Scientometric Analysis of Digital Entrepreneurship Through Bibliometric Visualizing in the Last 10 Years

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Abstract

The widespread availability of the Internet has surely altered how business is conducted. The journey from jobs to entrepreneurship is growing easier with continually expanding technology, business models, and increasingly imaginative advertising advances on social media. This research aims to identify research trends and visualization mapping on the issue of Digital Entrepreneurship using bibliometric analysis. The Scopus database was used to collect data for this study, and bibliometric network mapping was demonstrated online using the Scopus website and VOSViewer. We employ an article selection approach that begins with the searched keywords and year constraints and ends with the database being exported to RIS and CSV format files. We retrieved 1659 scientific publications from the Scopus database in the last ten years, from 2012 to 2021. VOSViewer is also used to map the network. According to the database the most knowledge is in the field of "Business, Management and Accounting", with 25.2% academic documents (N=584). Then the second is "Social Sciences" with 444 academic documents, and the third is Computer Science with 15% academic documents (N=347). Data study demonstrates a considerable growth in producing scientific articles on Digital Entrepreneurship worldwide from 2012 to 2021. This study suggests merging numerous Digital Entrepreneurship research themes, abbreviated as the LADESO research theme: Literature, Adoption, Digital Economy, Student, and Outcome.

Keywords
Digital, entrepreneurship, visualization, research mapping, bibliometric.

1. Introduction

Digital entrepreneurship has had a major influence on the corporate sector throughout the world. Microsoft, Google, Apple, Twitter, and Facebook have all revolutionized the way we connect with one other. It's at this point that artificial intelligence is able to help people make better decisions, as well as better understand the world around them. Cloud computing and the internet have made it easier, more flexible, and less expensive than ever before to calculate, store, and examine data. Two references are cited: (Bouncken et al. 2015; Tranfield, Denyer, and Smart 2003). Additionally, legal cryptocurrencies are now exchanged in the banking industry throughout the world (Kimani et al. 2020; Othman et al. 2019) and most technologies foresee a blockchain move to the internet for newly produced items.

Entrepreneurship scholars and entrepreneurs must ensure connected findings in order to recognize new company chances since digitalization creates many inferences via disruptive and quick change. This research defines entrepreneurship as the process of creating, establishing, and operating a new trade or business (Hsieh and Wu 2019). Hull et al. (Hull et al. 2007) examined how entrepreneurship, with its distinctive qualities of creating new value, is more than merely beginning a new business. In their research, Palmer et al. (Palmer et al. 2021) looked at entrepreneurial activity in the context of institutional engaging with the field of education or establishing entrepreneurs, enterprises, and shareholder. Entrepreneurial firm paradigms have been fundamentally altered by digitalization, and new digital business opportunities have emerged as a result. Traditional businesses, on the other hand, are moving online. An organization that has gone from traditional to digital, according to this study, is called digital entrepreneurship.

In Taiwan, social digital opportunities push low-income individuals (Huang and Cox 2016). It would be beneficial for future study to compare empirical approaches with the organization, which would help policymakers effectively overcome the digital gap in society. From 2001 to 2014, Maiolini et al. (Maiolini et al. 2016) studied the creative and social activities of small firms. Marketing, e-commerce, and education have been recognized as long-term drivers of social digital entrepreneurship by the researchers. In addition, the author looked at how organizations meet social needs and sustain social digital entrepreneurial concepts. – The author. Social digital entrepreneurship, according to Sarma and Sunny (Sarma and Sunny 2017), generates a smart ecosystem. Entrepreneurs and governments alike must examine the success factors of an intelligent environment. Social digital entrepreneurship was examined by Smith et al. (Smith, Smith, and Shaw 2017), which sparked study on affordable digital search to bridge social capital, affordability, transparent networks, and the user's Digital profile. Women's entrepreneurship was described by Dy et al. (Pan et al. 2021) An internet corporation founded on the principle of equal opportunity was created by the authors. To assist female social digital entrepreneurs, these problems must be aimed to them.

