a feature of markets or industries (Broos and Ramos, 2017). Consequently, we define digital platforms at the organizational level using the business model as a theoretical lens. In the next section, we briefly discuss the BM concept.

Business models

The BMs are commonly understood as a link between future planning (strategy) and their practical implementation (process management) (Wirtz *et al.*, 2016). The concept is essential for any organization since it provides a means to understand, analyze, communicate and manage strategic choices among its stakeholders (Al-Debei and Avison, 2010). There is still a lack of consensus in the literature for a single definition of the term (Al-Debei and Avison, 2010; Foss and Saebi, 2018). One of the most accepted definitions for a BM is proposed by Teece (2010) (Saebi and Foss, 2015; Zott *et al.*, 2011). The author defines a BM as the “design or architecture of the value creation, delivery and capture mechanisms it employs” (Teece, 2010, p. 172).

More recently, adopting an organizational perspective, researchers describe BMs as devices for structuring and designing organizations. BMs are understood as a manifestation of how organizational variables are configured, how the company structures its transactions with external stakeholders and the consequences of those configurations on company performance (Saebi and Foss, 2015). Accordingly, the BM is an activity system performed by the focal firm and third parties (partners, suppliers, customers). As a result, “the firm’s activity system may transcend the focal firm and span its boundaries but will remain firm-centric to enable the focal firm not only to create value with its partners, but also to appropriate a share of the value created itself” (Zott and Amit, 2010, p. 2017). Under this perspective, BMs are defined as “the

content, structure, and governance of transactions within the company and between the company and its external partners that support the company in the creation, delivery, and capture of value” (Saebi and Foss, 2015, p. 204).

Adopting the organizational perspective of the BM, we argue that this is a robust theoretical lens to define and analyze digital platforms. There are three main reasons for our approach. First, the BM encompasses relevant aspects of digital platforms and (Ardolino *et al.*, 2020) allows identifying different organizational choices related to how digital platforms create, deliver and capture value. Second, the concept considers external partners as important actors in creating, delivering and capturing value for organizations. Finally, the BM is used in the digital platform research not only to assess how value is (co)created and captured but also to highlight how value is (co)destroyed or lost (Andreassen *et al.*, 2018; Bivona and Cosenz, 2019). Consequently, understanding the main aspects of the DPBMs contribute to a better knowledge of the complexity of this phenomenon and their different outcomes.

Research design and methods

This article aims to assess the state of research on DPBMs. Specifically, we reviewed the literature at the intersection of the digital platforms and BM with particular attention to five aspects of this research field: (1) characteristics in terms of primary sources, countries, research methodologies and other descriptive data; (2) main frameworks and theoretical foundation; (3) primary definitions; (4) key themes; and most importantly; and (5) the gaps in this field.

For this purpose, we selected an inductive approach to review the literature based on the Grounded Theory Literature-Review Method proposed by Wolfswinkel *et al.* (2013). Therefore, our review unfolded in five stages to (1) define the scope of the review, (2) search the literature, (3) select the final sample, (4) analyze the corpus and (5) present the findings (Wolfswinkel *et al.*, 2013). Our research method is summarized in Figure 1.

In the first stage, our aim was to define the scope of the review. Therefore, we carried out a preliminary literature review, which was critical to fine-tuning the specific objectives for this paper as well as identifying the main keywords, databases and inclusion and exclusion criteria. We found that research on DPBMs is multidisciplinary. Thus, we selected Web of Science

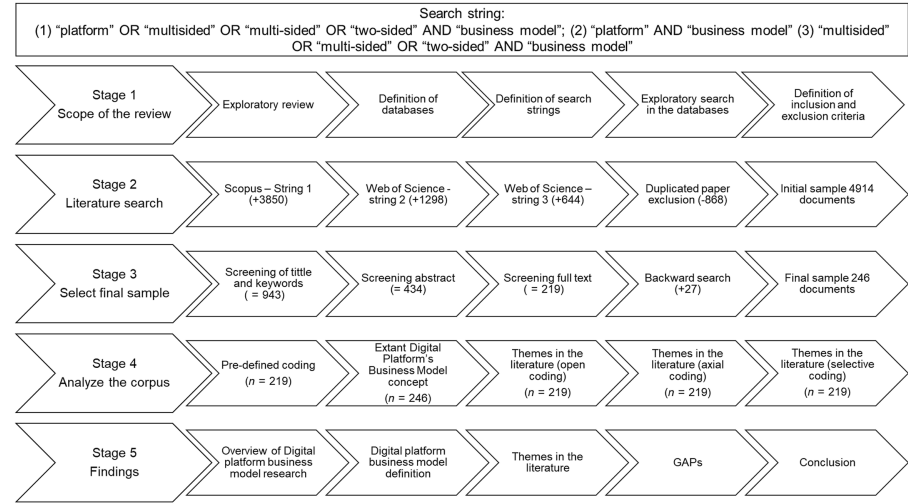


Figure 1. Five-stage literature review process

(WOS) and Scopus databases, which are multidisciplinary and index thousands of journals (Thomas *et al.*, 2014). The search strings (Kitchenham, 2004) were built with the following keywords: platform, multisided, multi-sided, two-sided and BM (Figure 1). After an exploratory search in the databases, we defined primary inclusion and exclusion criteria. The inclusion criteria consist of peer-reviewed articles published in journals and conferences, which were written in English and met the purpose of the review. The option to include conference papers aims to minimize the publication bias, even though, the present review does not include grey literature, such as technical reports, or work in progress (Kitchenham, 2004), as it (usually) does not go through a peer-review process. Finally, following Snelson's (2016) approach, we did not use the impact factor as the justification for limiting the search scope. Instead, we used this information only as a descriptive factor in the literature review. Table 1 synthesizes the inclusion and exclusion criteria.

The literature search stage was conducted in February 2022 and in both databases, the strings were searched in the topic field (Article Title, Abstract and Keywords). The results were filtered by peer-reviewed journals and conference papers published until 2021, which were written in English. As a result, 5,792 documents were identified whose metadata was exported in BibTeX format to Bibliometrix software (Aria and Cuccurullo, 2017). The software automatically excluded 868 duplicated papers, resulting in an initial sample of 4,914 papers for the next stage.

The third stage of our methodology aims to include all relevant studies in the field as well as to avoid the inclusion of documents peripherally related to the research theme. We analyzed the initial sample in four steps. First, we filtered the sample by articles that contained both search terms in the title or keywords. For example, if the paper has the term platform (or two-sided market) in the title and BM in the keywords or vice versa, it was included for analysis in the next step. If only one of the terms is present in the title or the keywords, the article was excluded (943 papers selected). Second, we read abstracts to identify relevant papers for review. Papers included in this step meet at least one of the following inclusion criteria: (1) studying the BM of a firm that uses platforms or (2) studying the BM of digital platforms. At the end of this process, a total of 434 papers were selected.

In the third step, we read the papers' content and, in addition to the inclusion criteria from the previous step, we also analyzed if the platforms being studied are technologically mediated, enable interaction between user groups and allow those user groups to carry out a set of defined tasks (Bonina *et al.*, 2021). We added this inclusion criterion because we identified many studies analyzing traditional BMs of technical platforms (e.g., energy platforms). In this step, we also did a manual inspection to remove additional duplicates that have been submitted in two different conferences or had not been entered into the databases in the same way. For example, the author's name or title might have been entered differently in the databases. We also excluded different document types (e.g., editorials, lecture notes, research in progress and so on) not identified in metadata, leaving a total of 219 selected articles in the sample. Finally, our fourth step is to conduct a backward search (Wolfswinkel *et al.*, 2013) to select the final sample. For this purpose, we used Bibliometrix to extract common citation information within each paper. This process led us to include an additional 27 sources. Although these sources do

Table 1. Primary inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Studying the business model of a firm that uses digital platforms or studying the business model of digital platforms	Grey literature (e.g., lecture notes, book chapter)
Peer-reviewed articles	Duplicated studies
Journal and conferences papers	
Articles are written in English	

not meet our inclusion criteria, they are the primary references to define the platform, multi (two)-sided market and BM, so they were analyzed in the stage of defining the DPBM concept. Our final sample includes a total of 246 articles (see [supplementary material](#)).

In the fourth stage of our methodology, we carried out the corpus analysis. This stage consisted of four steps: (1) pre-defined coding, (2) identification of the main themes in the literature on DPBMs and (3) definition of the concept of DPBMs. In the first step, based on the coding process presented in ([Vial, 2019](#)), we collected several pre-defined, descriptive elements on each paper, which are summarized in [Table 2](#).

During the research themes step, we read individual papers to develop open codes in the first instance ([Saldaña, 2021](#); [Wolfswinkel et al., 2013](#)). The analysis resulted in the development of 62 open codes ([Saldaña, 2021](#); [Wolfswinkel et al., 2013](#)). Next, we analyzed conceptual similarities of the open codes to generate axial codes ([Saldaña, 2021](#); [Wolfswinkel et al., 2013](#)). Consequently, we developed 41 axial codes. Finally, after the iterative analysis of the axial codes, we have identified 11 selective codes ([Saldaña, 2021](#); [Wolfswinkel et al., 2013](#)) as the main themes in the literature on DPBMs.

