

Scientific Mapping of Digital Entrepreneurship: Trends, Gaps, and Future Research Directions

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ABSTRACT

This study investigates the rapid growth of digital entrepreneurship research from 2019 to 2024, driven by technological advancements and the increasing relevance of digital platforms. Using digital bibliometric analysis, the study maps the intellectual landscape of the field by identifying key themes, leading authors, influential journals, and productive institutions. The findings reveal three major thematic clusters: Business Transformation, Digital Innovation, and Inclusive Entrepreneurship, emphasizing the impact of digital technologies on business models, innovation, and economic inclusion. The role of small and medium-sized enterprises (SMEs) is highlighted as increasingly central in the global digital ecosystem. A steady increase in publications and citations is observed, with journals such as *Technological Forecasting and Social Change* and *Journal of Business Research* shaping the discourse. The study recommends future research to focus on digital platforms, business model innovation, and supportive policy and infrastructure, underscoring the transformative potential of digital entrepreneurship in fostering inclusive and sustainable development.

Keywords: Bibliometric Analysis; Business Transformation; Digital Entrepreneurship; Digital Innovation; Inclusive Entrepreneurship

INTRODUCTION

The concept of digital entrepreneurship began to attract scholarly attention in academic literature in the early 2000s, coinciding with the rapid advancement of information and communication technologies. These technological developments have fundamentally transformed the entrepreneurial ecosystem, establishing a new paradigm regarding the creation, management, and scaling of ventures. Digital transformation empowers entrepreneurs to access global markets, leverage online platforms, and automate various business processes (Nambisan et al., 2019; Sahut et al., 2021). With technology serving as the foundation, entrepreneurial initiatives are no longer constrained by geographical boundaries or traditional resource limitations.

Data retrieved from the Scopus database indicate the existence of more than 1,500 documents that incorporate the term digital entrepreneurship in their titles, keywords, and abstracts. This observation suggests that the subject has attracted considerable interest from both academic scholars and industry practitioners. The growing volume of publications on digital entrepreneurship aligns with global trends such as the gig economy, platform economy, and the integration of social media into business operations (Le et al., 2018; Rifani et al., 2025). These transformations influence not only operational business methodologies but also trajectories of innovation, capital access, and collaborative strategies among enterprises.

Digital technologies facilitate entrepreneurs in aligning more closely with market demands, assimilating customer feedback in real time, and fostering stronger connections with online communities and strategic collaborators (Kee et al., 2024). The domain of digital entrepreneurship encompasses not only the deployment of technology but also the integration of innovative methodologies for value creation and competitive advantage (Kraus et al., 2019; Sussan & Acs, 2017). Through the utilization of data and digital tools, the process of identifying and exploiting business opportunities can be conducted more effectively and efficiently.

However, systematic investigations that map the scientific progress and research trajectories of digital entrepreneurship remain relatively limited. Few studies have comprehensively employed science mapping or bibliometric analysis techniques to examine the landscape of literature surrounding digital entrepreneurs (Di Vaio et al., 2022). Consequently, this article seeks to address this gap by utilizing metadata from the Scopus database to answer several key research questions: (a) What trends can be observed in the publications and citations related to women entrepreneurs? (b) Who are the most prolific authors contributing to this field? (c) Which journals are recognized as the most relevant and frequently cited? (d) Which institutions are the most productive contributors in this research area? (e) What are the prevailing themes within the intellectual structure of female entrepreneurship studies? (f) What promising avenues for future research can be identified in the examination of women entrepreneurs?

LITERATURE REVIEW

In recent years, bibliometric analysis has gained increasing popularity in research on digital entrepreneurship, in line with advancements in software such as VOSviewer and Biblioshiny, as well as the availability of databases like Scopus and Web of Science (Aria & Cuccurullo, 2017; Donthu et al., 2021). Digital entrepreneurship is defined as the process involving the creation of new ventures or the adaptation of business models by leveraging digital technologies such as online platforms, mobile applications, and social media (Kraus et al., 2019; Nambisan, 2017). The growing interest in bibliometric analysis

within this field is driven by its ability to provide an objective overview of research developments and to map the relationships among researchers, institutions, and emerging topics (Donthu et al., 2021; Zupic & Čater, 2015). Two primary approaches in bibliometric analysis—performance analysis and science mapping—allow for the evaluation of scholarly contributions while also revealing the conceptual structure of a research domain (Cobo et al., 2011; van Eck & Waltman, 2010).

Within the realm of digital entrepreneurship, bibliometric studies have successfully identified key emerging trends, including digital technology adoption, platform-based innovation, and the digitalization of business processes (Antara et al., 2024; Judijanto & Arfiansyah, 2024). Research by Meyer et al. 2023 revealed a consistent increase in publications related to digital entrepreneurship, with a predominant focus on entrepreneurial intentions, technological innovation, and the development of digital ecosystems. Network analyses conducted by these studies also highlight the growing strength of collaborations among authors and institutions in exploring these topics (Duan, 2024; Kee et al., 2024). Bibliometric visualizations depict thematic clusters centered around technology-based entrepreneurship, digital transformation, and the socio-economic impacts of digital businesses.

