Bibliometric Analysis of The Literature in The Field of Information Technology Relatedness

Ilham M
Airlangga University of Surabaya, East Java, Indonesia, ilham@uinsby.ac.id

Anis Eliyana
Airlangga University of Surabaya, East Java, Indonesia, anis_eliyana@feb.unair.ac.id

Praptini Yulianti
Airlangga University of Surabaya, East Java, Indonesia, praptini_y@feb.unair.ac.id

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Ilham[1], Anis Eliyana[2], Praptini Yulianti[3]

[1]Information Systems Study Program, Department of Technology, Faculty of Science and Technology, Sunan Ampel Islamic University Of Surabaya, East Java, Indonesia
anis.eliyana@feb.unair.ac.id

[1,2,3]Department of Management, Faculty of Economics and Business, Airlangga University
Airlangga Number 4-6 Street, Surabaya, East Java, Indonesia

ABSTRACT

Information Technology Relateness is defined as the use of information technology infrastructure and information technology management processes between business units together. There is not much research on Information Technology Relateness by providing a big picture that is visualized from year to year. This study aims to map research in the field of Information Technology Relateness with data from all international research publications. This study performs a bibliometric method and analyzes research data using the Services Analyze Search Results from Scopus and the VOSviewer application. The data obtained in this study amounted to 307 academic documents published from 1981 to 2020 globally. The results showed that the institutions and individual researchers at the global level that were most productive in the publication of Information Technology Relateness were the University of Kentucky, KU Leuven, and Parent University, each with 5 and Kim C with 5 articles of documents. Most fields of study are computer sciences with 138 documents. Then the most publications occurred in 2015 as many as 31 documents, and documents per year based on sources of 7 from Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics. The most document types in this field are in the form of articles. The most documents by country from the Information Technology Relateness Study are the United State with 82 and then China with 37 documents. And finally, the number of documents based on the Funding Sponsor of this study is the National Science Foundation, totaling 11 documents.
Keyword : Information Technology Relateness, Bibliometric, Analysis, Scopus, and VOSViewer

INTRODUCTION

The firm-level performance implications of information technology have been a long-standing research theme in the information systems literature (Kohli and Devaraj 2003). While some studies have found a significant relationship between Information Technology and firm performance, others have failed to do so (Devaraj and Kohli 2003). One explanation for this inconsistent finding is that the causal relationship of Information Technology to firm performance is too long and most studies have neglected important intermediate organizational capabilities that mediate the relationship between Information Technology and firm performance (Barua and Mukhopadhyay 2000; Sambamurthy et al. . 2003). Recent research interest in the phenomenon of knowledge management shows that knowledge management capabilities can be an important driver between information technology and company performance. Information systems researchers assume that information technology increases the knowledge management capabilities of an organization

(Alavi and Leidner 2001; Gold et al. 2001; Schultze and Leidner 2002). Furthermore, organizational theorists and strategists suggest that management knowledge capabilities, in turn, provide a competitive advantage and enhance firm performance (Eisenhardt and Santos 2002; Teece 1998).

Although there is a widespread belief that information technology makes it possible to improve firm performance, researchers have tried very little theoretical work on developing the nomological relationship between Information Technology and firm performance. Systematic empirical investigations of this relationship are also scarce. The information systems literature review has not identified much of any study that establishes the relationship of information technology to financial firm performance (Alavi and Leidner 2001; Schultze and Leidner 2002). In addition, a review of organizational theory and the strategic management literature suggests that knowledge management studies have not addressed key issues of strategic management such as the nature of competitive advantage and implications for firm performance (Eisenhardt and Santos 2002). Several studies on information technology examine these questions in the context of multi-business firms operating in multiple product markets. Since knowledge usually applies outside the single product market (Sampler, 1998), and there are several external markets for efficient knowledge exchange (Teece, 1980), the internal market for multibusiness firms provides opportunities to exploit knowledge across multiple product markets, creating knowledge-based synergies, and improve the overall performance of the company (Grant 1996 b; Robins and Wiersema 1995; Teece 1980). Information technology organization and management in multibusiness firms has important implications for the firm's ability to exploit synergies across these units (Brown and Magill 1994,1998; Samba Murthy and Zmud 1999, 2000; Weill and Broad Bow 1998; Weill and Ross 2004).

