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Global trends and visualization of knowledge organization reflected in the domain of LIS research:a bibliometric landscape

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Abstract: This paper examines global trends and visualization in Knowledge Organization research, concentrating in particular on the literature that has appeared in journal articles, editorial materials, conference proceeding, during 2001 to 2020. Data for this study was assembled from Web of Science (WoS) web database, Science Citation Index Expanded (SCI-E). The query of searching were "Knowledge Organization" OR "Organization of Knowledge" OR "Organization of Information" OR" Information Organization." In total, 3909 documents were retrieved and analyzed by various bibliometric metrices, and appropriate data presentation tools were planned by using Biblioshiny, HistCite, Citespace and VOSviewer software. Taken as a whole, the preliminary results that the content of Knowledge Organization literature has shifted since the advent web based environment. To provide deeper picture of the KO publishing and citation trends different bibliometric parameter were used to explore the leading countries, authorship, organizations, topics, and collaborations. Results found that the countries with relatively higher impact journals were USA followed by England and Canada. Among organizations, National University Singapore (Singapore) was found leading impact indices. Hjorland B. was found as most productive author. Among journals, "The Journal of Knowledge Management" contributed the most publications. 'Knowledge Management' was the most frequently and representative authors keyword, Three-Factor Analysis (Country, Keyword and Organization) showed top three keywords ('Knowledge Management', 'Knowledge' and 'Knowledge Sharing') had strong relation with top 10 countries and Organizations. Country collaboration showed a major collaboration between the fringes of USA and emerged as leading collaborator with

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China. Study findings from this paper can benefit researchers and others interested in learning and visualizing trends to plan with better informed decision.

Keywords: Knowledge Organization, Knowledge Organization System, Bibliometrics, Trend Analysis, Factor Analysis, Research Output

INTRODUCTION

In the Library and Information Science community Knowledge Organization means especially the organization of information in bibliographical records, including citation indexes, full text records and the internet.[1]Knowledge Organization lies at the very heart of library and information science. As Library and Information Science (LIS) rapidly evolves and the digital dimension becomes increasingly pervasive, the role and scope of the knowledge organization curriculum is also evolving.[2]Knowledge Organization is not limited to the LIS field, its areas of interdisciplinary research and application well beyond LIS itself. The excitement engendered by wide interest from many disciplines in the field of knowledge organization has also caused some confusion about the meaning of "Knowledge Organization" and its relationship to other fields such as "Knowledge Management."[3] Knowledge Organization in the narrow sense is about 'Knowledge Organizing Systems' such as bibliographical records, classification systems (e.g., DDC, LCC and UDC), thesauri, semantic networks and it is about knowledge organizing processes such as classification, document description, "descriptive cataloging", indexing and subject analysis. Knowledge Organization is performed in 'memory institutions' such as libraries, archives, museums, and online databases and on the internet. 'Knowledge Organizing Systems' may be universal (covering all fields of knowledge) or they may be limited to certain domains or document types.[4]

Bibliometric analysis is used as a tool for mapping published scientific research records. Nowadays, it is widely recognized as a method to evaluate research in a particular area. Bibliometric analysis is also an essential approach to identifying the research trends in an area.[5]Therefore, the main aim of the present study is to evaluate global trend of scientific literature inKnowledge Organization. This study combined with bibliometric and modern visualization techniques to get a clear picture of globalKnowledge Organization research output.

LITERATURE REVIEW

(Pattanaik, 2020) study analyzed that the research profile of Library and Information Science (LIS) PhD of India, and make an assessment of the research contribution made by them with the help of bibliometric parameters. It evaluates the research both in qualitative and quantitatively that includes identifying research productivity, research trend, publication patterns, discover the key sources of publication, and visualize the research network of Indian researcher in LIS subject.[6](Saberi, Barkhan, & Hamzehei, 2019) study

analyzed that bibliometrics and visualization of Library Philosophy and Practice (LPP). Scopus citation database was used to gather the data. Using advanced search in the database, bibliographic data of the articles published in the journal over the past twenty years were extracted. Then, the analysis was performed using bibliometric indicators and some applications, such as Microsoft Excel and VOS viewer.[7](Kumar, 2018) found that the citation trends and disclose the patterns of scholarly communication of the source journal Library Hi Tech from 2009 to 2014 through various facets of bibliometric. A total number of 288 articles comprising 7344 citations published in Library Hi Tech during the period under study were downloaded from Emerald Insights through UGC-INFONET Digital Library Consortium and analysis in detail in every possible aspect of bibliometric by using Microsoft Word and spreadsheet 2013.[8](Akhavan, Ebrahim, Fetrati, & Pezeshkan, 2016) examines an overview of the knowledge management literature from 1980 through 2014. We employ bibliometric and text mining analyses on a sample of 500 most cited articles to examine the impact of factors such as number of authors, references, pages, and keywords on the number of citations that they received. We also investigate major trends in knowledge management literature including the contribution of different countries, variations across publication years, and identifying active research areas and major journal outlets.[9](Hasan & Singh, 2015) study Investigate the growth trend of "Library and Information and Science" (LIS) literature based on the output of research publications indexed in the Science Citation Index, Social Sciences Citation Index (SSCI) and Arts & Humanities Citation Index (A&HCI) during the period from 1975 to 2012. An overall total of 311,886 records were retrieved on LIS including all forms of literature. the study by way of analyzing some of the features of publications of the study period; Year-wise distribution of publications on LIS, Form-wise distribution, Language-wise distribution, Annual output of publications, Geographical distribution, Subject dispersion, Institutional distribution, Sources preferred for publishing, Indian contribution to LIS, etc.[10](Majid, Yun-Ke, Aye, Khine, & Wai, 2015) this study explore scholarly communication trends in the field of information literacy. A total of 1989 records from Scopus bibliographic database, published from 2003 to 2012, were analyzed.Some areas covered in the data analysis included: annual growth in information literacy publications, preferred journals for publishing information literacy articles, most prolific authors, top countries producing information literacy literature, and publication distribution by subject. It was found that the number of information literacy publications have increased steadily during the last ten years.[11](Manoj Kumar & Moorthy, 2011) study analyzed that DESIDOC Journal of Library and Information Technology (DJLIT) is one of the premier journals of library and information science being published in India. It is brought out by Defence Scientific Information and Documentation Centre (DESIDOC), a constituent establishment of Defence Research and Development Organisation (DRDO). DJLIT has just completed 30 years of its publication. This paper presents bibliometric analyses of DJLIT during 2001-2010. The analysis covers various parameters like growth pattern, content coverage, authorship patterns, subject-

