

# A Study of Digital Entrepreneurship through Bibliometric Visualizing from 1993 to 2019

*by Anita Kartika Sari*

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# A Study of Digital Entrepreneurship through Bibliometric Visualizing from 1993 to 2019

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**Abstract**—Digital entrepreneurship continues to grow. It has been research yet the notion about digital entrepreneurship review study which showed the big picture using data from all countries. This research aimed to map the status of digital entrepreneurship studies published internationally indexed by Scopus using bibliometric visualization. Bibliometric methods and analyzed research data were implemented by using the analysis search results service from the VOS viewer application and Scopus. The research data of 115 documents published from 1993 to 2019 were obtained from the Scopus database. The results showed that the most productive of countries, institutional affiliations, and individuals in the publication of digital entrepreneurship studies were the United States, Universität Liechtenstein, and Kraus, S. The most document type and study areas in digital entrepreneurship studies were Article and Business, Management and Accounting. There was one pattern of collaborative researchers in digital entrepreneurship studies. This research asserted a convergence axis classification consisting of digital entrepreneurship studies to characterize the body of knowledge generated from three decades of studies: Innovation, Digitalization, Entrepreneurship, Business development, Business models, E-commerce, and Social media, abbreviated as IDEBBES themes.

**Keywords**—digital entrepreneurship, entrepreneurship, bibliometric, scopus, vos viewer

## I. INTRODUCTION

Digitalization develops the process of modern entrepreneurship. Entrepreneurial activities are often described as solutions to global socio-economic challenges such as inequality and poverty [1], [2], as well as the pathway to personal emancipation [3]. Entrepreneurship involves efforts in recognizing and seizing opportunities. Entrepreneurship transforms chances into products or services available for market [4]. The digitalization of the entrepreneurial process has assisted to break boundaries between different phases and bring a greater degree of uncertainty into how they develop [5]. Digital entrepreneurship can be defined as an entrepreneurship pursuing potential profits based around the use of digital technology as well as other ICTs [6]. Digital

entrepreneurship is also understood as an entrepreneurial subcategory in which some or all physical assets in traditional organizations have been digitized [4] or as sales of online goods or services through e-networks [7]. Digital entrepreneurship has been seen as an important pillar of entrepreneurial work for economic development, job creation, and innovation in many countries [8].

Digital entrepreneurship continues to develop its main activities, characteristics, categories, and roles. The main activities of digital entrepreneurship include several fields namely decisions on potential evaluation, decisions on company entry, decisions on leveraging opportunities, and exit strategy [9]. Digital entrepreneurship links the characteristics of traditional entrepreneurship with the peculiarities of the digital sphere, creativity, better sensitivity to risk, or dexterity [10]. Digital entrepreneurship can be divided into three categories. The first is light digital entrepreneurship, where the digital economy is only involved as a complement to more traditional processes. The second category is moderate digital entrepreneurship, which cannot exist without digital infrastructure and requires the business to focus on digital products or other digital components. The latter is extreme digital entrepreneurship, which implies all business processes namely production, services, advertising, and digital distribution [4]. Theoretically, digital entrepreneurship has a very significant role in creating new businesses and entrepreneurs. This was related to how the mechanism of business formation which generally depended on the industrial sector, institutional characteristics, talents, and experiences of the entrepreneurs [11], [12].

There was a significant gap problem in the conceptualization of entrepreneurship focuses on digital entrepreneurship [13]. A deeper understanding is needed about the phenomenon of digital entrepreneurship. Digital entrepreneurship will become more common as a digital activity in all industries increased [14]–[16]. Generally, previous studies related to digital entrepreneurship were limited to study in one field [17], or one country [18]. The problem was limited studies reviewing research in the field of digital entrepreneurship that shows a big picture map

which visualized annual data from all countries. Also, there is no digital entrepreneurship study that specifically addresses the relationship between authors, affiliations, keywords, and the impact of the research. Therefore, this research purposed to portray the status of digital entrepreneurship studies published internationally indexed by Scopus using bibliometric visualization.

## II. RESEARCH METHODS

This research has mapped visual trends in digital entrepreneurship studies since it has been published internationally in the last 26 years and have been indexed by Scopus. The data used were gathered from the Scopus database using the document search service in April 2020 [19]. Hence bibliometric methods and analyzed research data were applied to analyze search results service from Scopus and the VOSviewer application [20], [21]. The VOSviewer tool is used to build and visualize bibliometric networks, namely the number of studies, researchers, academic affiliations, countries, fields, keywords, and author collaboration [22]. This research has been carried out by identifying keywords related to digital entrepreneurship to search for and identify related articles from within the Scopus database for 115 documents published from 1993 to December 2019. The data was limited for retrieval data 2019 without looking at 2020 (exclude 2020) thus the annual data obtained describe the condition of the study during the whole year from January to December. The query command that is applied when mining data on Scopus is TITLE-ABS-KEY ("digital entrepreneurship") AND PUBYEAR <2020).

