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A Bibliometric Analysis of the Internet of Everything in Business in 2012 - 2022

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Abstract

The Internet of Everything (IOE) plays a vital role in the business field in the current era of digitalization. The Internet of Everything (IOE) is a combination of 4 main elements, namely people, processes, data, and objects, that make network connections more valuable. In this article, researchers present an analysis of various studies related to the Internet of Everything (IoE) in Business over the last ten years. Bibliometric analysis was used to analyze 280 articles published from 2012 to 2022. Articles will be analyzed based on the trend of the topic raised, the type of document, the name of the journal, the source of the document, the name of the publisher and even the presentation of the authors' collaboration related to IoE. The data analysis method used is bibliometric analysis. The data is imported from the Scopus database and uses Harzing's Publish or Perish applications. Meanwhile, to get data visualization, this study uses the VoS Viewer application. This study found that most articles related to the topic of IoE in Business are published more in conference proceedings than in journals, books, or book series. The most significant number of citations were articles in 2014. The highest number of publications occurred in 2021. The results of network visualization show that articles related to the Internet of Things (IoT) are the main terms or topics that are widely found related to IoE. Other related terms are Internet, Cloud Computing, Big Data, Network Security, and Social Networking (online). Implications for businesspeople can maximize the use of IoE in their business to the maximum in the current digitalization era in order to increase their business's competitive advantage. This research also shows further researchers that there are still many research opportunities related to IoE, which can be related to IoT, big data, cloud computing, and other update issues.

Keywords: *Bibliometric analysis; IoE; Business; VoS Viewer.*

1. Introduction

Today, technological progress has developed rapidly. There has been a shift from information technology to human technology, and the answer is the Internet of Everything (IoE) [1]. In the current era of digitalization, the role of the Internet in various fields, one of which is the business field, is very helpful. The use of the Internet for all kinds of activities in running a business has been very widely used. Today's consumers are immersed in a vast and complex set of networks [2]. Therefore, research related to the Internet of Everything (IoE) is fascinating to discuss. IoE is a system that generally consists of four main elements, which include people/humans, processes, data, and objects/devices.

Studies related to IoE in business have begun to be found and began to be widely researched throughout the world. The results of this research have also been presented in literature published by various publishers in the form of journals, books, conference proceedings, and others. The Internet of Everything (IoE) paradigm is developing towards enriching people's lives by adding value to the Internet of Things (IoT), with connections between people, processes, data, and objects [3]. Previous research [4], [5] states that the Internet of Everything (IoE) connects people, organizations, and intelligent things and promises fundamental changes in the way people live, work, and interact in various industrial sectors.

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The uniqueness of this study is that it is unlike previous studies. This article presents a 10-year analysis of IoE in business using a bibliometric approach with the help of Publish or Perish and Vos Viewer applications. This article can contribute to the presentation of bibliometric analysis of IoE in business. This article also provides an overview of research over the last ten years related to the year of Publication, number of citations, type of study source, proximity of authors to this topic and others. In addition to contributing to the presentation of data visualization, this study also displays the results of using the VoS Viewer application. The systematics of writing this article will first present an introduction. The second part will explain the Theoretical Background, which explains theories related to IoE and IoE in Business. The third section will describe the research methodology used in this article. The fourth part will explain the results of the research with its discussion. The last section of this article will show the conclusions and opportunities for further research.

2. Theoretical Background

This section will explain the theoretical background related to the Internet of Everything (IoE), IoE components, IoE in business, and the concept of bibliometrics analysis using VoS Viewer.

a. IOE

The Internet of Everything (IoE) is a term first defined by CISCO in 2012 as a network that brings people, processes, data, and things together in more significant and valuable network connections. IoE lays a higher foundation than IoT and deals with connections and innovative network technologies. IoE supports the creation of new capacities, better competencies, and tremendous economic opportunities for businesses and society.

Research [1] reveals the concept of Internet of Everything (IoE) is a concept that is an extension of the Internet of Things (IoT) by encompassing machine-to-machine (M2M), machine-to-human (M2P), and person-to-person assisted technology (P2P) communication with broader digital features. The concept of IoE includes various types of devices, equipment and goods connected to the global Internet. IoE components enable users to create new capabilities, broader experiences, and economic opportunities for individuals and businesses. IoE will connect people in a fast, relevant and valuable way. IoE can connect devices and physical objects through the Internet of Things (IoT). IoE can convey the correct information to people or machines at a fast and precise time. The concept of IoE can process data into information that is more useful for decision-making. And lastly, IoE is a 5G technology that encompasses evolution, elasticity, capacity, speed, and agility.

b. IOE components

Internet of Everything (IOE) is a system consisting of 4 main elements, namely people, processes, data, and objects, to make network connections more relevant and valuable. According to [5], [6], [7], [9], the Internet of Everything (IoE) is a superset of the Internet of Things (IoT), which means the relationship between people, processes, data, and things. A clearer understanding of how IOE will impact the way organizations conduct their business. The following Figure 1, according to [9], describes the elements of the IOE in general terms.

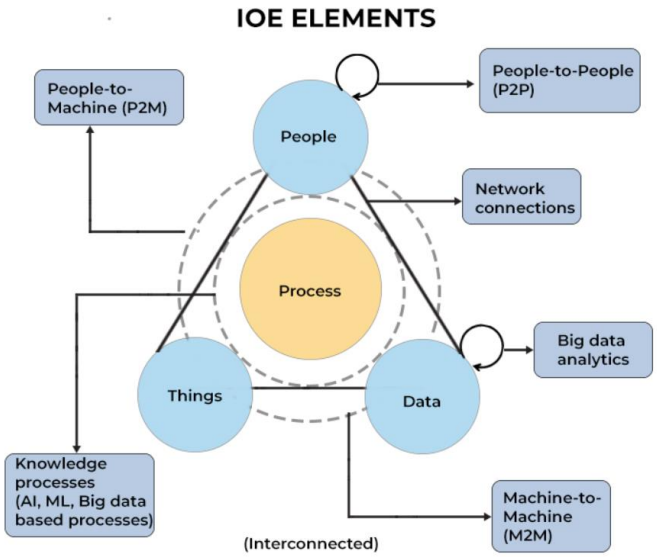


Figure 1. IoE Elements
Source: https://www.spiceworks.com/tech/iot/articles/what-is-internet-of-everthing/

The following is an explanation of the four components of IoE according to [9]. The first component is People. People in the IoE environment are connected to the Internet through various intermediate tools such as smartphones, tablets, computers, fitness trackers and others. People interacting with devices, social networks, websites, and a wide variety of applications will have the impact of generating different types of data that will make up big data. People act as nodes on the network-enabled by IoE that can help solve business problems and make decisions.

