Searching for opportunities in Business Digital Transformation research: Systematic Literature Review

Abstract: Current environment and digital future enforce companies to transform. The search to make transformation processes more efficient, not only is focused on Digital Transformation (DT), but also approaches the transformation of Business Model (BM). Which is often driven by the use, design, and orientation on new technology and causes a necessary evolution of culture, leadership, and organizational processes.

For a couple of decades there have been accelerators of technology adoption. But since COVID-19 disrupted business operations worldwide, now DT is considered as a necessary step in preserving business. This situation leads to an increase in research work, thus requiring a Systematic Literature Review (SLR) to identify opportunities of research.

Keywords: Digital Transformation; business; business model; business processes; service (business); systematic literature review.

INTRODUCTION

DT, implies fundamental changes in the activities of organizations based on the use of digital technologies (Barmuta, et al., 2020). As an example, the case of American Hardware Depot (AHD) set a critical inflexion point. AHD seeks to enhance its e-business efforts in at least three major areas: (1) to connect its dealers who had varied business processes and technologies, (2) to market and sell its products through the Web, and (3) to streamline its supply chain operations (Ranganathan & Seo 2006).

Information Systems (IS) have responded with the emergence of digital technologies and their continued growth as transformative organizational systems enabling boundary-less corporate structures, 24/7 real-time customer-centric communication, collaborative supply chain environments, and virtual IS infrastructures delivered via cloud computing (Kumar, et al., 2016).

The COVID-19 pandemic, a worldwide health and humanitarian crisis, has created unique challenges for citizens, governments, and organizations alike (Lee, et al., 2021). The COVID-19 crisis represents a new type and quality of challenge for companies […] companies in all industries and of all sizes adapt their business models to changing

environmental conditions within a short period of time (Kraus, et al. 2020). Organizations attempt to mitigate the negative effects of fighting COVID-19 using digital business model responses (Kronblad & Pregmark, 2021).

In this context, the study answers to the following research question:

RQ: Where are the opportunities in the research of Business Digital Transformation?

The study aims to discover the areas of opportunity for research on digital transformation in businesses. Learn about the top fields of study and top subjects dealing with this topic. It is also interesting to know the countries that are most active in carrying out this type of research. As well as identifying the main journals of scientific impact interested in these topics, to timely detect publication opportunities for my doctoral thesis research.

The remainder of this paper is organized as follows. The next section describes the research method following PRISMA methodology. After that, we present details of research papers founds where DT and BM interact. Subsequently, we present the research's main findings of selected sample and conclusions, and finally, we suggest future research directions.

Great opportunities in following fields were identified: small and medium enterprises, value creation and sustainable business models. Also, it is highly recommended to do research in Latin American Countries.

BRACKGROUND

Digital transformation affects socioeconomic systems, bringing inevitable changes to business processes, particularly those related to resource demands, networking processes, and communication mechanisms within entrepreneurial activities (Satalkina & Steiner 2020). The objectives of the digital infrastructure are substantiated, which are indicated: to increase the speed of decision-making, to increase the variability of processes depending on the needs and characteristics of the client, to reduce the number of employees involved in the process (Andriushchenko, et al. 2019).

Due to the importance of the topic, there are already some previous research papers on a systematic literature review about DT. Specially, those works that were carried out after the pandemic, are considered of great importance. Management and organizational scholars have

paid increasing attention to the interconnections between digital transformation and innovation management in the last decade (Appio, et al. 2021). Their study named "Digital Transformation and Innovation Management: A Synthesis of Existing Research and an Agenda for Future Studies" providing a framework that identifies three levels of analysis (i.e., macro, meso, and micro) to encouraging scholars to conduct theoretical and empirical studies on how digital transformation affects ecosystems' structure and governance (Appio, et al. 2021).

Interaction of DT and Business Model Innovation and DT and Organization Change have been previously studied. The purpose of the paper named "The Digital Transformation of Business Model Innovation: A Structured Literature Review" was to analyze the development of the digital transformation field, and to understand the impact of digital technologies on business model innovation. Results show a need for research in developing countries and for more collaboration between researchers and practitioners (Vaska, et al. 2021). "A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change" derive four perspectives on the phenomenon of DT: technology impact, compartmentalized adaptation, systemic shift and holistic co-evolution (Hanelt, et al. 2021).