The third step of corpus analysis was to study extant definitions of the main concepts for this research: platform, BM, platform business model, etc. We used the articles identified in the backward process only in the third step. First, we classified excerpts from articles by coding them as a concept. We analyzed each group of passages separately to identify common elements in the definitions. Based on this analysis, we redefined the concept of the DPBMs based on the following criteria for construct clarity: definitions, scope conditions and relations between constructs ([Suddaby, 2010](#)). The fifth stage of our methodology is to report the findings, which are presented in the next sections.

Findings

The results are organized into three subsections. The first subsection describes an overview of research on DPBMs in terms of primary sources, geographical distribution, research methodology, frameworks and theoretical foundation. The next subsection defines DPBMs. The last subsection explores the most relevant themes discussed by the authors.

Overview of research on digital platforms' business model

Overall, our results indicate that, as an emerging research domain, scholars' attention to DPBMs has significantly increased in the last five years ([Figure 2](#)). It is important to also highlight the high growth of publications in high-impact journals in the same time frame ([Figure 3](#)).

Table 2. Initial coding – pre-defined descriptive elements

Pre-defined descriptive elements
Title of the paper
Author(s)
Publication outlet
Type of publication outlet (research journal, conference proceedings)
Best quartile of Scimago Journal Ranking
Type of paper (empirical, non-empirical)
Context of application (e.g., education, healthcare, financial services)
Theoretical perspective(s)
Business Model Framework
Methods
Sample information (for empirical papers)
Definition if platform business model, if any or any related concept (e.g., platform, business model, multi(two)-sided market)

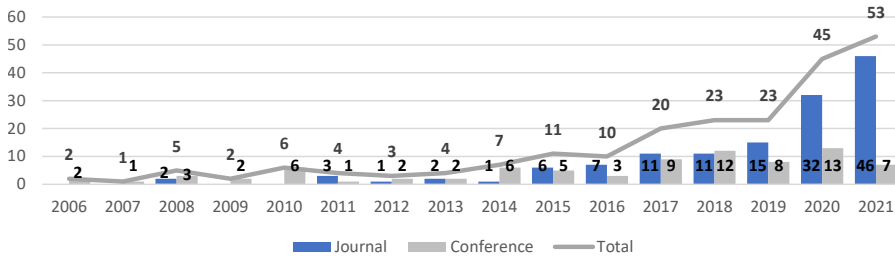


Figure 2. Distribution of selected papers per publication year

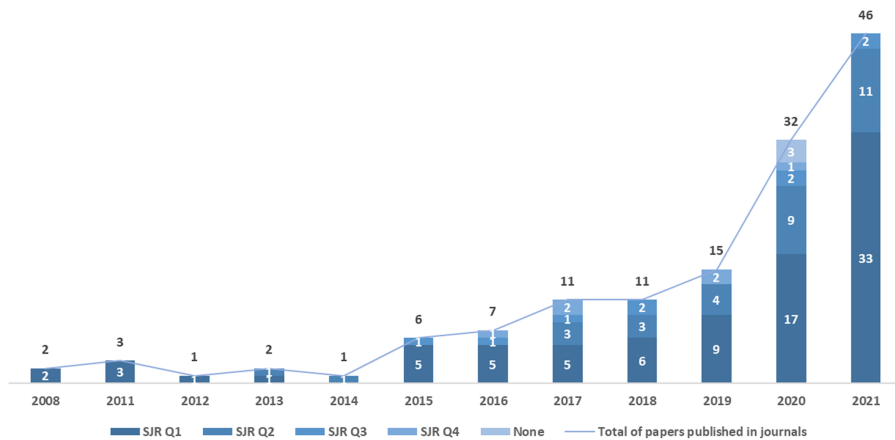


Figure 3. Distribution of journals for JCR quartiles

The articles were published in 163 different outlets, covering a variety of subject fields. This result corroborates the prior findings of the exploratory review, which indicated that the topic of this research is interdisciplinary and fragmented. Table 3 shows the journals with at least three publications in the sample. The top five journals are *Journal of Business Research*, *Journal of Cleaner Production*, *Journal of Service Management*, *Sustainability (Switzerland)* and *Technological Forecasting and Social Change*.

In terms of conferences, the International Conference on Intelligence in Next Generation Networks had the highest representation with six titles, followed by the ACM International Conference Proceeding Series, Americas Conference on Information Systems, European Conference on Information Systems, IEEE International Conference on Engineering, Technology and Innovation, and International Conference on Mobile Business with three titles each. Most of these conferences are categorized in computer science as their subject area.

Table 4 provides an overview of the types of research present in the sample. We considered empirical research, all research based on observation or experience, including primary or secondary data collection. Papers with intuition-based reasoning and academic literature reviews were classified as non-empirical research (Scornavacca *et al.*, 2006). As a result, approximately 73% of our sample is composed of empirical research (159 sources), of which close to 78% (122 sources) are based on case study design. This result may indicate that research related to the DPBM has not yet been consolidated, as discussed by Gomes *et al.* (2018).

Table 3. Most frequent article outlets

	N° of articles	Papers examples
<i>Journal</i>		
<i>Journal of Business Research</i>	4	Chandna and Salimath (2018) , Cuzzolino et al. (2021) , Huotari and Ritala (2021)
<i>Journal of Cleaner Production</i>	4	Guyader and Piscicelli (2019) , Piscicelli et al. (2018) , Grieco et al. (2021)
<i>Journal of Service Management</i>	4	Andreassen et al. (2018) , Fehrer et al. (2018) , Wirtz et al. (2019)
<i>Sustainability (Switzerland)</i>	4	Bocken et al. (2020) , Hu et al. (2019) , Li et al. (2020ab)
<i>Technological Forecasting and Social Change</i>	4	Abbate et al. (2019) , Rong et al. (2018) , Sengupta et al. (2021)
<i>Creativity and Innovation Management</i>	3	Dell'era et al. (2021) , Park et al. (2021) , Presenza et al. (2021)
<i>Industrial Marketing Management</i>	3	Gebauer et al. (2020) , Muzellec et al. (2015) ; Geissinger et al. (2021)
<i>Journal of Business Strategy</i>	3	Kohler and Nickel (2017) , Parmentier and Gandia (2017) , Mancha and Gordon (2021)
<i>Journal of Open Innovation: Technology, Market, and Complexity</i>	3	Ardolino et al. (2020) , Han and Cho (2015) , Kim and Min (2019)
<i>Telecommunications Policy</i>	3	Ballon and Van Heesvelde (2011) , Badran (2021) , Chen and Hu (2008)
<i>Conference</i>		
<i>International Conference on Intelligence in Next Generation Networks</i>	6	Berkers and Roelands (2013)
<i>ACM International Conference Proceeding Series</i>	3	Evens (2010) , Nicaise and Dufoulon (2010)
<i>Americas Conference on Information Systems</i>	3	Liu et al. (2019) , Pouri and Hilty (2020) , Yuan et al. (2021)
<i>European Conference on Information Systems</i>	3	Hahn et al. (2015) , Kuebel and Zarnikow (2014) , Rensmann (2012)
<i>IEEE International Conference on Engineering, Technology and Innovation</i>	3	Andrea et al. (2013)
<i>International Conference on Mobile Business</i>	3	Staykova and Damsgaard (2015) , Rothe et al. (2018)
		Bettoni et al. (2018) , Barni et al. (2018) , Rix et al. (2020)
		Yamakami (2008) , Ballon and Van Bossuyt (2006) , De Reuver et al. (2010)

[Table 5](#) presents the most frequent research contexts. Even though primary context research on digital platforms is focused on the software industry, the sample also shows a significant number of studies on multiple contexts or focused on aspects such as mobility, e-commerce, telecommunications, education or IoT.

[Table 6](#) shows the theoretical perspectives used in the articles. It is important to note that around 25% of the papers do not present a specific conceptual foundation or theory to analyze their phenomenon of interest. Furthermore, some articles use BM or platform literature as a foundation but do not explicitly state their theoretical contribution. Additionally, even though there are different frameworks for the BM, unexpectedly, our study found that 46% of the papers do not use any framework and 21% developed their framework based on extant literature (see [Table 7](#)). However, many of these new frameworks are not validated before their application.