The second component is Objects. These components refer to physical goods such as devices, consumer products, gadgets, enterprise machinery, or assets that are implanted with sensors and actuators to communicate across the network. These devices take information from the environment and generate data. Thus, things make things more context-aware, intelligent, and cognitive. The resulting data will be sent to the server for analysis so that it can help make intelligent business decisions.

The third component is Data. IoE-connected devices regularly transmit raw data to each to the server. Data is collected from all devices to be analyzed, classified, and summarized, resulting in processed data. The processed and analyzed data plays a vital role in controlling several IoE systems and for business purposes.

The fourth component is the Process. Many companies use artificial or IoT-based intelligence to analyze data generated by IoE networks. This process ensures that the correct information is appropriately distributed throughout the network. Proper processing can help in faster decision-making and strategy compared to their competitors. Technology-based data processing speeds up the decision-making process for businesses.

c. IOE in Business

IoE has a vital role in the business world. The components of IoE associated with business are examined by [10]. Figure 2 below shows the IoE Component in Marketing Analytics described in the study [10].

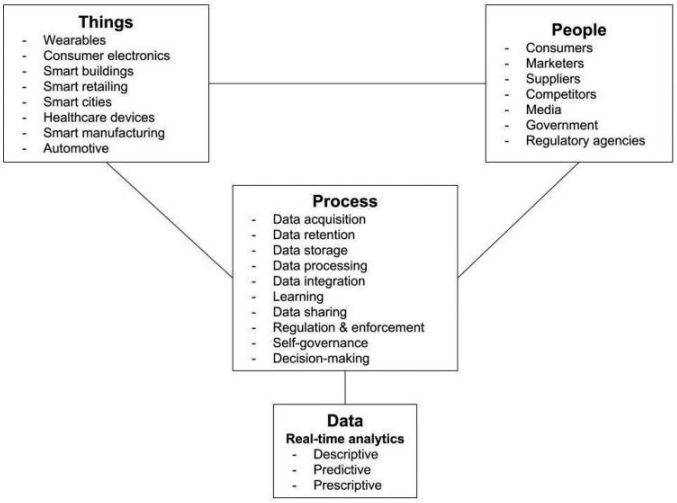


Figure 2. Components of IoE in Marketing Analytics
Source: Petrescu, M., Krishen, A., & Bui, M. (2020)

In [10] explains that IoE will connect consumers in a more relevant and valuable way in all aspects of interaction, e.g. Business-to-business (B2B), business-to-consumer, and consumer-to-consumer interactions. Professional marketers play an essential role in identifying patterns and trends in consumer behaviour and providing products and services more effectively and efficiently because they can benefit from analyzing all consumer data transmitted through IoE. Many parties or people involved in the IoE process in the business world include customers, marketers, suppliers, competitors, media, government, and regulatory agencies.

Further [10] explains the second component is Things. This component is often called IoT. These components include devices and physical objects connected to the Internet and each other that can be used to serve consumers and assist managers in intelligent decision-making. These devices not only interact with consumers but can also be machine-to-machine interactions. Some components related to devices in a business context can be wearables, consumer electronics, intelligent buildings, smart retailing, smart cities, healthcare devices, smart manufacturing, and automotive.

The third component, according to [10], is the process. The process includes all phases in the life of the machine that is integrated into the IoE during its interaction with the machine and others, starting from the initial data acquisition phase to the post-acquisition stage, when data processing takes place. The process in this IoE includes data acquisition, data retention, data storage, data processing, data integration, learning, data sharing, regulation & enforcement, self-governance, and decision-making.

The last component is Data. Data on consumer behaviour when using products and services will be collected by smart devices and sensors related to IoE components. In the business world, most of the data is used for marketing analysis to obtain intelligence information and forecast consumer behaviour and market trends [11]. This data component will be analyzed in real-time so that it provides data descriptively, predictively, and prescriptively.

Despite the importance of the role of IoE in the business world, it turns out that the realization of the application of IoE still has to be faced by actors, especially in facing challenges related to limited network coverage and limited network technology resources [12]. However, global development challenges require IoE progress so that long-standing problems such as business management, healthcare, matters related to supplies, cross-borders, technology diffusion, and others can be overcome in a fast and easy way [13].

d. Bibliometrics analysis using VoS Viewer

Bibliometric analysis is one alternative analysis that can be used in research that uses research data that has been published online, data related to the number of publications and publications of scientific papers and various data related to citations. This analysis can be used to map various research results and can provide information about international-level developments in science and technology. By doing this bibliographic analysis, you can find trends related to topics that are popular today. Bibliometric analysis is currently a widely used method of analysis in various fields of science. Bibliometric analysis related to tourism as in research [14], [15], [16]. It is related to the field of computer science [17], [18], [19], and economics and business [20], [21].

Data from the Scopus database greatly assists researchers in obtaining data used in bibliographic analysis. One of the largest providers of scientific papers such as scientific paper publications, conference proceedings, series, books and others with global or international coverage. Through a relatively strict selection of content and quality, Scopus encodes various articles from various fields of science. Researchers can easily find information related to the publication of quality scientific papers. Scopus also informs various profiles of authors and institutions. Scopus also provides complete information related to the quality level of a journal. Researchers can obtain complete data related to all research indexed there, including presentations related to researchers, country of origin, citations, abstractions, affiliations, and other information needed in bibliographic analysis. Scopus can also be a sorting tool for finding scientific paper publications according to the group of their fields of science.

The VoS Viewer application is a computer program that can be used in bibliometric analysis. This application focuses on presenting graphs, maps and bibliometric visualizations. Network visualization related to journals that the VoS Viewer application can display is related to the name of the researcher, publications, citations, journals and even relationships between authors who are on the same topic. Data sets that Viewer can read can come from Google Scholar, Scopus, Web of Science and others. As the review in [22] explains, VoS Viewer can display maps in several different views it can: the label view, the density view, the cluster density view, and the scatter view.