Wide range of topics interact with DT, allowing researchers to develop different kinds of studies. The authors of " Digital Transformation and Environmental Sustainability: A Review and Research Agenda" identified the disruptions driven by digital transformation in the environmental sustainability (Feroz, 2021). While the paper "Measuring Outcomes of Digital Transformation in Public Administration: Literature Review and Possible Steps Forward" provides an extensive review of theoretical and practical approaches to measuring government digitalization, identifies key limitations and proposes some steps for enhancing the existing practices (Dobrolyubova, 2021).

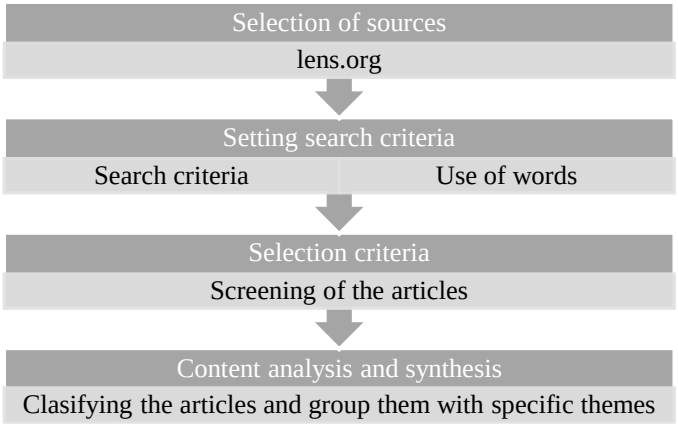
Through the research paper "DT: An Overview of the current State of the Art of Research" the authors stayed that research on DT has receiving growing attention, and the paper classifies the literature in three clusters based on technological, business and social impacts. To achieve this goal, the software VOSviewer was conducted to visualize the literature's node network (Kraus, et al. 2021). Keeping this previous SLR studies in mind, a literature

review is carried out to examine the studies, published in the last fifteen years (2006–2021), that analyzed both the Digital Transformation and Business.

RESEARCH METHOD

As stated above, this paper aims discover areas of opportunity for research regarding digital transformation in Latin American businesses. This study includes a systematic literature review (SLR) method to achieve the research objective mentioned above. SLR has been an effective method for identifying research trends and defining future research opportunities (Feroz, et al. 2021, Tranfield, et al. 2003 & Jones, 2004). This paper followed a step-by-step process for identifying research articles and analyzing them as per the SLR procedures. In this regard, we used the guidelines from the previous studies on doing a systematic literature review (Bandara, et al. 2011 & Vom Brocke, et al. 2009). Complete process of the literature review is presented in Figure 1.

Figure 1. Overview of literature research.



Selection of sources

Given this research is focused on trending topics like Digital Transformation and Business Models, it was decided to use a modern powerful tool that can manage several sources of literature. An online research was conducted in lens.org (Lens). Lens serves over 200 million scholarly records, compiled and harmonized from Microsoft Academic, PubMed and Crossref, enhanced with UnPaywall open access information, CORE full text and links to ORCID. The full scholarly citation graph is provided for the first time as an open public resource (lens.org, 2022).

Setting search criteria

Specific search criteria were set to identify relevant articles in Digital Transformation. The literature search was conducted in two phases. In the first phase, we focused on identifying articles in Business Field. Discarding, for example, articles on medicine, psychology, manufacturing, agriculture, among others. Following this, in the second phase, we extended our search to Managerial Business.

