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Research Trend of Journal of Information Science: A Bibliometric Analysis through Web of Science Database

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Research Trend of Journal of Information Science: A Bibliometric Analysis through Web of Science Database

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Abstract

The main objective of this bibliometric study is to examine the publications globally from the Journal of Information Science in the specific period of forty two years (1979-2020). It provides insights into research-based activities. The data was extracted from the Science Citation Index database, Web of Science. This analysis provides information about the document types, yearly published documents within 42 years, top productive authors, top productive institutions and countries, frequently used keywords, and greatly cited articles. These aspects also meet the objectives of the study and provide the major findings such as the majority of the publications are "articles" belong to the Department of Information Science from the UK. That is also a top productive country. The author "Oppenheim C." is on the first position with highest total publications (TP). The highly used keyword is "Information" and the article "Usage patterns of collaborative tagging systems" has the highest ranking in the citation. This bibliometric research will update the researchers about the writing trends, institutions, and the countries involved in research activities.

Keywords: Research Trends, Journal of Information Science, Bibliometric Analysis, Web of Science

Introduction

Bibliometric has been considered a strategy to quantify writings and data (Naseer, Shoaib, Ali, & Ahmad, 2021; Naseer, Shoaib, Ali, & Bilal, 2021; Shaukat, Ali, & Naveed, 2021; Shoaib, Ahmad, Ali, & Abdullah, 2021; Shoaib, Ali, & Naseer, 2021). These types of studies have been functional mostly in scientific productivity to show the trend of data (Ali, Shoaib, &

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Abdullah, 2021; Naveed, Aslam, Ali, & Siddique, 2021; Shoaib, Ahmad, et al., 2021; Shoaib, Ali, Anwar, et al., 2021). Bibliometrics has been used as a tool in systematic production for measure especially in the state of science (Keiser & Utzinger, 2005; Tang & Thelwall, 2003; Xie et al., 2008; Zitt & Bassecoulard, 1994). Scientometrics is currently utilized for the utilization of quantitative strategies and now bibliometric covers with an impressive extent (Hussain et al., 2011). Bibliometrics use, to sum up, research information in a specific statistical way (Naveed et al., 2021). A bibliometric method is usually used to calculate the productivity of any subject (Chhatwal, 2018).

Journals are the best way of communication in research and academic life (Ali & Naveed, 2020; Ali, Shoaib, & Asad, 2021; Aslam, Ali, Naveed, & Mairaj, 2021; Shoaib, Abdullah, & Ali, 2021). They have assumed an inexorably significant part in providing scientific data (Liebowitz & Palmer, 1984). Scientific publications have been considered a good way of delivering knowledge (Ali, Shoaib, & Asad, 2021). The literature plays an important role to record and communicate inventive thoughts in a particular field of information that gets headway of information and further innovation of a subject as well (Das, 2013).

In this regard, bibliometric research is a practical approach to measure the exact statistics of scientific publications. The bibliometric study is one of the significant examination areas and having practical applications in estimating the inclusion and nature of books, articles, and journals (Jena et al., 2012). Straight bibliometric techniques mostly analyze the publications, trends of researchers, productive countries, productive institutions, and frequently cited documents (Braun et al., 1995; Colman et al., 1995; Ho, 2008; Ugolini et al., 1997). It helps to monitor the literature growth and the researchers as well (Diamond & Bulfin, 2021; Onyancha, 2020; Thanuskodi, 2010).

About the Journal

The Journal of Information Science (JIS) is committed to the topics of knowledge management and information sciences. It is serving on an international level and is considered a peer-review journal. All material welcome by the editor relates to information science, its applications, theory, and practice, etc. Theoretical and applied types of articles are also welcomed in this journal. It is ranked in google scholar 5/20 in the category of Library and Information Science. The frequency of The Journal of Information Science is bimonthly and it

has been continuously providing services since 1979. The language of the journal is English and the publisher is SAGE, working on the behalf of Charted Institute on Library and Information Professionals (*Contributors Wikipedia*2021). It is an impact factor journal and according to the statistical report of 2019, it is calculated as 2.41.