3. Method

The analysis method used in this article is bibliometric analysis. The stages of data analysis start from determining keywords according to the research topic, searching for initial data, improving search results, compiling statistical data to be used, and finally, data analysis.

The first stage is to determine keywords according to the research topic. In November 2022, the search began using the keyword Internet of Everything (IoE) in Business with searches based on the title. Data search using the Scopus database for a period of 10 years, namely 2012 – 2022. The advantage of using a Scopus database is that it has a variety of options and analyses so that the results of the bibliometric analysis obtained can be more complete and provide information for readers. The second stage is the initial data search results**.** In the initial data search, 371 articles were found. This initial document will be used as a comparison with the document after the correction. The third stage is the improvement of search results. Of the 371 documents, after being filtered or corrected to obtain relevant results, 280 documents were obtained, which will be further analyzed using Vos Viewer. The fourth stage is to compile the statistical data to be used.

Data that has been corrected will be checked for completeness related to article components such as publication year, volume, number, page and others. The final stage is data analysis. This stage begins by accessing the Scopus database on November 19, 2022, at 10:00 AM. Initial data and data after repair are stored in RIS form, which is then used or entered into Publish or Perish. Improvement data is stored in CSV form for analysis of its Publication and citation. After analysis of the Publication and citation, the corrected

RIS data will be processed to display visualizations with Vos Viewer software. A more in-depth analysis of all the data processing outputs will be carried out. The following Figure 3 will describe the flow of analysis of this article.

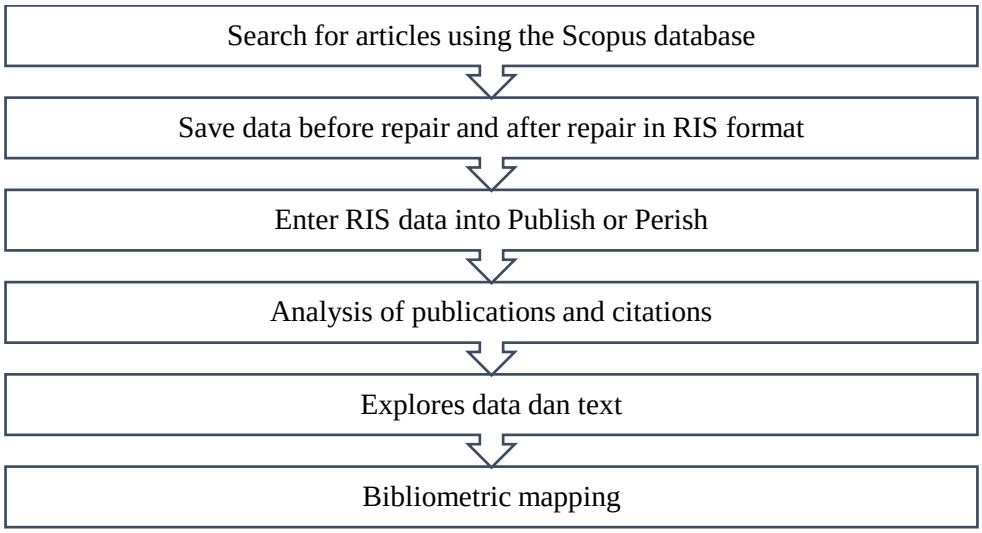


Figure 3. Flow chart of the proposed method

4. Results and Discussion

This section explains the results obtained from this work, which includes publications and citations, visualizations of topics using VoS Viewer, author and relationship between writer, and research locations and research domains.

4.1. Publications and citations

The researcher makes the table For knowing comparison of the citation matrix on the data taken via Scopus, which contains the number of articles, number of citations per year, number of authors per year, H index, G index, average hI, and hI yearly at the beginning search and on results repair. A comparison data matrix in result search start and result search after repair can be seen in Table 1.

Table 1. Comparison Matrix

Data	Initial Search Results	Search Results Repair
Database	Scopus	Scopus
Year publishing	(2012-2022)	(2012-2022)
Year citation	10	10
Number of Articles	317	280
Number citation	2232	1805
Number Citation per Year	223.20	180.50
Number of Authors per Year	2.87	2.79
H Index	20	18
G index	40	36
hI Normal	14	13
hI Annual	1.40	1.30

Table 1 above shows the results of searching data using PoP before repair, which found as many as 317 articles. After careful repair, 280 articles were obtained in accordance with the topic of analysis of the Internet of Everything in business in 2012 – 2022. In the beginning, it was found that for ten years (2012-2022), the number of citations was 2232, and the number of citations per year was 223.20. With the number of authors per year as much as 2.87, an H index of 20, a G index of 40, an hI Normal of 14, and an hI annual of 1.40. But the results after being repaired we get the number of

citations as much as 1805, the number of citations per year as much as 1805, with a number of authors per year of 2.79, H index 18, G index 36, hI Normal 13 and hI annual 1.30.

Table 2. The Statistics Descriptive of Publication

Year	TP	% (N=280)	NCP	TC	C/P	C/CP
2012	10	0,04	5	36	3,60	7,20
2013	6	0,02	4	18	3,00	4,50
2014	10	0,04	8	416	41,60	52,00
2015	19	0,07	94	94	4,95	1,00
2016	25	0,09	22	189	7,56	8,59
2017	25	0,09	16	197	7,88	12,31
2018	36	0,13	28	271	7,53	9,68
2019	29	0,10	23	292	10,07	12,70
2020	36	0,13	24	132	3,67	5,50
2021	51	0,18	29	118	2,31	4,07
2022	33	0,12	6	42	1,27	7,00
	280					

Note : TP= total number of publications ; NCP= number cited publications ; TC=total quotes ; C/P=average citations per Publication; C/CP= average citation per cited Publication

Table 2 above shows a descriptive statistical overview of publications related to the topic Analysis of Internet of Everything in Business in 2012 – 2022. From Table 2, it can be seen that in 2021, the most publications were published, with 51 publications, and the year that was published the least was 2013, with six publications. The highest number of publications with the most extensive total citations was 416 articles in 2014. At the same time, the least number of publications cited was in 2013, with a total of 18.
Figure 4 below shows the performance of the Publication.