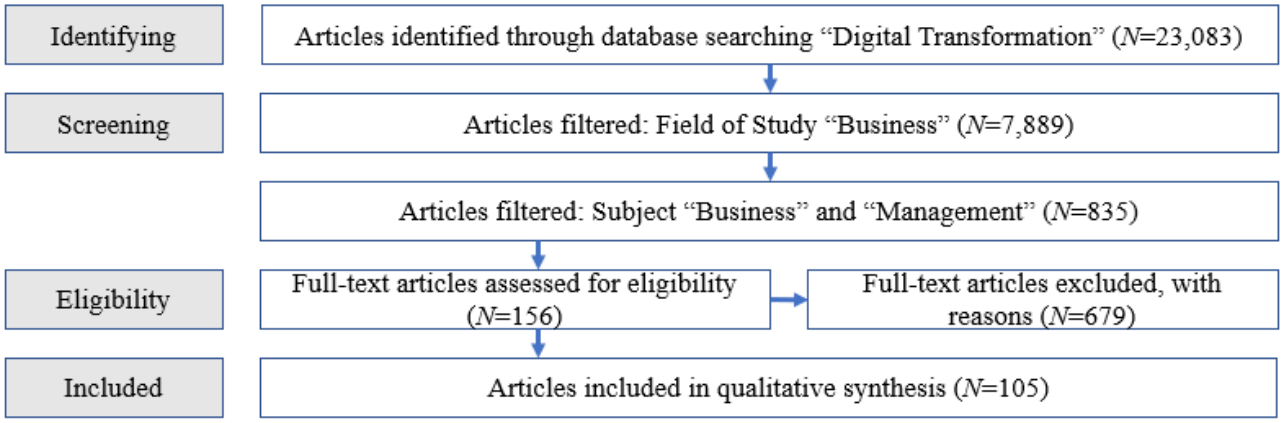
Using appropriate keywords is essential for identifying high-quality research articles. Keyword selection should be considered as an evolving step and should involve a continuous approach due to the limited lifespan of IT literature keywords (Feroz, et al. 2021). The search started with the fields of study Digital Transformation, Business, Business Model, Business, Business Processes, and Service (business). This fields of study produced many results due to their multidisciplinary nature.

The search focus was shifted to Digital Transformation related to Business Management. Selecting following subjects: Business and International Management, Strategy and Management, Information Systems and Management, Management and Technology Innovation, General Business Management and Accounting, Management Monitoring Policy and Law, Management Information Systems, Management Science and Operations Research, Business Management and Accounting (miscellaneous), Organizational Behavior and Human Resource Management, and Leadership and Management.

Selection criteria

Extensive prior literature search resulted in the retrieval of numerous articles, but we only focused on what was relevant to the research question based on the criteria defined in the previous section. The selection criteria for our sample were as follows: (a) the article had to be about Digital Transformation, (b) the article must deal with Business field of study, (c) the article had to be part of Business Management subjects. Furthermore, the article must include Business Model beside other Business topics. By using these criteria, a total of 156 were selected from Lens, which were reduced to 105 after further evaluation. Figure 2 describes the steps taken for identifying the target articles according to the PRISMA standard (Mother, et al. 2009).

Figure 2. Steps taken for identifying the target articles according to the PRISMA standard.

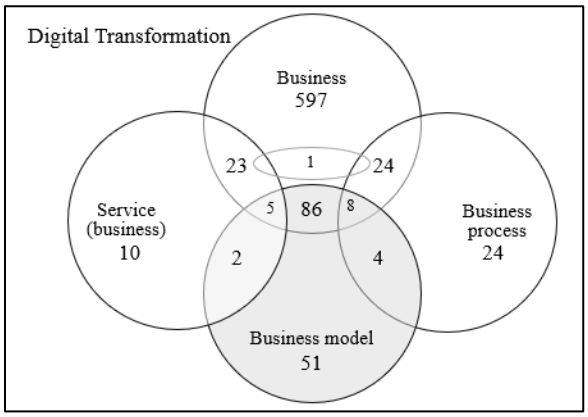


Content Analysis and Synthesis

After completing a sample of articles, a detailed content analysis was carried out. As in the bibliographic search, a systematic way of analyzing the articles was also followed. We analyzed them in detail and arrived at the main deductions derived from of them. We were able to group articles by different topics and developed a framework for a further research agenda. In the next section, we detail the main findings of this paper.

Specific criteria were set to select the articles for final review. Only articles that includes Business Model field of study interacting with other Business fields in Digital Transformation are included in qualitative synthesis (Figure 3).