2. Research Method

A systematic and clear bibliometric review technique that focuses on the limitations of knowledge (Purnomo et al. 2021). For the purposes of bibliometric analysis, the search and selection criteria are shown in Figure 1. Scopus, one of the most extensively cited archives, was used to acquire the data. Search terms for this study were “Digital Entrepreneurship to avoid picking papers that were irrelevant to the study’s purpose.

Only those terms are considered to maximize relevant search results. We used various specialty publications in the last ten years, from 2012 to 2021. On May 13, 2022, a search was conducted. Total retrieved documents were 1865, but this was reduced to 1578 when publications limit to 2012 until 2021 from the analysis. We restrict the source type to Journal, dan Conference Proceeding, then the result of the document reduces to 1307. Then, we choose the language English only, and the documents reduce to 1235. A total of 1235 publications were studied for their bibliometric data. The procedure of selecting an article is shown in Figure 1.

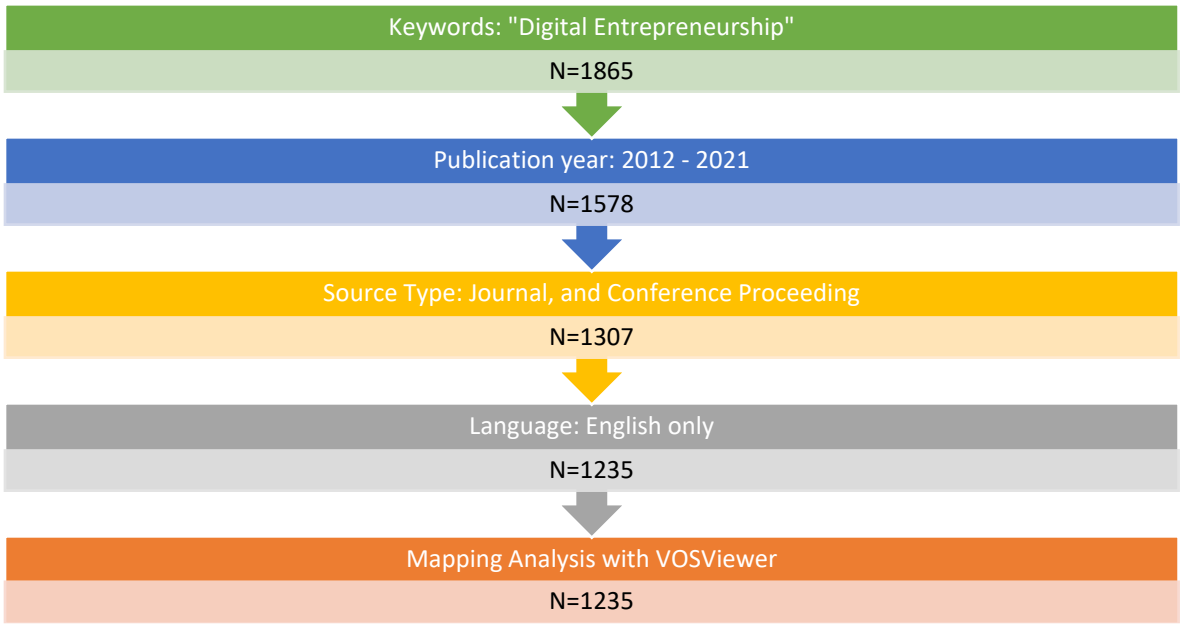


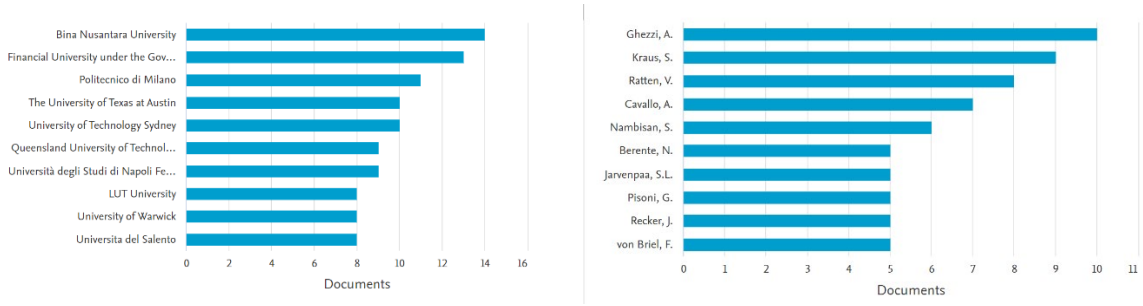
Figure 1. Research method to selection of the documents

3. Result and Discussion

From the search results using the keyword "Digital Entrepreneurship" on the Scopus website, it was found that 1235 articles had been published during the last 10 years from 2012 to 2021. The data obtained was then processed based on several information needs such as Annual Publication, the highest citation based on journal sources, the most productive organization and author, Scientific Source with SJR, to map using VOSviewer software to map the theme network and author network.