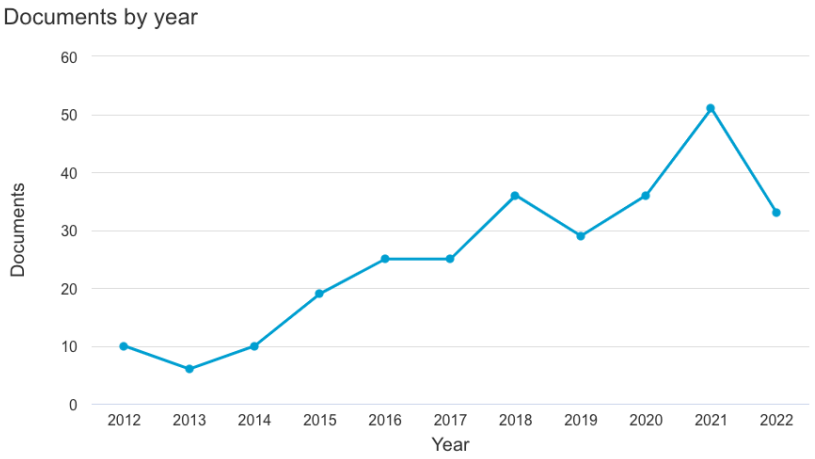
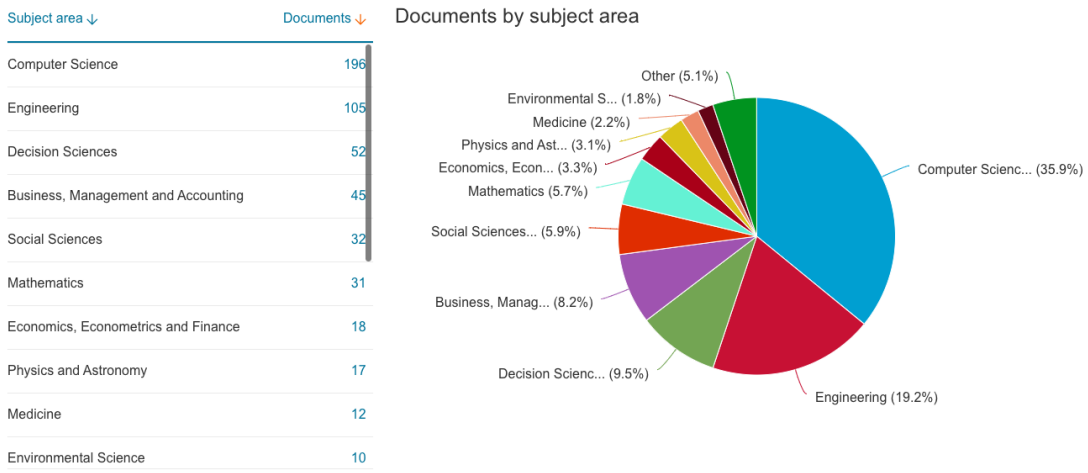


Figure 4. Publications from 2012-2022

Figure 4 above shows a bar chart of the number of publications over ten years from 2012-2022. The graphic image shows fluctuating data. The number of documents each year changes up and down. Although publication data fluctuates, the data for ten years shows an upward trend. The lowest number of publications occurred in 2013, at 6. Meanwhile, the number of publications in the peak or highest position occurred in 2021, which was 51. An overview of documents based on the subject area can be seen more clearly in Figure 5 below.



Subject area	Documents
Computer Science	196
Engineering	105
Decision Sciences	52
Business, Management and Accounting	45
Social Sciences	32
Mathematics	31
Economics, Econometrics and Finance	18
Physics and Astronomy	17
Medicine	12
Environmental Science	10

Figure 5. Documents By Subject Area Form 2012-2022

Figure 5 above describes documents related to the topic of Analysis of the Internet of Everything in Business in 2012 – 2022 according to their respective subject areas or fields of study. The field of computer science is the field of study that plays the most role in writing articles related to this topic, with the most significant percentage of 35.9%. Then in second place followed by subjects related to Engineering by 19.2%. The third place is related to Decision Sciences at 9.5%. The fourth place is the field of Business, Management and Accounting at 8.2%. Fifth place is the field of Social Sciences at 5.9%. In addition, other fields related to the topic of Internet of Everything in Business are Mathematics, Economics, Econometrics and Finance, Physics and Astronomy, Medicine, and Environmental Science. Table 3 below will present data related to document types.

Table 3. Type Document

Type	Number	Percentage
Conference Paper	130	46,4%
Article	74	26,4%
Book Chapter	45	16,1%
Book	20	7,1%
Review	6	2,1%
Conference Review	4	1,4%
Short survey	1	0.4%
Total	280	100%

Table 3 presents the types of documents related to writing various matters related to the Analysis of the Internet of Everything (IoE) in Business in 2012 – 2022. Documents can be included in the Conference Papers, Articles, Book Chapters, Book Reviews, Conference Reviews, and Short Survey groups. In the table, it can be seen that Conference Paper is a type of document that dominates 130 or around 46.4%, followed by article document types with a total number of 74, which is equivalent to 26.4%. Book Chapter occupies the third position with 45 documents, equivalent to 16.1%. They were followed by the type of document book, Review, Conference Review, and the last position occupied by Short Survey. Table 4 below will present all documents classified into publication source types.

Table 4: Type Source

Type	Number	Percentage
Conference Proceeding	104	37%
Journal	79	28%
Book	49	18%

Type	Number	Percentage
Book Series	45	16%
Trade Journal	3	1%
Total	280	100%

Table 4 presents all documents classified into five types of publication sources: Conference Proceedings, Journals, Books, Book Series, and Trade Journals. Conference Proceedings is a document that has the most significant contribution as a source of articles related to the Analysis of Internet of Everything in Business in 2012 - 2022 with a total of 104 or 37%. In second place is the source of the journal, which is as much as 79 or 28%. They were then followed by sources from books with a total of 49 articles, which is equivalent to 18%. The fourth position is occupied by sources from book series as much as 45, which is equivalent to 16%. The last source is from the Trade Journal, with as many as three articles, which is equivalent to 1%. Furthermore, this study will also present citations of articles that are included in the top 20 list, which will be presented in Table 5.