In general, previous research related to Information Technology Relateness was limited to researching only one research topic, such as one country (H. Abdul Halim et al, 2019) and one field (C. Curado et al, 2017). There has not been much research on Information Technology Relateness by providing a big picture visualized from year to year with data from all publications of affiliated researchers at the international level. Also, no research has specifically addressed the relationship between authors, organizations or affiliations, countries and the impact of their research. This study aims to study the position of research in the field of Information Technology Relateness by researchers at the world level published internationally indexed by Scopus using document analysis with a bibliometric perspective. We monitor the growth in the number of academic documents related to the topic of Information Technology Relateness by researchers at the world level that have been published and indexed by Scopus from 1981 to November 2020.

METHOD

This study measures the status of map publications in the field of Information Technology Relateness at the international level in the last 40 years. Research data were obtained from the Scopus database using the document search facility in November 2020 (A. Aziz and A. K. Sari, 2020). This study uses bibliometric capabilities, by displaying data visualization analysis and illustrations with the analyze search results feature available in the Scopus facility and coupled with the VOSViewer application. The VOSviewer tool can be used to display bibliometric network visualizations, such as network visualization between researchers, organizations, countries, affiliations, an increase in the number of studies, keywords, researcher collaborations, trending research concepts, the most cited research, and rare research concepts. done.

In conducting the survey, it will identify keywords related to Information Technology Relateness to search and identify related articles from international researchers globally in the Scopus database, and get 307 academic documents published from 1981 to 2020. The research limits data collection to 2020 without look at the year 2021 (exclude 2021) so that the annual data obtained describes the condition of the research in one whole year from January to December. The key commands that are applied when data mining at Scopus are TITLE-ABS-KEY ("Information Technology Relateness") AND PUBYEAR <2020. This research carries out a type of analysis and counting method strategy such as the type of analysis of co-authorship with unit of analysis of authors, Organization, Countries, and full counting method. This study also uses a type of analysis of co-occurrence with a unit of analysis of All keywords and a full and fractional counting method, then performs visualization based on network visualization, Visualization Overlay, and Density. Visualization to get various information about the document network, besides that it also displays analysis based on the title and abstract of the document. The application used is VOSViewer to get a network of research concepts through keyword visualization. In the flow of Figure 1 below is the mechanism and protocol for searching indexing journals such as Scopus and Google Scholar.
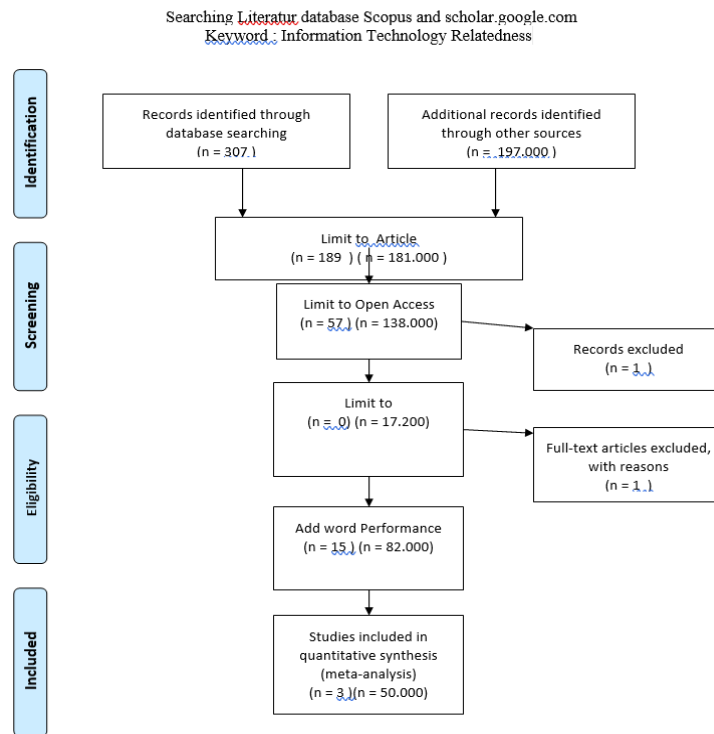

Figure 1. Searching Literature in Scopus Database and Google Scholar

RESULT AND DISCUSSION

At this stage it will explain all the results of data analysis based on affiliation, country, subject area, field type, documents per year from sources, documents per year from cited fields and documents, joint events, author networks and various network visualizations in the Information Technology Relatedness study. .