Conceptual analyses reveal that digital entrepreneurship is increasingly viewed not merely as an economic activity, but also as a social phenomenon closely tied to continuous innovation and social value creation (Nambisan et al., 2019). This view is reinforced by the digital ecosystem approach elaborated by Nambisan et al. 2019, who emphasize the critical role of digital technologies in creating new entrepreneurial opportunities, fostering collaborative networks, and accelerating venture growth. Overall, the research paradigm in entrepreneurship is shifting from a traditional focus on individuals and firms toward a broader understanding of the dynamics within digital ecosystems (Nambisan, 2017).

From a business strategy perspective, studies by (Giones & Brem, 2017; Kraus et al., 2019) demonstrate that the adoption of disruptive technologies, business model innovation, and organizational flexibility are crucial factors for success in digital entrepreneurship. Research by Nambisan, 2017; Sumampouw, 2021; Sussan & Acs, 2017 further emphasizes the importance of external factors such as digital infrastructure, public policies, and human resources in supporting the growth of technology-based startups. Beyond improving market access, digital technologies enable entrepreneurs to acquire new resources, accelerate innovation cycles, and build competitive advantages within an ever-changing global economy (Giones & Brem, 2017; Kraus et al., 2019). The literature indicates that digital entrepreneurship not only contributes to economic growth but also shapes new patterns of innovation and social value creation.

RESEARCH METHOD

The initial phase of the literature review was conducted using the Scopus database, given that Scopus is recognized as one of the most extensive and reliable repositories of scientific literature, offering multidisciplinary coverage along with academic journal indexing (Pratama et al., 2024; Wahyoedi et al., 2024). The selection of this database was further supported by its ease of access and the completeness of its bibliographic data, which facilitates the execution of bibliometric analysis.

To identify relevant literature in the field of digital entrepreneurship, the researchers formulated a search query using the keyword term "digital entrepreneur." This

methodological approach was applied to ensure that the collected data would be inclusive and representative of the development of scholarly discourse in this area. The search query utilized in this study was as follows:

TITLE-ABS-KEY ("digita entrepre*")*

The search strategy successfully retrieved a total of 1,151 documents. In the subsequent stage, the documents were filtered based on their publication year, restricting the selection to documents published between 2015 and 2024. Additionally, the selection criteria required that the documents be journal articles written in English. Following this screening process, 557 documents met the eligibility criteria. From the selected documents, the information collected included: author names, author affiliations, journal names, document titles, author keywords, abstracts, and citation counts. For the analysis process, Microsoft Excel and Publish or Perish were utilized to measure scientific productivity. Meanwhile, to map the intellectual structure, VOSviewer software version 1.6.20 was employed. The type of analysis conducted was co-occurrence analysis, with author keywords as the unit of analysis.

RESULTS

Research Productivity

Table 1 presents the dynamics of publication and citation growth in the field of digital entrepreneurship over the period from 2015 to 2024. There is a clear upward trend in the number of publications year by year, reflecting a growing academic interest in this topic. In the early years, namely 2015 and 2016, the number of publications remained very limited, with only three and two documents, respectively. A more significant surge began in 2019, with 43 publications, and this upward trend continued, reaching its peak in 2024 with 156 publications. This phenomenon indicates that digital entrepreneurship has increasingly become a major focus in global academic discussions, in line with the advancement of digital technologies and the growing need for adaptation across various business sectors.

From a citation perspective, publications released in the early years, particularly in 2017 and 2020, received exceptionally high total citations, amounting to 3,073 and 3,413 citations, respectively. This indicates that the articles published during these years had a significant impact and served as important references in the development of digital entrepreneurship studies. The average citations per publication (C/P) peaked in 2017, reaching 279.36, suggesting that each document published in that year garnered a remarkably high number of citations compared to other years. A general pattern in bibliometric studies indicates that newer articles require time to accumulate citations, making the sharp decline in C/P observed in 2023 and 2024 a common phenomenon.

The analysis of the h-index further reinforces these findings. The year 2021 recorded the highest h-index value at 27, indicating that 27 publications from that year had each been cited at least 27 times. This figure reflects the stability in the quality and scientific influence of documents published during that period, despite having lower total citations compared to peak years such as 2017 and 2020. These findings emphasize that beyond the quantity of publications, the quality and relevance of research play crucial roles in building long-term scientific contributions.

