

# Digital Business: A Scientific Publication Positioning using Scientometric Analysis

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# Digital Business: A Scientific Publication Positioning using Scientometric Analysis

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**Abstract**—The digital economy creates a digital business based on technopreneurship for the needs of digital citizens. It has been research yet the notion about digital business review which showed the big picture using data from all countries. This study aims to map the position of international business digital scientific publications indexed by Scopus using scientometric analysis. The study has carried out scientometric methods and analyzed research data using the analysis search results service from Scopus and the VOSviewer application. The research data of 933 scientific documents published from 1978 to 2019 were obtained from the Scopus database. The results showed an increasing trend in the number of digital business publications at the international level each year. Most countries, affiliation, author, subject areas, and type documents in digital business publications were Germany, Curtin University, Chang, E., computer science; and conference paper. There was one pattern of collaborative researchers in digital business publications. This research proposes a convergence axis classification consisting of digital business publication to characterize the body of knowledge generated from four decades of publication: Information technology, Management, Business ecosystem, Industry, Benchmarking, E-commerce, Digitalization, Strategy, abbreviated as IMBIBEDS themes.

**Keywords**—business, digital business, digital economy, scientometric, technopreneurship

## I. INTRODUCTION

The digital economy in the digital age creates digital business for the needs of digital citizens. The digital age creates new opportunities and provides the ability to effectively utilize information and communication technology essential for the survival and prosperity of a company [1]. Digital technology has provided ways to deal with uncertainty in the processes and outcomes in business and entrepreneurship [2]. The progress of digitalization and development of information and communication technologies has created many new business opportunities for entrepreneurial activities in developing countries [3], [4], as well as improving business models in information systems management [5]. Digital business is a business creation by utilizing the acceleration of information and

communication technology [7]–[10]. The transition of traditional business towards digital business has broadly begun to affect various industries, especially in the automotive, banking, health, telecommunications, and manufacturing sectors for digital citizens [6].

Digital business models play a role in integrating environmental benefits and safety. Digital business in new ways is considered capable of having a significant impact throughout the world in the last few decades [11]. Business in digital form is often considered to play a role as an environmental savior. Because digital business can reduce the use of paper to send bills, pay bills, and orders [12]. The business has been considered as one of the causes of environmental damage [13]. Thus, digital business has a beneficial role for both parties, both for business owners and the environment. Digitalization in business and management is often considered an integral concept of modern management and is the center of attention and a top priority topic for information technology-management and business process management [15]–[17]. Previous publications such as Remane, Hanelt, Nickerson, and Kolbe provide training instructions for systematically analyzing and finding digital business models for companies and business people. Understanding of business actors to find new business model combinations important to their enterprises and the demands of the current digital era [14]. Digital business needs to be developed with the spirit and principles of technology-based entrepreneurship or technopreneurship.

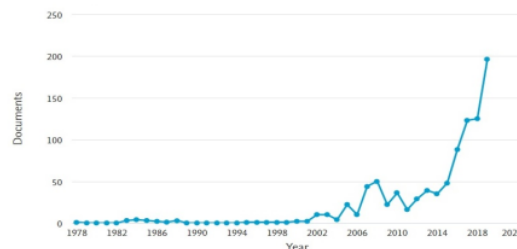


Fig. 1. Number of Documents Per Year from Digital Business Publications

The implications of business strategies in the form of using computing technology to social impacts have not yet been fully explained in terms of shared uses and creations [8]. The problem is that there has not been any research map on global business digital publications from year to year. Also, there is no scientific publication that specifically addresses the relationship between authors, affiliations, and the impact of digital business publications. This study aims to map the position of international business digital scientific publications indexed by Scopus using scientometric analysis. Researchers have observed a growing number of scientific publications related to digital business topics that have been published internationally and indexed by Scopus from 1978 to 2019 shown in Figure 1.