Results of data analysis based on Academic Affiliation of the Information Technology Relatedness Study

The figure 2 shows a list of research institutions in the Information Technology Relatedness publication. The first is the University of Kentucky, KU leuven and Parent University with 5 documents each, followed by The University Of Hong Kong, Stanford University, The University of Sydney and Universite De Lyon with 4 documents each, besides the University of Illinois at urbana-Champaign, Nanyang Technological University and Hankuk University of Foreign Studies each with 3 documents,
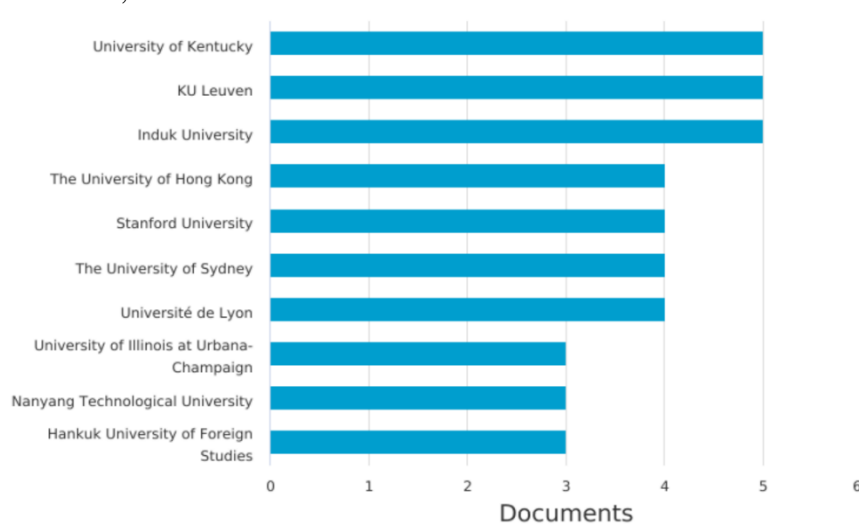

Figure 2. Affiliation Number of ITR Per Year

The results of data analysis based on the author of the Information Technology Relatedness Study

The Figure 3 shows the authors who have the greatest contribution in publishing in the field of Information Technology Relatedness. The author with the most publications in the field of Information Technology Relatedness is Kim, C. with 5 documents, followed by Kim M.S, Law, K, H, Liu. Y and Ravichandran, T with 3 documents each, Arzani A, Asch D A, Broda B, Chang K C, and Ferragina P with 2 documents each
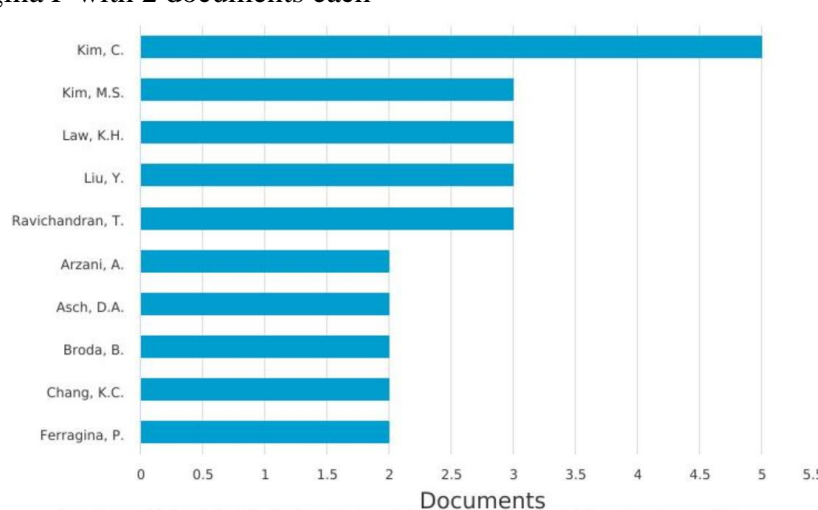

Figure. 3. Most Individual Authors of ITR Publication

Document data analysis results by country from the Information Technology Relatedness Study