3.1 The Most Productive Organizational Affiliations and Productive Author of Digital Entrepreneurship Research

In this research we get 439 affiliated organizations have researched Digital Entrepreneurship like in figure 2. The ten most prolific research affiliates in Digital Entrepreneurship research are "Bina Nusantara University" (N = 14); "Financial University under the Government of the Russian Federation" (N = 13); "Politecnico di Milano" (N = 11); "The University of Texas at Austin" (N = 10); "University of Technology Sydney" (N = 10); "Queensland University of Technology" (N = 9); "Università degli Studi di Napoli Federico II" (N = 9); "LUT University" (N=8); "University of Warwick" (N = 8); "Universita del Salento" (N = 8) as shown in Figure 2 (a). They are all Indonesian affiliates who have made a significant contribution to the digital economy's publications.



(a) (b)

Figure 2. The top ten lof Productive Organizational Affiliations (a) and ProductiveAuthor (b) of Digital Entrepreneurship Research

1421 individual researchers have researched Digital Entrepreneurship. As shown in Figure 2 (b), the most prolific Digital Entrepreneurship author may be identified (Table 1).

Table 1. The author with the most publications in the field of Digital Entrepreneurship

No	Author	Affiliation	Documents
1	Ghezzi, A.	Politecnico di Milano, Milan, Italy	10
2	Kraus, S.	Free University of Bozen-Bolzano, Bozen-Bolzano, Italy	9
3	Ratten, V.	La Trobe University, Melbourne, Australia	8
4	Cavallo, A.	Politecnico di Milano, Milan, Italy	7
5	Nambisan, S.	Weatherhead School of Management, Cleveland, United States	6
6	Berente, N.	University of Notre Dame, Notre Dame, United States	5
7	Jarvenpaa, S.L.	McCombs School of Business, Austin, United States	5
8	Pisoni, G.	Université Côte d'Azur, Nice, France	5
9	Recker, J.	Universität Hamburg, Hamburg, Germany	5
10	von Briel, F.	The University of Queensland, Brisbane, Australia	5

3.2 The Most Document Cited of Digital Entrepreneurship Research

From the research topic "Digital Entrepreneurship", we mapped the five highest document citations. From various sources along with the titles which we then attach in table 2.

Table 2. The Most Document Cited of Digital Entrepreneurship Research

No	Cites	Title	Source	Year
1	1328	"The real-time city? Big data and smart urbanism" (Kitchin 2014)	GeoJournal	2014
2	572	"Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship" (Nambisan 2017)	Entrepreneurship: Theory and Practice	2017
3	435	"Algorithmic labor and information asymmetries: A case study of Uber's drivers" (Rosenblat and Stark 2016)	International Journal of Communication	2016
4	375	"China's manufacturing locus in 2025: With a comparison of "Made-in-China 2025" and "Industry 4.0"" (Li 2018)	Technological Forecasting and Social Change	2018
5	336	"The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes" (Nambisan, Wright, and Feldman 2019)	Research Policy	2019

3.3 Digital Entrepreneurship Research Sector's Annual Publications

Figure 3 shows a graph of the annual trend of increasing publications in the last ten years, from 2012 to 2021. From the Digital Entrepreneurship publication database published in 2012, starting with 19 documents, there was a significant increase in the number of publications year in years. In year 2013 (N=17), 2014 (N=21), 2015 (N=35), 2016 (N=51), until 2021 the publications have increase of up to 382 documents.