Objectives of the Study

Keeping in view the importance of the journal of information science, it was valuable to determine the bibliometric analysis of published data in JIS. Hence, the present study was designed with the following objectives:

a.   To determine the documents types published in JIS

b.   To calculate the yearly published documents during 1979-2020 in JIS

c.   To find out the top productive authors who published the maximum number of documents in JIS

d.   To examine the top productive institutions and countries in JIS

e.   To highlight the frequently used keywords and cited articles published in JIS

Review of Literature

Several studies have been conducted employing bibliometric analysis to show the trend of data (Aslam et al., 2021; Naveed, Ali, Aslam, & Siddique, 2021; Shaukat et al., 2021; Shoaib, Abdullah, & Ali, 2020; Shoaib, Ali, & Naseer, 2021). However, researchers have also used other qualitative and quantitative techniques to their studies rather to use scientometric analysis (Ali, Shoaib, & Asad, 2021; Mariam, Anwar, Shoaib, & Rasool, 2021; Shoaib & Abdullah, 2020, 2021; Shoaib, Rasool, & Anwar, 2021; Shoaib & Ullah, 2021a, 2021b). It is pertinent to mention here that researchers asserted that bibliometric analysis is best to consolidate the data and to present it in the form of tables and figures (Naseer, Shoaib, Ali, & Ahmad, 2021; Naseer, Shoaib, Ali, & Bilal, 2021; Shoaib, Ahmad, et al., 2021; Shoaib, Ali, Anwar, et al., 2021; Shoaib, Ali, & Naseer, 2021; Ullah & Shoaib, 2021). Many studies have also asserted that bibliometric analysis is the technique to map the avaialbale literature on different topics, journals, organizations, and issues (Aparicio, Iturralde, & Maseda, 2020; Baker, 1991; Goyal & Kumar, 2021; Thanuskodi, 2010; Zeng, Ribeiro-Soriano, & Ren, 2021).

The study of Chaurasia (2008) revealed that journals were the trendiest system of communication and most people wanted to work jointly as a coauthor and liked to cite in

journals. Narang and Kumar (2010) study was on the evaluation of the publications of the Journal of Pure and Applied Mathematics, which included 400 articles in this bibliometric study that concluded the highly cited documents were articles and the contribution of foreign authors were high as compared to Indian authors. Patil (2010) examined the publications of the Herald of Library Science and this analysis highlighted that most papers were published as a single author and in-country-wise contribution, Nigeria was on top as a collaborative country. Hussain et al. (2011) study covered the "Electronic Library Journal" with a specific period and 578 publications were found. Papers' categories, yearly distributed papers, authorship pattern, institution's contribution in publications, and articles' distribution in subject wise were discussed in that study.

Similarly, Thanuskodi (2011) evaluated a bibliometric study on Library Herald journal within a specific timeframe from 2006 to 2010. It calculated the published articles, the pattern of authorship, year-wise contribution, status of single author and co-authors. Furthermore, study also deduced that most contribution was from India instead of foreign sources. Sethi and Panda (2012) analyzed the Journal of Library and Information Science (LIS) involving 1000 papers which were analysis. They found out the literature growth, citation analysis, frequently cited authors and authorship patron, etc. slam et al., (2021) bibliometric study was on a journal of Librarianship and Information Science which explored the productive countries, productive authors and organizations, type of publications, yearly published papers, etc. within a time frame 1999-2019. Naveed et al. (2021) covered the Library Quarterly publications from 2010 to 2019. In this study 469 publications were evaluated and concluded the highest trend of publications as 'articles' and the highly productive author Jaeger, Paul T. However, studies have also been conducted employing different other research related techniques to draw results and conclusion including qualitative and quantitative in nature (Anwar, Shoaib, & Javed, 2013; Shoaib, Khan, & Shaukat, 2012; Shoaib, Khan, & Khan, 2011; Shoaib, Latif, & Usmani, 2013; Shoaib, Munir, Masood, Ali, & Sher, 2012; Shoaib & Shah, 2012). Hence, this paper used bibliometric analysis to evaluate the publications globally from the Journal of Information Science in the specific period 1979-2020.

