

Mapping research on digital transformation in family businesses: A bibliometric analysis

Estructura y evolución de la investigación sobre la transformación digital en la empresa familiar: Un análisis bibliométrico

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Abstract: This paper presents a bibliometric study of the research on digital transformation in family business based on a dataset of 196 peer-reviewed articles extracted from Web of Science which aims to map the existing research on this topic. We integrate several different bibliometric methods to provide more comprehensive picture of the field. The study outlines trends in scientific production, providing information about most productive authors, institutions, countries, and journals. We show that the research interest in this topic has increased significantly during the last five years, and existing literature examines a great variety of research topics and employs diverse theoretical perspectives. The co-citation analysis of cited references describes the intellectual foundations of the research on digital transformation in family business, while the bibliographic coupling analysis of articles shed light on emerging research trends in this field. Based on co-occurrence analysis of author keywords, the main research topics in the field are outlined and their evolution during the last five years is discussed. A conceptual framework of the main thematic focuses and theoretical pillars in the research on digital transformation in family business is presented that can inform both academic research and practical applications. The paper highlights several directions for future research.

Keywords: Family business, digital transformation, bibliometric, bibliographic coupling, co-citation analysis.

Resumen: Este artículo presenta un estudio bibliométrico de la investigación sobre la transformación digital en la empresa familiar. El mapeo de la investigación existente sobre este tema se fundamenta en el análisis de 196 artículos revisados por pares extraídos de Web of Science. El trabajo integra diversos métodos bibliométricos con el fin de ofrecer una visión más completa del campo. El estudio identifica las principales tendencias en la producción científica y proporciona información sobre los autores, instituciones, países y revistas más productivas. Los resultados muestran que el interés por investigar en este ámbito ha aumentado significativamente durante los últimos cinco años, y la literatura existente examina una amplia variedad de temas de investigación y emplea diversas perspectivas teóricas. El análisis de co-citación de referencias describe los fundamentos intelectuales de la investigación sobre la transformación digital en

la empresa familiar, mientras que el análisis de acoplamiento bibliográfico de los artículos permite identificar las tendencias emergentes en este campo. A partir del análisis de co-ocurrencia de las palabras clave de los estudios analizados, se delimitan los principales temas de investigación en el área y se discute su evolución durante los últimos cinco años. Asimismo, se presenta un marco conceptual que sintetiza los principales enfoques temáticos y pilares teóricos de la investigación sobre la transformación digital en la empresa familiar, el cual puede orientar tanto la investigación académica como las aplicaciones prácticas. Finalmente, el artículo destaca diversas líneas para futuras investigaciones.

Palabras clave: Empresa familiar, transformación digital, bibliometría, acoplamiento bibliográfico, análisis de co-citación.

1. Introduction

The rapid development of a diverse set of digital technologies, digital platforms, and digital infrastructures has accelerated digital transformation (DT) in organizations (Liu et al., 2023). New digital technologies are transforming traditional business environments into digital ecosystems in which companies need to embrace DT to remain competitive (Subramaniam et al., 2019; Lafuente et al., 2023; Lafuente et al., 2024). DT was defined as “a fundamental change process, enabled by the innovative use of digital technologies accompanied by the strategic leverage of key resources and capabilities, aiming to radically improve an entity and redefine its value proposition for its stakeholders” (Gong & Ribiere, 2021, p.12). It is described as a three-stage process in which digitization (conversion of analog information into digital format) and digitalization (use of digital technologies to enable process improvements) are the two more incremental stages preceding the more pervasive stage of DT (Verhoef et al., 2021; Vaillant et al., 2025).

DT is associated with significant benefits leading to better firm performance that may include changes in value creation paths (Vial, 2019), increased entrepreneurial innovations (Galindo-Martín et al., 2019), improved total factor productivity (Guo et al., 2023), social network updates and training in digital tools (Ribeiro-Navarrete et al., 2021), lower cost, better operating efficiency, better innovation success (Zhai et al., 2022), greater profits, productivity, and competitiveness (Llopis-Albert et al., 2021). However, despite these benefits, organizations may face diverse challenges to their DT (Petzolt et al., 2022) and they must successfully overcome them to maintain their competitiveness (Soluk & Kammerlander, 2021).

In this article, we focus on DT in family businesses. Family business is “a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families” (Chua et al., 1999, p.25). In contrast to non-family firms, family firms are characterized by family involvement in the ownership and management, unique bundle of resources (familiness), socioemotional wealth, and vision and the transgenerational intention of the controlling family (Dawson & Mussolino, 2014). These distinctive characteristics of family business may present both opportunities and challenges for DT. Empirical research reveals that digitalization and DT lead to positive outcomes in family businesses (Lasio et al., 2024; Bürgel et al., 2023; Chatterjee et al., 2023; Nieto et al., 2023). Family businesses are under pressure to undertake DT to meet market expectations (Mikušová & Stanovská, 2025), but the transition toward DT is not straightforward in family firms (Ceipek et al., 2021). They may lack commitment and readiness for DT (Xie et al., 2023) and can be reluctant to digitize (Mikušová & Stanovská, 2025).

Although the research on DT and the research on family firms have grown consistently during the last decades (Kraus et al., 2021; Chrisman et al., 2024), the research at the intersection of these two areas is still scarce (Soluk & Kammerlander, 2021; Canjun et al., 2025) and there is a need for greater research attention on this topic. DT and family business have been predominantly studied in isolation. DT research is focused on specific domains and is highly specialized (Kraus et

al., 2022). For example, some authors have studied DT in companies of different sizes (Marino-Romero *et al.*, 2024) or in different industries (Hagberg *et al.*, 2016; Lafuente *et al.*, 2023). At the same time, various bibliometric analyses on various research topics in family business were published during the last decade including AI adoption within the context of family businesses (Atienza-Barba *et al.*, 2025), entrepreneurship in family firms (Anwar *et al.*, 2024), family business research published between 2011 and 2020 (Aparicio *et al.*, 2021), family firm internationalization research (Casprini *et al.*, 2020) conflict management in family businesses (Caputo *et al.*, 2018), sustainability in family business (Ferreira *et al.*, 2021), research on family business in tourism and hospitality (Shekhar *et al.*, 2022), family businesses adaptation to the rapid pace of globalization (Wu *et al.*, 2022). However, no study has focused on mapping the research on DT in family business. To address this research gap, this study conducts a bibliometric analysis on DT in family business. We describe the intellectual foundations of the research on DT in family business via co-citation analysis. We also outline the current research trends in the literature on DT in family business through bibliographic coupling analysis. Finally, we provide a conceptual framework of the main thematic focuses in the research on DT in family business, and we offer future research directions. The following research questions were addressed in this study:

RQ1: Which authors, articles, journals, institutions, and countries are the most influential in the field of DT in family business?

RQ2: What current research trends stand out in the literature of DT in family business?