wise distribution of articles, etc.[12](Patra, Bhattacharya, & Verma, 2006) investigates growth pattern, core journals and authors' distribution in the field of bibliometrics using data from Library And Information Science Abstracts(LISA). Growth of literature does not show any definite pattern. Bradford's law of scattering is used to identify core journals and determines 'Scientometrics' as the core journals in this field. Lotka's law was used to identify authors' productivity patterns. It is observed that authors' distributions do not follow original Lotka's law.[13]

OBJECTIVES

1. To identify the publishing trends in Knowledge Organization.
2. To identify the most productive countries, organizations, and authors.
3. To identify the preferred journals of researchers in Knowledge Organization.
4. To explore the most frequently used author keywords and co-occurrence of author keywords network in Knowledge Organization.
5. To explore the trends topics by year and clustering of authors keywords (topic dendrogram)
6. To explore the most frequently used all keywords in Knowledge Organization.
7. To identify the highly influential research papers concerning citation and average citation per year on Knowledge Organization.
8. To find out the relationship exists based on three-factor analysis (countries, keywords, organizations).
9. To find out the Country collabaration Map of Knowledge Organization researchers.

MATERIALS AND METHODS

This paper is based on the Web of Science (WoS) web database, Science Citation Index Expanded (SCI-E). A search has been carried out in WoS database to get overall results of the KO publications. The query of searching is TS= (Knowledge Organization" OR "Organization of Knowledge" OR "Organization of Information" OR" Information Organization" dated 30.11.2021. Here, we limited our research scope of KO in Library and Information Science because of large number of data is available for this period of study. For the study we were refined the search DOCUMENT TYPE (Article OR Editorial Material OR Proceeding Paper OR Review, or Book Chapter, OR Letter, OR Review) AND [excluding] DOCUMENT TYPES: (Book Review OR Early Access OR Data Paper OR Retracted Publication). Time span: 2001-2020. Indexes: SCI-EXPANDED, SSCI, A&HCI. REFINED BY WEB OF SCIENCE CATEGORIES: (INFORMATION SCIENCE AND LIBRARY

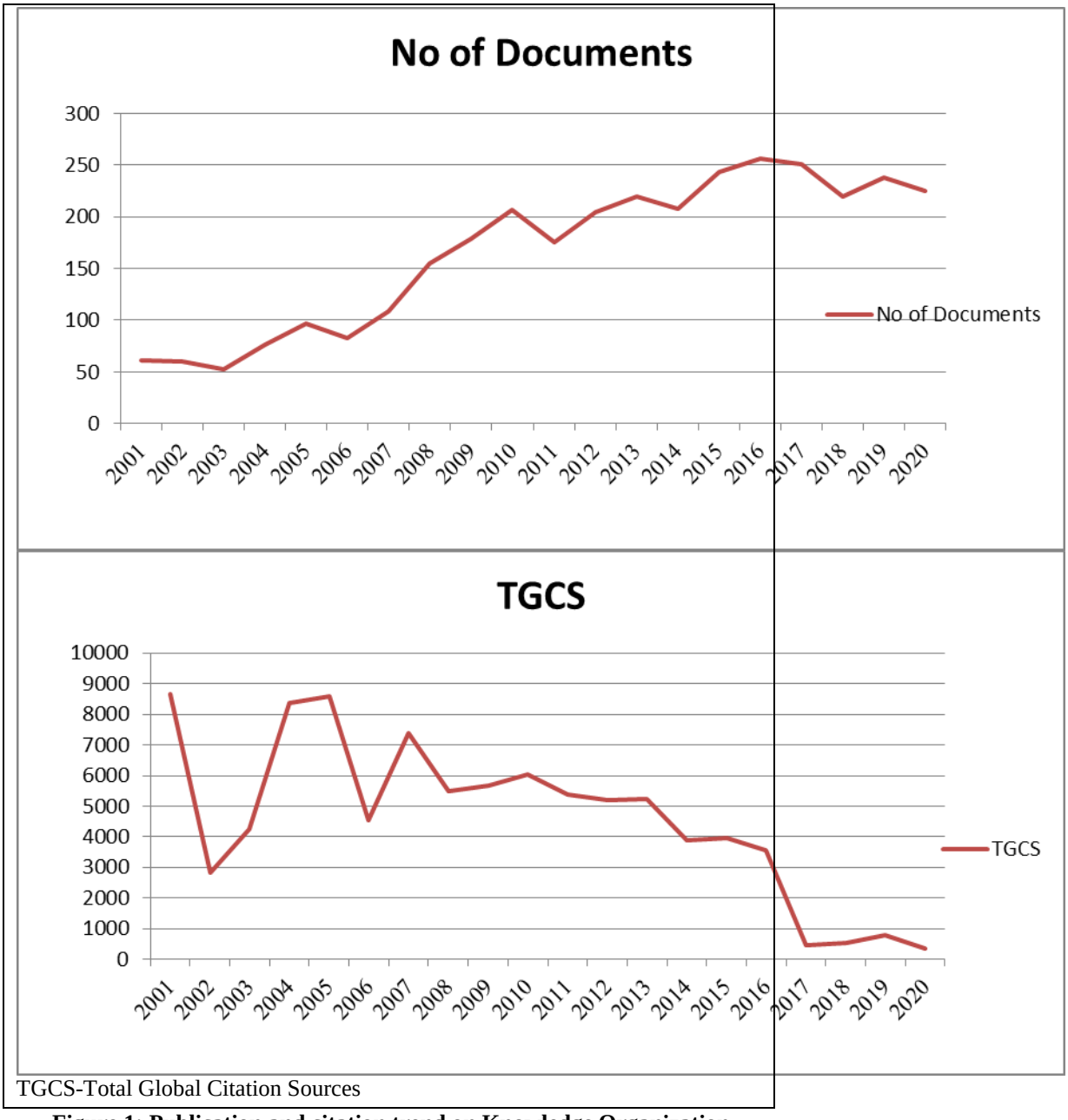
SCIENCE)
Though the results were many but we have chosen only Information Science Library Science categories and results produced total 3909 documents. Article (3,509) Review (172) Proceedings Paper (137) Editorial Material (91). To analyzethe global trends and visualization ofknowledge organization literature bibliometric tools like Biblioshiny, HistCite, Citespace,VOSviwer and MS excel have been used to perform bibliometric analysis and interpretation for building data matrixes of study.