[Table 8](#) provides a summary of articles by the level of analysis. Although surveys and case studies may rely on lower-level units of analysis to collect data (e.g., individuals) ([Wolfswinkel et al., 2013](#)), we report on the level of analysis under investigation. Most

Table 4. Breakdown of articles by types of research

	N° of articles	Papers examples
<i>Empirical research (n = 159)</i>		
Case study	122	Ardolino <i>et al.</i> (2020), Nadir <i>et al.</i> (2020), Wu <i>et al.</i> (2020)
Design Science	13	Andrea <i>et al.</i> (2013), Hmoud <i>et al.</i> (2017), De Reuver <i>et al.</i> (2010)
Survey	6	Dupont <i>et al.</i> (2017), Stoffberg and Bridoux (2019), Chandna and Salimath (2018)
Interviews	6	Oganda <i>et al.</i> (2020), Petrik and Herzwm (2018), Yablonsky (2018)
Focus group	3	Aji <i>et al.</i> (2018), Kutera <i>et al.</i> (2017), Michelini <i>et al.</i> (2020)
Cluster analysis	3	Holland and Gutiérrez-Leefmans (2018), Täuscher and Laudien (2018), Curtis (2021)
Action research	3	Yrjola (2020), Yrjola <i>et al.</i> (2018), Yrjola <i>et al.</i> (2020)
Mixed-Method	2	Grieco <i>et al.</i> (2021), Park <i>et al.</i> (2021)
Secondary data	1	Subramanian <i>et al.</i> (2021)
<i>Non-empirical research (n = 60)</i>		
Conceptual	30	Berkers and Roelands (2013), Bettoni <i>et al.</i> (2018), Fehrer <i>et al.</i> (2018)
Modeling	16	Chen <i>et al.</i> (2016), Li <i>et al.</i> (2020), Nishino <i>et al.</i> (2012)
Literature review	12	Belleflamme and Jacqmin (2016), Dahlan <i>et al.</i> (2018), Hruskova (2017)
Case study	1	Das and Dey (2021)
Essay	1	Demil <i>et al.</i> (2018)

Table 5. Most frequent research contexts

Context (sector or industry)	n	Papers examples
Multiple	33	Ardolino <i>et al.</i> (2020), Staykova and Damsgaard (2015), Yablonsky (2018)
Mobility	20	Berkers and Roelands (2013), Lygnerud and Nilsson (2020), Wu <i>et al.</i> (2020)
E-commerce	12	Chen <i>et al.</i> (2016), Hahn <i>et al.</i> (2015), Holland and Gutiérrez-Leefmans (2018)
Education	8	Belleflamme and Jacqmin (2016), Cornejo-Velazquez <i>et al.</i> (2020), Oganda <i>et al.</i> (2020)
Health	8	Dupont <i>et al.</i> (2017), Itala and Tohonon (2017), Solaimani <i>et al.</i> (2015)
Telecommunications	8	Chen and Hu (2008), Kuebel <i>et al.</i> (2014), Yrjola (2020)
Internet of Things	7	Abbate <i>et al.</i> (2019), Timeus <i>et al.</i> (2020), Petrik and Herzwm (2018)
Software	6	Giessmann and Legner (2016), Liang <i>et al.</i> (2006), Wang <i>et al.</i> (2017)
Tourism	6	Dell'era <i>et al.</i> (2021), Orefice and Nyarko (2020), Pucihar <i>et al.</i> (2015)
Media	10	Ballon and Van Bossuyt (2006), Evens (2010), Jääskeläinen <i>et al.</i> (2021)

articles focus on the platform level ($n = 104$), the industry level ($n = 60$) and the organizational level ($n = 22$). Only in six instances, there was no clear level of analysis identified by the authors (N/A category).

Table 9 provides a breakdown of articles by BM dimensions. We classify as “holistic” the papers that analyze all dimensions of a BM (value capture, value creation, value delivery and governance). Only in seven instances, there were no clear BM dimensions indicated by the authors (N/A category). It is important to notice that approximately 69% of the studies analyze all dimensions of the BM, corroborating our previous statement that this concept contributes to analyzing value creation as well as value capture and delivery.

Table 10 provides a breakdown of articles by platform interaction model. We classified the models into standardized categories: pure B2B, pure B2C, pure C2C and combinations such as B2B; B2C and B2B. Models not fitting these configurations or lacking sufficient detail were excluded from the count. The most frequent model was B2B (76 articles), followed by the

Table 6. Summary of articles by the theoretical perspective

Theoretical perspective	<i>n</i>	Papers examples
N/A	54	Aji et al. (2018) , Andrea et al. (2013) , Hahn et al. (2015)
Business model	46	Holland and Gutiérrez-Leefmans (2018) , Nadir et al. (2020) , Ranerup et al. (2016)
Platform	35	Ardolino et al. (2020) , Belleflamme and Jacqmin (2016) , Gonçalves and Ballon (2011)
Two(multi)-sided market	11	Chen and Hu (2008) , Hmoud et al. (2020) , Wang et al. (2014)
Ecosystem	10	Dupont et al. (2017) , Hoyer and Stanoevska-Slabeva (2009) , Rong et al. (2018)
Sharing economy	10	Hafermalz et al. (2016) , Markendahl et al. (2019) , Wirtz et al. (2019)
Business Model Innovation	6	Gao and Zhao (2016) , Landoni et al. (2020) , Still et al. (2017)
Open Innovation	4	Bettoni et al. (2018) , Daxhammer et al. (2019) , Yun et al. (2017)
Entrepreneurship	4	Baber et al. (2019) , Su et al. (2020) , Trabucchi, Muzellec and Ronteau (2021)
Value theory	3	Andreassen et al. (2018) , Kim (2016) , de Oliveira and Cortimiglia (2017)
Sustainable business model	3	Li et al. (2020a) , Mattila et al. (2020) , Piscicelli et al. (2018)
Strategy	3	Huotari and Ritala (2021) , Jäskeläinen et al. (2021) , Mody et al. (2020)
Sharing Business Model	3	Bocken et al. (2020) , Cui et al. (2020) , Vargas et al. (2020)

Note(s): We only report on theory or conceptual foundations covered by 3 or more papers. Sources may use more than one conceptual foundation

Table 7. Breakdown of articles by the business model framework

Business model framework	<i>n</i>	Papers examples
N/A	101	Belleflamme and Jacqmin (2016) , Gonçalves and Ballon (2011) , Li et al. (2020)
New framework	46	Andrea et al. (2013) , Ardolino et al. (2020) , Wu and Yang (2011)
Canvas	29	Aji et al. (2018) , Bettoni et al. (2018) , Nadir et al. (2020)
Canvas extended	5	Andreassen et al. (2018) , Dupont et al. (2017) , Hafermalz et al. (2016)
V4 BM Framework	4	Hruskova (2017) , Kuebel and Zarnekow (2014) , Ranerup et al. (2016)
Canvases	2	Barni et al. (2018) , Corti et al. (2021)
Platform canvas (Choudary, 2015)	2	Brechtel et al. (2021) , Laine et al. (2017)
MCM Business Model Framework	2	Bucherer and Hoyer (2016) , Hoyer and Stanoevska-Slabeva (2009)

Note(s): When the authors adapt the extant framework, we indicated the category with “extended” (e.g., Canvas extended). We only report on frameworks covered by 2 or more papers

hybrid B2B; B2C (40 articles) and C2C (37 articles). Pure B2C models appeared in 31 studies, while B2B and C2C were less common, with only 12 instances.

Conceptualizing digital platforms’ business model

Definitions. During our literature review, it became evident that many studies use the concepts of (digital) platform, BM or platform BM without explicitly defining them. Many of these studies present only examples of platform BMs, such as eBay, Uber and Facebook, or present some of their characteristics, such as the value creation process or the revenue model. In addition, we were able to observe three interesting aspects of definitions: First, the studies tend

Table 8. Summary of articles by the level of analysis

Level of analysis	<i>n</i>	Papers examples
Platform	104	Ardolino et al. (2020) , Nadir et al. (2020) , Wu et al. (2020)
Industry	60	Andrea et al. (2013) , Hmoud et al. (2017) , De Reuver et al. (2018)
Organizational	22	Dupont et al. (2017) , Stofberg and Bridoux (2019) , Chandna and Salimath (2018)
Ecosystem	17	Oganda et al. (2020) , Petrik and Herzwm (2018) , Yablonsky (2018)
N/A	6	Aji et al. (2018) , Kutera et al. (2017) , Michelini et al. (2020)
Multiple	3	Rothe et al. (2018) , Kohtamäki et al. (2019) , Wirtz et al. (2019)
Product/Service	2	Ranerup et al. (2016) , Gustavsson and Ljungberg (2020)
Country	1	Heeks et al. (2021)

Table 9. Breakdown of articles by business model dimensions

Business model dimension	<i>n</i>	Papers examples
Holistic	150	Ardolino et al. (2020) , Nadir et al. (2020) , Wu et al. (2020)
Value capture	25	De Reuver et al. (2010) , Mancha et al. (2021) , Gonçalves and Ballon (2011)
Value creation	24	Fehrer et al. (2018) , Holland and Gutiérrez-Leefmans (2018) , Hahn et al. (2015)
Value creation and capture	10	Stofberg and Bridoux (2019) , Evens (2010) , Chen et al. (2020)
N/A	7	Demil et al. (2018) , Broos and Ramos (2017) , Cui et al. (2020)
Governance	2	Bocken et al. (2020) , Ballon and Van Heesvelde (2011)
Value capture and governance	1	Yamakami (2008)

Table 10. Summary of articles by main platform interaction

Main platform interaction	<i>n</i>	Papers examples
B2B	76	Andrea et al. (2013) , Holland and Gutiérrez-Leefmans (2018) , Hmoud et al. (2017)
B2B; B2C	40	Hoyer and Stanoevska-Slabeva (2009) , Nishino et al. (2012) , Dell'era et al. (2021)
C2C	37	Nadir et al. (2020) , Wu et al. (2020) , Staykova and Damsgaard (2015)
B2C	31	Nadir et al. (2020) , Wu et al. (2020) , Staykova and Damsgaard (2015)
B2B; C2C	12	Gandia and Parmentier (2017) , Vitkauskaitė and Vaičiukynaitė (2019) , Rothe et al. (2018)
B2C; C2C	11	Comejo-Velazquez et al. (2020) , Münzel et al. (2018) , Bocken et al. (2020)
B2B; B2C; C2C	4	Ardolino et al. (2020) , Aji et al. (2018) , Hahn et al. (2015)
Other	8	De Reuver et al. (2010) , Timeus et al. (2020) Duval and Brasse (2014)

Note(s): We adopt the following definitions for platform interaction models: B2B (business-to-business); B2C (business-to-consumer); and C2C (consumer-to-consumer)

to define digital platforms and BMs separately instead of in a unified manner. Second, as the concepts are defined separately, many platform definitions emphasize only the creation process and do not include the delivery and capture of value, which are relevant elements in the design of the BM. Third, some definitions seem to merge the concept and its impacts into a single entity (performance, competition and profit) – e.g., [Al Debei et al. \(2016\)](#) and [Morris et al. \(2005\)](#).