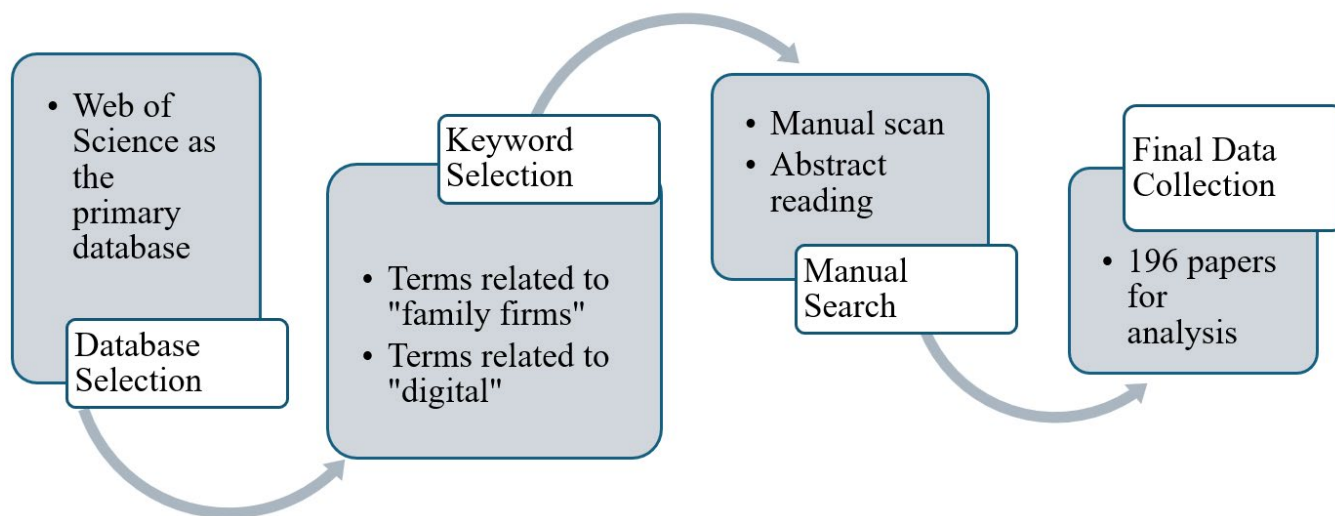
RQ3: What are the intellectual foundations of the research on DT in family business?

RQ4: What is the knowledge structure of the field of DT of family business?

Building upon existing research on DT in family business, our work offers several contributions to literature. The study provides a higher understanding of the field of DT in family business by identifying the current research trajectories and trends in this field that can inform future research agendas. By uncovering the knowledge structure, intellectual foundations, and current research trends in the literature of DT in the context of family business, this study may foster new research opportunities. The study provides value to both academic and practitioner audiences by presenting a conceptual framework of the main thematic focuses and theoretical pillars in the research on DT in family business. The remainder of the article is structured as follows. The next section describes the steps in the literature review process adopted in this study. The following section presents the results of the bibliometric analysis. The final section concludes, discusses the limitations of the study, and suggests directions for future research on DT in family business.

2. Methodology

Bibliometric analysis is a quantitative research method, using mathematical and statistical techniques to evaluate scholarly literature and publication patterns (Donthu *et al.*, 2021). This method allows for examining performance in a knowledge domain (Wallace *et al.*, 2011) and investigating implicit behaviors in knowledge dissemination (González-Valiente, 2016), thus facilitating the identification of research outputs and emerging trends (Merigó *et al.*, 2018). According to the research of Wolfswinkel *et al.* (2013), the literature review process requires the following sequential stages: (1) defining the scope of the review; (2) sourcing relevant literature; (3) finalizing sample selection; (4) analyzing the corpus; and (5) presentation of the findings (Vial, 2019). Therefore, the bibliometric analysis for this article was conducted following the procedural framework described in Figure 1.

Figure 1: Procedural framework of the bibliometric analysis.

Source: adapted from Ribes et al. (2018).

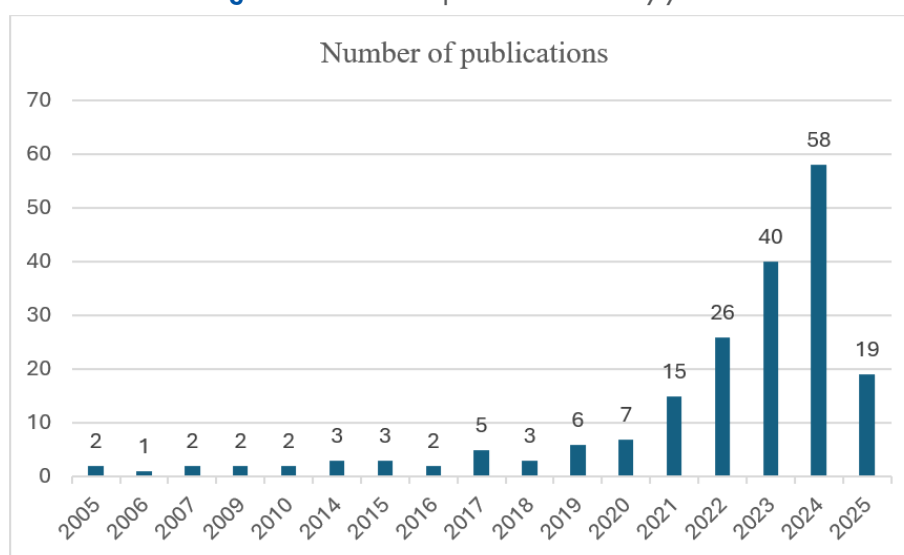
The methodology began with data retrieval from the Web of Science (WOS) database, a comprehensive repository for peer-reviewed literature (Crossan & Apaydin, 2010). We searched for articles published up to March 20, 2025, without a lower boundary for the time frame. The data extraction incorporated terms related to “family firms/family business/family controlled enterprise” and terms related to “digital*/digitization/digitalization/ICT”, which needed to appear in the title, abstract, or keywords of the articles. The selection process yielded 338 articles. We carefully read the titles, abstracts, introductions, or full texts of these articles to identify the relevant ones. The exclusion criteria for selecting relevant articles were: 1/ the selected publications should only include articles from peer-reviewed scientific journals, indexed in Web of Science, as they provide objective and reliable knowledge; 2/ only articles in English were selected, because English has become the most important language used in scientific communication; 3/ we did not fix a lower boundary for the time frame because we wanted to identify all published articles examining DT in family business; 4/ the selected articles must provide a clear relationship with the subject of DT in family business. This resulted in a final sample of 196 articles. The resulting dataset included article titles, author names, year of publication, journal of publication, abstract, number of citations, and related references. This dataset facilitated subsequent descriptive analysis and cartographic representation. VOSviewer software was used to systematize the relationships between articles, allowing for a comprehensive exploration of co-authorship networks and the identification of featured topics (Herrera-Barriga & Escandon-Barbosa, 2024), while also distinguishing influential publications and journals (Van Eck & Waltman, 2017). The number of citations are the primary metric for assessing scholarly impact (Mustafa et al., 2023). A manual keyword normalization and pre-screening process was performed before synthesis. We then conducted bibliographic coupling and co-citation analyses. This process allowed for the construction of detailed network maps of related research clusters and the identification of overarching thematic connections within the research domain (Kirby, 2023).

3. Results

3.1 Descriptive analysis

The 196 articles on DT in family business included in this analysis were published in 107 journals. The first 2 articles on this topic appeared in 2005, but the number of documents per year was under 10 until 2020 (see [Figure 2](#)). After 2020 the number of publications on DT in family business per year has increased continuously which indicates the growing research interest of the scientific community in this topic. This is not surprising as the outbreak of Covid-19 pandemic at the end of 2019 showed that DT is important for family businesses of all sizes and sectors.

