

Digital Platforms Business Models. A Systematic Literature Review[♦]

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Objectives. Research on digital platforms has increasingly grown over recent years (McIntyre et al., 2021) due to the pervasiveness of digital transformation, becoming relevant for scholars and managers (Abbate et al., 2022). Platforms are marketplaces, technology-mediated, that radically change how digital business ecosystems (Baumann, 2022) create, deliver, and appropriate value (Hein et al., 2019), by matching the supply side of the complementors, third-party collaborations and applications developers with the demand side of the end-users and customer groups contributions.

Literature has analyzed platforms in a quite fragmented way as separated research fields (Bonina et al., 2021) that consider different perspectives, mainly, the digital-technical view (Tiwana et al., 2010) and the economic-managerial ones.

While the technical perspective focuses on the digital technological components (Chae, 2019; den Hartigh et al., 2016), that enables platform transaction (Parker et al., 2016) for the matchmaking process, the economic-managerial view examines platforms regarding the interactions with users that disrupts traditional economic markets with a focus on the business model that enables new interactions (de Reuver et al., 2020) that lead to costs reduction for platform offerings (Deilen & Wiesche, 2021) in the ecosystems (Halckenhäusser et al., 2020)

This fragmentation poses risks for misunderstanding the complex interactions and interdependencies that determine the platform dynamics performance with relevant limitations. Moreover, literature fragmentation calls for a more focused research effort to better understand a comprehensive view of the digital platforms' business model.

By systematically analyzing the previous literature, our paper aims at providing a more comprehensive understanding of the digital platform phenomenon by collecting evidence from the literature, which is sparse in the various related research fields. Based on a systematic literature review, the paper aims to systematize the scientific knowledge of the phenomenon and set directions for research. Our approach differs from previous conducted literature reviews which focus solely on one topic at the interface between digitalization and business model platforms. Our research questions are the following:

RQ1. To what extent do digital platforms business models find consideration in current literature and how is it characterized?

RQ2. What are the main research directions suggested by the analysis of the literature?

Methodology. We approach our research through the systematic literature review method. We apply our research under the PRISMA approach (Moher et al., 2015), an evidence-based checklist composed of the four following steps: Identification, Screening, Eligibility and, Inclusion. (Fig. 1).

[♦] **Acknowledgement:** The participation at the Sinergie-SIMA conference and the contribution to the research study of Dr Giorgia Masili were funded by the project "Cultural Heritage Active Innovation for Next-Gen Sustainable Society - CHANGES" – Project PE 0000020 CHANGES - CUP B53C22003780006, NRRP Mission 4 Component 2 Investment 1.3, Funded by the European Union - NextGenerationEU".

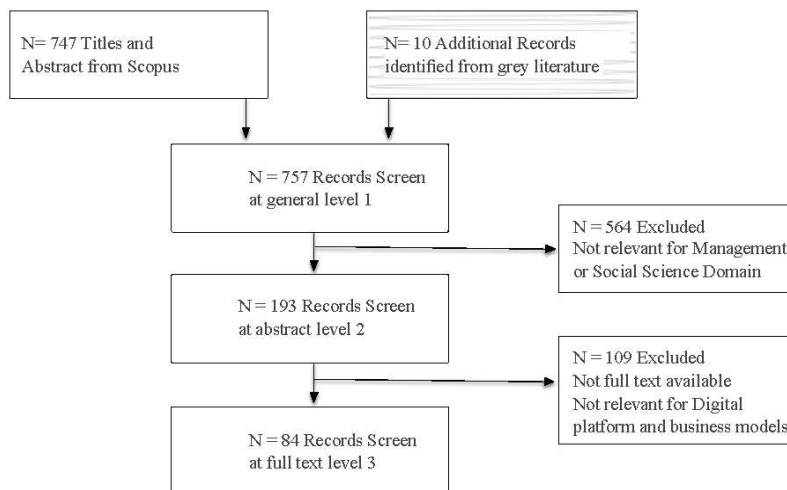
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Fig. 1: PRISMA Steps for literature review