Table 5. Top 20 Cited Articles of Internet of Everything in Business

No	Cites	Authors	Title	Year	Journal Name	Publisher
1	201	J. Holler, V. Tsiatsis, C. Mulligan, S. Avesand, S. Karnouskos, D. Boyle	From Machine-To-Machine to the Internet of Things	2014	From Machine-To-Machine to the Internet of Things	Elsevier Ltd
2	191	A.R. Biswas, R. Giaffreda	IoT and cloud convergence: Opportunities and challenges	2014	IEEE World Forum on Internet of Things	IEEE Computer Society
3	128	B. Omoniwa, R. Hussain, M.A. Javed, S.H. Bouk, S.A. Malik	Fog/edge computing-based IoT (FECIoT): Architecture, applications, and research issues	2019	IEEE Internet of Things Journal	Institute of Electrical and Electronics Engineers Inc.
4	82	A. Costanzo, D. Masotti	Energizing 5G: near- and far-field wireless energy and data train transfer as an enabling technology for the 5G IoT	2017	IEEE Microwave Magazine	Institute of Electrical and Electronics Engineers Inc.
5	60	M. Liyanage, I. Ahmad, A.B. Abro, A. Gurtov, M. Ylianttila	A comprehensive guide to 5G security	2018	A Comprehensive Guide to 5G Security	Wiley
6	53	H. Gao, Y. Duan, L. Shao, X. Sun	Transformation-based processing of typed resources for multimedia sources in the IoT environment	2021	Wireless Networks	Springer
7	50	Q. Zhang, Q. Zhang, W. Shi, H. Zhong	Firework: Data Processing and Sharing for Hybrid Cloud-Edge Analytics	2018	IEEE Transactions on Parallel and Distributed Systems	IEEE Computer Society

8	43	V.V. Martynov, D.N. Shavaleeva, A.A. Zaitseva	Information Technology as the Basis for Transformation into a Digital Society and Industry 5.0	2019	2019 International Conference" Quality Management, Transport and Information Security, Information Technologies"	Institute of Electrical and Electronics Engineers Inc.
9	39	, M	Innovative university, a new concept in the Internet of Things	2015	2015 14th RoEduNet international conference-networking in education and research	Institute of Electrical and Electronics Engineers Inc.
10	34	K. Zhou, T. Liu, L. Liang	From cyber-physical systems to Industry 4.0: Make future manufacturing become possible	2016	International Journal of Manufacturing Research	Inderscience Publishers
11	31	A. Dolgui, D. Ivanov	5G in digital supply chain and operations management: fostering flexibility, end-to-end connectivity and real-time visibility through internet-of-everything	2022	International Journal of Production Research	Taylor and Francis Ltd.
12	28	M.A. Khan, S.S. Zubair, M. Malik	An assessment of e-service quality, e-satisfaction and e-loyalty: Case of online shopping in Pakistan	2019	South Asian Journal of Business Studies	Emerald Group Holdings Ltd.
13	27	P. Farahani, C. Meier, J. Wilke	Digital supply chain management agenda for the automotive supplier industry	2016	Shaping the Digital Enterprise: Trends and Use Cases in Digital Innovation and Transformation	Springer International Publishing
14	20	X. Xu, S. Huang, L. Feagan, Y. Chen, Y. Qiu, Y. Wang	EAaaS: Edge Analytics as a Service	2017	2017 IEEE International Conference on Web Services (ICWS)	Institute of Electrical and Electronics Engineers Inc.
15	19	T. Baker, E. Ugljanin, N. Faci, M. Sellami, Z. Maamar, E. Kayan	Everything as a resource: Foundations and illustration through Internet-of-things	2018	Computers in Industry	Elsevier B.V.
16	19	J.S. Hiller, J.M. Blanke	Smart cities, big data, and the resilience of privacy	2017	Hastings Law Journal	Hastings College of Law
17	18	N. Streitz	Reconciling humans and technology: The role of ambient intelligence	2017	European Conference on Ambient Intelligence	Springer Verlag

18	18	I.W. Holloway, J.A. Cederbaum, A. Ajayi, S. Shoptaw	Where are the young men in HIV prevention efforts? Comments on HIV prevention programs and research from young men who have sex with men in Los Angeles County	2012	Journal of Primary Prevention	Springer Verlag
19	17	M.W. Rasooli, B. Bhushan, N. Kumar	Applicability of wireless sensor networks & IoT in saffron & wheat crops: A smart agriculture perspective	2020	International Journal of Scientific and Technology Research	International Journal of Scientific and Technology Research
20	17	M.R. Palattella, N. Accettura	Enabling Internet of Everything Everywhere: LPWAN with Satellite Backhaul	2019	2018 Global Information Infrastructure and Networking Symposium	Institute of Electrical and Electronics Engineers Inc.

Table 5 above describes a list of the top 20 articles cited in the Internet of Everything in Business-related fields in 2012 – 2022. Articles written by J. Holler, V. Tsiatsis, C. Mulligan, S. Avesand, S. Karnouskos, and D. Boyle, who wrote about From Machine-To-Machine to the Internet of Things in the journal From Machine-To-Machine to the Internet of Things published by Elsevier Ltd in 2014 have attracted the highest attention from other authors with 201 citations. In the second position of the article written by A.R. Biswas, R. Giaffreda entitled IoT and Cloud Convergence: Opportunities and Challenges in the journal IEEE World Forum on Internet of Things published by the IEEE Computer Society in 2014, which 191 other authors cited. The third position is occupied by authors B. Omoniwa, R. Hussain, M.A. Javed, S.H. Bouk, and S.A. Malik with the study Fog/edge Computing-based IoT (FECIoT): Architecture, Applications, and Research Issues published in the IEEE Internet of Things Journal published by the Institute of Electrical and Electronics Engineers Inc in 2019 which is of interest to other researchers with a total of 128 citations. The article written by M.R. Palattella, and N. Accettura who wrote a study on Enabling Internet of Everything Everywhere: LPWAN with Satellite Backhaul published by the Institute of Electrical and Electronics Engineers Inc. took last place with a total number of citations as many as 17. The following Table 6 presents the five largest publishers publishing related articles on this research topic.