Data and Methods

For the bibliometric analysis, data was extracted from the Science Citation Index database, Web of Science (Core Collection). Science Citation Index and Web of Science have been used frequently as a source of getting data in all fields of research (Bayer & Folger, 1966; Braun et al., 1995; Liet al., 2009). Search Queries: SO= (JOURNAL OF INFORMATION SCIENCE) AND PY= (1979-2020) have been utilized for getting data. Data has a specific time frame from 1979-2020 and within this period 2367 publications have been retrieved. Data was collected on June 12, 2021, at 10:40 AM. Various softwares have been used for data analysis such as Biblioshiny, ScientoPy, VOS viewer, MS Excel which are considered as the best tools of data evaluation.

Data Analysis

Documents Published by Types

Table 1 represents the types of a document published with a specific time frame 1979-2020. The total number of publications is 2367. Document published frequently 1789 (75.78) is in the type of "article". The Letter was ranked second with 156 (6.59%) publications. The third most published document type is Note 118 (4.98%) and the least published document types is 'Discussion' and 'Reprint' published 3 (0.13%) documents each. It is concluded that researchers having a trend in "article" instead of other writing.

Table 1
Documents Published by Types

Type of the documents	Total Publications (N=2367)	Percentage
Article	1789	75.58
Letter	156	6.59
Note	118	4.98
Editorial Material	105	4.44
Proceedings Paper	60	2.53
Book Review	55	2.32
Review	47	1.99
Correction	22	0.93
Item About An Individual	5	0.21
Biographical-Item	4	0.17
Discussion	3	0.13
Reprint	3	0.13

Documents Published by Years

The year-wise distribution of published document details during 1979-2020 is inspected in figure 1. The results specify that the year 2020 is the most productive year with 109 total publications (TP). The second most productive year is 2019 with 93 TP. The year 1980 is the third most productive year with 83 publications. The least productive years are 1991 and 1997 with 40 publications each. Total references in these publications were 50591 and the average citation per year per doc was 0.9073 percent. All the years were productive but the highest publications were in the year 2020.
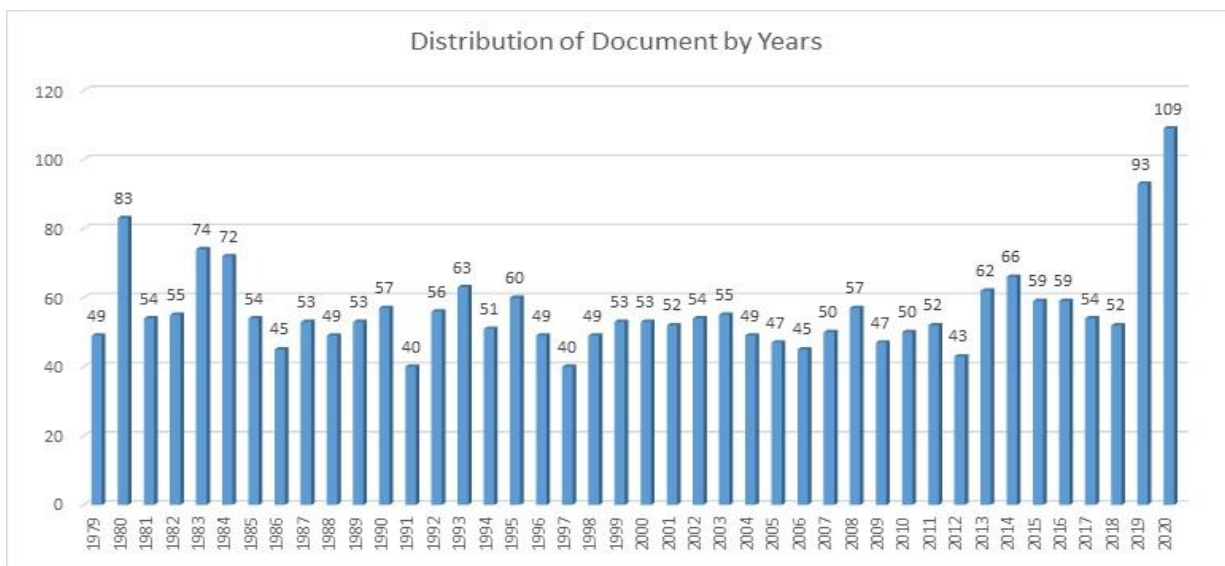