## II. RESEARCH METHODS

This research has mapped the position of digital business scientific publications globally and has been indexed by Scopus. Research data was obtained from the Scopus database using document search services in March 2020. [18]. This study has carried out scientometric methods and analyzed research data using the analyze search results service from Scopus and the VOSviewer application [19], [20]. VOSViewer tools were used to build and visualize scientometric networks, namely the number of studies, researchers, academic affiliations, countries, fields, keywords, and author collaboration [21]. This survey has been carried out by identifying keywords related to digital business to find and identify related articles from publications with the Scopus database for 933 academic documents published from 1978 to 2019 at the global level. The study limited data collection to 2019 without looking at 2020 (exclude 2020) so that the annual data obtained illustrates the condition of the study in one whole year from January to December. The query command that is applied when mining data on Scopus was TITLE-ABS-KEY ("digital business") AND PUBYEAR <2020.

The study analyzed co-authorship with units of analysis of authors and full counting methods using VOSViewer to get the author's collaboration network. The study carried out an analysis of co-occurrence with analysis of keywords and a full calculation method using VOSViewer to obtain a network of keywords.

## III. RESULT AND DISCUSSION

Digital business publications tend to increase every year. The highest publication peak in 2019, 214 documents. Digital business publications at the international level have been started since 1978.

### A. Most Frequent Country Affiliation of Digital Business Publications

The top research country in digital business publications was Germany with 138 documents. Then followed by the United States with 109 documents, the United Kingdom with 92 documents, Australia with 51 documents, Italy with

50 documents, Spain with 40 documents, France with 35 documents, Switzerland with 31 documents, China with 30 documents, Finland with 30 documents, Russian Federation with 29 documents, India with 27 documents, and Portugal with 27 documents as shown in Fig 2. Country Number of Digital Business in Year.

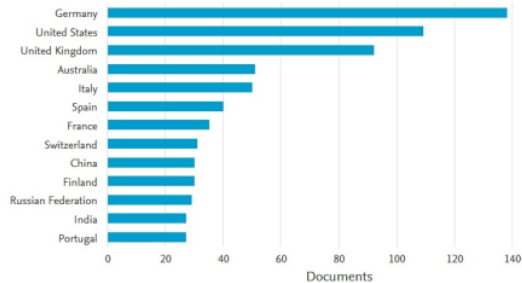


Fig. 2. Country Number of Digital Business in Year

### B. Most Common Institutional Affiliations of Digital Business Publications

The top research institutions in digital business publications were the Curtin University with 13 documents, Universität St. Gallen with 12 documents, Fujitsu Ltd. with 10 documents, Universität Göttingen with 10 documents, London School of Economics and Political Science with 9 documents, the University of the Aegean with 9 documents, University Politehnica of Bucharest with 8 documents, and Aalto University with 8 documents as shown in Fig 3. Affiliation Number of Digital Business in Year.

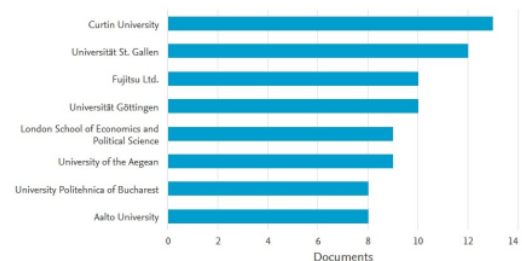


Fig. 3. Affiliation Number of Digital Business in Year

### C. Most Individual Authors in Digital Business Publications

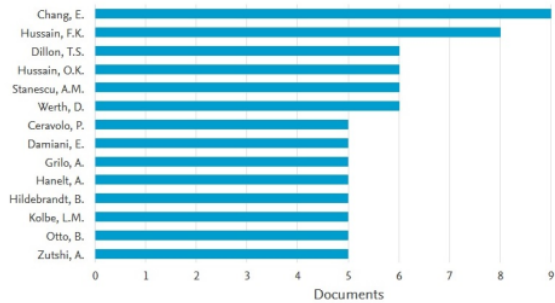


Fig. 4. Most Individual Authors of Digital Business Publications

The author with the most publications in the digital business was Chang, E. with 9 documents. Followed by Hussain, F.K. with 8 documents, Dillon, T.S. with 6 documents, Hussain, O.K. with 6 documents, Stanescu, A.M. with 6 documents, Werth, D. with 6 documents, Ceravolo, P. with 5 documents, Damiani, E. with 5 documents, Grilo, A. with 5 documents, and Hanelt, A. with 5 documents.