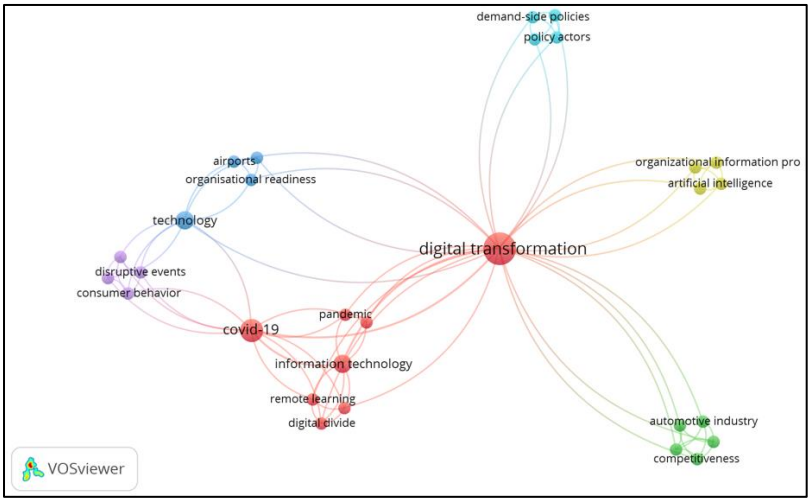
Figure 3. Number of articles at the nexus between Digital Transformation, and Business fields.



RESULTS AND DISCUSSION

In order to facilitate the visualization of the results obtained in this study, it was decided to build a bibliometric network. A bibliometric network consists of nodes and edges. The nodes can be, for instance, publications, journals, researchers, or keywords (van Eck & Waltman, 2014). In this paper research Figure 4 shows the bibliometric network for DT topics, which was achieve using VOSviewer. VOSviewer is a software tool for constructing and visualizing biometric networks (Centre for Science and Technology Studies, 2022).

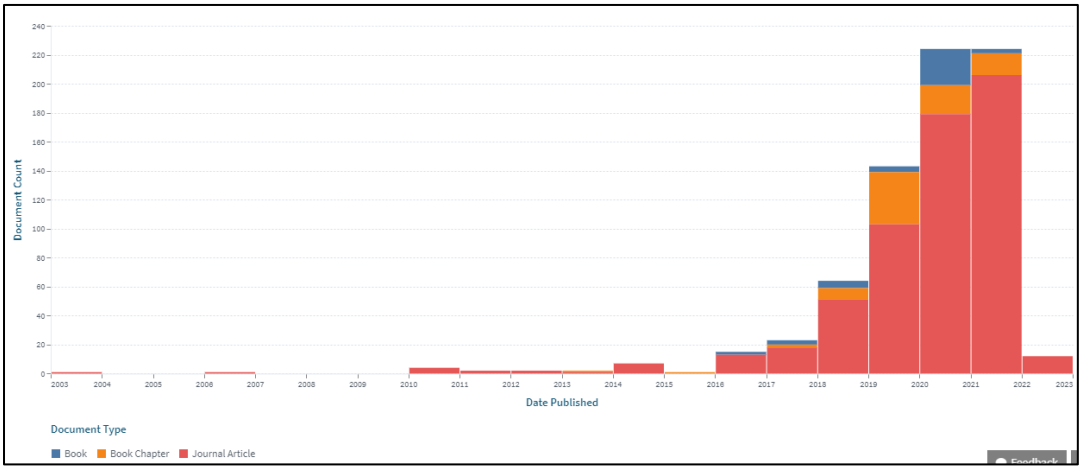
Figure 4. Bibliometric network for DT topics



Taking advantage of Lens provides a complete table that includes several details of research papers, like authors, publication year, publication type, publisher, source country, abstract, fields of study and citing works count. This information allows to organize and analyze information in many ways.

As stated before, DT has gained great importance in recent years. Since the purpose of this SLR is focused on the digital transformation of business, following graph shows the behavior of the 835 research papers that were found where Digital Transformation and Business coincide. In the graph we can see that in recent years research work has had a large increase. Both in books, book chapters and scientific articles (Figure 5).

Figure 5. Scholarly works overtime: DT & Business fields.



Source: Lens, April 30th, 2022.