Figure 1. Distribution of Document by Years (1979-2020)

Productive Institutions

The data (Table 2) and figure 2 portrayed the details of the top ten institutional publications. The Dept. of Information Science, United Kingdom is on top with 46 publications. The second highest publications (20) are by "The Dept. of Information Studies, United Kingdom". The Dept. of Information Management, Taiwan and School Sheffield, United Kingdom are on third with 15 publications each. The last position at the table shows 6 publications by the School Comp & Information Technology, United Kingdom. The results revealed that the Dept. of Information Science, United Kingdom has produced more research work as compared to other institutions.

Table 2
Top Ten Institutions

Institution	Country	Publication	h-index
Dept. of Information Science	United Kingdom	46	20
Dept. of Information Studies	United Kingdom	20	14
Dept. of Information Management	Taiwan	15	10
School Sheffield	United Kingdom	15	10
Nanyang Technology University	Singapore	12	10
School Lib & Information Science	United States	10	7
Jordan University Science & Technology	Jordan	9	7
University Granada	Spain	9	8
University Tampere	Finland	9	5
School Comp & Information Technology	United Kingdom	8	8
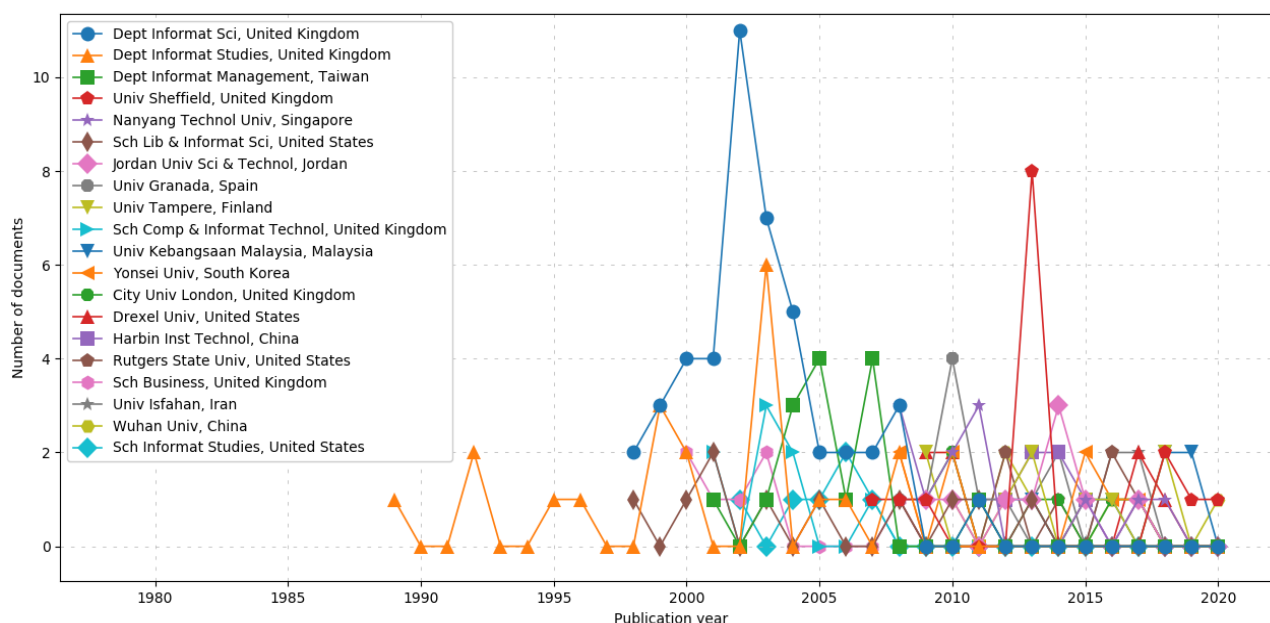
Figure 2. Top Productive Institutions (1979-2020)