The Figure 4 shows the country that has the largest contribution in publishing in the field of Information Technology Relatedness, namely the United States with 82 documents, followed by China with 37 documents, United Kingdom with 29 documents, Germany with 21 documents, Italy with 20 documents, Australia with 15 documents, France, Netherlands and Taiwan with 12 documents, and India with 11 documents.
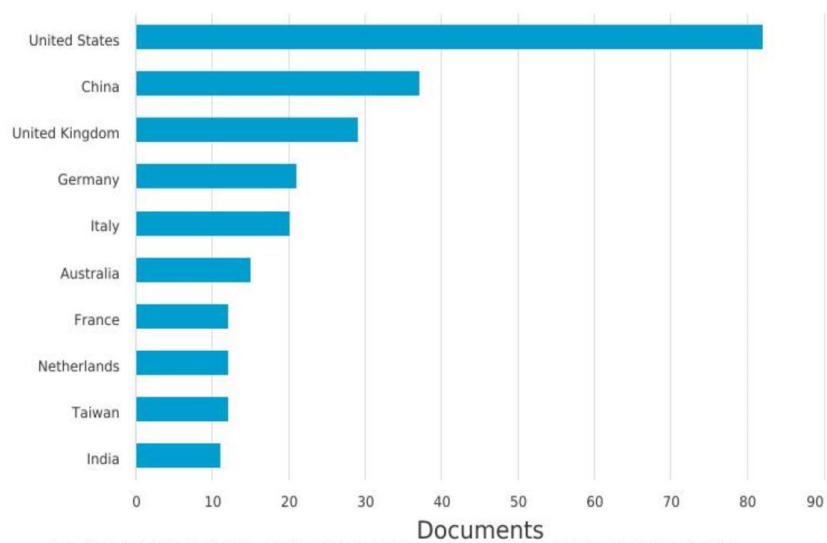
Figure 4. Country Number of ITR Per Year

Results of document data analysis based on Funding Sponsor from Information Technology Relatedness Study

The Figure 5 shows a list of Funding Sponsor institutions that are most intensive in assisting Information Technology Relatedness studies. The first position is the National Science Foundation with 11 documents, followed by the National Natural Science Foundation of China with 8 documents, the National Institutes of Health with 7 documents, the Seventh Framework Program with 3 documents, Academy of Finland and European Commission and Ministero dell'Istruzione, dell'Università e della Ricerca and Ministry of Education and Ministry of Education, Science and Technology with 2 documents.
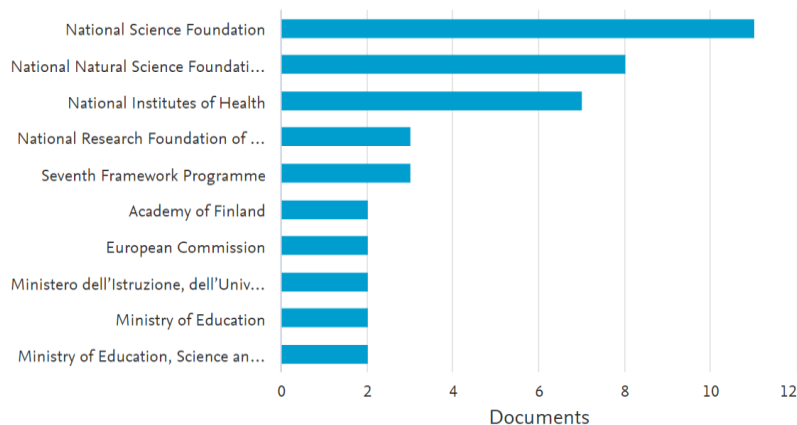
Figure 5. Number of Documents based on Funding Sponsor

Results of document data analysis based on the subject area of the Information Technology Relatedness Study

Figure 6 explains that the most intensive fields of study in the publication of Information Technology Relatedness are Computer Science (25.4%) with 138 documents; followed by Social Sciences (11.2%) with 61 documents; Engineering (9.2%) with 50 documents; Business, Management and Accounting (8.1%) with 44 documents, Agricultural and Biological Sciences (7.5%) with 41 documents, Medicine (7.2%) with 39 documents, Biochemistry, Genetics and Molecular Biology (6.8%) with 37 documents, Mathematics (4.6%) with 25 documents, Decision Sciences (3.9%) with 21 documents, Environmental science (2.8%) with 15 documents, and Other (13.4%) with 73 documents
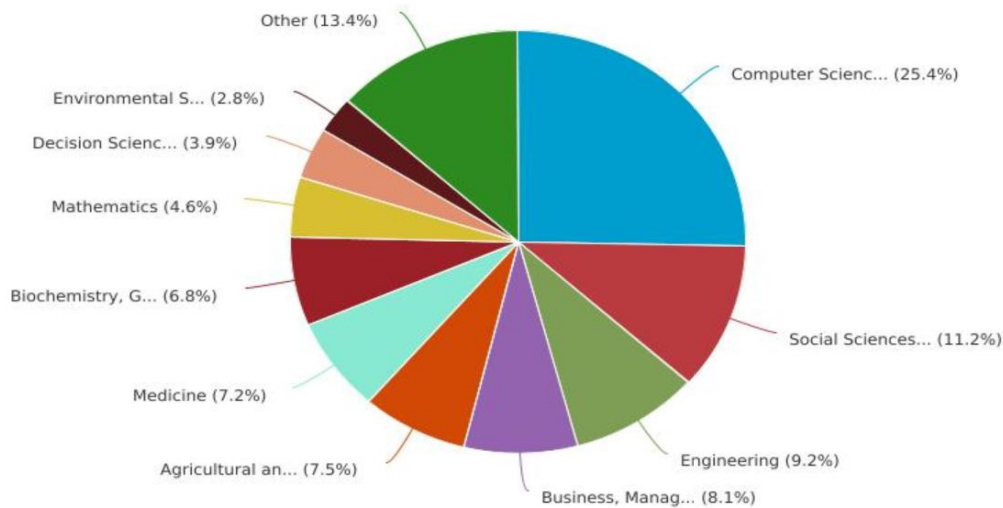
Figure 6. Most Frequency of ITR Publication by Subject Area