RESULT AND DISCUSSION

Analysis of the Overall Growth Trend

Figure 1 shows the year wise frequency of publications and citations published from 2001 to 2020. There were 3909 documents published by 116 journals, written by 5556 authors, affiliated with 1971 institutions and 81 countries. These documents received 107818 citations.

Analysis of the overall growth trend is portrayed in Figure 1.This has been done for numbers of total publications between 2001 and 2020 is presented. It shows that 2001 was the starting year for research publication on Knowledge Organization. The trend shows that publication and citation have not gradually increased. The years 2001-2006 were disappointing years as there were very less publications in those periods and between the years 2012-2020 significant growth has been observed. . In the years 2016 and 217 marvelous as in that year's highest number of research publications were produced. Trend shows that the 2001-2013 were average citation in that period and in the starting year of 2001 maximum. The years 2014-2020 were disappointing years as there number of citation were decreased.



TGCS-Total Global Citation Sources

Figure 1: Publication and citation trend on Knowledge Organization

Top Twenty Influential Countries on Knowledge Organization

Top twenty (20) highly publishing countries on Knowledge Organization literature were as presented in Table 1. The result shows that the USA is a top of the list with 966 publications, 55489 citations, 57.44 citation impact and it receivedhighest 3740 total link strength.England on 2nd rank with 344 publications, 8299 citations, 24.33 citation impact and it received 1186 total link strength. After this, Canada occupied third position, with 216 publications, 8617 citations, 44.02 citation impact and it received 1114 total link strength.Switzerland and Malaysia are on the bottom of the list, with 33 and 39 publications, respectively. It shows that the country South Korea have received highest citation impact (116.44)

Table 1: Top Twenty Influential Countries on Knowledge Organization

Country	Total Publication	Total Citation	Citation Impact	Total Link Strength
USA	966	55489	57.44	3740
England	344	8299	24.13	1186
Canada	223	9816	44.02	1114
China	216	8617	39.89	1322
Brazil	177	823	4.65	323
Australia	175	3421	19.55	723
Spain	163	2485	15.25	470
Taiwan	110	3614	32.85	725
Italy	104	2145	20.63	390
Netherlands	95	2772	29.18	337
Singapore	90	6343	70.48	922
Denmark	90	2999	33.32	489
France	83	5186	62.48	593
Germany	81	1825	22.53	418
India	77	1062	13.79	359
South Korea	68	7918	116.44	627
Finland	68	2156	31.71	360
New Zealand	40	898	22.45	188
Malaysia	39	862	22.10	236
Switzerland	33	1547	46.88	214

Top Twenty Highly Productive Organizations

Top twenty (20) organizations producing research publications on Knowledge Organization are given in Table 2. It shows that National University Singapore(Singapore) is on the top of the list with 40 publications, 4812 citations, 120.30 citation impact and total link strength 216. Nanyang Technological University (Singapore)) on 2nd rank with 40 publications, 1209 citations, 30.23 citation impact and total link strength 100; however, it received same publications like National University Singapore (Singapore) differences between two intuitions are citations, citation impact and total link strength. Royal School Library & Information Science (Denmark)on 3nd rank with 31 publications, 950 citations, 30.65 citation impact and total link strength 11.Baylor University (USA) and Emory University (USA) are on the bottom of the list respectively, but Emory University (USA) received highest citation (6084) and citation impact (553.09).

Table 2: Top Twenty Highly Productive Organizations

Organization	**Total Publication**	**Total Citation**	**Citation Impact**	**Total Link Strength**
National University Singapore	40	4812	120.30	216
Nanyang Technological University	40	1209	30.23	100
Royal School Library & Information Science	31	950	30.65	11
City University Hong Kong	30	5205	173.50	196
University Northern Carolina	29	3601	124.17	80
University Arizona	28	4559	162.82	54
University Illinois	27	1407	52.11	39
University Western Ontario	25	2095	83.80	73
Georgia State University	25	2099	83.96	64
University Loughborough	21	669	31.86	45
University British Columbia	20	1094	54.70	37
University Kentucky	19	1023	53.84	49
University Maryland	18	3333	185.17	104
Temple University	15	1459	97.27	47

University Oklahoma	14	2309	164.93	80
University Southern California	13	2147	165.15	81
Korea Advance Institute of Science & Technology	12	2307	192.25	97
Michigan State University	12	2723	226.92	63
Emory University	11	6084	553.09	127
Baylor University	11	866	78.73	41

Top Twenty Most Prolific Authors

Table 3 highlights the top twenty(20) most prolific authors on Knowledge Organization, their total publications, total citations, Citation Impact, G Index, H Index and Publication year start. The list of most prolific authors shows that Hjorland B.is the most productive authors with 24 publications, 879 citations, 36.63 citation impact, 17 H Index, 24 G Index Index. The author Smiraglia R.P. listed 2nd rank with 24 publications, 136 citations, 5.67 citation impact, 5 H Index, 10 G Index Index. Followed by Leydesdorff L. with 13 publications, 579 citations, 44.54 citation impact, 10 H Index, 13 G Index Index.Shiri A. andSerenko A. are on the bottom of the list respectively. It's also observed that the author Leidner De have highest citation impact (598.25) among the listed authors.