Based on the common elements identified in the literature, we define digital platforms' BM as a framework that represents the organizational and technological architecture, as well as the content, structure and governance of the activity system of a focal organization that leverages digital technologies to orchestrate and facilitate connections between people, organizations, resources and services within a dynamic digital ecosystem, enabling network effects that enhance value co-creation, delivery and capture.

This definition combines two complementary perspectives: the platform as both an organizational and technological architecture and a framework representing the activity system of the focal firm. This integrated view allows for a more comprehensive understanding of how platforms function as dynamic value-generating systems within digital ecosystems.

From a structural standpoint, the BM encompasses the selection and coordination of key activities (content), the configuration and sequencing of those activities (structure) and the allocation of responsibilities and control mechanisms (governance) (Amit and Zott, 2001; Zott and Amit, 2010, 2017). These components form the foundation of the activity system perspective, which serves as a practical and analytical tool for platform designers, managers and entrepreneurs. As a framework, the BM provides an abstraction of how value is created through digitally mediated interactions, supporting systemic and holistic thinking in BM design.

In the context of digital platforms, this activity system is embedded within a broader technological infrastructure that enables the coordination of people, organizations and resources. It facilitates direct interaction between distinct and interdependent user groups such as consumers, service providers, developers and business partners, generating network effects that reinforce adoption, participation and innovation (Gawer and Cusumano, 2014; Hagi and Wright, 2015; Gandia and Parmentier, 2017).

Governance mechanisms, including platform rules, protocols, APIs and legal or normative standards, are essential to ensure trust, interoperability and value alignment among stakeholders (Barni et al., 2018; Tiwana, 2014). Moreover, the model incorporates scalable monetization strategies, such as transaction fees, subscriptions and commissions, that sustain platform operations and adaptability over time.

Taken together, this integrated perspective on DPBMs advances a multidimensional understanding of how platforms operate, create value and evolve in response to technological and market dynamics. Table 11 synthesizes key components of our DPBM concept.

Scope conditions. Even though the BM transcends organizational boundaries, the focal organization is responsible for designing the system of activities, coordinating the different actors, creating laws, rules and standards and expanding and evolving the ecosystem. In this sense, we defined DPBM at an organizational level. In line with economic theory, we argue that multi-sidedness is a firm's decision about its BM and not a feature of markets or industries (Broos and Ramos, 2017). Lastly, we consider that a BM offers a unit of analysis centered on a single focal organization with broader boundaries, including their ecosystem (Chandna and Salimath, 2018).

Relationships between other constructs. There is reasonable agreement that the BM construct is different from the concepts of product, firm, industry or network (Rong et al., 2018). However, in our literature review, we identified some lack of conceptual clarity among the DPBM construct, business strategy (Holland and Gutiérrez-Leefmans, 2018) and revenue model, which leads to some confusion in the use of the correct terminology (Morris et al., 2005). The BM reflects the strategic choices that have been made (Shafer et al., 2005). It is an expression of the firm's business strategy (Guyader and Piscicelli, 2019). However, a BM is not a strategy (Fehrer et al., 2018); it is a link between strategy and effective implementation (process management) (Wirtz et al., 2016). The definitions of BMs have moved from an economic perspective to the strategic level, but some studies still use a more rudimentary perspective and consider the DPBM solely in terms of the firm's economic model (Morris et al., 2005). These studies use the BM and revenue model interchangeably. From a systematic and holistic perspective, we argue that the BM and the revenue model are different, a revenue

Table 11. Key components of the DPBM

Component	Description	Key references
Activity System Framework	The business model serves as a framework that captures the content (what activities are performed), structure (how they are linked) and governance (who performs them and under what mechanisms)	Amit and Zott (2001, 2010) , Zott and Amit (2010, 2017) , Tiwana et al. (2010)
Organizational and Technological Architecture	The platform is a socio-technical system that integrates people, organizations, processes and digital infrastructure to facilitate scalable and coordinated value creation	Timmers (1998) , Giessmann and Legner (2016) , Gawer and Cusumano (2014)
Value Creation, Delivery and Capture	The complete value cycle: how the platform generates value, delivers it to users and captures it through monetization mechanisms	Teece (2010) , Osterwalder and Pigneur (2014) , Shafer et al. (2005)
Multisided Interactions	The platform enables direct interactions between distinct but interdependent user groups, fostering exchange and reducing transaction costs	Hagiu and Wright (2015) , Fehrer et al. (2018)
Digital Ecosystem and Infrastructure	Platforms connect and coordinate heterogeneous actors (individuals, firms, institutions) through a shared digital infrastructure, fostering innovation and collaboration	Ruggieri et al. (2018) , Rothe et al. (2018) , Asadullah et al. (2018)
Network Effects and Co-Creation	As more users join the platform, its value increases for all participants. These effects can be same-side or cross-side and enhance collaborative value creation	Eisenmann et al. (2009) , Gandia and Parmentier (2017) , Still et al. (2017)
Governance and Standards	Includes participation rules, decision rights, technical protocols (e.g., APIs) and legal norms that govern interactions and ensure alignment across the platform ecosystem	Barni et al. (2018) , Ballon and Van Heesvelde (2011) , Tiwana (2014)
Scalable Monetization Mechanisms	The platform captures value through revenue models that scale with user adoption—such as commissions, data monetization, subscriptions and freemium pricing	Giessmann and Legner (2016) , Fehrer et al. (2018) , Parker et al. (2016)

model complements a BM, and it plays an important role in value appropriation ([Zott and Amit, 2010](#)).

Themes in research on digital platforms' business model. The coding process resulted in 11 DPBM research themes: (1) DPBM design, (2) Business model innovation (BMI) to DPBM, (3) DPBM artefacts, (4) DPBM life cycle, (5) Success and failure factors of DPBM, (6) DPBM outcomes, (7) DPBM external stakeholders, (8) DPBM antecedents, (9) Competition, (10) DPBM diversification and (11) other themes. [Figure 4](#) presents a longitudinal analysis of the most researched themes in DPBM. Success and failure factors of DPBM have been the most researched topic over time, with significant growth in the last 2 years. This is followed by DPBM artefacts and BMI to DPBM, and DPBM design themes. Although the first articles on external stakeholders and competition were published in 2009 and 2011, respectively, the development of these topics presented a few gap years with no publications. DPBM life cycle, DPBM outcomes, DPBM antecedents and DPBM diversification are more recent themes. In the past 2 years, particularly, there has been particular growth in BMI to DPBM, DPBM artefacts, Success and failure factors of DPBM and DPBM outcomes themes.

It is important to notice that 40 sources have been classified into two or more themes – revealing relationships across the different themes. Therefore, to make sense of these relationships, we analyzed codes as networks. Although this was not done to perform a

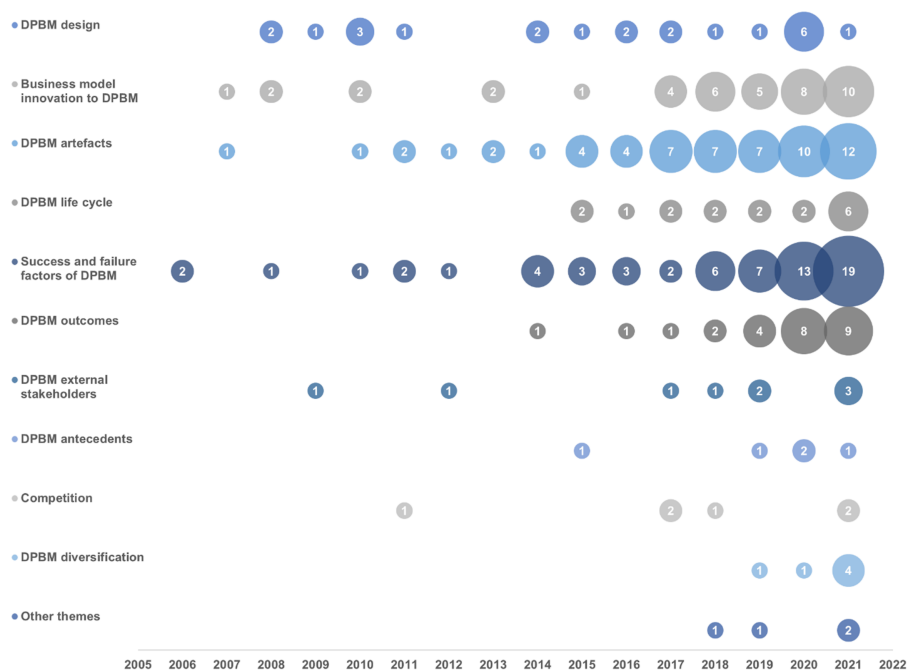


Figure 4. Sources in each theme over the years. Note: Some sources may be classified in more than one theme

quantitative analysis of the relationships between themes, it provided a convenient and interactive means to explore those relationships in a graphical format (Vial, 2019).