Results of data analysis by type from the Information Technology Relatedness Study

Figure 7. The most document types in Information Technology Relatedness publications were Articles (61.6%) with 189 documents, followed by Conference Papers (30.6%) with 94 documents, Conference Review (3.3%) with 10 documents, Review (2.6%) with 8 documents, and Book Chapter (2.0%) with 6 documents.
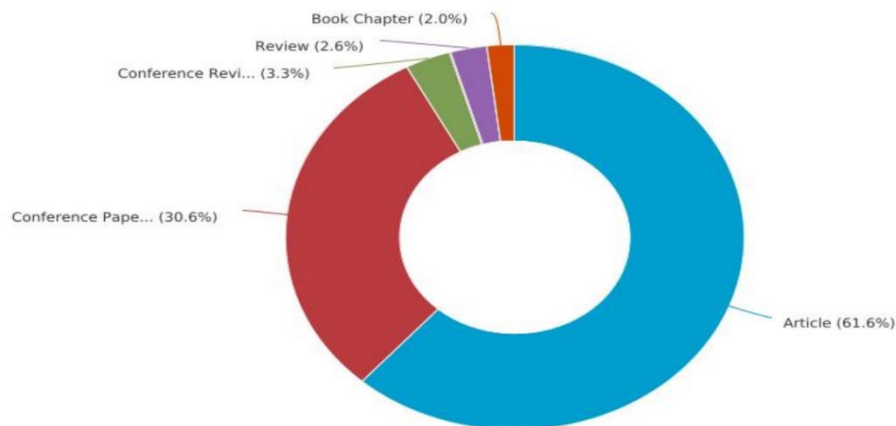

Figure 7. Most Frequent Type Document of ITR Publication

Document data analysis results per year based on sources from the Information Technology Relatedness Study

The Figure 8 Number of documents per year based on sources in international publications in the field of Information Technology Relatedness are Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics with 7 documents, followed by Ceur Workshop Proceedings, Plos One, Scientometrics are the masin-each with 4 documents, ACM International Conference Proceeding Series, Applied Mechanics And Materials and Communications In Computer And Information Science each with 3 documents.
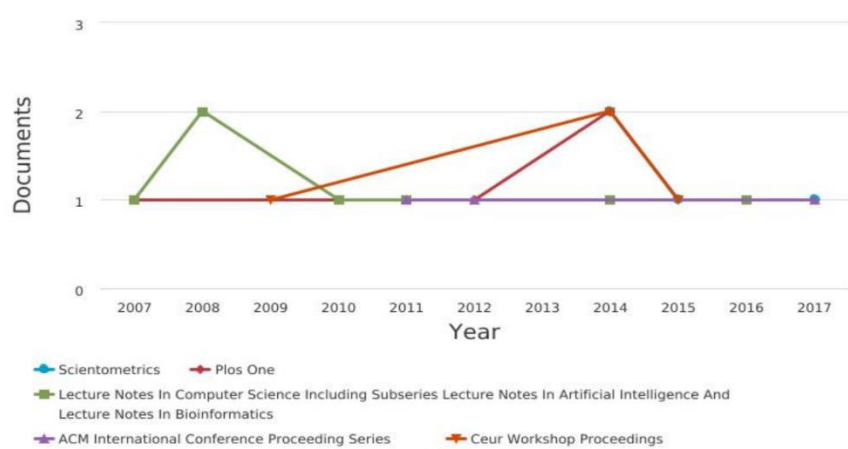

Figure 8. Number of Documents Per Year Based on Sources of the ITR Publication

The results of data analysis of the Annual Document of the Information Technology Relatedness Study