Table 3: Top Twenty Most Prolific Authors

Author	Total Publication	Total Citation	Citation Impact	H Index	G Index	Publication Year Star
Hjorland B.	24	879	36.63	17	24	2003
Smiraglia R.P.	24	136	5.67	5	10	2001
Leydesdorff L.	13	579	44.54	10	13	2003
Martinez-Avila D.	13	42	3.23	5	5	2014
Desouza K.C.	12	390	32.50	10	12	2003
Pan S.L.	11	420	38.18	8	11	2001
Gnoli C.	10	82	8.20	6	9	2004
Kankanhalli A.	10	1891	189.10	9	10	2005
Rowley J.	10	781	78.10	8	10	2001

Chua A.Y.K.	9	271	30.11	6	9	2008
Guimaraes J.A.C.	9	38	4.22	4	5	2009
Lyytinen K.	9	492	54.67	8	9	2001
Newell S.	9	364	40.44	9	9	2001
Tennis J.T.	9	80	8.89	6	8	2005
Kettinger W.J.	8	147	18.38	8	8	2006
Leidner De	8	4786	598.25	7	8	2001
Majchrzak A.	8	1004	125.50	6	8	2002
Malhotra A.	8	2766	345.75	6	8	2001
Serenko A.	8	294	36.75	6	8	2009
Shiri A.	8	47	5.88	4	6	2004

Top Twenty Highly Influential Research Journals

The journals impact in respect of number of publications, citations, citation impact, and total link strength are highlighted in Table 4. It shows that the Journal "Journal of Knowledge Management" is highly influential journal producing maximum 510 publications, 11547 citations, 22.64 citation impact and 1092 total link strength. "Knowledge Organization" is on 2nd rank with 410 publications, 1636 citations, 3.99 citation impact and 242 total link strength, followed by "Knowledge Management Research & Practice" with 244 publications, 2113 citations, 8.66 citation impact and 488 total link strength. The "Information and Organization " is at bottom of the list and has produced 36 publications, 553 citations, 15.36 citation impact and 92 total link strength. It's also observed that the journal "MIS Quarterly" highest citation (27663), citation impact (263.46) and 1289 total link strength among the listed top journals.

Table 4: Top Twenty Highly Influential Research Journals

Source	**Total Publication**	**Total Citations**	**Citation Impact**	**Total Strength**
Journal of Knowledge Management	510	11547	22.64	1092
Knowledge Organization	410	1636	3.99	242
Knowledge Management Research & Practice	244	2113	8.66	488
International Journal of Information Management	165	4403	26.68	362

Information & Management	115	4655	40.48	406
MIS Quarterly	105	27663	263.46	1289
Journal of Documentation	99	1052	10.63	218
Journal of Information Science	82	2929	35.72	249
Journal of Management Information Systems	79	8215	103.99	569
Journal of The American Society for Information Science and Technology	78	2123	27.22	210
European Journal of Information Systems	71	2011	28.32	210
Information Systems Research	67	6744	100.66	391
Journal of Information Technology	62	1522	24.55	229
Journal of Strategic Information Systems	61	4026	66.00	396
Information Systems Journal	59	2054	34.81	179
Information Technology & People	51	423	8.29	145
Library Trends	47	547	11.64	88
Journal of Enterprise Information Management	46	293	6.37	75
Journal of The Association for Information Systems	42	935	22.26	164
Information and Organization	36	553	15.36	92

Co-Occurrence Network of Author Keywords

Frequently used authors' keywords in Knowledge Organization research are highlighted in Figure 2. The keywords analysis has been performed in VOSviewer software. The minimum number of 5 keywords occurrence is selected and hence only 351 keywords meet the threshold out of total 6691 keywords. The distance and size of the bubble indicates the number of keyword occurrence and associational links. ‘Knowledge Management’ is the most frequently and representative keyword as it appears 524 times and 985 total link strength, followed by ‘Knowledge Sharing’ that appear 249 times and 474 total link strength, followed by ‘innovation’ that appear 88 times and 209 total link strength.

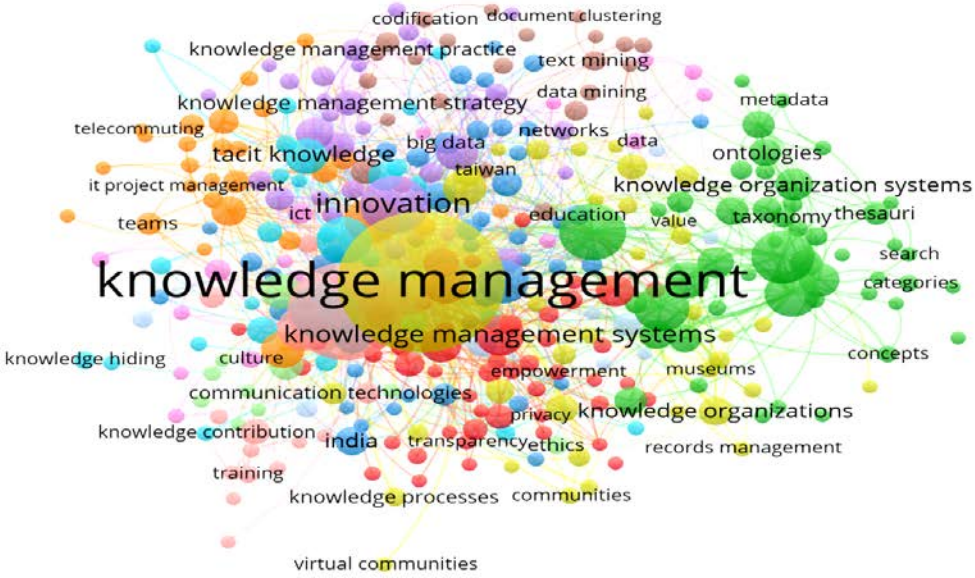


Figure 2: Co-Occurrence Network of Author Keywords

Trends by Year and Clustering of Authors Keywords (Topic Dendrogram)