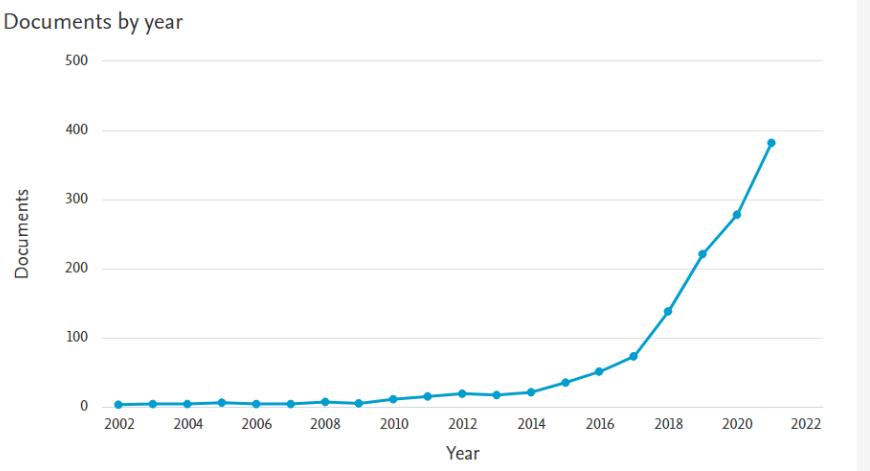


Figure 3. Chart documents per year on Digital Entrepreneurship literature

3.4 Digital Entrepreneurship Research from Scientific Source with SJR

A total of 1235 sources of study have been published on the topic of digital entrepreneurism. The "ACM International Conference Proceeding Series", SJR 2021 (N = 32) publishes the most articles each year in the field of digital entrepreneurship research. The details are shown in Table 3.

Table 3. The Most Document Cited of Digital Entrepreneurship Research

Scientific Source	SJR 2021	Article
"ACM International Conference Proceeding Series"	0.232	32
"Sustainability Switzerland"	0.664	28
"Technological Forecasting And Social Change"	2.336	26
"Journal Of Business Research"	2.316	22
"International Journal Of Entrepreneurial Behaviour And Research"	1.206	21

Over a three-year period prior to the reporting year, each journal's SCImago Journal Rating (SJR) is determined by the average number of papers published in each journal during the reporting year that were referenced. SJR 2021 indicators ranging from 0.232 to 2.336 are found in the most prolific Digital Entrepreneurship research publications.

3.5 The Subject Area of Digital Entrepreneurship Research

Found 1235 documents published by Digital Entrepreneurship in the last ten years, from 2012 to 2021. The most knowledge is in the field of "Business, Management and Accounting", with 25.2% academic documents (N=584). Then the second is "Social Sciences" with 444 academic documents, and the third is Computer Science with 15% academic documents (N=347). Economics, Econometrics and Finance with 8.4% academic documents (N=194), Engineering with 175 academic documents, Decision Sciences with 5.3% academic documents (N=123), Environmental Science with 80 academic documents, and others with 41.1% academic documents such as images of Digital Entrepreneurship publication documents (Figure 4).

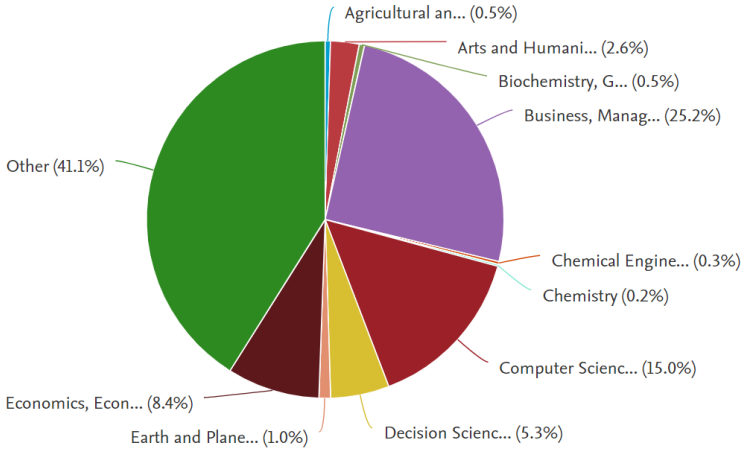


Figure 4. The Subject Area of Digital Entrepreneurship Research

3.7 Theme Map of Digital Entrepreneurship Research

Using the VOSViewer application, Digital Entrepreneurship on keyword mapping networks, the following subject map investigation was conducted. In this inquiry, we'll be looking at the titles and abstracts of articles. A binary representation of the result is used in the calculation. We can see from Figure 5.