In general, figure 9 explain about the number of academic document publications on Information Technology Relatedness has increased every year. This can be seen in Figure 8, the highest publication peak in 2015 with 31 documents. Research on Information Technology Relatedness has been started since 1981. The number of international publications on Information Technology Relatedness has shown a fluctuating increasing trend every year. It is also possible that in 2020 there will be increased research on Information Technology Relatedness. The number of documents per year in the publication of Information Technology Relatedness is that in 2015 there were 31 documents, decreased in 2016 to 18 with a total of 65 documents, in 2019 it increased to 28 documents, and decreased until November in 2020 as many as 26 documents.
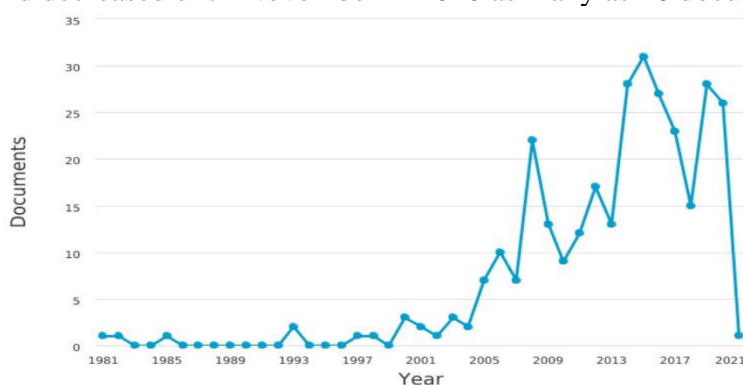

Figure 9. Number of Documents Per Year of the Information Technology Relatedness Publication

The results of data analysis with citation visualization based on the author of the Study of Information Technology Relatedness by using the Vosviewer application.

Figure 10 describes about the most cited international publications in the field of Information Technology Relatedness as a form of academic impact are the work of Corman V.M., with 1182 citations and Tanriverdy H with 579 citations, and Roca J.M with 341 citations. The most cited numbers were in 2020 and in 2005 and 2008.
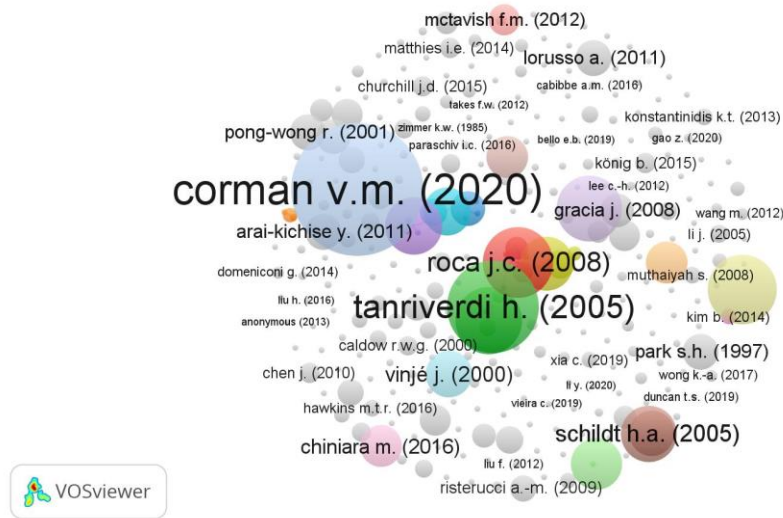
Figure 10. Citation Based On Author

The results of data analysis with citation visualization based on the Sources of Information Technology Relatedness Study