Table 6. Top Five Publishers in the Related Field

No	Publisher	Number of Articles	Percentage
1.	Institute of Electrical and Electronics Engineers Inc.	69	43%
2.	Springer	60	37%
3.	Elsevier	18	11%
4.	Association for Computing Machinery	8	5%
5.	Taylor and Francis	7	4%
		162	100%

Table 6 above describes the top 5 publishers who published articles related to the theme of Internet of Everything in Business in 2012 – 2022. There are 162 articles in total. The research found that as many as 43% were published by the publisher Institute of Electrical and Electronics Engineers Inc., followed by publisher Springer, who took second place with 60 articles, equivalent to 37%. Furthermore, the third position is occupied by the publisher Elsevier, who has 18 articles. The publisher Association for Computing Machinery occupies the fourth position with eight articles, which is equivalent

to 5%. Then, the last position of 7 articles, equivalent to 10%, is occupied by Taylor and Francis publishers. Furthermore, to find out the results of the top five journals related to the Internet of Everything in Business in 2012 – 2022 can be seen in Table 7 below.

Table 7. Top Five Journals Ranking Within the Internet of Everything In Business

No	Journal Name	Number of Articles	Percentage
1.	IEEE Internet of Things Journal	3	25%
2.	Journal of Advanced Research in Dynamical and Control Systems	2	17%
3.	Lecture Notes in Networks and Systems	2	17%
4.	Wireless Networks	2	17%
5.	International Journal of Engineering and Technology(UAE)	3	25%
		12	100%

Based on Table 7 above, the names of journals in the top 5 positions related to the topic of the Internet of Everything in Business are presented with a total of 12 articles in the IEEE Internet of Things Journal and International Journal of Engineering and Technology (UAE) published journals related to the Internet of Everything in Business each three articles or equivalent to 25%. Followed by the journal Journal of Advanced Research in Dynamical and Control Systems, Lecture Notes in Networks and Systems, and Wireless Networks with two articles each or equivalent to 17%.

4.2. Visualization Topics Use VoS Viewer

Figure 6 below shows a visualization of the topic of the Internet of Everything in Business in 2012 – 2022 using network visualization from VoS Viewer.

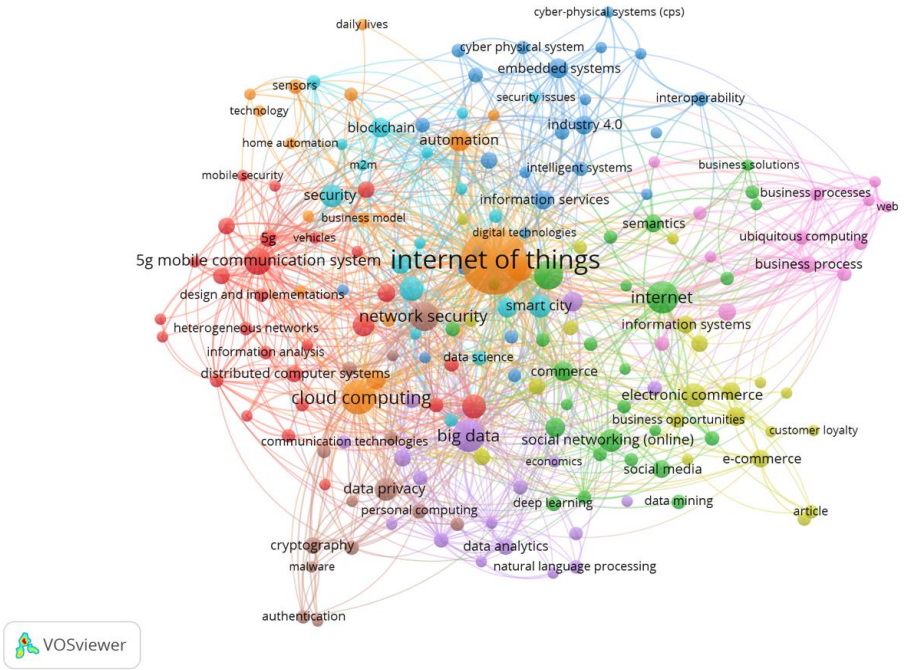


Figure 6. Visualization Topic Area Using Network Visualization

In network visualization, topics are represented with labels and also with circles. Many at least related topics determine the size of the circle. The more related topics, the larger the circle drawn. The colour of the circle is also determined by the cluster to which the

topic belongs. The lines between the circles represent links. The distance between the two journals in the visualization more or less shows the relationship between the journals in relation to citations. In general, the closer the two journals/research topics are, the stronger the relationship. From Figure 7 above, it can be seen that topics related to the Analysis of the Internet of Everything in Business in 2012 - 2022 were collected and processed using VosViewer. The results of network visualization show that articles related to the Internet of Things are the main terms or topics that are widely found. In addition, terms that often appear are related to the Internet, Cloud Computing, Big Data, Network Security, and Social Networking (online).
Table 8 as follow describes the item number in clusters obtained from VoS Viewer.

Table 8. Item Number In Clusters

Cluster	Colour	Number of Items
1	Red	27
2	Green	27
3	Blue	25
4	Yellow	21
5	Purple	18
6	Light Blue	18
7	Orange	16
8	Brown	14
9	Pink	13

Table 8 shows a summary of colours in the visualization that shows the cluster the item or topic is in. The results of data processing show that there are 9 clusters. Items with cluster 1 have connecting lines and red dots with a total number of items of 27. In cluster 2, there is a green colour with 27 items. Cluster 3 is represented in blue with a total of 25 items, then the position of cluster 4 in yellow with a total of 21 items. In the purple cluster, there are 18 items, and in the light Blue cluster, with 18 items. In the orange colour cluster, there are 16 items. On brown with the number of items as much as 14. In the pink colour cluster, the number of items is as many as 13. Figure 7, as follows, describes the visualization topic area using overlay visualization from VoS Viewer.