Table 1. Publications by Year of Publication and Citations

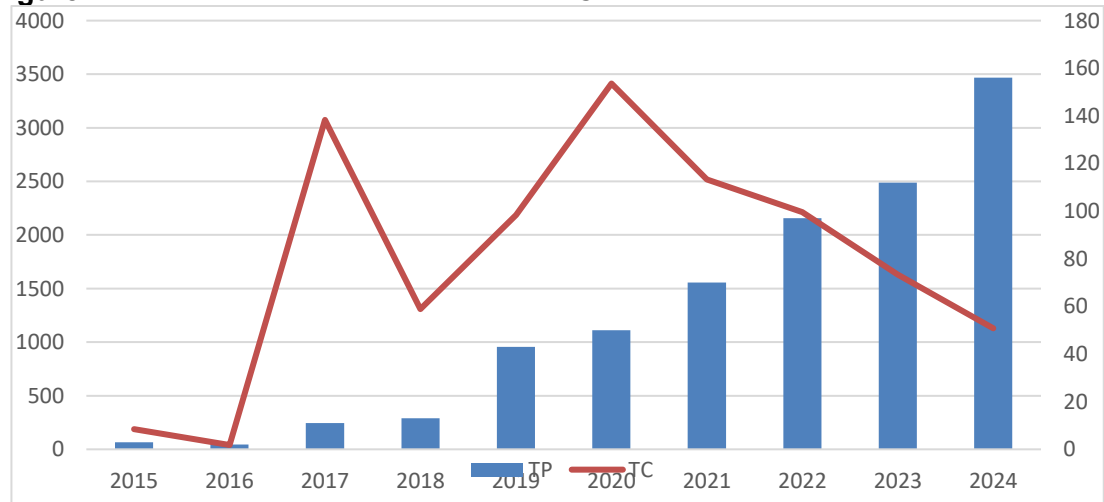
Year	TP	TC	C/P	C/CP	h
2015	3	187	62.33	62.33	3

2016	2	40	20.00	20.00	2
2017	11	3073	279.36	279.36	9
2018	13	1309	100.69	100.69	13
2019	43	2187	50.86	50.86	25
2020	50	3413	68.26	71.10	26
2021	70	2517	35.96	37.01	27
2022	97	2213	22.81	23.54	22
2023	112	1632	14.57	15.54	21
2024	156	1128	7.23	9.48	17

Note. TP = Total Publications; NCP = Number of Cited Publications; TC = Total Citations; C/P = Average Citations per Publication; C/CP = Average Citations per Cited Publication; h = h-index.

Table 1 illustrates that the literature on digital entrepreneurship has experienced dynamic growth in terms of both quantity and citation impact. The consistent increase in the number of publications, along with spikes in citations during certain periods, reflects that this topic is not merely a transient trend but is establishing itself as a foundational theme in digital economy and modern entrepreneurship research. This trend opens avenues for future research to explore emerging issues surrounding digital entrepreneurship, such as the role of digital platforms, startup ecosystems, business model innovations, and the dynamics of technological adaptation across various industrial sectors.

Figure 1. Annual Trends in Publications and Citations



Note. TP refers to the total number of publications, and TC refers to the total number of citations.

Authorship Analysis

Table 2 presents a list of the most productive authors in the field of digital entrepreneurship, based on the number of publications, total citations, and other bibliometric indicators. According to the data, the three most productive authors are Kraus, S., Duong, C.D., and Ghezzi, A. These authors have demonstrated significant contributions to the development of the digital entrepreneurship literature, both in terms of the quantity and quality of their publications.

Their scholarly outputs not only exhibit a high level of productivity but also indicate substantial influence within the academic community, as reflected by the citation metrics. Analyzing the contributions of these leading authors provides valuable insights into the

key thematic directions and research trends that have shaped the evolution of digital entrepreneurship studies.

Table 2. Top Authors in Digital Entrepreneurship Research

Author Name	Affiliation	TP	NCP	TC	C/P	C/CP	h
Kraus, S.	Free University of Bozen-Bolzano, Italy	8	8	762	95.25	95.25	7
Duong, C.D.	National Economics University Hanoi, Viet Nam	6	6	38	6.33	6.33	4
Ghezzi, A.	Politecnico di Milano, Italy	5	5	875	175.00	175.00	5
Hidayat, H.	Universitas Negeri Padang, Indonesia	5	5	18	3.60	3.60	2
Wannapiroon, P.	King Mongkut's University of Technology North Bangkok, Thailand	5	4	13	2.60	3.25	2
Cavallo, A.	Politecnico di Milano, Italy	4	4	706	176.50	176.50	4
Darmanto, S.	Universitas 17 Agustus 1945, Indonesia	4	4	29	7.25	7.25	3
Dwivedi, Y.K.	King Fahd University of Petroleum and Minerals, Saudi Arabia	4	4	325	81.25	81.25	4
Ekopriyono, A.	Universitas 17 Agustus 1945, Indonesia	4	4	29	7.25	7.25	3
McAdam, M.	Dublin City University, Ireland	4	4	266	66.50	66.50	4

Note. TP = Total Publications; NCP = Number of Cited Publications; TC = Total Citations; C/P = Average Citations per Publication; C/CP = Average Citations per Cited Publication; h = h-index.