Figure 2: Number of published articles by year.



Only 9 journals have published 3 or more articles in the field of DT in family business, and 16 journals have published 2 articles, while 82 journals have published only 1 article. The majority of the journals with more than 2 publications are in the field of business and management and are positioned in Q1 or Q2 (see [Table 1](#)). The top 10 journals with the highest number of citations are also in the field of business and management (see [Table 1](#)). They include *International Journal of Entrepreneurial Behavior & Research* (522 citations), *Journal of Family Business Management* (255 citations), *Technovation* (194 citations), *European Journal of Information Systems* (169 citations), *Research in International Business and Finance* (156 citations), *Entrepreneurship Theory and Practice* (153 citations), *Technological Forecasting and Social Change* (147 citations), *Journal of Retailing and Consumer Services* (137 citations), *Research Policy* (132 citations), and *Journal of Business Research* (106 citations).

In total 564 authors from 390 institutions in 66 countries contributed to the research on DT in family business. Interestingly, all of the top institutions ranked by the number of publications are located in Europe (see [Table 2](#)).

The country with the highest number of published articles in the field of DT in family business is China (see [Table 3](#)). Half of the top 10 countries ranked by the number of publications are on the European continent.

Table 1: Top journals ranked by the number of publications.

Journal	Number of publications	Impact factor	Position JCR
Journal of Family Business Management	34	3.6	Q2
Sustainability	10	3.3	Q2
Technological Forecasting and Social Change	7	12.9	Q1
Journal of Business Research	7	10.5	Q1
IEEE Transactions on Engineering Management	7	4.6	Q1
International Journal of Entrepreneurial Behavior & Research	6	4.5	Q1
International Entrepreneurship and Management Journal	4	6.2	Q1
European Journal of Innovation Management	4	5	Q1
Journal of Enterprising Communities-People and Places in the Global Economy	3	2.4	Q3

Table 2: Top 10 institutions ranked by the number of publications.

Rank	Institutions	Documents	Citations	Total Link Strength
1	WHU – Otto Beisheim School of Management	8	458	316
2	University of Bern	5	283	218
3	IPAG Business School	5	32	48
4	Free University of Bozen-Bolzano	4	135	98
5	University of Nicosia	4	87	44
6	Witten/Herdecke University	3	446	98
7	University of Bergamo	3	148	39
8	University of Valencia	3	99	47
9	University of Siegen	3	74	65
10	University of Turin	3	38	28

Note: The total link strength of a country indicates the total strength of the co-authorship links of a given country with all other countries, whereas the strength of a link between two countries represents the number of papers in which authors are from these two countries (van Eck and Waltman, 2021).

Table 3: Top 10 countries ranked by the number of publications.

Rank	Country	Documents	Citations	Total Link Strength
1	China	35	333	186
2	Italy	29	1100	310
3	Germany	22	1152	354
4	Spain	20	483	234
5	USA	18	624	112
6	India	18	298	56
7	England	16	962	190
8	France	13	534	114
9	Malaysia	11	182	44
10	Australia	9	178	51

Only 8 authors published 3 or more articles in the field of DT in family business (see Table 4). Nadine Kammerlander, with 6 articles, Jonas Soluk, with 5 articles, and Demetris Vrontis, with 4 articles were the most productive authors. The most cited authors are Sascha Kraus (482 citations), Jonas Soluk (437 citations), and Thomas Clauss (435 citations).

Table 4: Top 8 authors ranked by the number of publications.

Rank	Author	Documents	Citations	Total Link Strength
1	Kammerlander, Nadine	6	413	82
2	Soluk, Jonas	5	437	93
3	Vrontis, Demetris	4	87	5
4	Bargoni, Augusto	3	37	0
5	Chatterjee, Sheshadri	3	74	5
6	Chaudhuri, Ranjan	3	74	5
7	De massis, Alfredo	3	225	49
8	Hiebl, Martin R. W.	3	74	27

The analysis of the number of citations of the articles in our dataset provides an overview of the most influential research. There are 196 articles in the dataset published in the period 2005 – 2025 with a total of 3558 citations which indicates an average of 18.06 citations per article. However, 38 articles have no citations, 18 articles have a minimum of one citation, 63 articles have between 2 and 9 citations, and 67 articles have between 10 and 70 citations. The top ranked articles in the field of DT in family business in terms of the highest number of citations received in WoS have 72 or more citations (see citation analysis column in Table 5). In this regard, the article on DT in family business with the highest number of citations (429 citations) is by Kraus, Clauss, Breier, Gast, Zardini and Tiberius (2020).

Table 5: The top ranked articles in the field of DT in family business in terms of total citations in WoS and total link strength.

Citation analysis		Bibliographic coupling	
Article	Total citations	Articles	Total Link Strength
Kraus, Clauss, Breier, Gast, Zardini and Tiberius (2020)	429	Soluk, Miroshnychenko, Kammerlander, and De Massis (2021)	528
Bruque and Moyano (2007)	183	Ardito and Capolupo (2024)	495
Soluk and Kammerlander (2021)	169	Bornhausen and Wulf (2024)	461
Caballero-Morales (2021)	156	Basly and Hammouda (2020)	401
Soluk, Miroshnychenko, Kammerlander and De Massis (2021)	151	Cucculelli, Dileo and Pini (2022)	393
Orth and Green (2009)	137	Pini (2019)	386
Cumming, Meoli and Vismara (2019)	132	Soluk (2022)	377
Cooper, Upton and Seaman (2005)	104	Bürgel, Hiebl and Pielsticker (2023)	370
Škare and Soriano (2021)	97	Costa, Presenza and Abbate (2023)	350
Soluk, Kammerlander and De Massis (2021c)	72	Soluk and Kammerlander (2021)	347

3.2 Co-citation analysis

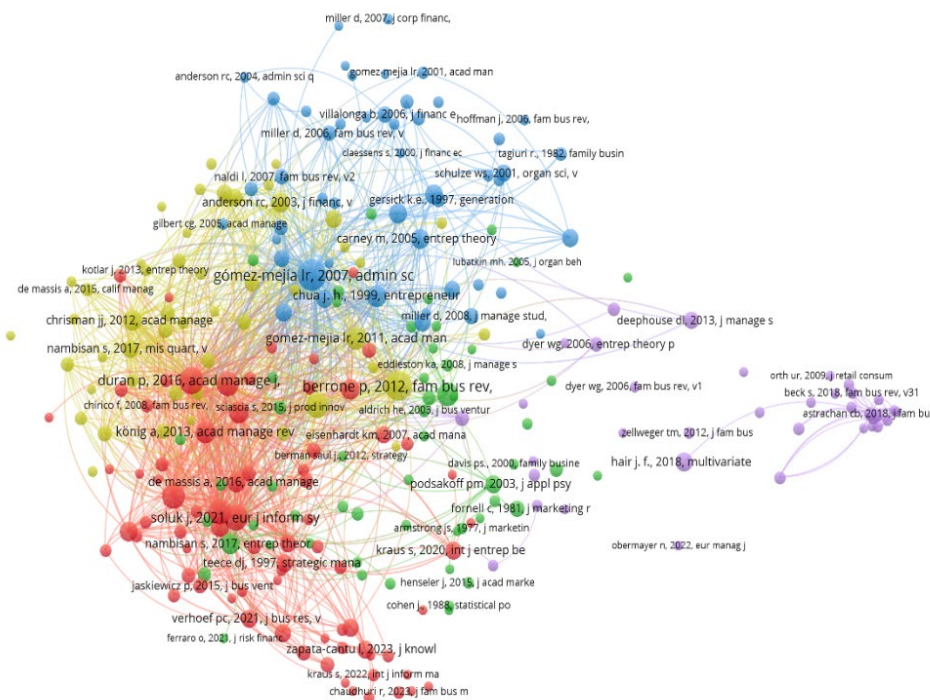
The co-citation analysis of the references cited in the articles in the dataset reveals the theoretical foundations and structure of the literature on DT in family business. Following Ferreira (2018), a threshold of 5 citations for each co-cited reference was used to reduce the complexity of visualization. Of the 11506 cited references, 264 were cited 5 times. The 10 references with the highest total link strength which can be considered the main theoretical pillars of the field are presented in Table 6. The co-citation analysis of the cited references sheds light on the main theoretical perspectives and highly influential contributions constituting the intellectual structure of the field (see Figure 3).