Final sample of 105 research works includes 91 journal articles, 9 book chapters and 5 books. All of them are included because they are considered real options for the publications of future articles. These papers are distributed among 26 publishers. Table 1 shows details of top 5 publishers and help researchers to clearly recognize opportunities of publications.

Table 1. Top five Publishers by type of selected sample.

Publisher	Journal Article	Book Chapter	Book
Emerald	23		
MDPI AG	15		
Springer International Publishing		8	5
Elsevier BV	12		
Springer Science and Business Media LLC	7		
Wiley	4		

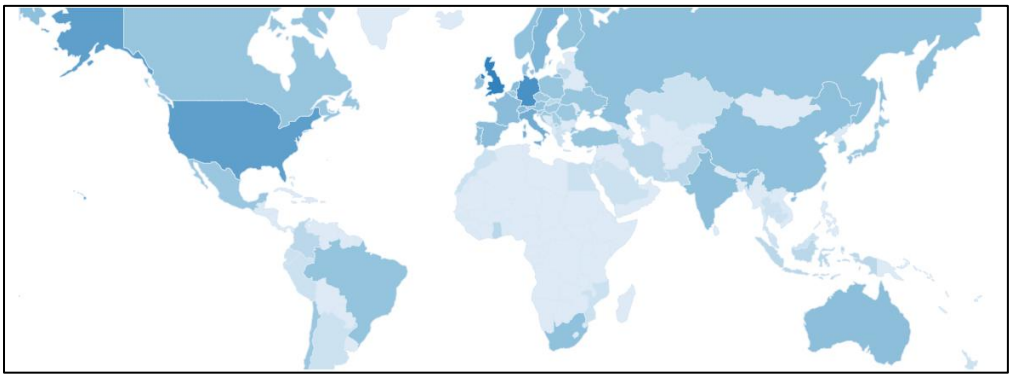
The present research helps to identify Top Subjects in DT and Business Management and show it visually through a Word Cloud (Figure 6). And helps to identify trends and opportunities in less developed topics. Based on this results, great opportunities in following fields are identified: small and medium enterprises, value creation and sustainable business models.

Future 6. Top subjects word cloud.

Source: Lens, April 30th, 2022.

Lens provides information of Source Country and also provides a map that help us to identify visually most active countries in research (Figure 7). It is observed that light blue countries offer greats opportunities of research. Meaning that Latin America is a fertile field to develop research.

Figure 7. Most active countries/regions: research papers about DT & Business fields



Source: Lens, April 30th, 2022.

Table 2 is only considering final sample of 105 papers, showing the number of papers by Source Country and the Citing Work Counts. Europe and USA are the top countries interested in these fields of study, while Brazil is the only country in Latin America developing research in DT and BM. This is a great opportunity to do research, because Latin American Countries are early adopters of technology, for example, Consumer FinTech adoption rate developed by Ernst & Young Global Limited revealed following results: Colombia 76%, Peru 75%,

Mexico 72%, Argentina 67%, Chile 66% and Brazil 64% (EY, 2019). In sum, Latin America serves as an interesting and rather unique context for testing old theories and generating new insights about DT and BM.

Table 2. Top three Countries publishing papers and citing works count

Source Country	Papers	Citing Works Count
United Kingdom	31	887
Switzerland	16	547
United States	15	464

Qualitative analysis

Selected sample (*n*=105) includes 86 papers which include DT, BM and Business topics. These research works analyzed and classified according to their main area of interest. Table 3 presents these results, providing a reference for the authors interested in this fields, also works as quick reference for future research.

Table 3. Digital Transformation, Business Model and Business.