Figure 5 shows the relationship between all selective codes. DPBM artefacts, DPBM life cycle and DPBM outcomes are the themes with the most relationships with other selective codes in the network. Even though DPBM external stakeholders are present in the network, they are not linked to DPBM outcomes, revealing that this theme is mainly focused on analyzing outcomes for the digital platform owners.

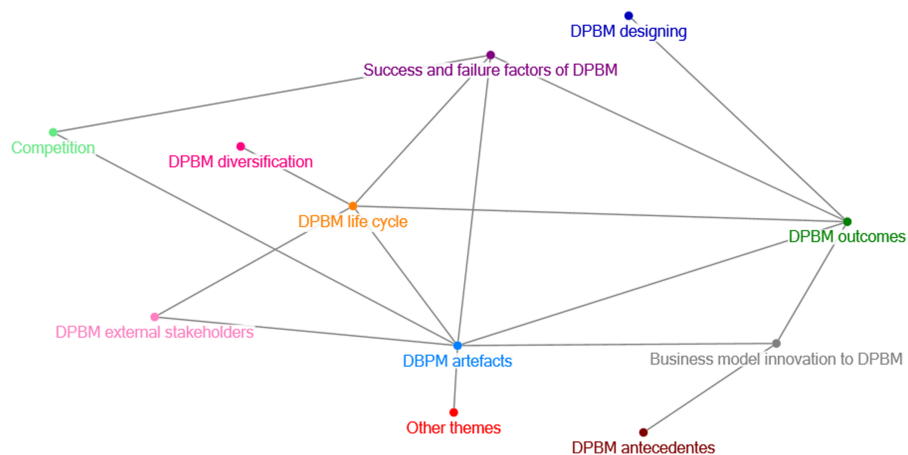


Figure 5. Selective codes as a network

The network reveals that the five other themes are directly linked with DPBM outcomes. The network also shows that the “other themes” category is linked with “DPBM artefacts” and “DPBM success and failure factors” themes.

In order to better understand the relationships across the different themes (selective codes), we also analyzed the axial codes as a network. **Figure 6** shows the relationship between 20 of the 41 axial codes that emerged from the analysis of the articles. The colors represent the selective codes in which these axial codes were grouped, and the different types of arrows represent the number of articles in which a relationship is present. The analysis of this network reveals that axial codes “Outcomes” and “Configurations” are central in the network and have the highest number of relationships, including the relationship between themselves (with nine occurrences).

Based on an analysis of the codes as networks, **Figure 7** presents our proposed framework summarizing current research on DPBM. The solid blocks represent main themes, and the arrows represent how these themes are related to each other (not implying causality or statistical relationship). While solid arrows and blocks represent the relationship of the selective and axial coding as a network (see **Figures 5 and 6**), dotted arrows and blocks are based on our findings from the literature review. Since the “Other themes” block contemplates unrelated sub-themes, it was broken down, showing its axial codes.

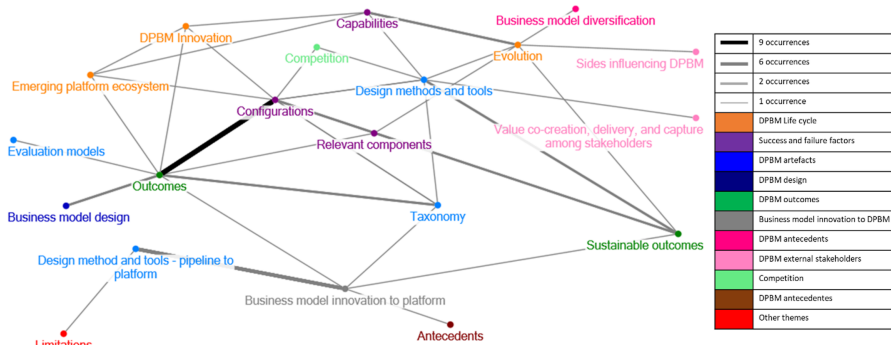


Figure 6. Axial codes as a network

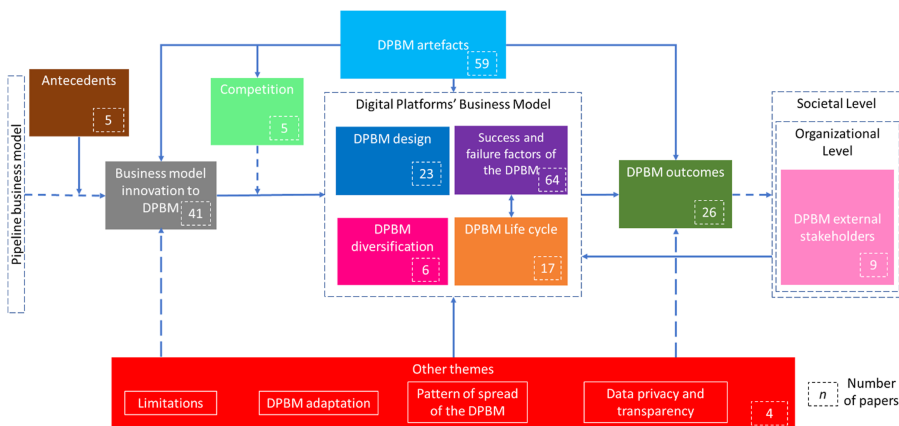


Figure 7. Framework of main themes of the DPBM research

The next subsections describe each theme of the research on DPBM.

DPBM artefacts. “DPBM artefacts” emerged in 2007, and it is the most prominent theme in our sample. It discusses artefacts in the form of methodologies, frameworks, taxonomies and ontologies. The main contributions of these papers are methods and tools to drive the process of transforming pipeline BMs to platforms, as well as to identify failure and success factors and evaluate their associated outcomes. Approximately 65% have been published in journals. Nearly 78% ($n = 47$) of the articles are empirical and most of them use case study ($n = 32$) or design science ($n = 9$) methods. Table 12 presents sub-themes (axial codes), sources and theories in this theme.

Business model innovation to DPBM. The BMI to the DPBM theme is composed of articles that propose to transform pipeline businesses to platforms. This theme is characterized by non-empirical papers (54.8%; $n = 17$), and most of the works use industry as the level of analysis (83.9%; $n = 26$). The literature in this stream identifies the benefits of the existing digital platforms and analyzes industries whose enterprises have traditional BMs. The main purpose of these articles is to explain how these industries can have better outcomes by adopting DPBMs. We found 4 papers describing the transformation process from a pipeline BM to a DPBM, which contributes to identifying lessons learned in the process (Dell’Era *et al.*, 2021; Gustavsson and Ljungberg, 2020; Jääskeläinen *et al.*, 2021; Wesselius, 2008). Another significant characteristic of this theme is that, although using different BM frameworks, 34.1% ($n = 14$) of the studies do not discuss any theory. Table 13 presents sub-themes, sources and theories in this theme.

DPBM design. Articles within the DPBM design theme focus on proposing a BM to existing platforms. These studies mainly propose the design of the BM aiming at financial sustainability – e.g., Belleflamme and Jacquemin (2016), Dupont *et al.* (2017) and Hruskova (2017). However, there is a growing number of studies focusing on social sustainability (Okano *et al.*, 2018; Wu *et al.*, 2020). Even though frameworks were used for the development of the study, 47% of them ($n = 11$) do not discuss the theory. Table 14 presents sub-themes (axial codes), sources and theories in this theme.

DPBM success and failure factors. The different dimensions of the BM are formed by attributes, also known as “building blocks.” They describe functions, features, or actions of the firm. Distinct alternatives for each attribute are the configuration options. For example, the value delivery dimension can be formed by the customer relationships and distribution channels attributes and distribution channels can be configured as web or application (Curtis, 2021). Therefore, this theme mainly categorizes studies that analyze the attributes of the DPBMs and highlight their patterns or compare their different configurations with the goal of identifying success and failure factors.