#### D. Most Frequency of Digital Business Publications by Subject Area

The most subject area in digital business publications was Computer Science with 560 documents (30.9%). Followed by Business, Management, and Accounting, with 339 documents (18.7%), Engineering with 266 documents (14.7%), Decision Sciences with 161 documents (8.9%), Mathematics with 146 documents (8.0%), Social Sciences with 110 documents (6.1%), Economics, Econometrics and Finance with 102 documents (5.6%), Environmental Science with 25 documents (1.4%), Materials Science with 22 documents (1.2%), and Chemical Engineering with 17 documents (0.9%).

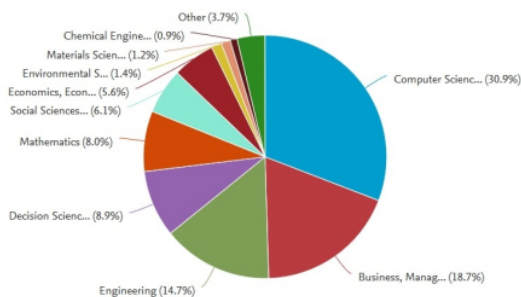


Fig. 5. Most Frequency of Digital Business Publications by Subject Area

#### E. Most Frequent Type Document of Digital Business Publication

The most frequent type document in digital business publication was Conference Paper (47.9%) with 447 documents, then Article (32.4%) with 302 documents, Book Chapter (6.4%) with 60 documents, Conference Review

(6.1%) with 57 documents, Book (2.7%) with 25 documents, Review (2.1%) with 20 documents, Editorial (1.1%) with 10 documents, Note (0.6%) with 6 documents, Short Survey (0.4%) with 4 documents, and Erratum (0.1%) with 1 documents.

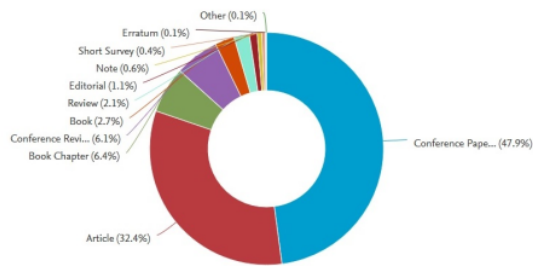


Fig. 6. Most Frequent Type Document of Digital Business Publication

#### F. Documents by Funding Sponsor of Digital Business Publications

Fig. 7 shows the top sponsoring Funding agencies that were most helpful in publishing digital business are the European Commission with 13 documents, the National Natural Science Foundation of China with 6 documents, the Academy of Finland with 3 documents, Bundesministerium für Bildung und Forschung with 3 documents, Universitas Indonesia with 3 documents, and Vedecká Grantová Agentúra MŠVVaŠ SR a SAV with 3 documents.

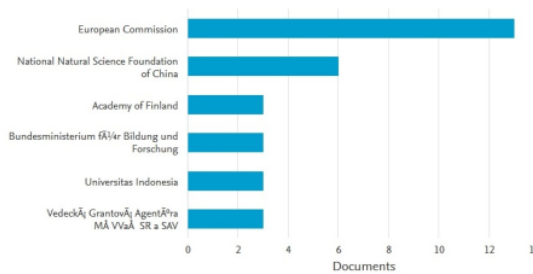


Fig. 7. Most Frequency of Digital Business Publications by Funding Sponsor

#### G. Year Documents Based on Sources of Digital Business Publications

The number of documents each year based on sources in international publications in the Digital Business is Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics with 54 documents. Followed by the Lecture Notes In Business Information Processing with 27 documents, IFIP Advances In Information And Communication Technology with 14 documents, and Communications In Computer And Information Science 13 documents.





digital business ecosystems, digital ecosystem, and ecosystem. Most of these keywords relate to digital business ecosystems themes.