Related fields of study	Related Studies
Knowledge management	AnthonyJr, et al. 2020, Brunetti, et al. 2020, Camarinha-Matos & Afsarmanesh 2021, Do Vale, et al. 2021, Gierlich-Joas, et al. 2020, Matarazzo, et al. 2021, Mattsson & Andersson 2019, Maric 2020, Mugge, et al. 2020, Pizzi, et al. 2021, Řepa 2020, Saarikko, et al. 2020, Vike 2020, Ylijoki 2018.
Sustainability	Bican & Brem 2020, Birkel, et al. 2019, Cantele, et al. 2020, Dalmarco, et al. 2021, George, et al. 2020, Hilali, et al. 2020, Kim 2021, Parida, et al. 2019, Parida & Wincent 2019, Pasqualino, et al. 2021, Pezzuto 2020, Tirabeni, et al. 2019.
Process management	Andersson & Lessing 2020, Cozzolino, et al. 2018, Danuso, et al. 2021, D'Ippolito, et al. 2019, Favoretto, et al. 2021, Fonseca, et al. 2021, Gupta & Bose 2022, Heinze, et al. 2018, Sandkuhl 2021, Simmons & McLean 2020, Zenezini, et al. 2019.
Entrepreneurship	Florek-Paszkowska, et al. 2021, Gavrila & de Lucas 2021, Gunasilan, et al. 2020, Kasperovica & Lace 2021, Reddy 2019, Ruggieri, et al. 2018, Soltysova & Modrak 2020,
Marketing/Commerce	Ballestar, et al. 2018, Caliskan, et al. 2020, Cooney, et al. 2021, Dasí, et al. 2017, Fernandez-Vidal 2022, Schlüter & Sommerhoff 2017, Song, et al. 2021.
Digital economy/ecosystem	Ansong & Boateng 2019, Dressler & Paunovic 2020, Li 2020, Lichtenthaler 2018, Rocha, et al. 2021, Romanova 2018.
Financial services/finance/fintech	Broby 2021, Fenwick, et al. 2019, Gomber, et al. 2018, Tsakalidis, et al. 2020, Svatoš 2020, Volberda, et al. 2021.
Value proposition/ Co-creation	Gaiardelli, et al. 2021, Gozman, et al. 2018, Klos, et al. 2021, Mikl, et al. 2020, Stoll, et al. 2020, Wasono, et al. 2021.
Technological change	Aloisi & De Stefano 2020, Jugel 2020, Magadán-Díaz & Rivas-García 2021, Mikl, et al. 2020, Núñez, et al. 2021.

Pandemic/crisis management	Anderson, et al. 2020, Kraus, et al. 2020, Lee, et al. 2021, Miklaszewska, et al. 2021.
Transformational leadership	Diller, et al. 2020, Kronblad & Pregmark 2021, Mihardjo, et al. 2019.
Supply chain/ Purchasing	Bienhaus & Haddud 2018, Do Vale, et al. 2021, Llopis-Albert, et al. 2020.
Emerging technologies	Iriqat & Jaradat 2019, Sordi, et al. 2020.

Table 4 Includes main findings in eight papers which DT, BM, Business and Business Process fields of study are developed.

Table 4. Research fields of study: DT, BM, Business and Business Process.

Main Findings	Related Studies
Modern digital technologies cause an exponential growth of data flows, for the effective functioning of which the need arises to transform a classic enterprise into digital; DT fosters the formation of new business models or the reshaping of existing ones; DT enabled by IoT and Big Data can positively impact many facets of business; DT strategies can be used to adopt digital technologies and attract investment; Many companies' digitalization programs have concentrated on strengthening the efficiency of current business processes; technological innovations that can support organizations and entrepreneurs to face these problems become increasingly important.	Andriushchenko, et al. 2019, Satalkina & Steiner 2020, Sestino 2020, Rossi, et al. 2019, Miethlich, et al. 2021, Lichtenthaler 2021, Rossi, et al. 2019 (2), Trivelli 2019.

Table 5 Includes main findings in 4 papers which DT, BM and Business Process fields of study are developed.

Table 5. Research fields of study: DT, BM, and Business Process.

Main Findings	Related Studies
To analyze the problems of switching to a digital format, develop a digital transformation strategy and rebuild a business model; architectural framework designed to support a digital platform fostering the optimization of supply chains; some of the e-business efforts met with moderate success others faced severe challenges; IS have promised to streamline business processes, integrate disparate systems, increase innovation, and offer greater competitive advantage.	Barmuta, et al. 2020, Silva, et al. 2019, Ranganathan & Seo 2006, Kumar, et al. 2016.

Table 6 Includes main findings in five papers which DT, BM, Business and Service (Business). Table 6. Research fields of study: DT, BM, Business and Service (Business).