Table 6: The ten most connected references.

Rank	Reference	Citations	Total Link Strength
1	Gómez-Mejía et al. (2007), ASQ	47	1494
2	Berrone at al. (2012), FBR	41	1255
3	Duran et al. (2016), AMJ	34	1230
4	Ceipek et al. (2021), JPIM	30	1084
5	Soluk and Kammerlander (2021), EJIS	33	1036
6	Soluk et al. (2021), ETP	31	967
7	Chrisman et al. (2015), JPIM	28	938
8	König et al. (2013), AMR	23	925
9	Calabrò et al. (2019), IJMR	30	897
10	Chua et al. (1999), ETP	23	756

Note: ASQ = Administrative Science Quarterly; FBR = Family Business Review; AMJ = Academy of Management Journal; JPIM = Journal of Product Innovation Management; EJIS = European Journal of Information Systems; ETP = Entrepreneurship Theory and Practice; AMR = Academy of Management Review; IJMR = International Journal of Management Reviews.

Figure 3: Network visualization of co-cited references.



The identified 5 different clusters (red with 75 documents, blue with 49 articles, yellow with 49 articles, green with 55 articles, and lilac with 36 documents) highlight the following five main theoretical approaches: 1/ family influence and family involvement; 2/ entrepreneurship and innovation; 3/ behavioral approach; 4/ socioemotional wealth; and 5/ heterogeneity among family businesses and between family and non-family businesses. The studies in the first cluster (red) emphasize the role of family involvement and family influence on innovation and digitalization in family firms. Duran et al. (2016), Ceipek et al. (2021), Soluk and Kammerlander (2021), Soluk et al. (2021), Chrisman et al. (2015), and König et al. (2013) are the main authors in this cluster. Duran et al. (2016) demonstrate that family control is related to lower innovation input but

with increased conversion rate of innovation input into output. [Ceipek et al \(2021\)](#) find that higher family involvement in the top management team decreases the development of exploratory Internet of Things (IoT) innovations relative to exploitative IoT innovations. [Soluk and Kammerlander \(2021\)](#) identify family firm paternalism i.e. decision-making power concentrated in a senior family member (i.e., a patriarch) as a major barrier to developing the dynamic capabilities required in the DT process. [Soluk et al \(2021\)](#) find a positive effect of family influence on digital business model innovation and this effect is mediated by dynamic capabilities. [Chrisman et al \(2015\)](#) provide a framework of the influence of family involvement on ability and willingness for innovation management. To summarize, family involvement and family influence are relevant theoretical constructs for understanding DT in family business.

The second cluster (green) is centered on entrepreneurship and innovation in family firms. [Nambisan \(2017\)](#) and [Zahra et al \(2004\)](#) are the articles with the highest total link strength in this cluster. [Nambisan \(2017\)](#) explains the importance of digital entrepreneurship as a new research area and discusses pathways for future research in this area. [Zahra et al \(2004\)](#) find a relationship between several dimensions of organizational culture and entrepreneurship in family and non-family businesses. Furthermore, they demonstrate that the relationship with entrepreneurship for most of these dimensions of organizational culture is stronger in family firms than in non-family firms. [Sciascia et al \(2015\)](#) identify a link between family ownership and R&D intensity in SMEs. [Leppäaho and Ritala \(2022\)](#) find evidence that risk-averse family firms can use a crisis to productively engage in innovation efforts. Overall, the literature in this cluster reveals that entrepreneurship and innovation is another major theoretical underpinning of family firms' DT.

Documents in the third cluster (blue) draw upon the behavioral approach and behavioral agency model perspective to examine the characteristics, determinants and results of the behavior of family firms. [Gómez-Mejía et al. \(2007\)](#), [Chua et al. \(1999\)](#), and [Nieto et al. \(2023\)](#) are the publications with the highest total link strength in this cluster. Using behavioral theory, [Gómez-Mejía et al. \(2007\)](#) investigate the behavior of family firms in response to venturing risks and find that the predictions of behavioral theory differ depending on family ownership. [Chue et al. \(1999\)](#) propose a definition of family business based on the vision, intentions and behavior that distinguish them from non-family business. [Nieto et al. \(2023\)](#) shed light on innovation behavior of family firms by analyzing their innovation efforts, sources, and results. Their findings reveal that family firms are less likely to use external sources (contracting mechanisms and collaboration agreements), exhibit fewer innovation efforts, and are less likely to achieve radical innovations than incremental innovations than non-family firms. [Kotlar et al. \(2013\)](#) adopt a behavioral agency model perspective to gain greater understanding of the effects of behavioral factors on external technology acquisition. Based on the documents in this cluster, we conclude that DT in family business is significantly influenced by idiosyncratic behaviors of family firms.

The fourth cluster (yellow) emphasizes socioemotional wealth (SEW) preservation and its implications in family business. [Berrone et al. \(2012\)](#) are the main authors in this cluster. They argue that SEW approach can be a dominant paradigm in family business research as it can help to differentiate the family business as a unique entity. [Berrone et al. \(2012\)](#) discuss its origins, advantages, dimensions, and different approaches to measuring this concept. [Calabrò et al. \(2019\)](#) highlights the SEW approach is one of the key theoretical perspectives in the family firm innovation research. [Chrisman and Patel \(2012\)](#) examine how family goals that create socioemotional wealth influence R&D investments of family firms. [Gómez-Mejía et al. \(2011\)](#) demonstrate that SEW preservation is a predictor of managerial choices in family firms (management processes, strategic choices, organizational governance, stakeholder relations, and business venturing) and identify several contingency variables (hazards faced by the firm, family stage, firm size, and the presence of nonfamily shareholders) that moderate the influence of SEW on managerial choices in family firms. To summarize, the literature in this cluster reveals that SEW approach is another major theoretical perspective used in research on DT in family business.