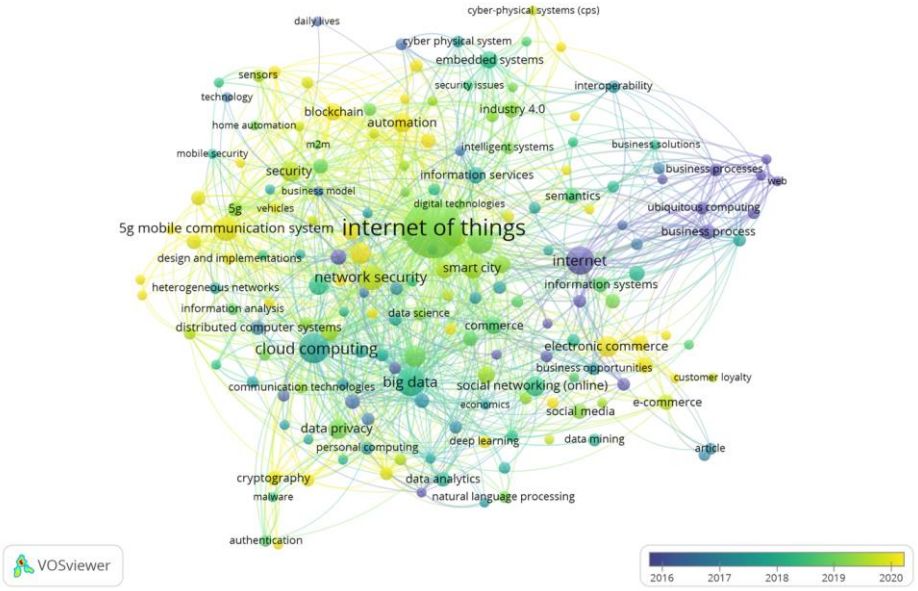


Figure 7. Visualization Topic Area Using Overlay Visualization

Figure 7. Shows a visualization of the topic area using overlay visualization. From Figure 7 above, it can be seen that the topic Analysis of Internet of Everything in Business in 2012 - 2022 shows a trend that is widely researched. This overlay visualization image shows more keywords up-to-date with the year of research as the primary year of research, so it can also be seen that the keywords Internet, Cloud Computing, Big Data, Network Security, and Social Networking (online) are the main themes and are widely made for the 2012-2022 study year. Figure 8, as follows, describes the visualization topic area using density visualization from Vos Viewer.

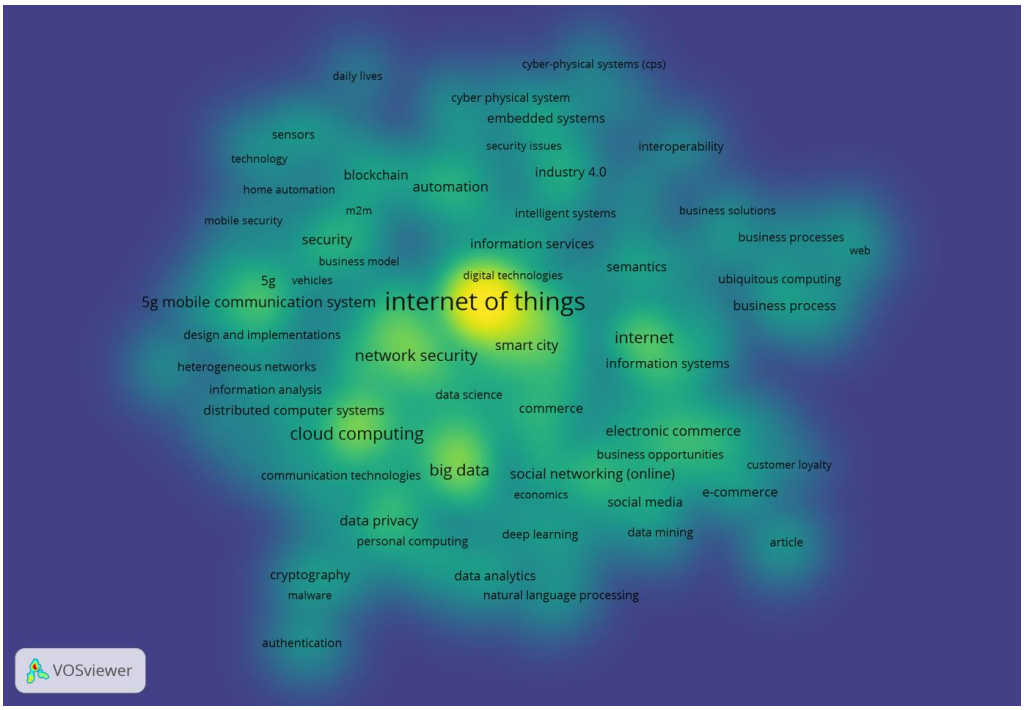


Figure 8. Visualization Topic Area Using Density Visualization

In the visualization topic area using density visualization in Figure 8 above, the items represented by their labels show in the same way as in the network visualization and overlay visualization. Each point on the item density visualization has a colour that indicates the density of the item at that point. By default, colours range from blue to green to yellow. The greater the number of topic items around a point, the closer the colour of the dot becomes yellow. Conversely, the smaller the number of topic items around a point and the lower the weight of surrounding items, the closer the colour of the point becomes blue. When viewed in Figure 8 above, it can be seen that the lighter the colour of the area around the keyword or topic, the more journals/articles that publish research on the journal/article and vice versa. So it can be concluded that topics/keywords regarding the Internet of Things, Internet, Cloud Computing, Big Data, Network Security, Social Networking (online), and Digital Technologies are more researched and published.

4.3. Author and Relationship Between Writer

Figure 9 below depicts an overlay visualization of the author and co-author using VoS Viewer.