Productive Countries

The details of top ten productive countries have been acknowledged in table 3 and figure 3. A total of 85 countries have published their documents during this period (1979-2020). The United Kingdom is leading from the front with 274 total publications (TP). The United States is on second in order of publications with 146 TP. China has on third with 103 TP. The countries with the least, amongst the top ten countries, publications 29 are Australia and Singapore. The

United Kingdom is producing massive publications as compared to other research-producing countries.

Table 3

Top Ten Productive Countries

Country	Publication	AGR*	ADY*	PDLY*	h-index
United Kingdom	274	-1.5	2.5	1.8	35
United States	146	-2	3.5	4.8	30
China	103	1	10	19.4	17
South Korea	62	-2.5	1	3.2	14
Taiwan	62	0	1	3.2	20
Spain	54	-1	2	7.4	16
Iran	42	3	6	28.6	15
Canada	30	1.5	1.5	10	12
Australia	29	0	1.5	10.3	13
Singapore	29	-0.5	0	0	15

AGR* = Average Growth Rate, ADY* = Average Documents per Year, PDLY* = Percentage of Documents in Last Years
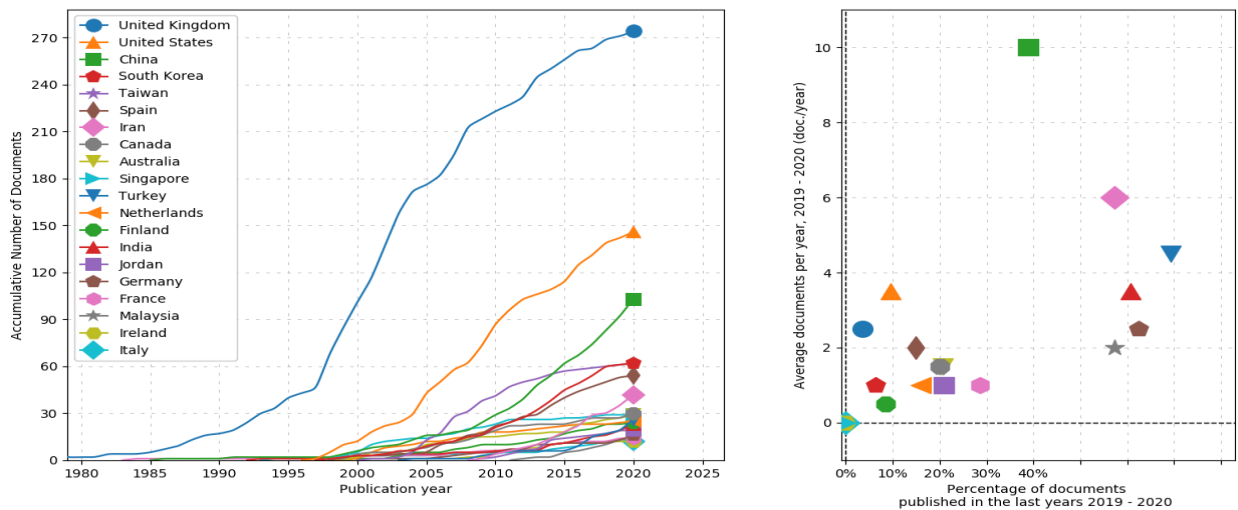
Figure 3. Top Productive Countries (1979-2020)

Productive Authors

The information about the top ten productive authors is provided in table 4. The findings highlight the uppermost publications (72) produced by Oppenheim C with 501 total citations (TC) and 14 h_index. The second highest, 32, publications were produced by Brookes BC with 477 TC, 7 h_index. The third highest publications were retrieved from Willett P, and Bawden D, 27 TP, 501 TC, 14 h_index and 27 TP, 672 TC, 9 h_index respectively. The least, amongst the

top ten productive authors, publications 13 were received from the author's Meadows AJ with 86 TC and 6 h_index.