This literature cluster shows that differences in the design and execution of the BM generate different results that affect the success or failure of digital platforms (Piscicelli *et al.*, 2018). This theme has the most powerful relationship with the “DPBM outcomes” (as shown earlier in Figure 7). Furthermore, this cluster of the literature has contributed to identifying relevant mechanisms and capabilities to support the evolution of DPBMs (Asadullah *et al.*, 2018; Rong *et al.*, 2018). On the other hand, it also has the largest number of papers that analyze one specific dimension of the BM ($n = 12$), i.e. they do not do a holistic analysis. This approach can be problematic considering that the success or failure of a business can hardly be attributed to a single reason (al Debei *et al.*, 2016).

Most studies on this topic are empirical (75%; $n = 48$) and use case study as a research method (83.3%; $n = 40$). A critical issue is that 25% ($n = 16$) of the papers do not discuss the theory. Sub-themes, sources and theories used in this theme are presented in Table 15.

DPBM life cycle. This theme is composed of papers that examine the DPBM life cycle – how DPBM emerges, innovates its BM, evolves and declines. This research stream is mainly related to “DPBM Success and Failure Factors” and “DPBM outcomes” themes. Hence, it mostly contributes to the literature by suggesting that the success or failure factors depend on the phase of the DPBM life cycle. Most papers use single (50.0%; $n = 9$) or multiple (44.4%;

Table 12. DPBM artefacts

Axial coding	Source (n = 60)	Theories
Design method and tools – pipeline to DPBM (n = 16)	Barni <i>et al.</i> (2018), Daxhammer <i>et al.</i> (2019), Gebauer <i>et al.</i> (2020), Giessmann <i>et al.</i> (2014), Hoch and Brad (2021), Hmoud <i>et al.</i> (2017), Itala and Tohonen (2017), Jeannerat and Theurillat (2021), Kang <i>et al.</i> (2010), Kim (2016), Orekhova (2019), Parmentier and Gandia (2017), Qanbari <i>et al.</i> (2015), Tian <i>et al.</i> (2021), Suroso and Jamilah (2017), Weissshuhn <i>et al.</i> (2021)	Business Model; Platform; Two(multi)-sided market; Ecosystem; Open Innovation; Theory of Constraints (TOC); Servitization; Value-chain; Value-net
Taxonomy (n = 18)	Bonazzi and Liu (2015), Chen <i>et al.</i> (2020), Curtis (2021), Hahn <i>et al.</i> (2015), Holland and Gutiérrez-Leefmans (2018), Kim and Min (2019), Mancha and Gordon (2021), Nishino <i>et al.</i> (2012), Oncini <i>et al.</i> (2020), Petrik and Herzworm (2018), Rix <i>et al.</i> (2020), Shah and Shome (2019), Staykova and Damsgaard (2015), Täuscher and Laudien (2018), Wirtz <i>et al.</i> (2019), Yablonsky (2016), Yrjölä <i>et al.</i> (2021), Zhang (2007)	Business Model; Platform; Game theory; Two(multi)-sided market; Sharing economy; Value Creation; Value Capture; Value theory
Ontology (n = 1)	Derave <i>et al.</i> (2021)	Not applicable
Design method and tools (n = 25)	Aapaoja <i>et al.</i> (2017), Andrea <i>et al.</i> (2013), Andreassen <i>et al.</i> (2018), Ardolino <i>et al.</i> (2020), Ballon and Van Heesvelde (2011), Berkers <i>et al.</i> (2020), Brecht <i>et al.</i> (2021), Curtis (2021), de Oliveira and Cortimiglia (2017), Fehrer <i>et al.</i> (2018), Gandia and Parmentier (2017), Giessmann and Legner (2016), Gutierrez-Leefmans and Holland (2019), Hafermalz <i>et al.</i> (2016), Li <i>et al.</i> (2020a, b), Shi <i>et al.</i> (2021), Long and van Waes (2021), Michelini <i>et al.</i> (2020), Schiavone <i>et al.</i> (2021), Timeus <i>et al.</i> (2020), Trabucchi <i>et al.</i> (2021a, b), Täuscher and Laudien (2018), Walravens and Ballon (2013), Wecht <i>et al.</i> (2021), Yablonsky (2018), Zoric (2011)	Business Model; Platform Business Strategy; Digital Business Strategy; Design Theory; Ecosystem; Service-dominant logic; Open network; Sharing economy; Sustainable Business Model; Theory of change (ToC); Sustainability; Value theory
Evaluation models (n = 1)	Bivona and Cosenz (2019)	Dynamic performance management

n = 8) case studies. Table 16 shows sub-themes (axial codes), sources and theories in this theme.

DPBM outcomes. Although the first paper on this theme was published in 2014, it has the most significant number of relationships with the other topics in the field. Therefore, this theme demonstrates that the literature on DPBM has evolved from studies focused on understanding how this BM is characterized to analyze its impacts on organizations and society. At the organizational level, this literature assesses the implications of different BMs on organizational performance (Bivona and Cosenz, 2019; Rothe *et al.*, 2018) as well as on the level of participation and perceived value of users (Clauss *et al.*, 2019; Stofberg and Bridoux, 2019).

Table 13. Business model innovation to platform

Axial coding	Source (n = 41)	Theories
Business model innovation to DPBM (n = 41)	Aji et al. (2018) , Bartczak (2021) , Berkers and Roelands (2013) , Bettoni et al. (2018) , Braet and Spkek (2010) , Dahlan et al. (2018) , Das and Dey (2021) , Dell’Era et al. (2021) , De Reuver et al. (2010) , Gustavsson and Ljungberg (2020) , Hmoud et al. (2020) , Hoch and Brad (2021) , Hummel and Silva (2020) , Jääskeläinen et al. (2021) , Jeannerat and Theurillat (2021) , Kang et al. (2010) , Kammerlohr et al. (2021) , Kutera et al. (2017) , Laine et al. (2017) , Lee and Patel (2020) , Lynch et al. (2017) , Mitin et al. (2019) , Orefice and Nyarko (2020) , Ostapenko (2019) , Strulak-Wójcikiewicz et al. (2020) , Qanbari et al. (2015) , Braet and Spek (2010) , Ruan et al. (2019) , Shah and Shome (2019) , Stecken et al. (2019) , Tian et al. (2021) , Tohoneyan et al. (2020) , Verstegen and Doorneweert (2017) , Viswanadham (2021) , Viskovic and Franki (2021) , Wesselius (2008) , Yang and Mohammed (2008) , Yrjola (2020) , Yrjola et al. (2018) , Yuanxing et al. (2019) , Zhang (2007)	Business Model; Platform; Two(multi)-sided market; Open Innovation; Digital Materiality; Discursive Work; Service-dominant logic; Sustainable value creation; Sistemic view; Multi-stakeholders perspective; Value-chain; Value-net

Table 14. DPBM design

Axial coding	Source (n = 23)	Theories
Business Model Design (n = 23)	Belleflamme and Jacqmin (2016) , Bucherer and Hoyer (2016) , Corti et al. (2021) , Dupont et al. (2017) , Duval and Brasse (2014) , Evens (2010) , Fischer et al. (2014) , Hoyer and Stanoevska-Slabeva (2009) , Hruskova (2017) , Li et al. (2020a, b) , Nadir et al. (2020) , Nicaisse and Dufoulon (2010) , Oganda et al. (2020) , Okano et al. (2018) , Pawar et al. (2008) , Pucihar et al. (2015) , Ricart et al. (2020) , Stanoevska-Slabeva and Wozniak (2010) , Vargas et al. (2020) , Wu and Yang (2011) , Wu et al. (2020) , Xu et al. (2019) , Yamakami (2008)	Business Model; Business model design; Platform; Stakeholder management; Ecosystem; Sharing Business Model; Social entrepreneurship

At the societal level, these studies identify that through the DPBM, it is possible to offer social actions and sustainability to different contexts ([Okano et al., 2018](#)). This literature cluster examines positive outcomes for regional development ([Yun et al., 2017](#)), the implementation of transportation that satisfies the needs of disabled people ([Wu et al., 2020](#)) and the improvement of sustainability in the food sector ([Michelini et al., 2020](#)). On the other hand, [Shah and Shome \(2019\)](#), while demonstrating the positive consequences of the DPBM in the Indian market, also outlined their negative consequences, such as the negative impact on