Kraus, S., affiliated with the Free University of Bozen-Bolzano, Italy, and the National Economics University Hanoi, Vietnam, holds the top position with a total of 8 publications (TP=8), all of which have been cited (NCP=8). Kraus recorded 762 total citations (TC=762), resulting in an average of 95.25 citations per publication (C/P=95.25) and a C/CP value of 95.25, indicating consistency between the number of publications and the number of cited documents. Additionally, Kraus has an h-index of 7, suggesting that at least seven of his articles have been cited at least seven times, reflecting both strong productivity and significant academic impact.

In second place is Duong, C.D., from the National Economics University, Vietnam, with 6 publications (TP=6), all of which have been cited (NCP=6). However, Duong's total citations remain relatively modest, with only 38 citations (TC=38), resulting in an average of 6.33 citations per publication (C/P=6.33). The C/CP value of 6.33 also indicates that all of his documents have been cited, although the overall impact remains lower compared to other authors. Duong's h-index stands at 4, reflecting a reasonably good level of productivity, yet leaving room for future improvement in research impact.

Ghezzi, A., from Politecnico di Milano, Italy, ranks third with 5 publications (TP=5), all of which have been cited (NCP=5). Ghezzi demonstrates outstanding performance in terms of quality, achieving a total of 875 citations (TC=875) and an impressive average of 175.00 citations per publication (C/P=175.00), the highest among all authors listed in the table. The C/CP value of 175.00 confirms that each of his publications not only received citations but also exerted substantial academic influence. Ghezzi's h-index is 5, aligning with his number of publications and reflecting consistency between productivity and research quality.

These three authors exhibit distinct characteristics of research productivity. Kraus excels in terms of the volume and consistent citation impact of his publications; Ghezzi stands out for the exceptionally high quality and influence per publication; while Duong demonstrates solid quantitative productivity, although with a relatively developing citation impact. This variation highlights that in bibliometric evaluations, both the quantity of publications and the quality of citations are crucial considerations in assessing a scholar's contribution to a scientific field.

Most Active Source Titles (Journals)

Table 3 presents a list of the most active journals in publishing research related to the theme of digital entrepreneurship. Journal activity is measured by the number of publications (TP), the number of cited publications (NCP), total citations (TC), average citations per publication (C/P), and the h-index. Based on the data, the three most influential journals are Technological Forecasting and Social Change (Elsevier), Journal of Business Research (Taylor & Francis), and Small Business Economics (Elsevier).

These journals not only lead in terms of publication volume but also demonstrate considerable academic influence through high citation counts and strong bibliometric performance. A closer examination of their publication and citation metrics provides deeper insights into their roles in shaping the scholarly landscape of digital entrepreneurship research.

Table 3. Most Active Journals by Publication Output

Source Title/ Publisher	TP	NCP	TC	C/P	C/CP	h
Sustainability Switzerland/ Multidisciplinary Digital Publishing Institute (MDPI)	27	26	610	22.59	23.46	12
Technological Forecasting and Social Change/ Elsevier	26	26	2365	90.96	90.96	22
International Journal of Entrepreneurial Behaviour and Research/ Elsevier	22	22	620	28.18	28.18	12
Frontiers in Psychology/ Taylor & Francis	13	13	135	10.38	10.38	7
Journal of Business Research/ Taylor & Francis	12	12	1523	126.92	126.92	11
Small Business Economics/ Elsevier	10	10	1346	134.60	134.60	8
International Entrepreneurship and Management Journal/ Wiley-Blackwell	8	8	166	20.75	20.75	6
Problems And Perspectives in Management/ Taylor & Francis	6	5	23	3.83	4.60	2
International Journal of E Entrepreneurship and Innovation/ Taylor & Francis	5	5	96	19.20	19.20	5
International Journal of Information Management Data Insights/ Editura Universitati din Oradea	5	5	188	37.60	37.60	5

Note. TP = Total Publications; NCP = Number of Cited Publications; TC = Total Citations; C/P = Average Citations per Publication; C/CP = Average Citations per Cited Publication; h = h-index.

Technological Forecasting and Social Change stands out as the most influential journal, with 26 publications, all of which have been cited (NCP=26). This journal has accumulated a total of 2,365 citations, with an average of 90.96 citations per article (C/P=90.96) and an h-index of 22, the highest among all journals listed in the table. These metrics indicate that the journal's publications are not only numerous but also have substantial citation impact, establishing it as a key reference point in the field of digital entrepreneurship, particularly concerning technological innovation and social change forecasting.