An author analysis co-authorship units and full counting methods using VOSviewer were carried out to get the author's collaboration network. The study implemented a co-occurrence analysis along with keywords analysis and a full calculation method using VOSviewer to obtain a portray of digital entrepreneurship studies.

## III. RESULT AND DISCUSSION

The highest peak of publication is 2019 with 52 documents. The publication of digital entrepreneurship studies has been started since 1993.

### A. Most Common Country Affiliations of Digital Entrepreneurship Studies

The country with the largest contribution in the publication of digital entrepreneurship studies was the United States with 19 documents. It was followed by the United Kingdom with 14 documents, Australia with 13 documents, Germany with 12 documents, China with 9 documents, France with 9 documents, Denmark with 7 documents, Iran with 7 documents, Italy with 6 documents, Liechtenstein with 6 documents, and Spain with 6 documents.

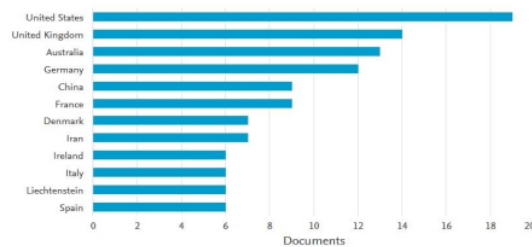


Fig. 1. Number of Documents by Country of the Digital Entrepreneurship Studies

### B. Documents based on Higher Education Affiliates from the Digital Entrepreneurship Studies

The most productive research institute in the publication of digital entrepreneurship studies was Universität Liechtenstein with 6 documents. Followed by The University of Warwick with 5 documents, Lappeenranta Teknillinen Yliopisto with 4 documents, Politecnico di Milano with 4 documents, University of New South Wales UNSW Australia with 4 documents, and the Queensland University of Technology QUT and Dublin Technological University with 3 documents.

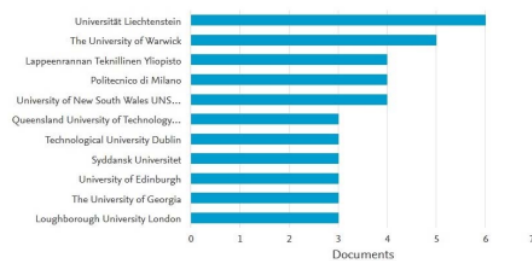


Fig. 2. Documents Number based on Higher Education Affiliates from the Digital Entrepreneurship Studies

### C. Documents Based on Authors of the Digital Entrepreneurship Studies

The author with the most publications in the digital entrepreneurship studies was Kraus, S., with 5 documents. Followed by Berente, N., with 3 documents, Cavallo, A., with 3 documents, Ghezzi, A., with 3 documents, Nzembayie, K.F., with 3 documents, Richter, C., with 3 documents, Tumbas, S., with 3 documents and Vom Brocke, J., with 3 documents.

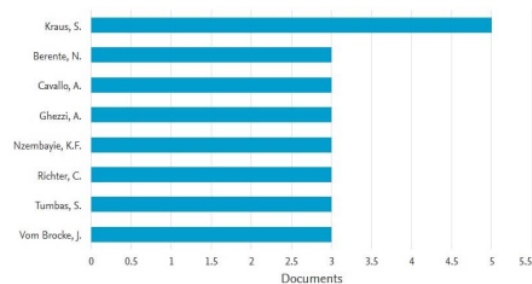


Fig. 3. Documents Number based on Authors of the Digital Entrepreneurship Studies

#### D. Documents based on Subject Areas of the Digital Entrepreneurship Studies

The most subject areas in international academic publications in digital entrepreneurship studies were Business, Management, and Accounting with 71 documents (35.7%). Followed by Computer Science with 40 documents (20.1%), Social Sciences with 25 documents (12.6%), Economics, Econometrics and Finance with 20 document (10.1%), Decision Sciences with 12 document (6.0%), Engineering with 10 document (5.0%), Psychology with 9 documents (4.5%), Mathematics with 6 documents (3.0%), Arts and Humanities with 4 documents (2.0%) and Environmental Science with 1 document (0.5%).