Table 15. DPBM success and failure factors

Axial coding	Source (n = 64)	Theories
Configurations (n = 34)	Amaldoss et al. (2021) , Ballon and Van Heesvelde (2011) , Ballon and Van Bossuyt (2006) , Bocken et al. (2020) , Buchinger et al. (2015) , Chen and Hu (2008) , Chen and Tang (2021) , Chen et al. (2016) , Clauss et al. (2019) , Curtis (2021) , Ditta-Apichai et al. (2020) , Deng et al. (2021) , Foramitti et al. (2020) , Fu et al. (2021) , Gonçalves and Ballon (2011) , Hasselwander et al. (2021) , Kuebel et al. (2014) , Kuebel and Zarnekow (2014) , Li et al. (2020) , Lin et al. (2021) , Münzel et al. (2018) , Qu et al. (2021) , Ranerup et al. (2016) , Rothe et al. (2018) , Stoffberg and Bridoux (2019) , Su and Jin (2021) , Subramanian et al. (2021) , Vitkauskaitė and Vaiciukynaitė (2019) , Vizzarri and Vatalaro (2014) , Wang et al. (2014) , Wei et al. (2020) , Wirtz et al. (2019) , Yuan et al. (2021) , Zenny (2020)	Business Model; Two(multi)-sided Market; Platform; Game-theoretic mode; Ecosystem; Micro-entrepreneurship; Sharing economy; Community-based tourism; Pricing strategy; Network effects; Rational choice theory; Relational Models theory; Sharing Business Model
Capabilities (n = 4)	Okano et al. (2021) , Schrieck et al. (2021) , Shi et al. (2021) , Rong et al. (2018)	Ecosystem; Digital innovation; Business model; Dynamic capabilities
Relevant components (n = 17)	Allam and Chan-Olmsted (2020) , Badran (2021) , Cornejo-Velazquez et al. (2020) , Isabelle et al. (2020) , Kohler (2015) , Kohler and Nickel (2017) , Liang et al. (2006) , Liu et al. (2019) , Lygnerud and Nilsson (2020) , Mhalla et al. (2020) , Markendahl et al. (2019) , Rensmann (2012) , Ruggieri et al. (2018) , Setiawan et al. (2020) , Weiner (2010) , Yun et al. (2017) , Zhao et al. (2019)	Platform; Business Model; Business Model Strategy Audit; Data-Driven Business Models; Open Innovation; Open Business Model; Organizational economics; Sharing economy
Reasons for success or failure (n = 3)	Rohn et al. (2021) , Piscicelli et al. (2018) , Sengupta et al. (2021)	Sustainable business model; Sharing economy; Value theory; Platform; Business Model
Failure and success drivers (n = 2)	Trabucchi et al. (2021a, b) , Al Debei et al. (2016)	Business Model; Platforms; Drivers of value creation
Platform business model alignment (n = 1)	Solaimani et al. (2015)	Business Model
Evolution mechanisms (n = 1)	Asadullah et al. (2018)	N/A
Patterns for financial attractiveness (n = 1)	Grieco et al. (2021)	Sharing economy

the labor market. [Table 17](#) presents sub-themes (axial codes), sources and theories in this theme.

DPBM external stakeholders. Papers in this theme mainly analyze the BM of companies that are external stakeholders of digital platforms (such as complementors). This literature cluster has contributed to analyzing relevant components of these companies' BMs that can lead to success in their ecosystem ([Abbate et al., 2019](#); [Chandna and Salimath, 2018](#); [Crowley](#)

Table 16. DPBM life cycle

Axial coding	Source (n = 18)	Theories
Emerging platform ecosystem (n = 2)	Rothe et al. (2018) , Schrieck et al. (2021)	Ecosystem
DPBM Innovation (n = 9)	Gao and Zhao (2016) , Hu et al. (2019) , Jocovski et al. (2020) , Landoni et al. (2020) , Muzellec et al. (2015) , Ning and Yuan (2021) , Okano et al. (2021) , Rothe et al. (2018) , Still et al. (2017)	Business Model; Two(multi)-sided market; Business Model Innovation; Platform Ecosystem; Sustainable business model innovation; Sharing economy
The decline of the ecosystem (n = 1)	Tellier (2017)	Ecosystem
Evolution (n = 8)	Fürstenau et al. (2021) , Han and Cho (2015) , Hu et al. (2019) , Presenza et al. (2021) , Rong et al. (2018) , Shi et al. (2021) , Trabucchi and Buganza (2021) , Zhao et al. (2019)	Business Model; Platform; Two-sided market; Ecosystem; Sustainable business model innovation; Sharing economy; Value theory
Life cycle revenue (n = 1)	Huotari and Ritala (2021)	Business model; Strategy; Life cycle revenue

Table 17. DPBM outcomes

Axial coding	Source (n = 26)	Theories
Outcomes (n = 13)	Bivona and Cosenz (2019) , Chen et al. (2016) , Clauss et al. (2019) , Ditta-Apichai et al. (2020) , Fu et al. (2021) , Hasselwander et al. (2021) , Lin et al. (2021) , Oncini et al. (2020) , Rothe et al. (2018) , Shah and Shome (2019) , Stofberg and Bridoux (2019) , Su and Jin (2021) , Wang et al. (2014)	Platform; Business Model; Two(multi)-sided market; Dynamic performance management; Ecosystem; Open Innovation; Open Business Model; Rational choice theory; Sharing Economy; Business Model; Relational Models theory
Sustainable outcomes (n = 10)	Cui et al. (2020) , Deng et al. (2021) , Heeks et al. (2021) , Mancha et al. (2021) , Mattila et al. (2020) , Michelini et al. (2020) , Okano et al. (2018) , Orefice and Nyarko (2020) , Pouri and Hilty (2020) , Presenza et al. (2021)	Micro-entrepreneurship; Sharing economy; Community-based tourism; Resource perspective; Socio-economic perspective; Service-dominant logic; Sustainable value creation; Systemic view; Multistakeholders perspective; Sharing Business Model; Sustainable business models; Theory of change (ToC); Sustainability
Social outcomes (n = 3)	Long and van Waes (2021) , Wu et al. (2020) , Yun et al. (2017)	Open Innovation; Open Business Model; Responsible innovation; Social entrepreneurship

[et al., 2012](#); [Stecca et al., 2009](#)). Another contribution refers to understanding how organizations that integrate the DPBM ecosystem can innovate their BM ([Baber et al., 2019](#); [Gatautis et al., 2017](#)). Recent topics in this field use an active perspective to analyze stakeholders and how they can impact the DPBM ([Trabucchi and Buganza, 2021](#)) or change their own roles in the ecosystem ([Park et al., 2021](#)). This different perspective is important to understanding how value is created, delivered and captured among the various stakeholders ([Schiavone et al., 2021](#)). All papers in this theme are empirical, and most of them use case studies as a research method (78%; n = 7). Sub-themes, sources and theories in this field are presented in [Table 18](#).

Table 18. DPBM external stakeholders

Axial coding	Source (n = 9)	Theories
Relevant components of external stakeholders' business model (n = 4)	Abbate et al. (2019) , Chandna and Salimath (2018) , Crowley et al. (2012) , Stecca et al. (2009)	Business Model; Innovation theory; Network theory; Information processing theory
Evolution of external stakeholders' business model	Baber et al. (2019)	Entrepreneurship (Causation and effectuation)
Business model innovation of external stakeholders (n = 1)	Gatautis et al. (2017)	N/A
Change in the pre-defined role (n = 1)	Park et al. (2021)	Platform; Entrepreneurship
Sides influencing DPBM (n = 1)	Trabucchi and Buganza (2021)	Platform
Value co-creation, delivery and capture among stakeholders (n = 1)	Schiavone et al. (2021)	Digital business model; Sharing economy; Multi-stakeholder ecosystem

DPBM antecedents. Although many papers propose transforming pipeline BMs into a DPBM, only a few studies investigate the antecedents and drivers of this process. These studies provide evidence that trusted institution legitimacy, cooperative organizational model, founders' experiences, entrepreneurial orientation, industry influences, as well as environmental characteristics are relevant antecedents to pipelines BMs transform themselves in DPBM ([Jääskeläinen et al., 2021](#); [Rumble and Mangematin, 2015](#)). Furthermore, this stream has identified that servitization is a relevant driver for DPBM ([Kohtamäki et al., 2019](#)). Table 19 presented the sub-themes, sources and theories in this field.

Competition. While digital platform competition is a prolific research theme in the field of economics, only a handful of studies in the field use BMs as a theoretical lens. Even though DPBM competition is a small research stream, it has significant theoretical and practical implications. [Broos and Ramos \(2017\)](#) use DPBM as a lens to discuss antitrust and argue that two-sidedness is not a feature of markets but of firms. In addition to this debate, [Demil et al. \(2018\)](#) argue that the BM is a choice of the firm; hence, the managers can select the relevant competitive landscape. It is quite clear that the phenomena of the digital platforms' BM have theoretical and practical implications for the strategy literature.

[Wang et al. \(2017\)](#) investigate the competition between licensing BM and the platform BM to understand when the platform BM is feasible. Results of this study suggest that when both BMs coexist, the platform model possesses an apparent advantage over the licensing model in dominating the market. [Cuzzolino et al. \(2021\)](#) use a different approach to discuss competition between pipeline and DPBM. These authors examine how incumbent producers respond to digital entrant platforms by shifting between competitive and cooperative strategies. They conclude that the process is characterized by three sequential phases: (1) selective cooperation, (2) allied competition and (3) selective cooptation. Sub-themes, sources and theories in this field are presented in Table 20.