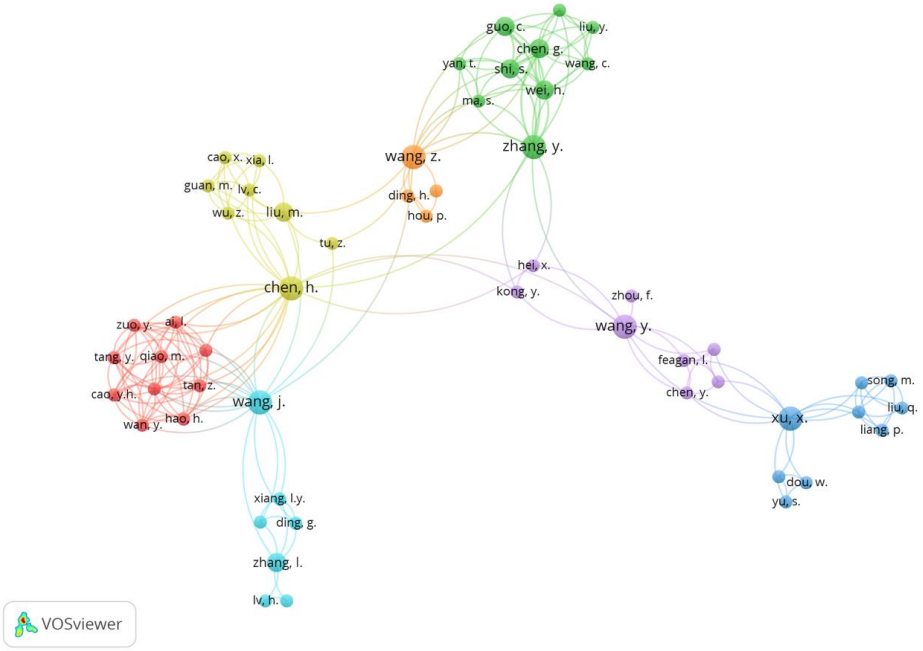


Figure 9. Visualization Of The Author And Co-Author Overlay

Figure 9 above presents a visualization map of the network of relationships from one author to another. The distance between two journals in an adjacent group that has been visualized in the figure shows the relationship of journals in terms of shared citation links. Thus, the closer the two journals are located in one place, the stronger their linkage. In accordance with the topic related to the Analysis of the Internet of Everything in Business in the period 2012 – 2022, it is illustrated that there are seven groups of writers. The following is an example of interpretation from Figure 9. The first group of authors related to each other is Zuo, Y., Ai, I., Tang, Y., Qiao, M., Cao, Y.H., Tan, Z., Wan, Y., Hao, H. The second group of authors, e.g. Guo, C., Liu, Y., Chen, G., Yan, T., Shi, S., Wang, C., Ma, S., Wei, H., Zhang, Y.

4.4. Research Locations and Research Domains

Figure 10 below depicts the author's country of origin. Figure 10 shows that India has the most publications related to the Analysis of Internet of Everything in Business for the period 2012 – 2022, followed by the United States and China.

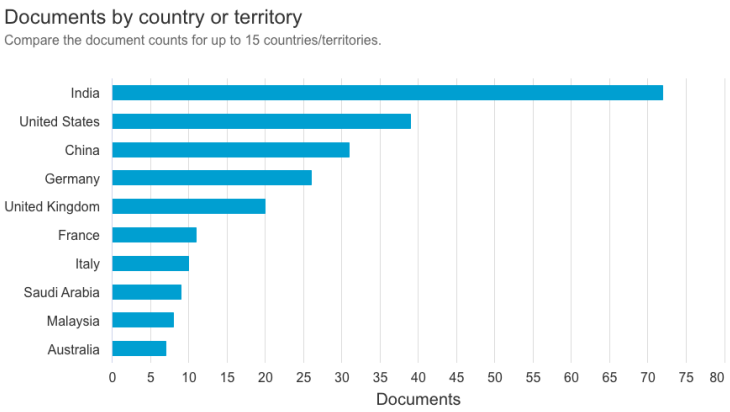


Figure 10. Country of origin

Figure 11 below depicts the map of the author's country of origin.

Figure 11. Map of country of origin (Please use https://mapchart.net/)

Figure 11 above also shows the top 10 rankings of countries that produced a lot of research related to the Analysis of Internet of Everything in Business in 2012 – 2022 in map form. The top 10 rankings that produce research related to the Analysis of the Internet of Everything in business in 2012 – 2022 are India, United States, China, Germany, United Kingdom, France, Italy, Saudi Arabia, Malaysia, and Australia. Table 9 below presents the country of research location and their respective research domain.

Table 9. Top 10 countries of Location Research and Research Domain

No	Country	Number of Articles	Research domain
1	India	72	Internet of Things, cloud computing, machine learning, big data, artificial intelligence, electronic commerce, security and privacy
2	United States	39	Machine learning, data privacy, big data, data mining, network security, IoT, social networking, sentiment analysis
3	China	31	Internet of things, 5G mobile communication system, digital storage, Internet of everything, big data
4	Germany	26	Internet of Things, information science, Internet of Everything, internet protocols, machine learning
5	United Kingdom	20	Electronic commerce, website, cloud computing, IoT, network security, security and privacy
6	France	11	Internet of things, business processes, cloud, web, block-chain, business models
7	Italy	10	5G mobile communication systems, data mining, digital transformation, IoT
8	Saudi Arabia	9	Internet of things, 5G, 5G mobile communication systems, Internet of everything
9	Malaysia	8	Smart devices, privacy, security, network security, cloud computing, IoT, citation analysis
10	Australia	7	Commerce, analytic networks, behavioral research, big data, business information systems

Based on Table 9 above, the location of research related to the topic of Analysis of Internet of Everything in Business is mainly carried out by India with 72 publication articles with research domains such as Internet of Things, cloud computing, machine

learning, big data, artificial intelligence, electronic commerce, security and privacy. Ranked second in the United States region with 39 publication articles with research domains such as machine learning, data privacy, big data, data mining, network security, IoT, social networking, and sentiment analysis. Ranked third is the Chinese region with 31 publication articles with research domains such as the Internet of Things, 5G mobile communication systems, digital storage, Internet of everything, and big data.

5. Conclusion

The development of today's business world is increasingly utilizing the Internet of Everything (IoE). The concept of Internet of Everything (IoE) is an expanding concept of the Internet of Things (IoT). Internet of Everything (IOE) is a system consisting of 4 main elements, namely people, processes, data, and objects, that make network connections more relevant and have value for the business world. This research has presented an analysis of various studies related to the Internet of Everything (IoE) in Business in the last ten years. This study concluded that most articles related to the topic of IoE in Business are published more in conference proceedings than in journals, books, or book series. The most significant number of citations were articles in 2014. The highest number of publications occurred in 2021. The results of network visualization show that articles related to the Internet of Things (IoT) are the main terms or topics that are widely found related to IoE. Other related terms are Internet, Cloud Computing, Big Data, Network Security, and Social Networking (online). This research has implications for business people so that they can maximize the use of the Internet, especially IoE, in their business optimally in the current digitalization era in order to increase their business competitive advantage and develop their business better than their competitors. There is an opportunity for further research that can conduct bibliometric analysis using other topics such as those related to Artificial Intelligence, IoT, Big Cata, Cloud Computing and other update issues. In addition, the data sources used may be not only sourced from the Scopus database so that the results are even more comprehensive.

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