22. Bibliometric Study: Its Relevance and Approaches to Analyse Publications in Sciences

Maya Moyee Narzary

U. N. Brahma College,
Kajalgaon, Chirang, BTR.

Abstract:

Bibliometrics is a very crucial term so far research publications are concern. It is an important tool for evaluation of research and impact of the same in the downstream/future article/research. Indeed, in 1934 it was used as "bibliométrie" by Paul Otlet and later in 1969 the term "bibliometric" was initially used by Alan Pritchard in mathematical and statistical methods. Other than bibliometrics; Informetrics, Scientometrics, Webometrics, Cybermetrics, Librametrics, Patentometrics, Altmetrics are also carried out to analyse different aspects of information/publication/research. According to Merriam Webster, (https://www.merriam-webster.com/dictionary/bibliometrics) Bibliometrics is "the application of statistical methods to the study of bibliographic data". Bibliometric study/analysis is an approach to any publications published in journals related to particular domain indicates the trends in research practices, statistical evaluation on the use/importance of the articles, development of literature in particular field/subject area, impact of the intellectual product and its productivity/output. To carry out this particular study, different tools methods, and software are applied to have the quantitative statistical analysis of publications highlighting on citations and citations count which outcome may be described the way it is, compared with other various aspect in the particular field and can also be mapped/visualized through different tools available inbuilt in the software. Moreover, bibliometrics enables to: analyse quantitatively collaboration and interdisciplinary research; be transparent in results, takes less time and energy base on the source, the present study is a secondary research attempts to focus on preliminary aspects of bibliometrics pertaining to significance and different approaches of bibliometrics in publications of sciences. To accomplish the present work different secondary web sources and databases (Scopus, Web of Science and Google Scholar) are accessed, used and compared.

Keywords:

bibliometrics, scopus, impact factor, bibliometric tools, citation analysis.

22.1 Introduction:

Bibiliometric study came into existence in late 19th century. Earlier, carrying out a bibliometric study by manually collecting the data from different bibliographic references or cited work was very time consuming and lengthy too. Before citation index (information provided at the end of the articles, conference proceedings, etc.), author index, title /subject index (base on the keywords used), etc. are searched for the bibliographic information which

uses some pattern of referencing-APA (American Psychological Association), MLA (Modern Language Association), Chicago format, etc. In the present scenario, existence of different online databases, web technology, bibliometric tools and software has eased the data retrieval for the purpose and its analysis simultaneously in a very less time. Indeed, to use these tools and software's, researchers need practice and some training/awareness to uses different options/features of it smoothly and efficiently.

Bibliometrics is basically used in library and information science to study the pattern of use, production, trend/growth of literature related to specific field based on the bibliographic data and its citation. Now a day, it is also finding a base on other field also to access different attributes of the publication and the contribution of the author for one or the other reason.

Thus, **"Bibliometrics** is the use of statistical methods to analyse books, articles and other publications, especially in regard with scientific contents."

(https://en.wikipedia.org/wiki/Bibliometrics)

Other quantitative research evaluation metrics

(https://www.researchgate.net/publication/311612500) are:

1. Informetrics- confined to any form of information (subjective, objective, factual and analytical) in regard to its production, dissemination and use.
2. Scientometrics- pertains to science, scientific research and its scholarly communication
3. Webometrics/ Cybermetrics -it features on use pattern of internet resources, World Wide Web and hyperlinks.
4. Librametrics- it is a study focus on documents/collections of the library, its use and impact of library services on users.
5. Patentometrics- studies patent citations and its pattern of using it.
6. Altmetrics/Article Level Metrics (ALM)- it is a qualitative study of the article or impact of the scholarship on different platforms-books, journals, twitter, presentations, videos, etc.

Thus, it is a study of quantitative impact of scholarly publications which is ascertained through assessing the citations made by other resources/scholars/researchers in a particular field. In other words, bibliometrics analysis is one of the review methods other than the meta-analysis and systematic literature review.