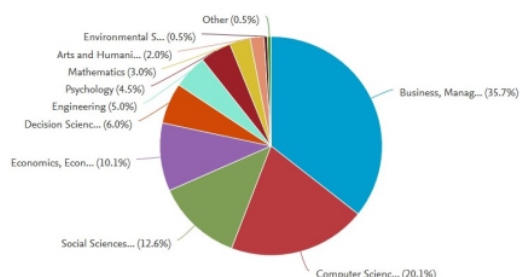


Fig. 4. Number of Documents based on Subject Areas of the Digital Entrepreneurship Studies

#### E. Documents based on Types of Digital Entrepreneurship Studies

The most frequent type of document in digital entrepreneurship studies were Conference Article (60.09%) with 69 documents, then Conference Paper (23.5%) with 27 documents, Book Chapter (7.0%) with 8 documents, Editorial (2.6%) with 3 documents, Review (2.6%) with 3 documents, Conference Review (1.7%) with 2 documents, Book (0.9%) with 1 document, letter (0.9%) with 1 document and note (0.9%) with 1 document.

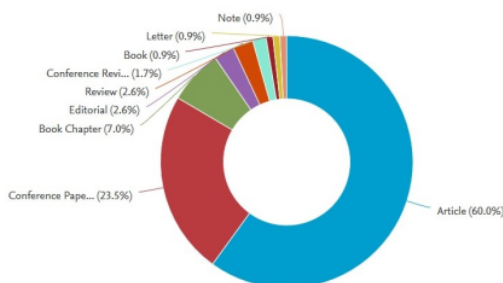


Fig. 5. Number of Documents by Type of Digital Entrepreneurship Studies

#### F. Document-based on Sponsoring Funding of the Digital Entrepreneurship Studies

The top sponsoring institutions that assist in the publication of digital entrepreneurship studies were the National Natural Science Foundation of China with 3 documents, the Australian Research Council with 2 documents, and the Marianne and Marcus Wallenberg Foundation with 2 documents.

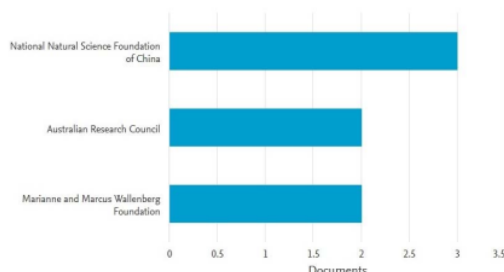


Fig. 6. Number of Documents based on Sponsoring Funding of the Digital Entrepreneurship Studies

#### G. Annual documents from the Digital Entrepreneurship Studies

Publications on digital entrepreneurship studies at the global level have been started since 1993. The number of international publications on digital entrepreneurship studies has shown an increasing trend every year. This can be seen in Fig. 7, the highest publication peak occurred in 2019 with 52 documents.

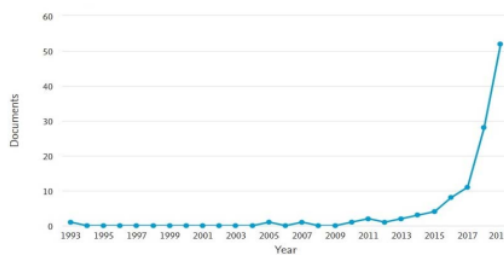


Fig. 7. Number of Documents Per Year from the Digital Entrepreneurship Studies

#### H. Map of Study Theme

The construction on the digital entrepreneurship keyword network for the theme map study was built through VOSViewer application. The criterion for a minimum number of documents related to keywords is three repetitions. Therefore, from 605 keywords there were only 41 keywords that meet the thresholds.

Fig. 8. shows that there were six groups of study themes based on research keywords related to digital entrepreneurship study, abbreviated as IDEBBES themes.

1. Innovation cluster (light blue). In this cluster, we can find innovation themes. This cluster was related by the keywords innovation, digital innovation, entrepreneur and technological forecasting.
2. Digitalization cluster (red). This cluster dominated by the keywords digitalization, digital platforms, digital technologies, entrepreneurial activity, information use and information systems.
3. Entrepreneurship cluster (green). In this cluster, we can find entrepreneurship themes. This cluster was related by the keywords entrepreneurship, start-up, internet, ecosystem, and digital economy.
4. Business development clusters (blue). This cluster dominated by the keywords business development, start-up, crowd funding, and digital business.
5. Business models cluster (yellow) and the big data themes in this cluster were found. This cluster was related by the keywords business models, digitization, lean startup, and big data.
6. E-commerce cluster (purple). This cluster dominated by the keywords electronic commerce, e-commerce, entrepreneurial process and effectuation.
7. Social media cluster (orange). This cluster dominated by the keywords social media and insider action research.