4. Industry cluster (purple). In this cluster, we can find industry themes. This cluster was related to the keywords industry, finances, and surveys.
5. Benchmarking cluster (brown). In this cluster, we can find benchmark themes. This cluster was related by the keywords benchmarking
6. E-commerce cluster (yellow). This cluster dominated by the keywords e-commerce, electronic commerce, internet, marketing, and consumer behavior. Most of these keywords relate to e-commerce themes.

The topmost cited digital business publications were shown in Table 1. The most cited international publications in the "MIS Quarterly: Management Information Systems" was Bharadwaj, A., El Sawy, O.A., Pavlou, P.A., Venkatraman, N. in 2013 entitled "Digital Business Strategy: Toward A Next Generation of Insights" cited 632 documents.

#### J. Authorship Network

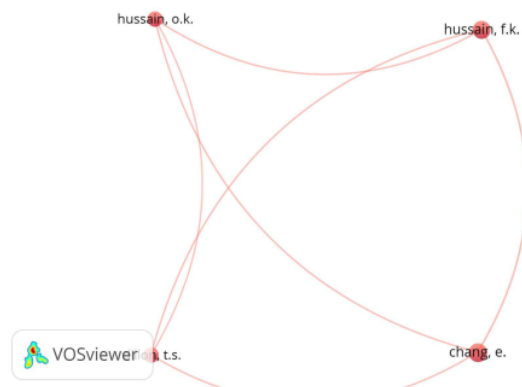


Fig. 10. Authorship Network

The criteria for the minimum number of documents per author were five documents. Thus, from 1,983 authors, 15 authors were found who met the thresholds. There was one group collaboration network between researchers in the digital business publications as seen in Fig. 10. The red cluster which contains Hussain, F.K., Dillon, T.S., Hussain, O.K., and Chang, E. They both from the Curtin University of Technology, Perth, Australia.

#### IV. CONCLUSION

The results of this study indicate that there were maps and visual trends in increasing the number of publications on digital business studies at the international level. The country that has the largest contribution in making publications in digital business studies was Germany with 138 documents. The most productive research institution in

7. Digitalization cluster (blue). In this cluster, we can find digitalization themes. This cluster was related by the keywords digitalization, digital business transforming, digital transformations, digital innovation, business strategy, and digital business.
8. Strategy cluster (orange). This cluster dominated by the keywords digital business strategy, digital strategy, strategic planning, it strategy, and competitiveness. Most of these keywords relate to strategy themes.

#### I. Document Cited of Digital Business Publications

the publication of the digital business studies was Curtin University with 13 documents. The individual author with the most publications in the digital business study was Chang, E. with 9 documents. The most widely studied areas published in the digital business studies were Computer Science with 560 documents (30.9%). The most document types published are Conference Paper with 447 documents (47.9%). Most documents per year by the source in international publications in the digital business studies were the "Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics" with 54 documents. The most sponsoring institution that helped in the study of the publication of digital business is the European Commission with 13 documents. The highest publication of international academic documents in digital business studies was in 2019 with 214 documents. Most publications with the most citations were the works of Bharadwaj, A et al in 2013 entitled "Digital Business Strategy: Toward A Next Generation of Insights" with 632 citations. There were one collaboration group on research related to the digital business publication.

In terms of contributing implications to knowledge, this research proposes a convergence axis classification consisting of digital business publication to characterize the body of knowledge generated from four decades of publication: Information technology, Management, Business ecosystem, Industry, Benchmarking, E-commerce, Digitalization, Strategy, abbreviated as IMBIBEDS themes. As implications for practical, identifying key themes in the digital business 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 business contribution to business and digital economy.

Future research is to analyze contributions and explain the impact of digital business publication based on a combination of data obtained from Scopus dan Web of Science.

#### ACKNOWLEDGMENT

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