The fifth cluster (lilac) focuses on heterogeneity in performance and success among family firms and between family and non-family firms stemming from family firm identity, familiness, family members' identification with the family firm, family structures, etc. For example, [De Massis et al. \(2018\)](#) discuss different sources of family firm heterogeneity to understand the determinants, processes, and outcomes of family business internationalization. [Deephouse and Jaskiewicz \(2013\)](#) identify reputational differences among family and non-family firms associated with differences in family ownership, presence of family members on the governing board, and the presence of the family's name in the firm's name. [Dyer Jr. and Whetten \(2006\)](#) demonstrate that family firms exhibit better corporate social performance along several dimensions in comparison with non-family firms which is explained by family concerns among image and reputation and a desire to protect family assets. [Arregle et al \(2019\)](#) use the structure of the family institution to shed light on family businesses' internationalization heterogeneity. [Zellweger et al \(2010\)](#) propose a multi-dimensional model of family influence in the family firm, which demonstrates the heterogeneity among families and can help to better understand differences among family firms and differences between family and non-family firms. Based on the documents in this cluster, we suggest that heterogeneity in performance and success among family firms and between family and non-family firms is a valuable theoretical basis for researching DT in family business.

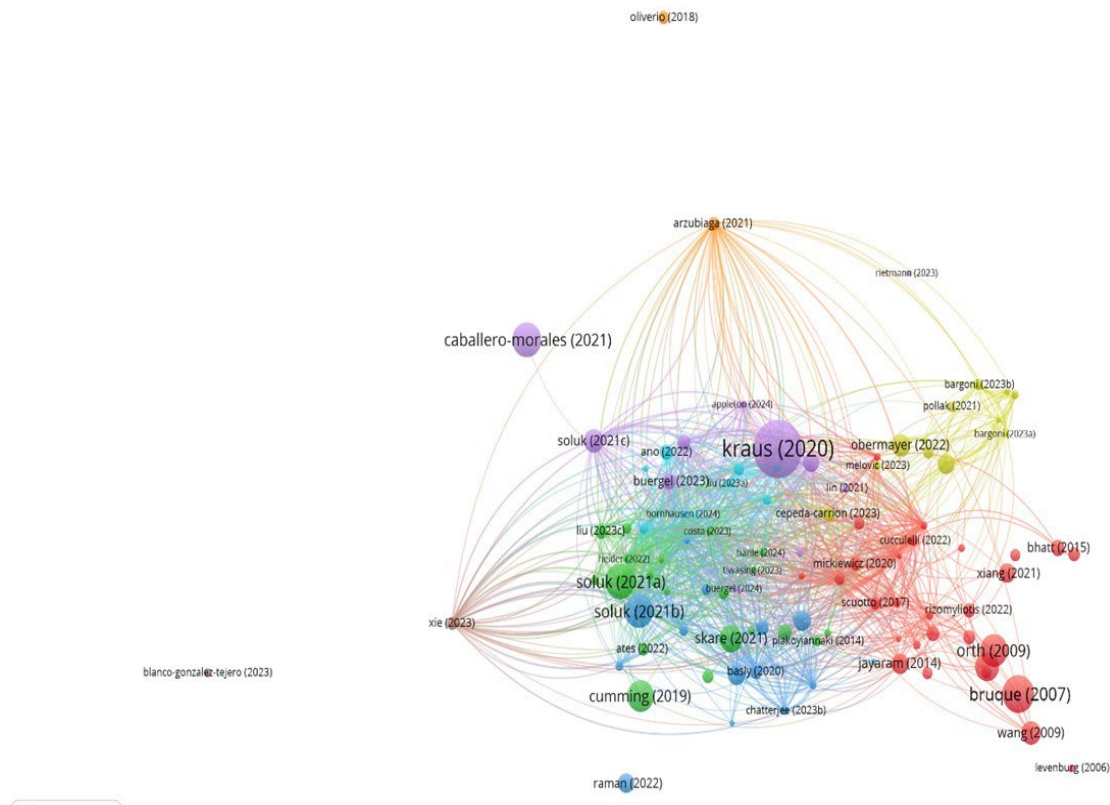
3.3 Bibliographic coupling analysis

The bibliographic coupling analysis of the 196 articles in our dataset “is suitable for detecting current trends and future priorities as they are reflected at the forefront of research” ([Vogel & Güttel, 2013](#), p.429). We use a threshold of 5 minimum citations of a document in Web of Science to identify core sets of articles for the bibliographic coupling analysis ([Baier-Fuentes et al., 2019](#)). The bibliographic coupling of the 196 articles in our dataset shows that the largest set of connected documents contains 100 publications (50.07% of the dataset). The top 5 articles in terms of total link strength are published during the last 5 years (see [Table 5](#)). The network visualization for bibliographic coupling documents is presented in [Figure 4](#). The identified 8 research clusters (red, green, blue, olive, lilac, turquoise, orange, brown) represent the major research streams on DT in family firms and consist of articles that may be extensively cited in the future. Two clusters contain only 2 documents (orange and brown) and therefore they were excluded from the analysis. Publications in the red cluster (29 documents) examine the adoption of digital technologies in family businesses. [Cucculelli et al. \(2022\)](#) discuss the influence of family ownership and family management on the adoption of Industry 4.0 business models including activities aimed to influence value generation through the adoption of digital technology. [Pini \(2019\)](#) emphasizes that the effects of external management on digital innovation related to investments in Industry 4.0 in family firms depends on the areas' development levels. [Dutot \(2022\)](#) stress that IT governance and strategy can mediate positively the relationship between family harmony and firm performance in family SMEs. [Gargallo Castel and Galve Gorriz \(2017\)](#) highlight the moderating effect of family involvement on the influence of ICT on firm performance. [Amato et al. \(2024\)](#) report that the degree of process digitalization negatively moderates the relationship between family firm status and the maturity level of management control systems. [Meroño-Cerdán \(2017\)](#) find that although family firms perceive higher barriers to the adoption of teleworking than non-family firms, they adopt teleworking evaluating only the perceived benefits. [Kathuria et al. \(2023\)](#) discuss that professional executive may decrease the negative effect of family ownership on IT investment.

Studies in the green cluster (22 documents) focus on DT and its outcomes in family firms. [Costa et al. \(2023\)](#) highlight the influence of familiness on DT of family-owned SMEs. Drawing upon a multiple case study of 15 family-owned SMEs, [Soluk and Kammerlander \(2021\)](#) outline three stages of the process of DT in these firms (process digitalization, product and service digitalization, and business model digitalization), their internal and external triggers, the developed capabilities throughout this process, as well as specific enablers and barriers that can accelerate or impede the advancement through the stages of the DT process. [Heider et al. \(2022\)](#) identify the effects of family willingness and family ability on process digitalization, product digitalization, as well as DT. [Liu et al. \(2023\)](#) examine factors affecting digital investments and disclosure of symbolic cues about DT in family firms. [Tuncalp \(2025\)](#) emphasizes strategic, operational and cultural factors driving artificial intelligence adoption in family firms. [Putritamara et al \(2023\)](#) find that dynamic capabilities affect DT

which improves firm resilience in family firms. [Barile et al. \(2024\)](#) describes the reconfiguration of the traditional business model of a family firm into a digital business model through the adoption of digital tools.

Figure 4: Network visualization for coupling documents.