The Figure 11 describes the citation of the most widely used articles based on international journal sources like namely, such as Eurosurveillance, Mis Quarterly Management, Journal of Molecular evalution, Research Policy dan Communication Of The ACM.
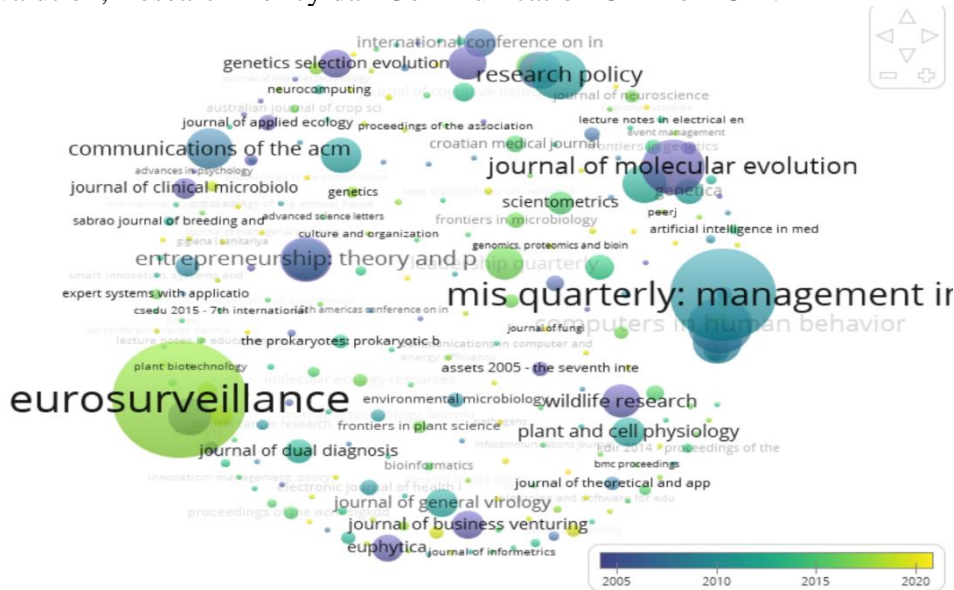

Figure 11. Citation Based on Sources

The results of the analysis of the author's collaboration visualization data each year with the Information Technology Relatedness study

Figure 12 shows a visualization that there are 9 groups of construction patterns in the author's collaboration network in the Information Technology Relatedness study that was compiled with the VOSViewer application. The minimum criteria for the number of documents per author is 1 document and the minimum number of citations from the author is 0 documents.Thus, out of 1000 authors it was found that there were 9 groups of collaboration patterns between researchers in the Information Technology Relatedness study as shown in Figure 11. And there were 3 groups of authors. who have research in 2020.
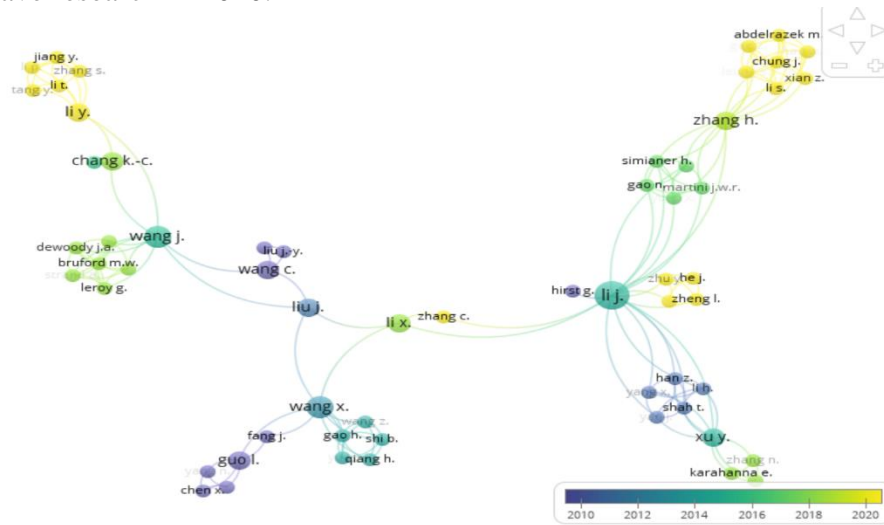
Figure 12. Author Collaboration

The results of data analysis visualization of research development based on the title and abstract with the Information Technology Relatedness Study Theme Map

Whereas Figure 13 shows the visualization of research development with search methods based on titles and abstracts, which are obtained with the most documents related to the titles of genetic diversity and joint ventures, while the least is advanced technology and nature relatedness and this is an opportunity to make it a topic in subsequent research.
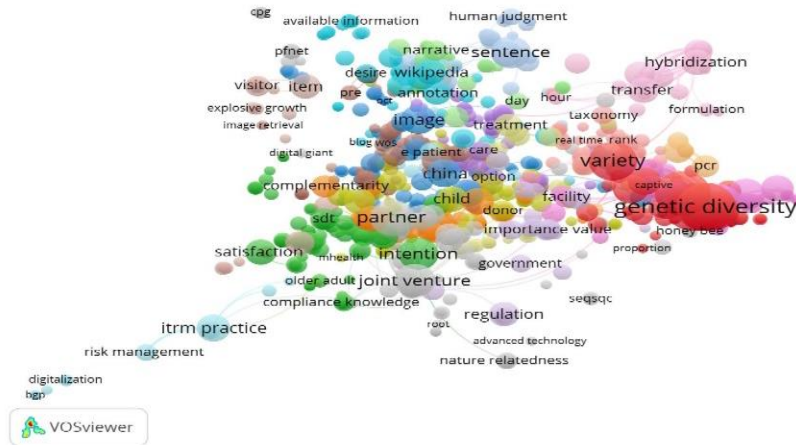