DPBM diversification. This is a recent topic in the literature that analyzes the synergies of managing multiple BMs and objectives ([Reuter, 2021](#)). During the evolution of a DPBM, new stakeholders are incorporated, and the organization tends to diversify how they do business; in other words, they start to work with a BM portfolio ([Aversa et al., 2021](#)). Even though DPBM diversification increases management complexity, it allows organizations to realize both for-profit and for-purpose value creation, specifically with a hybrid DPBM ([Reuter, 2021](#); [Sparviero, 2021](#)). Hybrid DPBM can manage the tensions emerging from the parallel pursuit of economic and social goals ([Sparviero, 2021](#)). Thus, this theme contributes to solving a significant challenge of digital platforms: delivering sustainable value for multiple

Table 19. DPBM antecedents

Axial coding	Source (n = 5)	Theories
Antecedents (n = 4)	Rumble and Mangematin (2015) , Jääskeläinen et al. (2021) , Su et al. (2020) , Yrjola (2020)	Business Model; Two(multi)-sided market; Entrepreneurial orientation; Business Model Innovation, Strategy
Drivers (n = 1)	Kohtamäki et al. (2019)	Theory of the firm; Service-dominant logic

Table 20. Competition

Axial coding	Source (n = 6)	Theories
Antitrust (n = 2)	Broos and Ramos (2017) , Etro (2021)	Economic theory; Strategy
Competition (n = 3)	Ballon and Van Heesvelde (2011) , Cozzolino et al. (2021) , Wang et al. (2017)	Economic theory; Strategy
Theoretical implications (n = 1)	Demil et al. (2018)	Business Model; Ecosystem

stakeholders, including socio and environmental aspects. Further, this cluster of the literature contributes to demonstrating potential convergence and challenges for DPBMs to add pipeline components and vice versa ([Mody et al., 2020](#)). Sub-themes, sources and theories in this field are presented in [Table 21](#).

Other themes. There are other themes about DPBM that did not fit in the previous topics. The first one is related to data privacy in data-driven DPBM. Even though other themes introduce data privacy as an unintended impact of DPBM ([Lin et al., 2021](#); [Long and van Waes, 2021](#)), only one paper analyzes DPBM in terms of the monetization of personal data – raising concerns about data privacy and transparency ([Fahy et al., 2018](#)).

Another topic in the literature is the analysis of how the different patterns of DPBMs spread among different sectors. Specifically, the authors investigate how new digital platforms mimic Uber and Airbnb’s BMs. The study concludes that new platforms imitate previous BMs across distant sectors to avoid competition while replicating activities in ever-new resource settings ([Geissinger et al., 2021](#)).

Another aspect investigated is how digital platforms adapt their BM to a highly regulated labor market. In this case, analyzing how Uber adapted their BM to the Norwegian regulation of the taxi market ([Oppegaard, 2021](#)). This case shows that even though many governments have changed the regulations to adapt to new technologies, digital platforms have changed their BM to adapt to existing regulations.

The last paper classified in “other themes” analyzes the limitations of DPBM. While papers on BMI to DPBM theme discuss benefits for pipeline BM to migrate their BM to digital

Table 21. DPBM diversification

Axial coding	Source (n = 6)	Theories
DPBM diversification (n = 3)	Aversa et al. (2021) , Fürstenau et al. (2021) , Guyader and Piscicelli (2019)	Sharing Economy; Business model diversification; Business model alignment; Business model portfólios
Hybrid DPBM (n = 2)	Reuter (2021) , Sparviero (2021)	Hybrid business model
Pipeline and platform convergence (n = 1)	Mody et al. (2020)	Strategy

platforms, our study found just one paper that analyzes the limitations of DPBM for some traditional industries (Orekhova, 2019). This article highlighted some restrictions on the use of this DPBM for industrial enterprises in the Russian context. Table 22 presents sub-themes, sources and theories used in papers classified as “other themes”.

Conclusion and future directions

Our review of the literature at the intersection of digital platforms and BMs reveals that research in this domain is fragmented across a number of inter-related fields. Publications are also scattered across a multitude of journals, and many of them do not provide a clear definition of the main concepts used (e.g., BM) or use different concepts interchangeably (e.g., BM and strategy). Unclear and unconverging concepts tend to produce imprecise literature, which inhibits the advancement in the field of research.

This paper highlights a rich body of literature that contributes to our understanding of how this research field is organized and proposes an integrative definition of DPBM. Further, we expand our contribution by presenting avenues for advancing knowledge in this field. Specifically, we presented three pathways for future research that can contribute to understanding and forecasting the impacts of digital platforms on society.

First, scholars should increase the focus on the alignment between value creation and value capture to innovate DPBMs. This alignment is particularly important because these models rely on the ability to orchestrate interactions among the actors in the ecosystem (Parker *et al.*, 2016). As a result, changes in the BM of the focal company may imply corresponding adjustments in the BMs of other ecosystem participants (Aji *et al.*, 2018). Moreover, actors may hold different perceptions of value and pursue conflicting objectives and interests (Velter *et al.*, 2020). Therefore, innovating a DPBM requires articulating changes with other ecosystem actors to ensure the alignment of value creation and capture for all stakeholders.

Hybrid DPBMs represent a relevant unit of analysis to explore this gap, as the complexity of aligning diverse interests tends to be greater in such models – where achieving both social and economic sustainability is essential. Furthermore, DPBMs are not inherently sustainable; collaborative approaches with stakeholders are necessary to incorporate responsibility into BMI (Long and van Waes, 2021).

While the BMI literature has largely focused on internal organizational factors (Sjödin *et al.*, 2020), drawing on theories such as the resource-based view, dynamic capabilities and entrepreneurship (Achtenhagen *et al.*, 2013; Demil and Lecocq, 2010), we suggest that incorporating perspectives from open systems (Berglund and Sandström, 2013), stakeholder theory (Laczko *et al.*, 2019) and responsible innovation (Long and van Waes, 2021) could offer valuable insights into this issue. Accordingly, future research should examine:

- (1) How do governance mechanisms in hybrid DPBMs influence the alignment of value creation and capture among marginalized stakeholders?
- (2) What are the dominant failure patterns of hybrid DPBMs in highly regulated sectors such as healthcare or finance?

Table 22. Other themes

Axial coding	Source ($n = 4$)	Theories
Data privacy and transparency ($n = 1$)	Fahy <i>et al.</i> (2018)	N/A
Limitations ($n = 1$)	Orekhova (2019)	Platform; Strategy; Neo-institutional economic theory
Pattern of spread of the DPBM ($n = 1$)	Geissinger <i>et al.</i> (2021)	Sharing economy
DPBM adaptation ($n = 1$)	Oppegaard (2021)	Platform economy

These questions can be addressed through longitudinal multiple-case studies of platforms operating in domains such as education, mobility or sustainability, where social impact is prioritized. Such studies could adopt stakeholder theory or open systems theory to explore how platforms navigate divergent objectives and expectations. Additionally, comparative cross-national research may shed light on how institutional environments in emerging markets shape alignment practices in the absence of strong regulatory frameworks.

Second, future studies could focus on artefacts and success factors of hybrid DPBM. Overall, the literature on DPBM is market-oriented, and only a few studies focus on analyzing how these BMs can affect social outcomes. Therefore, frameworks, taxonomies and methods to analyze hybrid DPBM can contribute to improving the social impact of digital platforms while minimizing unintended and negative impacts. In addition, specific artefacts to hybrid DPBM could be used to analyze the success and failure factors of these BMs. This approach could contribute, for example, to identifying which configurations could lead to optimal social outcomes (Kohtamäki *et al.*, 2019).

Therefore, we propose design science research to develop artefacts such as sustainability scorecards or stakeholder alignment matrices, tailored to hybrid platform contexts and experimental and simulation-based research to test how these artefacts influence user behavior, platform governance decisions or ecosystem-wide performance metrics.

Finally, as an extension to the second point, it is important to further our understanding of the unintended consequences of DPBM (Bocken *et al.*, 2013). Our review identifies that most of the studies have been focused on the positive side of value co-creation (Andreassen *et al.*, 2018). We argue that it is relevant to understand how value can be destroyed and what the potential negative outcomes are for different stakeholders (Bocken *et al.*, 2013).

Hence, we call for empirical research that investigates:

- (1) What unintended consequences do DPBMs generate for informal workers in platform economies in Latin America, Africa, or Southeast Asia?
- (2) How do digital platforms amplify or mitigate inequalities across stakeholder groups?

Mixed-methods approaches, combining interviews, platform data and policy analysis, are well-suited for this line of inquiry. Such studies could draw on social entrepreneurship and social innovation literatures to examine tensions between inclusion and efficiency. Contextualizing research in developing economies will also help uncover dynamics often invisible in mature markets.

This research agenda is especially important in developing countries, as digital platforms can potentially amplify inequalities (Bonina *et al.*, 2021). For example, how DPBMs impact employability and the overall economic scenario is still unclear (Münzel *et al.*, 2018). For this purpose, combining literature on BMs, social entrepreneurship and social innovation can be an interesting approach for future studies in the field. Beyond these avenues, future research may use our framework to investigate under-researched relationships or themes, for example, antecedents and limitations of BM innovation to DPBM, the pattern of spread of the DPBM or DPBM adaptation. By addressing these questions with more contextualized, theoretically informed and methodologically diverse studies, future research can offer deeper insights into the evolution, performance and social consequences of DPBMs.

Although great care was taken to ensure that the choices made adhered closely to selecting a representative sample of paper for our study, we recognize that our database choices, as well as inclusion and exclusion criteria, represent a limitation of this study.

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