Articles part of the blue cluster (14 documents) shed light on the interrelationships among family influence, entrepreneurship, DT and internationalization in family firms. [Soluk et al. \(2021\)](#) find that the positive effect of family influence on digital business model innovation is mediated by dynamic capabilities. [Basly and Hammouda \(2020\)](#) provide a conceptual model revealing the factors impacting digital entrepreneurship adoption in family firms and the moderating influence of family involvement on digital entrepreneurship adoption in family firms. [Lasio et al. \(2024\)](#) demonstrate that entrepreneurial orientation significantly enhances the effect of DT of family firm performance. [Chatterjee et al. \(2023\)](#) describe digitalization and international networking capability as moderators for the successful internationalization and performance of family firms. [De Groote et al. \(2023\)](#) reveal how family-owned SMEs can use historical, venture, and collaborative capital to master digitalization. [Upadhyay et al. \(2023\)](#) shed light on the role of digital entrepreneurship and entrepreneurial orientation on the intention of family businesses to adopt artificial intelligence.

Researchers in the olive cluster (12 documents) address the use of social media, digital marketing and consumer behavior in family firm context. [Bargoni et al. \(2023a\)](#) examine the influence of family firms' characteristics on millennials' consumer behavior and the moderating role of millennials' digital savviness. [Cepeda-Carrion et al. \(2023\)](#) investigate the relationship between social media use and open innovation in family firms. [Zanon et al. \(2019\)](#) demonstrate that family firm image promotion affects positively perceived brand authenticity, which in turn leads to higher level of customer-company-identification. This in turn is associated with increased intention to engage in social media. [Bargoni et al. \(2022\)](#) explore

the role of brand authenticity dimensions on consumer engagement in the context of social media in family and non-family firms. [Bargoni et al. \(2023b\)](#) find that family firms' characteristics are important antecedents of consumers' willingness to pay for family firms' products in an online environment. [Ibáñez et al. \(2022\)](#) explore the effect of visual attention to visual stimuli on a website affects consumers' recognition of the family firm identity and its influence on consumer behavior.

Studies published in the lilac cluster (11 documents) focus on DT and strategic behavior of family businesses in different contexts including during Covid-19 pandemic. [Soluk \(2021\)](#) presents a theoretical framework of family firms' motives, resource allocation and entrepreneurial action leading to digital innovation (digital process innovation, digital product innovation, and digital business model innovation) in response to external shocks. [Bürigel and Hiebl \(2023\)](#) examine the influence of conflict management strategies on the level of family business digitalization and the moderation effect of generational ownership dispersion during the global pandemic of Covid-19. [Zapata-Cantu et al. \(2023\)](#) discuss the role of knowledge management processes that could provide avenues of innovation and adaptation of family firms in turbulent and uncertain times. [Soluk et al. \(2021c\)](#) provide a framework of a family firm adaptation to an exogenous shock. [Bürigel et al. \(2023\)](#) discuss the role of digitalization for firms' resilience to pandemic crises in a sample of family and non-family firms. [Kraus et al. \(2020\)](#) examine the strategies used by family firms to adapt to the Covid-19 crisis. Their findings reveal that as a result of the crisis family businesses tend to make strategic changes in their business models, use digital tools in operations, and develop culture of digitalization.

Scholars in the turquoise cluster (8 publications) explore the interrelationships between the role of human factor and DT in family firms. [Ardito and Capolupo \(2024\)](#) find that the presence of family owners negatively impacts exploratory innovation intensity, but this relationship is positively moderated by digital search (i.e. digital technologies related to knowledge components during the innovation process). [Bornhausen and Wulf \(2024\)](#) report that the share of non-family managers in the top management team positively affects digital innovativeness in family firms and transgenerational control intentions play a moderating role in this relationship. [De Groote et al. \(2021\)](#) discover that the presence of a family member who drives the adoption of new technologies may lead to successful coping with disruptive change (e.g., the Internet and with it the advent of ecommerce). [Nieto et al. \(2023\)](#) reveal that there is a positive link between digitalization and the breadth of technological collaboration, and this effect is higher among family firms, i.e. when one or more members of the owner family hold managerial positions, than in their non-family counterparts.

3.4 Keywords co-occurrence analysis

A network visualization map of author keywords was used to understand the knowledge structure of the field of DT of family business (see [Figure 5](#)). This resulted in 19 out of 655 keywords. The co-occurrence analysis of author keywords yielded six clusters ([Table 7](#)). The twelve most occurring keywords are: Family Business (123), Digital Transformation (33), Digitalization (14), Innovation (13), SMEs (11), Covid-19 (11), Social Media (9), Entrepreneurship (8), Dynamic Capabilities (7), Technology (7), Sustainability (7), E-Commerce (7).

The temporal co-occurrence map of author keywords illustrates the changes in research interests in the field of DT of family business over time (see [Figure 6](#)). Since 2021, the hot topics in this research field have shifted from e-commerce, entrepreneurship, performance, and SMEs towards digital transformation, digitalization, innovation, dynamic capabilities, technology, artificial intelligence, family SMEs, sustainability. This change is related to global crises like Covid-19 ([Plekhanov et al., 2023](#)), remarkable developments in artificial intelligence in recent years ([Minh et al., 2022](#); [Lafuente & Sallan, 2024](#)), and the 2030 Agenda for Sustainable Development, adopted by the United Nations (UN) General Assembly in 2015.

Figure 5: Co-occurrence map of author keywords of documents published in the field of DT of family business.

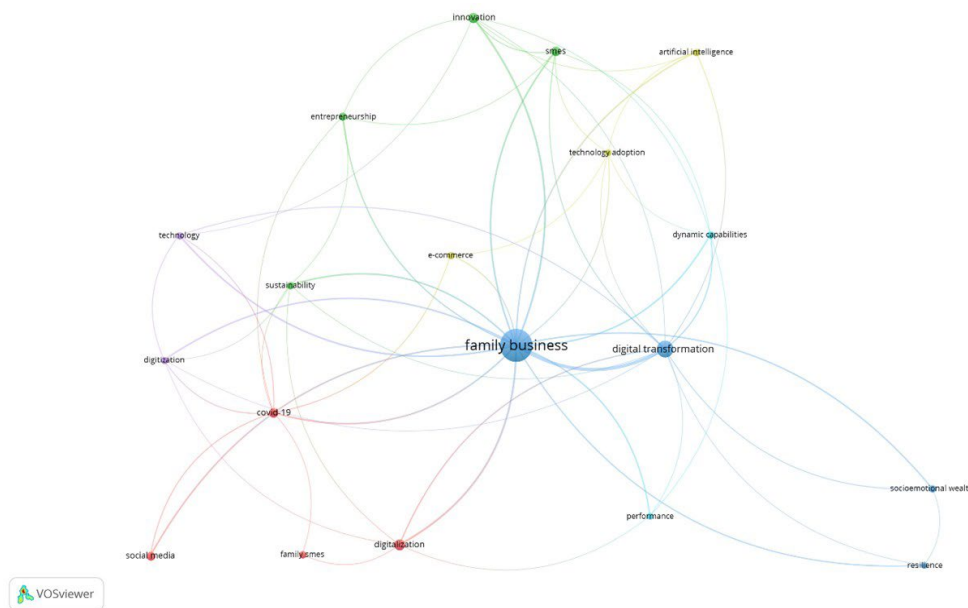
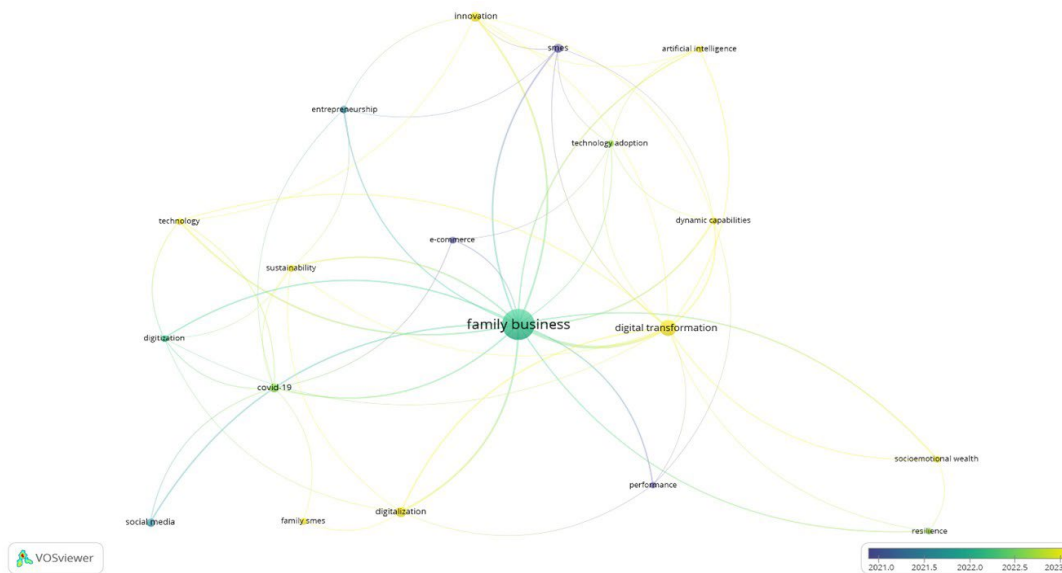