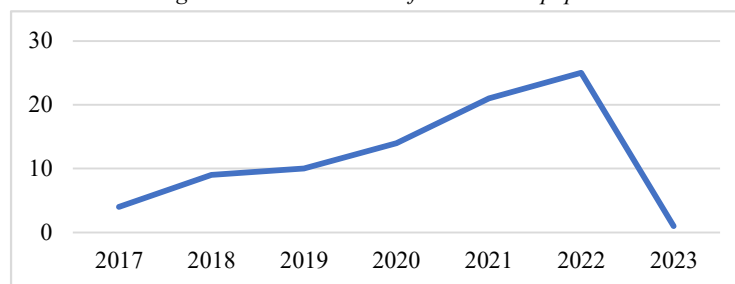
Identification

The first step of data search is literature identification to locate the relevant topics by targeting prominent literature. The Scopus search engine which is widely acknowledged as a world-leading source in the research field (Paschou et al., 2020) was chosen to identify papers from relevant journals according to our purpose. We use two sets of keywords related to the concepts of the digital aspects of the platform and platform business model. The first set of keywords was related to the digital platforms: (“Digital Platform*” or “open platform” or “Multi-side Platform*” or “Transaction Platform*” or “Innovation platform*”). The second set of keywords was based on the business model perspective by using the general keywords “Business models” or “Business Model”. The dataset was enriched also by grey literature. Initially, a total of 757 studies were identified from the database.

Screening

Next, we used the screening criteria by including in the sample the most appropriate journals for the topic by selecting only published papers in the area of business and social sciences, written in the English language only. At this stage we selected 193 records. Not all the papers were available as full text. 115 papers were selected for the next steps (78) as not all the papers were available. The review covered studies conducted from 2017 to 2023 (Fig. 2).

Fig. 2: Time distribution of the selected papers



Eligibility and Inclusion

The abstracts of the articles were checked deeply to ensure quality and only digital platforms relevant publications were included in the review process. In this process, we excluded 31 papers as they were irrelevant. After removing the publications that did not meet the inclusion-exclusion criteria and quality assessment, a total of 84 remained for the “digital platform” business model literature review analysis. The data was then exported to an Excel sheet to perform the qualitative review analysis.

Findings. In this stage, a careful evaluation of each full journal article was carried out for the 84 finalized articles to ensure we captured only the digital platform. All 84 journal articles were identified as relevant to analyze, synthesize and present the interpretations on the paper topic. The papers selected are descriptively analyzed in this section concerning the year of publication, journal, and impact factor according to the Scopus database.

Figure 2 depicts the time distribution of the papers analyzed, all published between 2017 and 2023. More specifically, 60 articles (i.e., 71% of the 84 scrutinized papers) were published between 2020 and 2023, pointing to an increased scholarly interest in the digital platforms’ business model analysis. The growing interest in the digital platform business model phenomenon has been testified by recent literature reviews on the subject (Mishra, S. &

Tripathi, A. R., 2020; Mukhopadhyay, S. & Bouwman, H.; 2019; Trabucchi, D. & Buganza, T.; 2021). The journals were also classified according to the Scopus database subject area (Table 1).

Eight papers focus on the ICT sector, while fourteen are on strategy and management. It is worth mentioning that a journal may belong to more than one subject area. Moreover, several other subject areas were represented by fewer papers (such as decision science and social sciences). This trend confirms a rather fragmented picture, typical of a research area that is multidisciplinary and at an early stage of maturity. Additionally, the fragmentation of journals demonstrates that researchers studying this phenomenon have different perspectives and that the subject does not yet have established publishing outlets. and the industrial sector with the aim to identify trends within this body of literature. The journals are ranked by the number of published papers and their impact factor. The journal impact factor (IF) was retrieved from the Journals Website. The 84 articles in our database appeared in a total of 59 journals. Only 16 of these journals published two papers or more, showing a high degree of fragmentation of the literature. As an exception, two journals (the Journal of Business Research and Technological Forecasting and Social Change) published four articles each.