Table 4
Top Ten Authors

Author	TP*	TC*	h_index	g_index	m_index	PY*_Start
Oppenheim C	72	501	14	21	0.326	1979
Brookes BC	32	477	7	21	0.167	1980
Willett P	27	501	14	22	0.333	1980
Bawden D	27	672	9	25	0.214	1980
Mcmurdo G	23	82	5	7	0.119	1980
Cronin B	20	468	10	20	0.238	1980
Nicholas D	18	302	10	17	0.233	1979
Thelwall M	15	527	12	15	--	2001
Hartley J	15	193	7	13	0.206	1988
Meadows AJ	13	86	6	9	0.143	1980
TP* = Total Publication, TC* = Total Citations, PY* = Publication Year						

Top Occurrences Keywords

Table 5 and figure 4 highlight the most frequently used author keywords and their occurrences used in 2367 published documents during 42 years. The highly utilized keyword is "Information" with, 95, occurrences and 252 total link strength (TLS). The second highly used keyword is "Model" with 67 frequency and 227 TLS. "Science" is the third-highest keyword with a frequency of 65 and 226 TLS. The minimum occurred keyword "System" has received 32 occurrences and 82 TLS.

Table 5
Top Occurrences Keywords

Keyword	Occurrences	Total Link Strength	Keyword	Occurrences	Total Link Strength
Information	95	252	Knowledge Management	43	135
Model	67	227	Management	43	139
Science	65	226	Classification	37	110
Information Retrieval	56	136	Ontology	36	76
Impact	53	176	Seeking	36	117
Retrieval	50	141	Sentiment Analysis	36	79
Behavior	49	175	Internet	33	88
Knowledge	49	165	Quality	33	88
Web	48	156	Networks	32	114
Systems	44	141	System	32	82

Figure 4. Top Occurrences Keywords

Top Funding Agencies

Table 6
Top Funding Agencies

Funding Agencies	Publication	% of 2367
National Natural Science Foundation of China NSFC	70	2.957
European Commission	30	1.267
Fundamental Research Funds for The Central Universities	21	0.887
Ministry of Science And Technology Taiwan	13	0.549
UK Research Innovation UKRI	11	0.465
National Research Foundation of Korea	10	0.422
Spanish Government	10	0.422
Academy of Finland	7	0.296
Ministry of Education Science and Technology Republic of Korea	7	0.296
National Science Foundation NSF	7	0.296

The distribution of published documents by the top ten funding agencies is provided in table 6. The National Natural Science Foundation of China NSFC is on top with 70 (2.957%)

total publications (TP) which is far ahead of the other funding agencies. The second most publications produced by European Commission with 30 (1.267%) TP. The Fundamental Research Funds for The Central Universities has produced the third most with 21 (0.887%) total publications. The least, amongst top ten funding agencies, publications were 7 (0.296%) published each by the Academy of Finland, Ministry of Education Science and Technology Republic of Korea, and National Science Foundation NSF.

Top Cited Articles

Table 7
Top Ten Cited Articles

Citations	Title	Authors	Vol./Issue	PY*	ACPY*
874	Usage patterns of collaborative tagging systems	Golder, SA; Huberman, BA	32(2)	2006	54.63
724	Towards an integrated crowdsourcing definition	Estelles-Arolas, Enrique; Gonzalez-Ladron-de-Guevara, Fernando	38(2)	2012	72.4
713	Social network analysis: a powerful strategy, also for the information sciences	Otte, E; Rousseau, R	28(6)	2002	35.65
574	Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions	Lin, Hsiu-Fen	33(2)	2007	38.27
511	The wisdom hierarchy: representations of the DIKW hierarchy	Rowley, Jennifer	33(2)	2007	34.07
400	The dark side of information: overload, anxiety, and other paradoxes and pathologies	Bawden, David; Robinson, Lyn	35(2)	2009	30.77
341	Bibliometric studies of research collaboration - a review	Subramanyam, K	6(1)	1983	8.74
291	Knowledge sharing, absorptive capacity, and innovation capability: an empirical study of Taiwan's knowledge-intensive industries	Liao, Shu-hsien; Fei, Wu-Chen; Chen, Chih-Chiang	33(3)	2007	19.4
267	The foundations of information science .1. Philosophical aspects	Brookes, BC	2(3-4)	1980	6.36
230	What are communities of practice? A comparative review of four seminal works	Cox, A	31(6)	2005	13.53