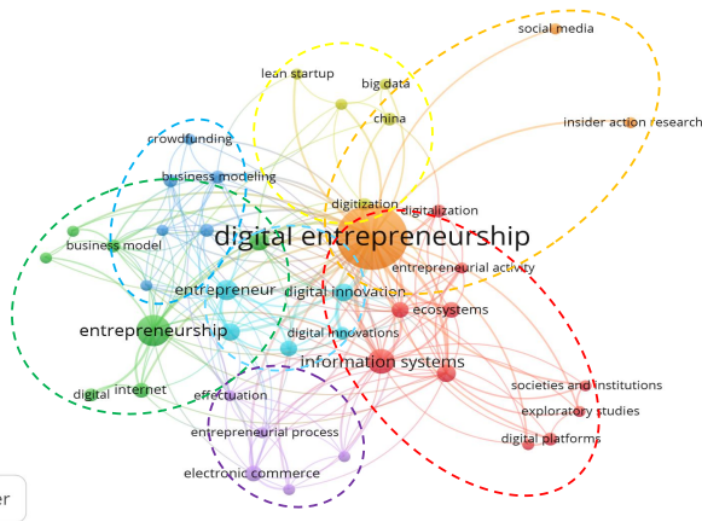


Fig. 8. Map of Study Theme

#### I. Document Cited of the Digital Entrepreneurship Studies

The publication of digital entrepreneurship studies with the most citations as an academic impact is the work of Nambisan, S in 2017 entitled "Digital Entrepreneurship: Towards a Digital Technology Perspective of Entrepreneurship" in the journal of "Entrepreneurship: Theory and Practice" with 111 document citations.

#### J. Authorship Network

The criteria for the minimum number of documents per author were three documents. Thus, from 260 authors, 8 authors were found who met the thresholds. There was one group of collaboration patterns between researchers in digital entrepreneurship studies as shown in Fig. 9, which is a red cluster consisting of 3 authors namely Brente, N., Vom Brocke, J., and Tumbas, S.

Brent Neiman is Professor of Economics at University of Chicago, United States of America. Jan vom Brocke is professor at the University of Liechtenstein, German. Sanja Tumbas focus on Department of Management Information Systems, University of Georgia, United States of America.

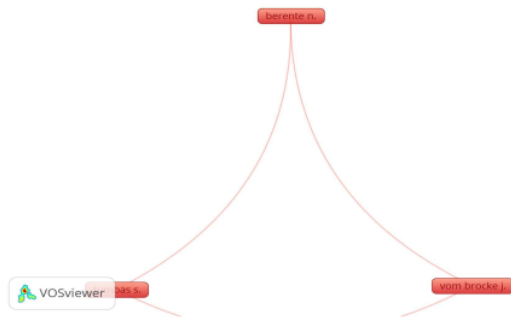


Fig. 9. Authorship Network

#### IV. CONCLUSION

From this study, it can be concluded that the trend on international publications on digital entrepreneurship studies was every years increased in numbers. The culmination of a publication on the digital entrepreneurship Study in 2019 is 52 documents. Digital entrepreneurship studies are still dominated by developed countries, namely the United States with 19 documents. The most productive research institute is Universität Liechtenstein with 6 documents. The most productive author in digital entrepreneurship studies is Kraus, S., with 5 documents, and the most cited document type is Article with 69 documents (60.09%). Meanwhile, the most study area in digital entrepreneurship studies is Business, Management, and Accounting with 71 documents (35.7%). Digital entrepreneurship publication with the highest number of document citations is Nambisan, S.'s 2017 work entitled "Digital Entrepreneurship: Towards a Digital Technology Perspective of Entrepreneurship" with 111 citations. There is one collaboration group namely three writers, each named Brente, N., Vom Brocke, J., and Tumbas, S.

In terms of contributing implications to knowledge, this research proposes a convergence axis classification consisting of digital entrepreneurship studies to characterize the body of knowledge generated from three decades of studies: Innovation, Digitalization, Entrepreneurship, Business development, Business models, E-commerce, and Social media, abbreviated as IDEBBES themes. As implications for practical, identifying key themes in the digital entrepreneurship sector leads to understanding the development of studies to understand common topics and contexts, as well as the research gaps. With all of this, new studies can be led to address a lack of study and advance knowledge in the areas. The themes most researched also demonstrate the digital entrepreneurship contribution to entrepreneurship, business and management.

Future research hopefully is giving contributions and explanation the impact of research by measuring citations based on a combination of data obtained from Scopus and Web of Science.

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