Ranked second is the Journal of Business Research, published by Taylor & Francis, with 12 cited publications (NCP=12). Although its total number of publications is lower than that of Technological Forecasting and Social Change, it has garnered 1,523 citations, with an exceptionally high average of 126.92 citations per publication (C/P=126.92). This figure surpasses the C/P of Technological Forecasting and Social Change, suggesting that, despite fewer articles, each publication has made a substantial impact within the academic community. With an h-index of 11, the Journal of Business Research solidifies its position as a highly credible and influential source in the area of digital entrepreneurship.

Small Business Economics, published by Elsevier, ranks third with 10 cited publications (NCP=10). The journal has accumulated 1,346 total citations, achieving the highest average citations per publication among the top three journals at 134.60 (C/P=134.60). With an h-index of 8, Small Business Economics reinforces its contribution to digital entrepreneurship research, particularly concerning the transformation of small and medium-sized enterprises through digital technology adoption.

This analysis demonstrates that these three journals are not only active in publishing research on digital entrepreneurship but have also produced highly cited scientific works. The high total citations and average citations per publication serve as indicators that articles from these journals are essential references in the development of theories and practices related to digital entrepreneurship at the global level. Therefore, these journals are highly recommended as primary sources for future studies and research in the domain of digital entrepreneurship.

Most Active Institutions Contributing to Digital Entrepreneurship Publications

Table 4 presents a list of the most influential institutions in digital entrepreneurship publications, measured by the number of publications (TP), the number of cited publications (NCP), total citations (TC), average citations per publication (C/P), and h-index. Based on these indicators, the three institutions that stand out in their contributions to the development of digital entrepreneurship research are Politecnico di Milano (Italy), Università del Salento (Italy), and LUT University (Finland).

Table 4. Leading Institutions in Digital Entrepreneurship Research

Institution, Country	TP	NCP	TC	C/P	C/CP	h
Universidade da Beira Interior, Portugal	9	9	284	31.56	31.56	8
Pécsi Tudományegyetem, Hungaria	7	7	17	2.43	2.43	2
LUT University, Finlandia	7	7	556	79.43	79.43	7
Jilin University, Tiongkok	6	6	127	21.17	21.17	5
Politecnico di Milano, Italy	6	6	911	151.83	151.83	6
National Economics University Hanoi, Vietnam	6	6	22	3.67	3.67	3
University of Johannesburg, Afrika Selatan	5	5	244	48.80	48.80	5
Universiti Kebangsaan Malaysia, Malaysia	5	4	45	9.00	11.25	2
Università del Salento, Italy	5	5	803	160.60	160.60	4
Qingdao University, Tiongkok	5	5	51	10.20	10.20	4

Note. TP = Total Publications; NCP = Number of Cited Publications; TC = Total Citations; C/P = Average Citations per Publication; C/CP = Average Citations per Cited Publication; h = h-index.

Politecnico di Milano in Italy is recorded as the institution with the greatest impact, despite having only 6 publications (TP=6). The institution accumulated a total of 911 citations (TC=911), with an average of 151.83 citations per publication (C/P=151.83), the highest value among all institutions listed. Additionally, its h-index of 6 indicates that all of its publications consistently maintain high academic influence. The exceptionally high citation-per-publication ratio highlights that the research outputs from Politecnico di Milano are not only productive but also highly relevant and serve as critical references in the digital entrepreneurship literature.

The second position is occupied by Università del Salento in Italy. Although it produced only 5 publications (TP=5), the institution achieved a total of 803 citations (TC=803), with an average of 160.60 citations per publication (C/P=160.60), even higher than that of Politecnico di Milano. An h-index of 4 suggests that the distribution of citations across publications is somewhat uneven; however, the exceptionally high C/P value indicates that several of Università del Salento's publications are highly influential in advancing digital entrepreneurship research.

LUT University in Finland ranks third with 7 publications (TP=7), all of which have been cited (NCP=7). The institution garnered a total of 556 citations (TC=556), resulting in an average of 79.43 citations per publication (C/P=79.43). Its h-index of 7 reflects consistent quality across all publications, with each article demonstrating strong citation performance. This achievement shows that LUT University is an active contributor to the development of digital entrepreneurship scholarship, particularly in the context of innovation and technology within Northern Europe.

These three institutions exhibit distinct characteristics: Politecnico di Milano excels in total citation volume, Università del Salento leads in terms of average citations per publication, and LUT University demonstrates strong consistency between research productivity and citation quality. These findings affirm that academic institutions in Europe, particularly those in Italy and Finland, play a key role in enriching the global body of knowledge on digital entrepreneurship.