PY* = Publication Year, ACPY* = Average Citation Per Year

The information about the top ten most cited articles is provided in table 7. An article titled" Usage patterns of collaborative tagging systems" by Golder, SA; Huberman, BA is on top position with (874) citations. The second most cited paper is "Towards an integrated crowdsourcing definition" by Estelles-Arolas, Enrique; Gonzalez-Ladron-de-Guevara, Fernando with (724) TC. The "Social network analysis: a powerful strategy, also for the information sciences" by Otte, E; Rousseau, R is on the third number with (713) TC.

Discussion and Conclusion

The research covers the journal of information science (JIS) publications in the specific period 1979-2020. This research covers a time of 42 years and provides a thorough calculation of research productivity. The research identifies the types of documents published, yearly publications, top productive authors, and productive institutions and their countries for documents production, repeated keywords, and highly cited sources, and to identify the nations who are much interested in research activities.

A total number of 2367 documents were published in the journal of information science during the period 1979-2020. The average of year-wise publications was 21.6 percent, and the average citation per document was 11.81 percent. Total references in these publications were 50591 and the average citation per year per doc was 0.9073 percent.

The bibliometric assessments have been generally employed techniques for considering the design of the statistical mechanism. In this exploration, a bibliometric analysis of JIS as the direct method of research was performed utilizing different research objectives which are argued underneath, and these key findings meet the goals of the research:

Twelve (12) types of documents were published during this period (1979-2020). Articles were highest with 1789 (75.58%) in terms of published documents. This bibliometric analysis shows that people are having an interest in articles publishing.

Total published documents were 2367, and the evaluation provides the information that year 2020 was remarkable with the highest number of 109 publications, and the second-highest contribution 93 publications were in 2019. The most productive author was Oppenheim C with 72 highest publications and the Brookes BC was the second most productive author with 32 publications during the investigation from 1979 to 2020. The paper "Usage patterns of collaborative tagging systems" has received the highest 874 total citations (TC) in the year 2006

and second most citations 724 TC received by the paper "Towards an integrated crowdsourcing definition" in the year 2012.

Different public and worldwide projects have been dispensed in several nations to focus on advancing interdisciplinary investigation through the funding of research (Okamura, 2019). A total of 85 countries have published their documents during this period of study. The status of highly published documents was from the United Kingdom with the highest 274 publications. The USA was on the second number with 146 total publications. The "Information" was the most occurred keyword with a frequency of 95 appearances and 252 total link strength (TLS). The second most repeated keyword is "Model" with 67 occurrences and 227 TLS.

For the time frame from 1979 to 2020, no bibliometric study on the journal of information science has been analyzed yet. The acquired outcomes regarding the bibliometric analysis have significant value. The general motivation behind this research was to give detailed information about the publications of the journal of information science in the period of 1979-2020 through bibliometric analysis. The researchers conclude that out of twelve (12) types of published documents, the article is the most preferred mode of writing and the year 2020 was the most remarkable year with the highest number of publications. The analysis measured the productivity of journal of information science research, type of documents published, the author's contribution, worldwide cooperation and information about productive authors, research productive institutions, countries, and most cited sources and frequently used keywords. This study will facilitate those researchers who want to get exact and detailed information about the publications of the journal of information science. The outcomes from this examination can educate scholastic analysts regarding research deficiencies and encourages the authors to produce more research work.

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