Trend of author keywords in Knowledge Organization research are highlighted in Figure 3(A).The most frequent keywords in last 20 years to observe the latest trends in Knowledge Organization research. The most popular themes presented at Figure 3 (A) shows that 'Knowledge Management' 486 frequency is the most trending word in year 2011, 'Knowledge' 233 frequency(2013), 'Knowledge Sharing' 226 frequency(2014), are the top three keywords that are repeated most frequently in Knowledge Organization literature from 2001 to 2020. The most popular theme in 2020 are 'Subject', 'Paradox' and 'Knowledge Hiding'. At the beginning of Knowledge Organization research the broad-level trends wereCataloging and Classification, information organization, Indexing and Abstracting, Thesauri Initiatives, Taxonomy, Cognitive Models, bibliographic control, subject analysis, etcare received a marked emphasis. Later on Metadata Applications and Uses, Information Retrieval, Digital Preservation and Digital Libraries, Machine Assisted Knowledge Organization, Classifying Web Information, Interoperability etc. received as much significance. [14]

Figure 3(B) is showing a Topic Dendrogram of top 50 author keywords of Knowledge Organization. A dendrogram represent the result of the hierarchical clustering of Knowledge Organization. The result shows that there are two major topic clusters. Clause 1 is the topics about Culture and Organizational. Cluster 2 consists of five (5) sub-clusters, where each sub-cluster consists of sub-clusters. Sub-cluster 2.1. consists of certain topics on Semantic Web,

Ontologies and Knowledge Organization Systems. Sub-cluster 2.2. consists of certain topics on System, Internet, Research, Ontology, Information, Digital Libraries, Libraries, Information Retrieval, Information Science, Epistemology, Knowledge Organization and Classification. Sub-cluster 2.3. consists of certain topics on Analyses, Social, Knowledge Sharing, India, Case Study, Collaboration, trust, Social Networking, Social Networking Analysis, China, Social Media, Communication, Social Capital and Learning. Sub-cluster 2.4. consists of certain topics on Organizational Culture, Organization, Knowledge Creation, Communities of Practice, Knowledge Management, Organizational Learning, Information Technology, Innovation, Case Studies, Knowledge Transfer and Tacit Knowledge. Sub-cluster 2.5. consists of certain topics on Management, Knowledge Organization, Intellectual Capital, Absorptive Capacity, Performance, Knowledge, Information Management, Information Systems and Theory.