Visualization Map

Figure 2 illustrates a co-occurrence keyword mapping within the domain of digital entrepreneurship, which is organized into three principal clusters: Business Transformation, Digital Innovation, and Inclusive Entrepreneurship. These clusters represent the major thematic orientations in the literature, focusing respectively on technological disruption, innovation processes, and the promotion of inclusivity within entrepreneurial ecosystems. The first cluster, Business Transformation, underscores the pivotal role of digital technologies—such as digital transformation, digital economy, and crowdfunding—in reshaping traditional business models into more modern, efficient, and technology-driven frameworks. Meanwhile, the second cluster, Digital Innovation, centers on the application of emerging technologies, notably artificial intelligence (AI) and information and communication technologies (ICT), which significantly contribute to the development and growth of start-ups by creating novel business opportunities through technological advancement.

The third cluster, Inclusive Entrepreneurship, highlights efforts to expand access to entrepreneurial opportunities across diverse social groups. This cluster is characterized by keywords such as entrepreneurial ecosystem, social media, small and medium-sized enterprises (SMEs), and internationalization, reflecting the crucial role of digital platforms in fostering community networks and facilitating the global expansion of smaller businesses. Collectively, the bibliometric mapping demonstrates that technology,

innovation, and inclusivity are interrelated and foundational to the advancement of digital entrepreneurship. Digital transformation emerges as a critical driver in enabling the creation of adaptive, inclusive, and sustainable business models, reinforcing the vital role of ongoing research in this rapidly evolving field.

Figure 2. Author Keyword Co-Occurrence in Digital Entrepreneurship Research

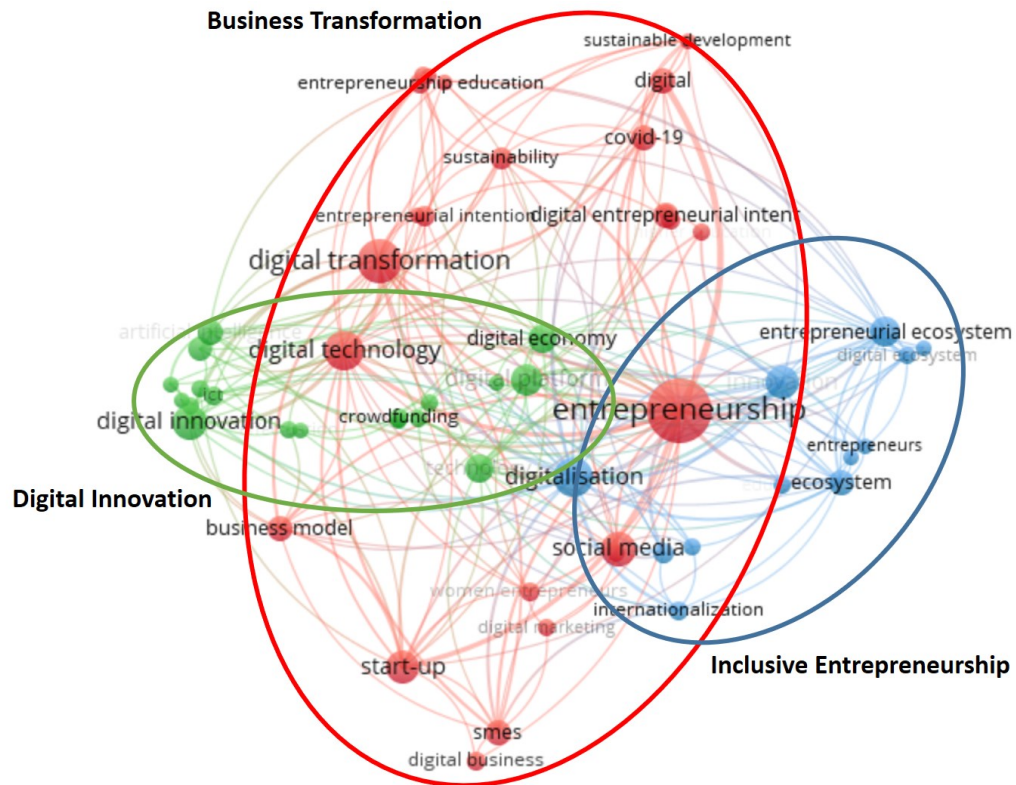


Figure 3 presents the mapping of trends in keyword occurrences and the average publication years within the domain of digital entrepreneurship, segmented into three primary clusters: Business Transformation, Digital Innovation, and Inclusive Entrepreneurship. Each cluster reflects the evolving trajectory of scholarly interest, particularly between 2021 and 2023, with a growing emphasis on technological advancement and digital transformation. The Business Transformation cluster highlights the transition from traditional to digital business models, underscored by keywords such as digital transformation, digital economy, and digital technology. Additionally, the presence of themes like sustainable development, entrepreneurial intention, and COVID-19 suggests an expanded research focus on sustainability and resilience amid global disruptions. The observed increase in publications during this period illustrates the strategic prioritization of digitalization as a mechanism for business survival and growth.