Table 7: Author keywords in the six co-occurrence clusters.

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Digitalization	Innovation	Family business	E-commerce	Technology	Dynamic capabilities
Covid-19	SMEs	Digital transformation	Artificial intelligence	Digitalization	Performance
Social media	Entrepreneurship	Socioemotional wealth	Technology adoption		
Family SMEs	Sustainability	Resilience			

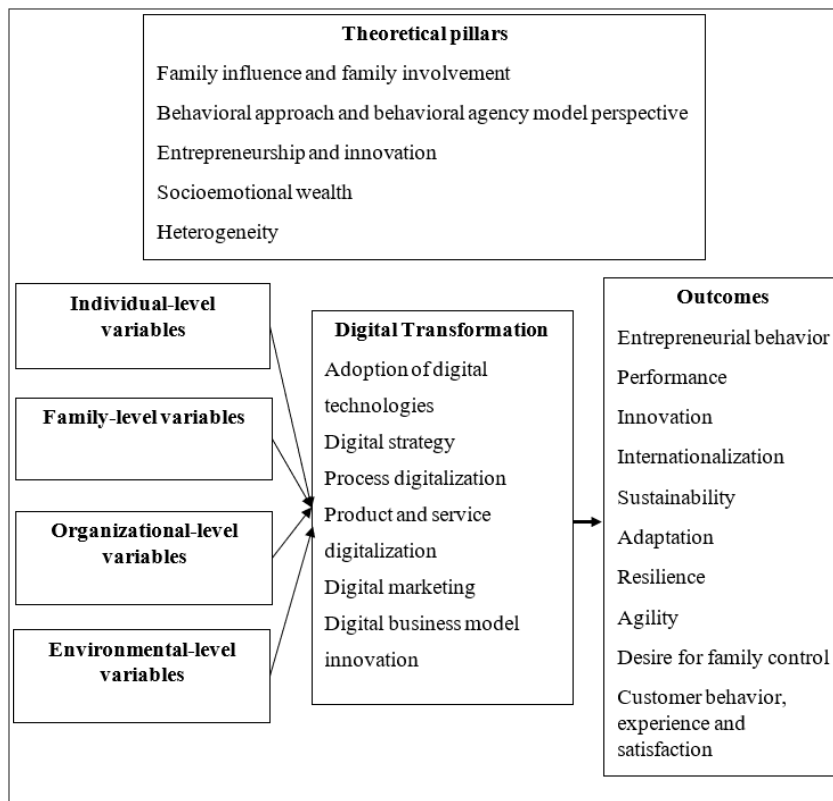
Figure 6: Temporal co-occurrence map of author keywords of documents published in the field of DT of family business.



3.5 Integrated framework

Based on co-citation and bibliographic coupling analyses and a content analysis of the set of 100 coupled articles aimed at identifying the utilized dependent variables, we propose an integrated framework to organize thematic focuses and theoretical approaches and to provide guidance for future research on DT in family business. Figure 7 depicts drivers, outcomes, and dimensions of DT examined in the literature on DT in family business. Drivers are variables that influence DT in family businesses, while outcomes are effects of DT on the family businesses.

Figure 7: Main thematic focuses and theoretical pillars in the research on DT in family business.



Source: Own elaboration.

The studied drivers belong to the following four levels of analysis: the individual, the organization, the family, and the environment. Research on DT in family business considers various dimensions and aspects of this phenomenon including adoption of digital technologies, digital strategy, process digitalization, product and service digitalization, digital marketing, and digital business model innovation. Diverse outcome (dependent) variables are used in empirical research on family firms and DT: performance-related (e.g., financial performance, internationalization, innovation); capability-related (e.g., agility, resilience, adaptation), consumer-related (consumer experience, consumer satisfaction) and family-related (desire for family control). By integrating the drivers, dimensions, and outcomes of DT in family business, we offer a framework which scholars and practitioners can use to pinpoint and test specific paths towards DT and performance outcomes, interactions among different elements (e.g., how do individual, family, organization, and environmental drivers interact to drive DT), as well as challenges and opportunities in the process.

4. Discussion and conclusions

4.1 Discussion

This article presents a bibliometric study of previous research on DT in family business based on a dataset of 196 peer-reviewed articles extracted from Web of Science which aims to map and integrate existing research on this topic. The study outlines trends in scientific production, providing information about most productive authors, institutions, countries, and journals. Although the first 2 publications on DT in family business appear in 2005, the research interest in this topic started growing after 2020, most likely due to the outburst of Covid-19 pandemic. The most productive authors are Nadine Kammerlander, Jonas Soluk, and Demetris Vrontis, while the authors with the highest numbers of citations are Sascha Kraus, Jonas Soluk, and Thomas Clauss. China is the country with the highest total number of publications. The analysis of the 10 most influential institutions and the 10 most influential countries in terms of total number of publications shed light on the leading role of European countries, especially Italy, Germany and Spain, and European higher education institutions. In relation to the sources generating knowledge about DT in family business, Journal of Family Business Management stands out for the highest number of publications, while International Journal of Entrepreneurial Behavior & Research leads the ranking with the highest number of citations. The seminal study on DT in family business is by Kraus, Clauss, Breier, Gast, Zardini, and Tiberius (2020).