Main Findings	Related Studies
The impact of DT on the adoption of service BM in manufacturing, with particular focus on problems, challenges and opportunities for (SMEs); Implement the design, development, and scaling processes for revenue models in the context of new digital services; Products-as-Service will have an impact on their whole value chain; The role of information and communication technologies in service in general; Digitalization should increase opportunities to create positive social effects.	Paiola 2019. Linde, et al. 2021. Qvist-Sorensen 2020. Breidbach, Keating, Lim 2019. Jabłoński & Jabłoński 2019.

Table 7 Includes main findings in two papers which DT, BM and Service (Business).

Table 7. Research fields of study: DT, BM and Service (Business).

Main Findings	Related Studies
DT has the potential to dramatically improve the customer experience, Entrepreneurial ventures often fail to attain financial viability due to the initial design of the business model and the inability to evolve the model over time.	Hinterhuber & Nilles 2021, Khuntia, et al. 2017.

CONCLUSION

Digital technologies are thus more than enabling technologies: digital technologies allow the creation of fundamentally new, disruptive business models. (Hinterhuber, A., Nilles, M. 2021). Digital disruption and transformation is a rather recent research stream, and at the best of our knowledge no research has been carried out with specific attention to its impact on service business models and servitization in SMEs (Paiola, M., 2019).

This business model shift has profound implications for cost structures, risk management, and revenue streams, providing manufacturing companies with the key challenge of rethinking how to capture value (Linde, L., Frishammar, J., Parida, V., 2021). The companies will need to re-evaluate their market justification and define their value proposition to both existing and potentially new customers. New skills are required as data and analytics, represented by IIoT and AI, will play an ever-larger role in the companies' interaction with their present and new customers (Qvist-Sorensen, P. 2020).

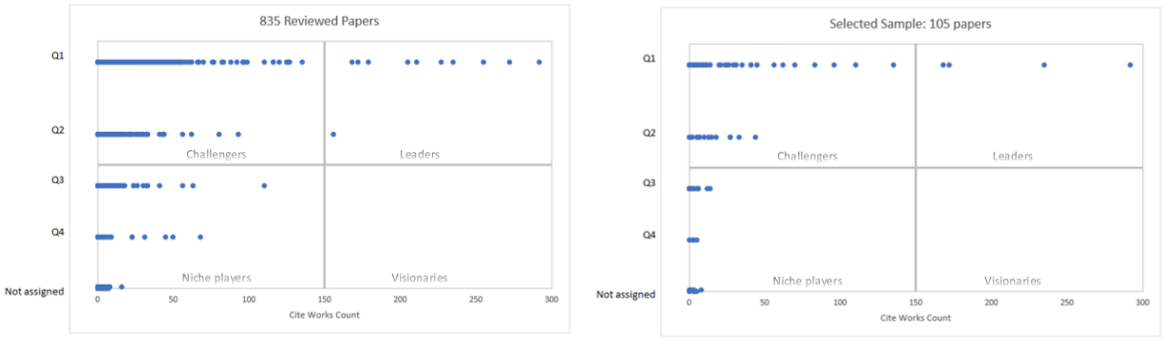
To take advantage of this new aggregated market paradigm new business models with a heavy focus on servitization are changing the value proposition of businesses (Silva, et al., 2019). The rapid turn toward digital business models will have enduring effects, as organizations have gained transformational capabilities that will remain, and that the digital trajectory has, as a result, changed forever (Kronblad & Pregmark, 2021).

FUTURE RESEARCH DIRECTIONS

Inspired by Gartner's magic square (Gartner, Inc., 2022). Two four-quadrant matrix charts were constructed where the papers included in this research can be seen. The journals where they are published have different levels of impact and vary in number of citations. With these graphs we can visually analyze this information. Figure 8 includes the total number of papers

and the selected sample. By creating this database, it is also possible to represent the information by publisher, by country or by year of publication in a similar way.

Figure 8. Four-Quadrant Matrix Chart



Based on these results, great opportunities in following fields were identified: small and medium enterprises, value creation and sustainable business models. Also, it is highly recommended to do research in Latin American Countries.

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