The Digital Innovation cluster centers on the integration of advanced technologies, including artificial intelligence (AI), information and communication technologies (ICT), and the emergence of new business models. The surge in related publications in 2022 and 2023 indicates the growing role of digital innovation as a catalyst for start-up development and market disruption. Meanwhile, the Inclusive Entrepreneurship cluster emphasizes the role of digital platforms in enhancing entrepreneurial inclusivity, with keywords such as entrepreneurial ecosystem, social media, SMEs, and internationalization reflecting efforts to broaden market access and community engagement for smaller enterprises. Collectively, this mapping demonstrates that

technological transformation, innovation, and inclusivity constitute interconnected pillars of digital entrepreneurship, with recent research increasingly highlighting their importance in fostering sustainable and diversified entrepreneurial ecosystems.

Figure 3. Trends in Occurrence and Average Publication Year

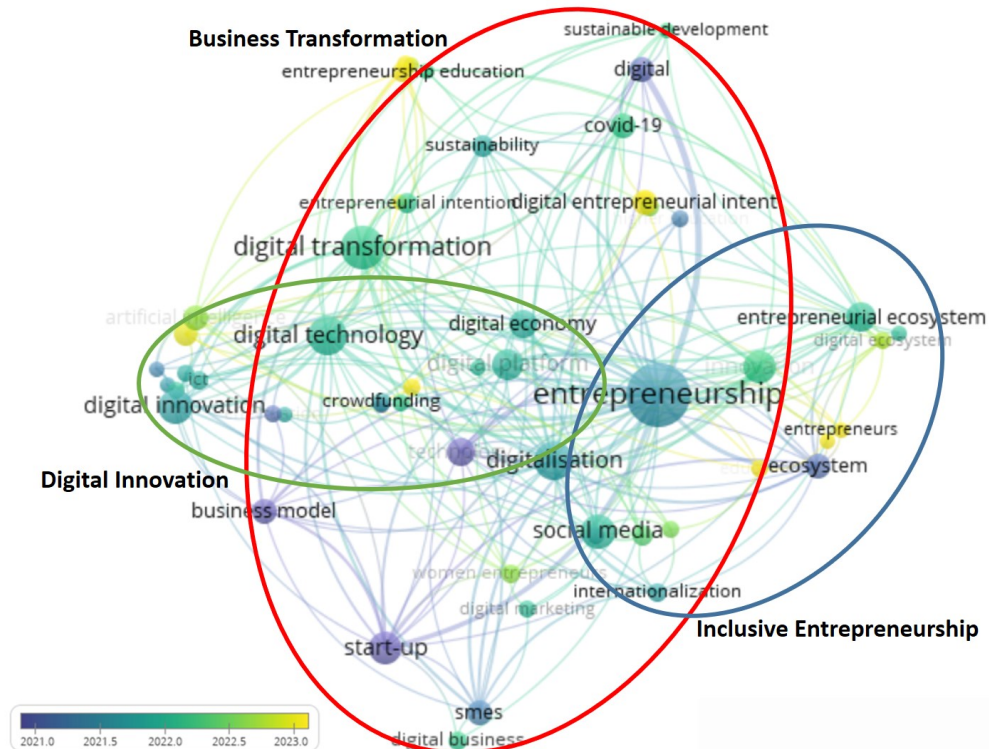
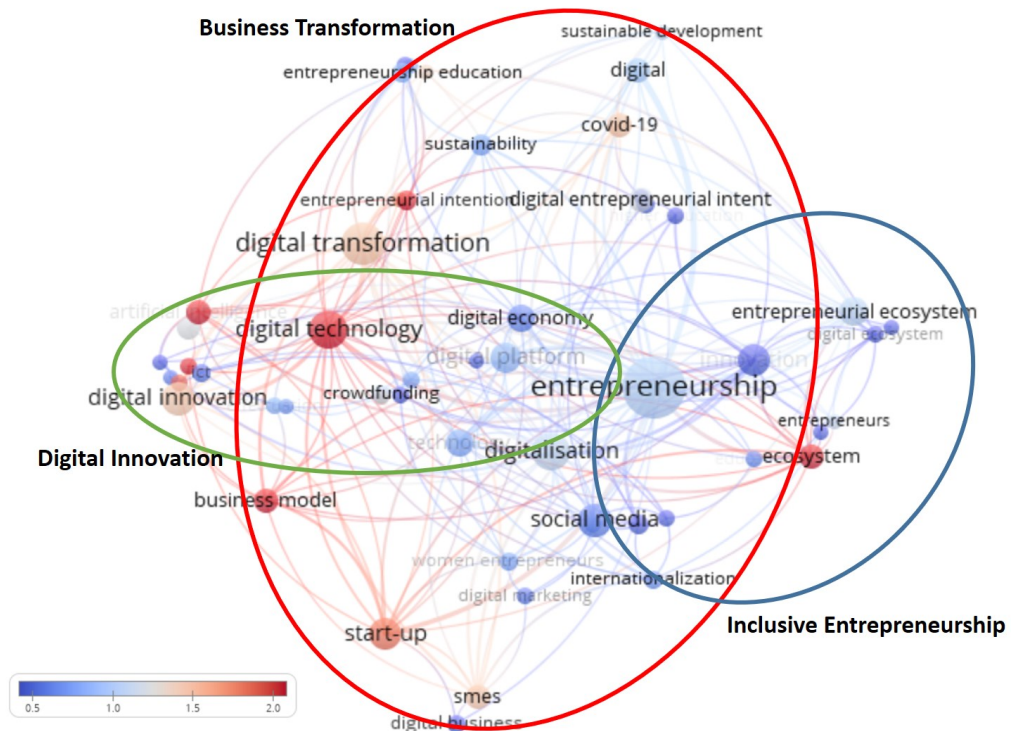