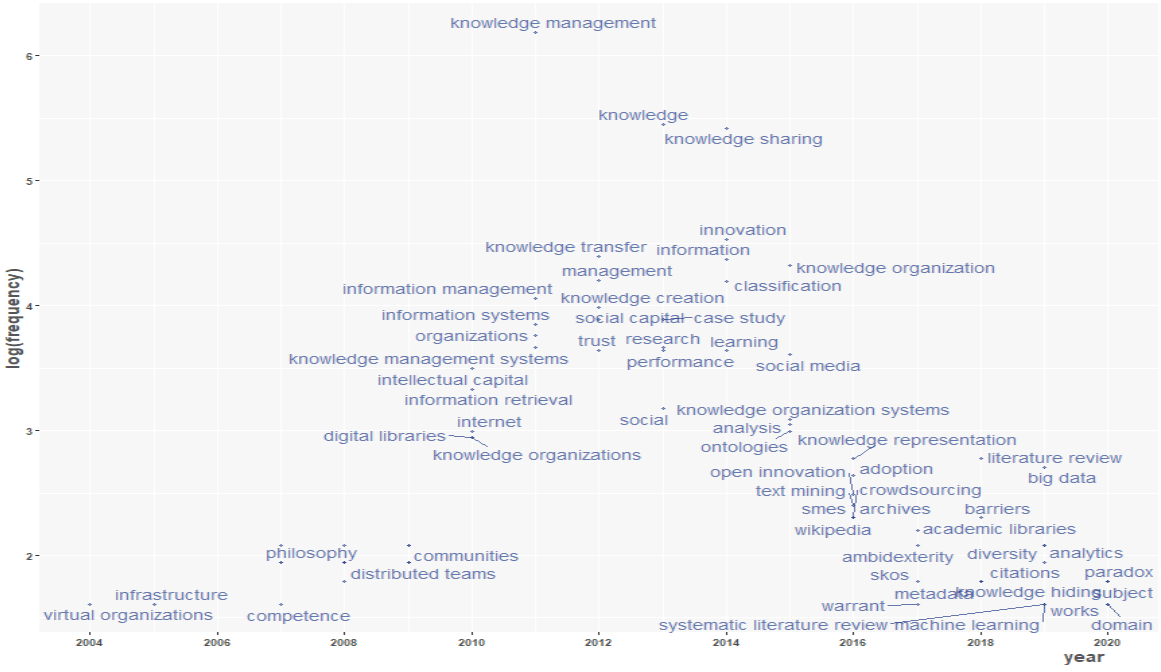


Figure 3 A: Trend Topics (Author Keywords) by Year

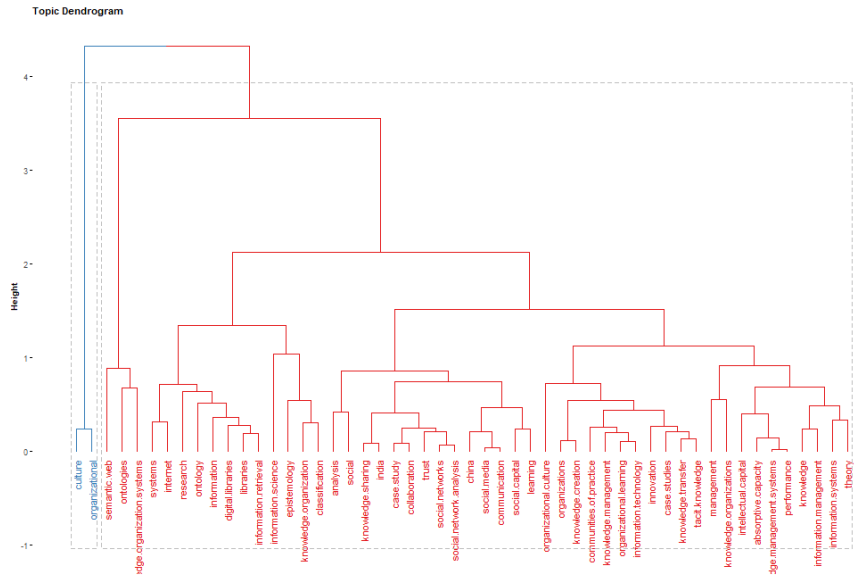


Figure 3 B: Trends and Clustering of Author's Keywords.

Term Analysis

Frequently used all keywords in Knowledge Organization research are highlighted in Figure 4. The minimum number of 5 keywords occurrence is selected and hence only 807 keywords meet the threshold out of total 8732 keywords. The term 'Management' is the most frequently and representative keyword as it appears 600 times and 3731 total link strength, followed by 'Knowledge' that appear 510 times and 3363 total link strength; 'Management' that appear 451 times and 3731 total link strength; 'Performance' that appear 379 times and 3268 total link strength; 'Organizations' that appear 354 times and 2789 total link strength.

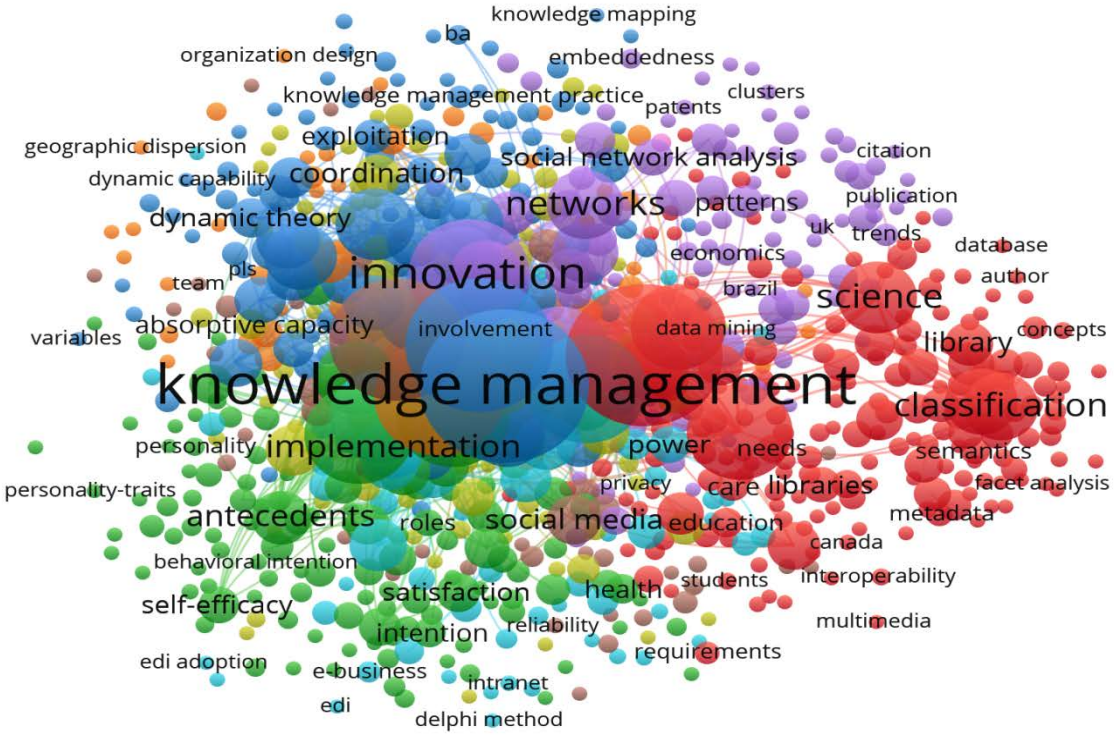


Figure 4: Term Analysis

Top Twenty Highly Cited Articles

The bibliographic information of top twenty(20) most cited articles is indicated in Table 5. The article entitled "Design Science in Information Systems Research" by Hevner A. R. published in 2004 in "MIS Quarterly" is on the top of the list with 4015 citations and 223.06 total citations per year. The article entitled “Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues” by Alavi M. published in 2001 in "MIS Quarterly" is on 2nd rank with 3994 citations and 190.19 total citations per year, followed by “Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces, and Organizational Climate” by Bock G.W. published in 2005 in "MIS Quarterly" is on 3rd rank with 1879 citations and 110.53 total citations per year. It is noted that “A Design Theory for Systems That Support Emergent Knowledge Processes” is the bottom of this list, written by Markus L.M. published in 2002 in “MIS Quarterly” with 398 citations and 19.90 total citations per year. It’s observed that total ten articles published from “MIS Quarterly” that is highest number of article published from one journal.