Tab. 1: Journals, Articles' focus and Impact factor

Journal	Focus	No. Articles	%	Impact Factor
Journal of Business Research	Business	4	4,76%	10.96
Technological Forecasting and Social Change	Technology	4	4,76%	10.88
Research in Transportation Business and Management	Policy	3	3,57%	4.23
Research Policy	Policy	3	3,57%	9.47
Electronic Markets	Marketing	3	3,57%	6.02
Journal of Service Management	Service	3	3,57%	11.77
Technology Analysis and Strategic Management	Technology	2	2,38%	3.75
Strategic Management Journal	Strategy	2	2,38%	7.82
Journal of Cleaner Production	Environment	2	2,38%	11.07
Technology in Society	Technology	2	2,38%	6.87
Creativity and Innovation Management	Innovation	2	2,38%	3.64
Others	-	54	64,29%	-
Total		84	1	

Evidence 1. The increasing interest in digital platforms and platform business models is recent but shows a fast-growing trend, with the knowledge stocks fragmented among different journals, such as innovation, strategy, business, policy, marketing and environment.

3 Methodological approach analysis

The papers were classified according to the methodological approach as either 'theoretical' or 'empirical'. The theoretical papers were further divided into three subcategories: a) literature reviews, b) taxonomy papers, and c) conceptual papers. Papers in the first category present a review of the studies of a given topic; papers in the second category develop taxonomies about the research topics; the articles published in the third category develop interpretative models about the digital platform business models. We also used three sub-categories to further classify the empirical papers: a) qualitative, which employ empirical research methods such as case studies, focus groups, or the Delphi method; b) quantitative, which employ surveys, simulations, or other model-based analyses, and c) mixed-method papers, which combine the above-mentioned methods. As indicated in Table 2, 63.1% of the studies were classified as empirical. Qualitative empirical research is the most prevalent (36 papers, 42.86%). As expected in such an emerging field of studies, this subset mostly relies on analyses of exploratory case studies (83%) (Paschou et al., 2020). Case studies (single or multiple) dominate the sample. Moreover, in general, emerging fields of research are predominantly conceptual and qualitative as researchers at this phase try to establish a common vocabulary, define concepts, and explore the phenomenon.

Focus groups and GT studies are the less frequent methods adopted. Quantitative and model-driven research accounts for only eight articles (16.47%), with mixed-method studies recording the lowest ranking (three articles, 3.57%). Conversely, there are 31 theoretical papers, which account for 36,90% of the sample, divided among literature reviews (twelve articles, 14.29%), taxonomy (three articles, 3.57%), and conceptual papers (sixteenth articles, 19.05%).

Tab. 2: Methodological approach

Paper Type	Method	Total	Percentage %
Theoretical	Literature review	12	14,29%
	Taxonomy	3	3,57%
	Conceptual paper	16	19,05%
	Total	31	36,90%
Empirical	Qualitative	36	42,86%
	Quantitative	14	16,67%
	Mixed	3	3,57%
	Total	53	63,10%
Overall Total		84	100,00%

Evidence 2. *The reviewed literature addresses the digital platform business model, mainly through empirical and qualitative methods, but quantitative and conceptual studies are also represented. In particular, most of the work was based on case studies, thus confirming the early stage of this research stream, wherein confirmatory and normative papers are almost non-existent.*

The platform sectors

The papers were classified according to the sector and industry analyzed. According to the idea that the business platform fits with digital service and servitization, the service sector contains about 75% of the papers, further divided into mobility and energy (38%), healthcare and payment (25%) and tourism and retail (12,5%). The resting 25% of the papers (4 in total) analyze the automotive and fashion industries.

Evidence 3. *The service industry is most addressed by empirical studies as it constitutes one of the most promising domains for exploring and/or exploiting the benefits of digital platforms. The energy and mobility sector has attracted significant attention from researchers. The rest of the literature is quite sparse on the different industrial sectors.*

Tab. 3: Platforms and sector analyzed

Sector	Industry	Total	Percentage%
Service	Mobility	3	18,75%
	Energy	3	18,75%
	Healthcare	2	12,50%
	Payment	2	12,50%
	Tourism	1	6,25%
	Retail	1	6,25%
Manufacturing	Automotive	3	18,75%
	Fashion	1	6,25%
	Overall Total	16	100,00%

3. Thematic analysis

The thematic analysis of the selected articles concerned three main areas. These include the challenges, the processes and the output of the digital platform business models.