The findings of co-citation, bibliographic coupling, and keywords co-occurrence analyses provide novel insights from the intellectual structure of this research field. The field is fragmented across diverse research streams, research topics and theoretical perspectives. The identified theoretical foundations of the research on DT in family business (family influence and family involvement; behavioural approach and behavioral agency model perspective; entrepreneurship and innovation; socioemotional wealth; and heterogeneity among family businesses and between family and non-family businesses) are very similar to those identified in the research on other topics in family business (for example see Anwar *et al.*, 2024; Bağış *et al.*, 2023). The proposed integrated framework extends the existing literature by conceiving DT in family business as a multidimensional phenomenon influenced by multiple variables at four levels of analysis and associated with diverse outcomes. This framework is consistent with systems perspective of family business (Davis & Stern, 1981; Tagiuri & Davis, 1996; Habbershon *et al.*, 2003).

4.2 Contributions to scholarship

This study makes relevant scientific contributions. The findings generated by combining different bibliometric methods give an integrated framework for organizing the research on DT in family business. This framework provides novel conceptual insights into the relationships among drivers, dimensions and outcomes of DT studied in the literature on DT in family business as well as the theoretical pillars of this field. The identified main research topics and their evolution during the last five years may advise future research agendas. The outlined theoretical roots established in the field of DT in family business provide useful insights and directions that may facilitate theoretical development and may reveal new research opportunities in this field. The identified research streams in the literature on DT in family business can help researchers better understand the current state and trends in the development of the field and can facilitate the choice of research topics by future researchers. The presented information about scientific production, influential authors, articles, journals, institutions, and countries in the field of DT in family business may inform future research efforts.

4.3 Contribution to practice

The results of this study provide valuable insights about the importance and scope of DT and the need to speed up DT for owners, managers, and members of the controlling family in family businesses, educators, and policy makers. Owners,

managers, and members of the controlling family in family businesses can gain greater understanding about drivers, dimensions and outcomes of DT in family firms. The publications identified in the bibliometric analysis can help them to overcome various obstacles and barriers to DT and to cope with diverse challenges in the process of DT. The proposed integrated framework can inform organizational practices and strategic decision-making in family businesses. Being able to categorize the different drivers (as proposed in the framework) can help family firms understand both forces shaping DT and sources of resistance or challenges. Likewise, understanding the variety of possible outcomes from DT, practitioners can prioritize activities that are aligned with their objectives. The framework can also enable the design and implementation of well-informed public policies and measures to support DT in family businesses, especially resource-constrained family SMEs. The findings of this study are also relevant for education and training. The theoretical foundations, thematic areas, and relationships among drivers, dimensions and outcomes of DT family business identified in this study can help to develop or adapt educational and training programs and courses in various fields (Lafuente & Sallan, 2024).

4.4 Limitations and future research

4.4.1 Limitations of the study

This bibliometric analysis has several limitations that should be addressed in future studies. First, this study is focused only on peer-reviewed articles in English published in journals, while books and book chapters, conference proceedings, and reports in English and publications in other languages were not analyzed. Second, it is important to acknowledge that this study was based solely on Web of Science. Third, we performed our analyses solely in VOSviewer and therefore they are limited by the features and functionalities of this software. Finally, our study provides a map of the field of DT in family business rather than in-depth analysis of the content of the literature in this field.

4.4.2 Future theoretical directions

This study suggests several directions for future research. The findings from the co-citation analyses highlight five main theoretical approaches to researching DT in family business: 1/ family influence and family involvement; 2/ behavioral approach and behavioral agency model perspective; 3/ entrepreneurship and innovation; 4/ socioemotional wealth; and 5/ heterogeneity among family businesses and between family and non-family businesses. Promising pathways for future research to advance understanding of the complex nature of DT in family firms may include dynamic capability perspective, resource-based view, stewardship theory and systems approach. For example, future research may investigate more deeply the influence of unique bundles of resources in family firms (familiness) (Habbershon et al., 2003) on their DT. Stewardship theory could help to explain the role of stewardship governance and steward behaviour (Davis et al., 1997) in the process of DT in family firms.

Previous research has highlighted that DT is associated with profound structural changes in organizational structure, leadership, organizational culture, employee roles and skills in organizations (Vial, 2019; Lafuente et al., 2023; Vaillant & Lafuente, 2024). Future research should examine in greater detail the nature of structural changes taking place in family firms undergoing a process of DT. Furthermore, as family business comprises the overlapping subsystems of the family, the ownership and the firm (Tagiuri & Davis, 1996), future research based on systems approach needs to explore in-depth the changes taking place in the family and ownership subsystems associated with the process of DT in the family business.

4.4.3 Future methodological directions

Our analysis has identified a plethora of different outcome (dependent) variables which have been used in research on family firms and DT. They can be broadly classified into the following groups: (1) performance-related – e.g., financial performance, internationalization, innovation; (2) capability-related – e.g., agility, resilience, adaptation; (3) consumer-

related – e.g., consumer experience, consumer satisfaction; and (4) family-related. While each of those outcomes is important in their own right, future research can assess the relationships among those various outcome groups. For instance, building on theoretical perspectives such as resource-based view and dynamic capabilities, scholars could investigate more closely the relations between different capability-related outcomes and performance, and the role of digitalization in this process (Lafuente *et al.*, 2010; Lafuente *et al.*, 2018). Another fruitful avenue for future research is the relationship between customer-related outcomes and performance in family firms in a digital world. From a consumer point of view, the “familiness” of a family firm may be key for brand image perceptions; hence, how DT is leveraged by family firms to convert consumer-related outcomes (e.g., consumer experiences) to various firm performance outcomes is of particular importance. Critically important, family-related outcomes were very rarely used in research on DT and family firms. Yet, the way in which DT affects family dynamics and relationships within the family business needs further research attention. Therefore, from a methodological point of view, it is important to build and test mediation models, where digital transformation efforts drive a set of (intermediate) outcomes, which in turn affects a different set of performance variables. Ideally, those models need to be longitudinal to test for mediation and especially considering that DT activities may not manifest quickly and directly into performance outcomes but should be tracked over time.

Furthermore, in the proposed integrative model we offer a classification of DT drivers in family business. While each of those drivers is important for understanding DT adoption, future research needs to build models that test the interactions among those drivers, and the relative importance of each driver for achieving specific outcomes.

4.5 Conclusions

In recent years DT has become an important topic for both research and practice. This bibliometric analysis has mapped the scientific landscape of DT in family business. To address the stated research questions, we utilized descriptive, citation, bibliographic coupling, and keywords co-occurrence analyses on a dataset of articles indexed in Web of Science database. The descriptive statistical results reveal not only the top contributors, journals, and articles, but also highlight influential institutions and countries in the field of DT in family business. The topic of DT in family business has received a marked increase in research interest during the last 5 years after the global crisis caused by COVID-19 pandemic and new developments in digital technologies. The majority of the 10 most influential journals publishing research on this topic are in the field of business and management. The most productive authors in terms of number of publications are affiliated with European institutions, while the majority of the 10 most influential countries and institutions are located in Europe.

Our study reveals that DT in family business can be considered as a very recent research field. Moreover, the field is fragmented and is characterized by heterogeneity in both theoretical perspectives employed, and research topics examined. Based on the findings of the performed bibliometric analyses, we propose an integrated framework highlighting thematic focuses and theoretical approaches used in the research on DT in family business. The framework posits that individual-level, family-level, organizational-level, and environmental-level variables influence digital transformation in family business, which can produce diverse performance-related, capability-related, consumer-related, and family-related outcomes. Our bibliometric analysis contributes to better understanding of the field of DT in family business and provides suggestions for future research and valuable insights for practices.

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