Table 5: Top Twenty Highly Cited Articles

Paper	Author	Source Title	Total Citations	AVG TC per Year
Design Science in Information Systems Research ,2004	Hevner A. R.	MIS Quarterly	4015	223.06
Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues ,2001	Alavi M.	MIS Quarterly	3994	190.19
Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces, and Organizational Climate, 2005	Bock G.W.	MIS Quarterly	1879	110.53
Knowledge Management: an Organizational Capabilities Perspective,2001	Gold A.H.	Journal of Management Information Systems	1784	84.95
Contributing Knowledge to Electronic Knowledge Repositories: an Empirical Investigation, 2005,	Kankanhalli A.	MIS Quarterly	1318	77.53
Special Issue on Information Technologies and Knowledge Management,2005	Sambamurthy V.	MIS Quarterly	1166	61.37
The Concept of Information Overload: A Review of Literature from Organization Science, Accounting, Marketing, MIS, and Related Disciplines,2004	Eppler M.J.	The Information Society	661	36.72
Social network, social trust and shared goals in organizational knowledge sharing,2008	Chow W.S.	Information and Management	557	39.79
Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions,2007	Lin H.F.	Journal of Information Science	552	36.80
When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies,2011	Leonardi P.M.	MIS Quarterly	536	48.73
Effect of Information Systems Resources and Capabilities on Firm Performance: a Resource-Based Perspective,2014	Ravichandran T.	Journal of Management Information Systems	501	29.47
The wisdom hierarchy: representations of the DIKW hierarchy,2007	Rowley J.	Journal of Information Science	489	32.60
Informational Influence in Organizations: an Integrated Approach to Knowledge Adoption,2003	Sussman S.W.	Information System Research	489	25.74
Sources of Influence on Beliefs about Information Technology Use: an Empirical Study of Knowledge Workers,2003	Lewis,W.	MIS Quarterly	467	24.58
Toward a Theory of Knowledge Reuse: Types of	Markus L.M.	Journal of	465	22.14

Knowledge Reuse Situations and Factors in Reuse Success,2001		Management Information Systems		
Absorptive Capacity Configurations in Supply Chains: Gearing for Partner-Enabled Market Knowledge Creation,2005	Malhotra A.	MIS Quarterly	457	26.88
The impact of knowledge sharing, organizational capability and partnershipquality on IS outsourcing success,2001	Lee J.N.	Information and Management	446	21.23
Through a Glass Darkly: Information Technology Design, Identity Verification, and Knowledge Contribution in Online Communities,2007	Ma M.	Information System Research	435	29.00
Shaping up for E-Commerce: Institutional Enablers of the Organizational Assimilation of Web Technologies,2002	Chatterjee D.	MIS Quarterly	412	20.60
A Design Theory for Systems That Support Emergent Knowledge Processes,2002	Markus L.M.	MIS Quarterly	398	19.90
TC- Total Citations				

Three- Factor Analysis (Country, Keyword and Organization)

The three-factor diagram has been generated of top 10 keywords, countries, and organizations on literature Knowledge Organization research are highlighted in Figure 5. The size of the block shows the associational relationship with each factor. The top three keywords (‘Knowledge Management’, ‘Knowledge’ and ‘Knowledge Sharing’) have strong relation with top 10 countries and Organizations. Accordingly, other keywords have minimum relation with countries. USA, China, United Kingdom and Brazil have strong relation with top 10 keywords.

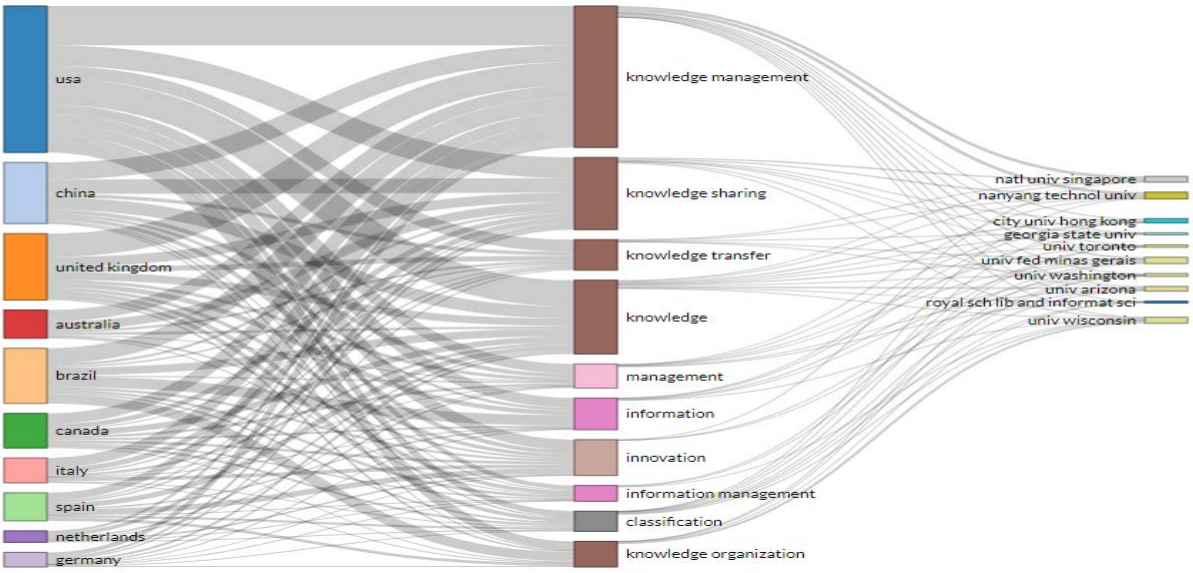


Figure 5: Three-factor analysis of relationship among Country (left), Keyword (middle), and Organization (right)

Country Collabaration Map

Figure 6 shows the country collaboration map on Knowledge Organization research. The USA emerged as top collaborator with China (57 publications), followed by USA with Canada (46 publications), UK with USA (29 publications), USA with Singapore (24 publications) and others. The least collaborator countries among 20 collaborators were USA with Brazil (8 publications).