1. *The digital platform challenges. An important streamline related to the digital platform business model is the digital transformation process of the platform (Andrade et al., 2021). It requires promotion and sensitization, suitable platform architecture and strategic judgment of platform providers as well as a start-up culture. But it also presents implementation barriers perceived by both customers and service providers for building a critical mass of producers and consumers (Hazée et al., 2020). In particular, an important challenge is related to the digital experience of the platform and the monetization opportunities, the exploitation of the synergy of digital and physical assets, and the innovation beyond the digital experience. Finally, an important challenge for the platformization is the avoidance of the fatal weakness of disintermediation of buyers and sellers on which they find each other on the platform and then bypass that platforms and its commission to complete their transaction directly, off of the platform.*

2. *The evolution of the digital platform business model. The idea of the business model transition from a linear business model towards a platform business model is quite pronounced in literature. This category groups studies that show how digital business models evolve when organizations move to digital platforms (Chen et al., 2022) and manage the complexities and the interplay of regulative, normative and cognitive challenges (Dell’Era et al. 2021), on platform competition (Parmentier et al., 2017). Longitudinal case study (dos Santos et al., 2022), theory of change (Mukhopadhyay et al., 2022), and process models are used for understanding the emergence of dominant platforms (Michelini et al., 2020), and explaining the ways in which innovation, sensing and integrative capabilities impact on value creation and capture dimensions (Khanagha et al., 2022).*

3. *Digital platform output: the service experience. This category groups the study related to the understanding of service experience toward retailers’ digital platforms (Lian et al., 2021; Nahr et al., 2022) and the relationships between platforms and customers (Cao et al., 2022), included the impacts on the servitization pathways (Tian et al., 2022) on platform value proposition and revenue model. (Holland et al., 2018). Service experience is also determined by critical antecedents both, from the entrepreneurial point of view, including entertainment, tangibility, reliability, and empathy and from the customer’s point of view, including entertainment, interactivity, tangibility, and empathy. Meanwhile, also platform consequences of service experience directly affect both use intention and satisfaction (Lian, 2021). Clients’ evaluation of the platform represents an important aspect (Cao, L., et al., 2022).*

Evidence 4. *It is important to understand how these platforms are extended and how customers evaluate them. Several themes have been associated with the digital platform concept (e.g., new business models, value creation and capture, change and digital transformation); however, a fragmented view of them prevails. Given the sparseness of the research on the topic in the literature and the absence of a common definition of the phenomenon, the extant research tends to focus on one or a few of the themes only. Although a detailed investigation of the single concepts can increase the knowledge of digital platforms, we suggest that future research should adopt a holistic and interconnected approach to the digital platformization phenomenon.*

Research limits. *Our work-in-progress review presents some limitations. The first limitation of our review is in the exclusion criteria: we are aware that including papers only in the English language and excluding publications (such as conference papers) might have circumscribed our main findings and implications. This limitation is particularly related to the procedure we follow for analyzing the papers that provide different mandatory exclusion criteria. We are also aware that due to the journal type selected and the keyword-based selection method for refining the sample analyzed, some papers that are related to the research focus but contain different keywords or have been published in other Journals could be excluded. Finally, related to the previous limitations, our findings are consistent due to the reliability of the systematic literature review approach, despite they are basically depending on the authors' background and the interpretivist approach for analyzing the papers' content.*

Practical implications. *Practitioners may find our review particularly useful as we summarized the state of the research on the digital platform business model. Particularly, the challenges of Digital Platforms are useful for practitioners who want the platformization of their business model as it indicates the trends such a topic is dealing with. The digital transformation process, the platform digital architecture and the start-up culture are important pillars for overcoming the implementation barriers of the digital platform business model. In addition, the summary of the relationships between platforms and customers, including the impacts on service experience as well as on the critical mass of producers and consumers as critical antecedents of platform business models are important insights that practitioners should pay attention to.*

Originality of the study. *This systematic literature review provides new elements for analyzing digital platform business models in an integrative perspective focused both on the digital platforms issues as well as on the business model perspective. Despite previous literature having been focused more on the specific streamline of the digital aspects of the platforms or on the business model perspective, by highlighting respectively the technological challenges or the economic perspectives, we provide a more comprehensive approach that considers how digital platforms business models find consideration in current literature and how is it characterized, including the main research directions suggested by the systematic review of the literature.*

Key words: *Digital platform; Business model; Digital Transformation; Service Experience; Systematic literature review.*

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