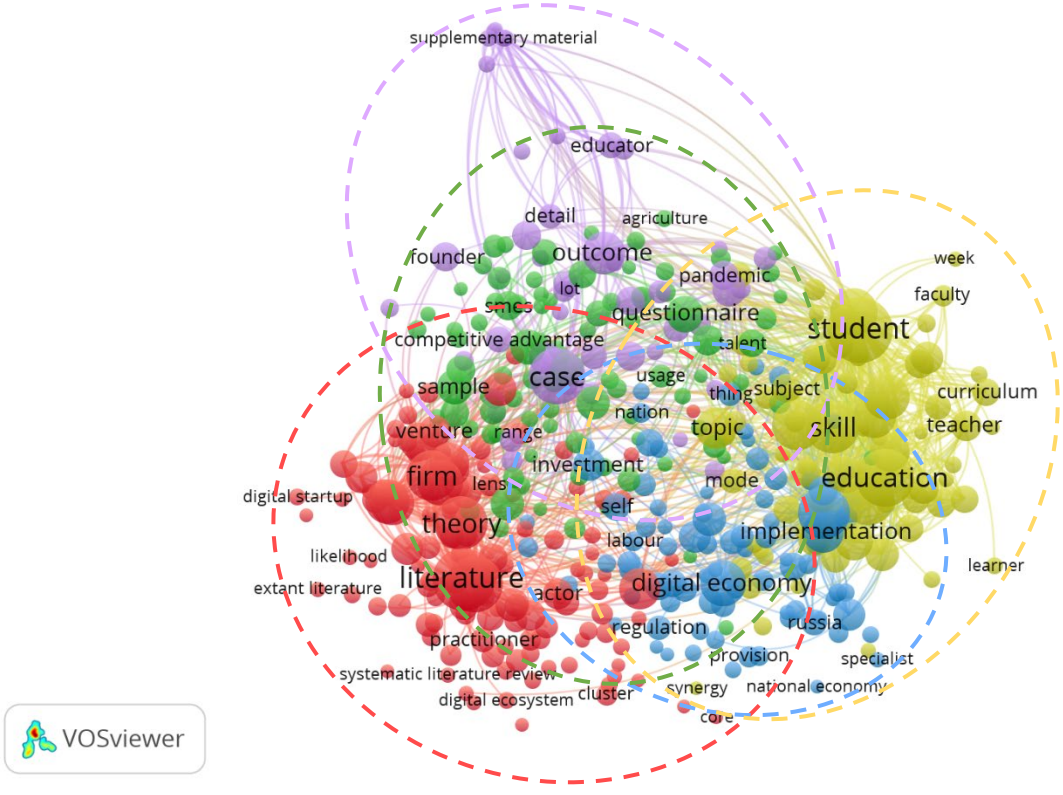


Figure 5. The coexistence of 416 of the most common terms (with at least four occurrences).

The thickness of the lines reflects the severity of the link between terms, based on how often they appeared in articles together.

The data on the topic "Digital Entrepreneurship was processed using VOSviewer software and obtained 24751 terms, with 693 meetings the threshold. By default, from each of the 639 terms, 60% of the relevant terms will be selected, making 416 terms selected. The 416 network terms will be mapped as in Figure 5 and divided into five clusters, Links is 33148, TLS (Total Link Strength) is 68506:

1. Cluster 1 has 123 items, which are red node color. In this network we choose terms Literature. This cluster with the word network like academic, academic entrepreneurs, bibliometric analysis, business model, cluster, conceptual framework, content analysis, digital entrepreneur, digital, digital business model, entrepreneurship research, teory, firm, originality value, and other items.
2. Cluster 2 has 91 items, which are green node color. In this network we choose terms Adoption. This cluster with the word network like agriculture, adoption, business development, digital business, digital disruption, e commerce, entrepreneurial culture, facebook, hypothesis, Indonesia, key role, location, small business, smes, survey data, variable, and other items.
3. Cluster 3 has 82 items, which are blue node color. In this network we choose terms Digital Economy. This cluster with the word network like accuracy, algorithm, big data, blockchain, business process, business environment, computer, problem, communication technology, formation, and other items.
4. Cluster 4 has 72 items, which are yellow node color. In this network we choose terms Student. This cluster with the word network like art, assessment, class, classroom, creativity, curriculum, day, department, digital literacy, digital world, engineering, skill, education, competency, teacher, higher education, program, school, feedback, college, faculty, and other items.
5. Cluster 5 has 48 items, which are purple node color. In this network we choose terms Outcome. This cluster with the word network like business model innovation, case, contact, covid, crisis, educator, digital marketing, india, home, investor, educator, founder, contact, supplementary material, and other items.

3.8 Authorship Network

A trend of collaborative research may be seen in figure 6 of a Digital Entrepreneurship article. There are 3017 authors in the Authorship Network; 13 of them fulfill the criterion, the authors with the greatest total link strength (TLS) will be selected. There are three distinct research teams, each of which is related to the others.

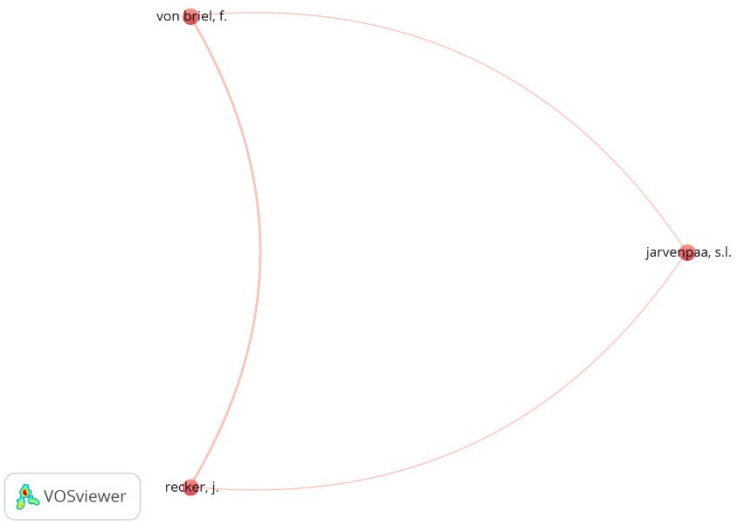


Figure 6. The network of 13 co-authors publishing in Digital Entrepreneurship. Each node presents an author.

From figure 6, in the red nodes, Jarvenpaa, S.L., Recker, J., Von Briel, F., are connected to each other with the red node color. The three of them are in touch with the red node because they have written a joint document entitled

"Researching digital entrepreneurship: Current issues and suggestions for future directions" which has been published through the publication of "Communications of the Association for Information Systems" in 2021.

4. Conclusion

A rising number of Scopus-indexed worldwide articles on digital entrepreneurship is examined in this research. Digital Entrepreneurship has being studied by 439 connected organizations. The ten most prolific research affiliates in Digital Entrepreneurship research are "Bina Nusantara University" (N = 14); "Financial University under the Government of the Russian Federation" (N = 13); "Politecnico di Milano" (N = 11). 1421 individual researchers have researched Digital Entrepreneurship. From the Digital Entrepreneurship publication database published in 2012, starting with 19 documents, there was a significant increase in the number of publications year in years. In year 2013 (N=17), 2014 (N=21), 2015 (N=35), 2016 (N=51), until 2021 the publications have increase of up to 382 documents. The top most of articles per year by source in Digital Entrepreneurship research is "ACM International Conference Proceeding Series", SJR 2021 is 0.232 (N = 32). The most knowledge is in the field of "Business, Management and Accounting", with 25.2% academic documents (N=584). Then the second is "Social Sciences" with 444 academic documents, and the third is Computer Science with 15% academic documents (N=347). According to the contribution to knowledge, this study offers a categorization of the Digital Entrepreneurship study may have to wait several years to find the important themes. So, new topics may be studied or researched in order to increase understanding in this area. Future evaluations of Digital Entrepreneurship's contribution and influence should be based on the combination of Scopus information, WoS, or other database.

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