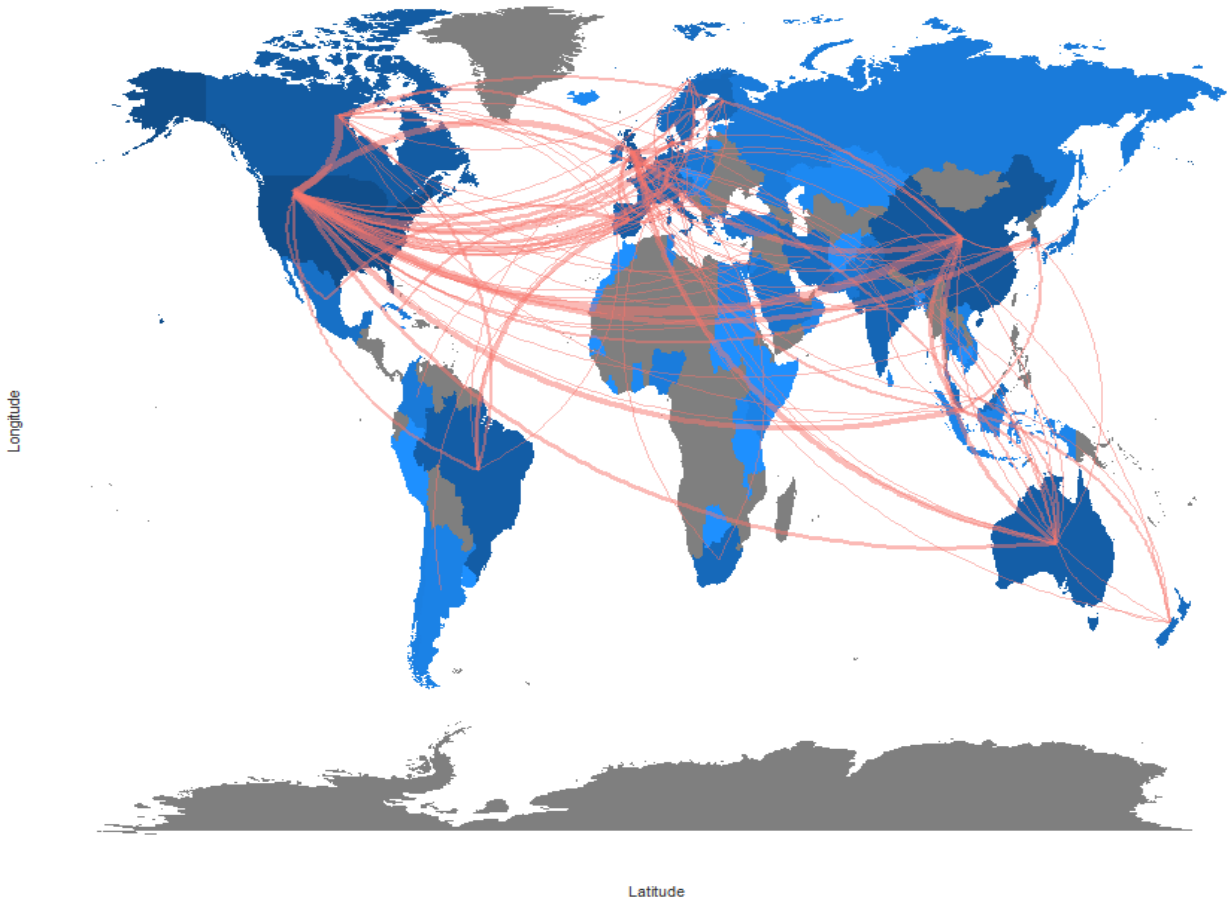


Figure 5: Country Collabaration Map

CONCLUSION

The current research review used bibliometric and visualization methods to analyze the literature on Knowledge Organization published in the Web of Science during 2001-2020. Bibliometric analysis software packages Biblioshiny, Histcite, Citespace and VOS-viewer were used for data processing and extraction of bibliometric indicators. An overview of the research in the Knowledge Organization field was presented with the information related to most productive countries, organizations, and authors; preferred types of sources of researchers; most frequently used author keywords; co-occurrence network in Knowledge Organization research; citations and use of influential research; top-ranked papers;Three Factor Analysis (Country, Keyword and Organization); Country Collabaration Map based on collected data.

The study presents the findings of mapping and exploring Knowledge Organization as reflected in the published research literature. A total of 3909 document forms were examined from different sources during the research. The result shows that the USA is a top of the list with 966 publications, 55489 citations, 57.44 citation impact and it received highest 3740 total link strength. England on 2nd rank with 344 publications, 8299 citations, 24.33 citation impact and it received 1186 total link strength. National University Singapore (Singapore) is on the top of the list with 40 publications, 4812 citations, 120.30 citation impact and total link strength 216. The most prolific authors shows that Hjorland B.is the most productive authors with 24 publications, 879 citations, 36.63 citation impact, 17 H Index, 24 G Index Index. The Journal entitled "Journal of Knowledge Management" is highly influential journal producing maximum 510 publications, 11547 citations, 22.64 citation impact and 1092 total link strength. 'Knowledge Management' is the most frequently and representative authors keyword as it appears 524 times and 985 total link strength, followed by 'Knowledge Sharing' that appear 249 times. The article entitled "Design Science in Information Systems Research" by Hevner A. R. published in 2004 in "MIS Quarterly" is on the top of the list with 4015 citations and 223.06 total citations per year.Three-Factor Analysis (Country, Keyword and Organization) shows the top three keywords ('Knowledge Management', 'Knowledge' and 'Knowledge Sharing') have strong relation with top 10 countries and Organizations. Accordingly, other keywords have minimum relation with countries. USA, China, United Kingdom and Brazil have strong relation with top 10 keywords. The map of country collaboration suggested a major collaboration between the fringes of USA emerged a top collaborator with China (57 publications), followed by USA with Canada (46 publications), UK with USA (29 publications). Generally, this study results have shown that the proportion of Knowledge Organization literature is on the rise. Furthermore, research on Knowledge Organization can be done in a more and other specific area in the future and it must be undertaken on the various backgrounds of bibliometric researchers. This would largely contribute to a better understanding of Knowledge Organization for researchers in different disciplines.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

WoS: Web of Science; **KO**: Knowledge Organization; **LIS**: Library and Information Science; **TC**: Total Citations; **SCI-E**: Science Citation Index-Expanded; **DDC**: Dewey Decimal Classification; **UDC**: Universal Decimal Classification; **LCC**: Library of Congress.

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