Figure 13. Title and Abstract Visualization

The results of data analysis visualization of the development of titles and abstracts in each year the Theme Map of Information Technology Relatedness Studies

Figure 14 shows a visualization of the development of research from each year with a search method based on titles and abstracts that are obtained with the most recent documents in 2020, including itrm practice, risk management, advanced technology and nature relatedness and this is an opportunity to also be make the topic in the next research.
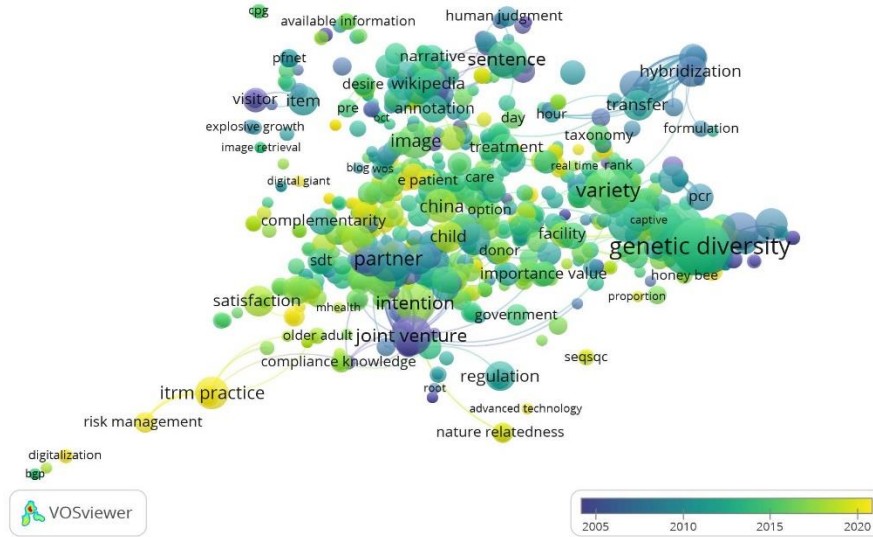
Figure 14. Title and abstract Visualization

The results of data analysis visualization of the development of the number of studies in each year the Theme Map of Information Technology Relatedness Studies

Whereas Figure 15 shows a visualization of the development of the number of research occurrences using a co-occurrence based search method with all keyword analysis units obtained with research documents on Semantic with 48 occurrences, Human with 40 occurrences, information technology with 39 occurrences and semantic relatedness with 25 occurrences . And the least research documents are social networks, business method Patents, Need Satisfaction and Corporate Performance.

Figure 15. Occurance All Keyword Visualization

CONCLUSION

From the results of this study, it shows that there is a map and an increasing trend of the number of international research in the field of "Information Technology Relatedness" based on the results of bibliometric data analysis that has been processed, it can be concluded that the number of studies is 307 academic documents published from 1981 to 2020 on a regular basis. global. The results also show that the institutions and individual researchers at the global level that are most productive in the publication of Information Technology Relateness are the University of Kentucky, KU Leuven, and Parent University, each with 5 and Kim C with 5 articles of documents. Most fields of study are computer sciences with 138 documents. Then the most publications occurred in 2015 as many as 31 documents, and documents per year based on sources of 7 from Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics. The most document types in this field are in the form of articles. The most documents by country from the Information Technology Relateness Study are the United State with 82 and then China with 37 documents. And finally, the number of documents based on the Funding Sponsor of this study is the National Science Foundation, totaling 11 documents.

In terms of contributing implications to knowledge, this study proposes a classification of the convergence axis consisting of Publications in the field of Information Technology Relatedness. to characterize the pool of knowledge generated from the four decades of literature. As implications for practicality, identify key themes in the area of Information Technology Relatedness. leads to understanding the development of studies to understand the general topic and context, as well as research gaps. With all this, new studies can be directed towards overcoming the lack of study and advancing knowledge in the field. The most researched themes also show the contribution of research in the area of Information Technology Relatedness. for innovation, technology and information, management and performance.

RECOMMENDATION

The researcher suggests the next researchers to analyze the benefits, contributions and test the effect of the application of Information Technology Relatedness by measuring the literature with a combination of data obtained from Scopus, Google Scholar, Science Direct & Thompson at Airlangga University, Surabaya.

ACKNOWLEDGMENT

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