Figure 4 depicts the mapping of keyword occurrences and normalized average citations within the field of digital entrepreneurship, categorizing the research into three primary clusters: Business Transformation, Digital Innovation, and Inclusive Entrepreneurship. Each cluster reflects the dynamic evolution of research interests, particularly concerning the role of digital technologies in reshaping business models, fostering innovation, and promoting inclusivity within entrepreneurial ecosystems. The Business Transformation cluster underscores the interconnection between digital transformation, digital technology, and the digital economy, with higher citation averages indicating its significant influence on global business adaptation and resilience. Keywords such as sustainable development, entrepreneurial intention, and COVID-19 further highlight the relevance of digitalization in addressing contemporary global challenges. In parallel, the Digital Innovation cluster emphasizes the pivotal role of technological advancements, such as crowdfunding, start-ups, and new business models, in driving entrepreneurial innovation. The substantial citation impact within this cluster affirms the critical contribution of digital innovation to the emergence and growth of competitive, technology-driven enterprises.

The Inclusive Entrepreneurship cluster highlights the ways in which digital platforms facilitate broader participation in entrepreneurial ecosystems. Keywords such as entrepreneurial ecosystem, social media, SMEs, and internationalization illustrate how digital technologies enable small and medium-sized enterprises to expand market reach, strengthen entrepreneurial networks, and access global opportunities. The increasing citations associated with this cluster demonstrate a growing academic emphasis on fostering inclusivity and diversity within entrepreneurial environments. Overall, the mapping illustrates that digital transformation, technological innovation, and

entrepreneurial inclusivity are interrelated pillars that are redefining entrepreneurial practices, offering new avenues for business development and competitiveness in an increasingly interconnected global economy.

Figure 4. Trends in Occurrence and Normalized Average Citations



DISCUSSION

The research highlights the significant growth of digital entrepreneurship from 2019 to 2024, driven by the increasing influence of digital technologies on business models and entrepreneurial practices. Key figures such as Kraus, S., Duong, C.D., and Ghezzi, A. have made substantial contributions, with prominent journals like Technological Forecasting and Social Change and Journal of Business Research playing a central role in advancing the field. The analysis identifies three primary clusters: Business Transformation, Digital Innovation, and Inclusive Entrepreneurship, each focusing on how digital technologies are reshaping business models, creating opportunities for start-ups, and fostering inclusive ecosystems for SMEs.

The findings emphasize the growing importance of both digital transformation and inclusivity, with a focus on enabling small businesses and diverse entrepreneurs to succeed in the global marketplace. Future research should explore digital platforms, innovative business models, and the role of policy and infrastructure in supporting digital entrepreneurship. These insights highlight digital entrepreneurship as a key driver of global business change, fostering a more inclusive and diverse entrepreneurial ecosystem.

CONCLUSION

This study underscores the rapid growth of digital entrepreneurship research, particularly from 2019 to 2024, highlighting how digital technologies are reshaping business models, driving innovation, and fostering inclusivity. The analysis reveals key contributors,

influential journals, and productive institutions, with journals like Technological Forecasting and Social Change and Journal of Business Research playing a central role in advancing the field.

The research identifies three main clusters: Business Transformation, Digital Innovation, and Inclusive Entrepreneurship, emphasizing the transformative impact of digital platforms and technologies. It also highlights the increasing focus on inclusivity, enabling SMEs to thrive globally.

The findings suggest that digital entrepreneurship is not just an economic activity but a social phenomenon, with technology providing new opportunities for diverse entrepreneurs. Future research should explore digital platforms, business model innovations, and the role of policy and infrastructure in supporting digital entrepreneurship. This field holds vast potential to transform global business practices and foster inclusive growth in the entrepreneurial ecosystem.

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DECLARATION OF CONFLICTING INTERESTS

The author(s) declare that there is no conflict of interest regarding the publication of this article. The research was conducted independently, and the results presented are free from any external influence or bias.

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