Journals, books, monographs, reports are some of the important sources of scientific information. Thus, to accumulate data related to published scientific information, bibliometric study can be helpful to a great extent.

Scientific publications are the most authenthic resource for the scientific communications. Kumaragurupari, R, etal(https://journals.lww.com/ijo/Fulltext/2010/58040) mentioned that "Scientific publications serve an important role in the scientific process, providing a link between the production of knowledge and its use."

22.2 Purpose of the Paper:

The basic purpose of the paper is to acquaint the members of the academic fraternity/ community about the bibliographic study which gives a direction or enlighten about the various aspects of the subject through different metrics/approaches supported by different bibliographic databases or abstracting & indexing sources. It is one of the important tools in academic field-study and research. The particular paper anticipates to bring some crucial points need to be considered while going for bibliographic study and its significance.

22.3 Significance of the Study:

Library is a growing organism. Growing in all aspects –users/readers, resources, services, needs of readers, platforms of information are changing, etc. Through various media one can acquaint themselves with new evolving technologies and academic excellences/ scholarship. As the library is the heart of academic intuitions, professionals assigned have the right setup to orient the scholars about Bibliometric Study and its relevance in their respective area for better hold and understanding about developments/advances/growths in their respective fields. This study will sensitize the scholars /academic patrons to make an effort to do/adopt advance approaches in their respective field. It is noteworthy that, for carrying out bibliographic study –perseverance, practice and little bit training is required.

22.4 Review of Literature:

To accomplish the present paper, various secondary existing web-based literatures are accessed and used. Some of the literatures reviewed are:

In "A bibliographic study on big data: concepts, trends and challenges", Mishra, Deepa, et.al (https://www.emerald.com) found that articles pertaining to big data has increased and also able to find the potential area of research, trends and challenges associated with the big data.

Ruggeri, Giordano, etal. (https://onlinelibrary.wiley.com/doi/abs/10.1111/ijcs.12492) done quantitative study by collecting literature from Web of Knowledge Core Collection. Through this study the authors attempted to identify trend of research, challenges and subfields in the fair-trade.

Garcia Garcia, P., etal. (https://www.sciencedirect.com/science/article/abs/pii/) used data of 20 years from1986-2006 available in EMBASE and MEDLINE databases. Besides, bibliographic indicators, they have used different plant indicators for the purpose predefined in *PDR for Herbal Medicines and found that United States has the highest percentage of documents followed by Germany and Japan.*

Vioque,J., etal.(https://onlinelibrary.wiley.com/doi/abs/10.1111) have taken data from PubMed Online from 1988-2007 to study the publications related to obesity. Through the study it is disclosed that USA and Europe have the highest publication on obesity.

Patra, Swapan Kumar and Bhattacharya, Partha *(*http://eprints.rclis.org/19350/*) extracted oncology research data from* the national center for Biotechnology (NCBI) Pub Med and did many helpful study related to trends of literature growth, research activities carried out worldwide, authors productivity pattern, etc. through this study it was revealed that per year nearly 500 literature are published by the cancer researchers. It is also evident that All India Institute of Medical Science (AIIMS), Delhi has the highest contributions and Tata Memorial Hospital, Mumbai stands the second.

Sarkhel, Juran Krishna and Choudhury, Nitai Ray

 (http://nopr.niscpr.res.in/bitstream/123456789/) did a specific study on Contributions of Bidhan Chandra Krishi Viswavidyalaya to agricultural research. They took CAB Abstract Commonwealth Agricultural Bureau International (CABI) covering the period from 1993-2007 i.e. of 15 years and analysed on 7 parameters. The results indicated that pattern of growth of literature by the researcher is not uniform and multi-authored publications are mostly collaborative research.

Hassan, Saeed-UL, etal.(https://link.springer.com/article/10.1007) Carried out a study based on the data collected from Scopus from 2000-2010 to study the use of scientific literature in the world's research activity in sustainable development. The authors affirm that the information collected through the study can be useful for the government research agencies and the institutes related to the subject.

Kumaragurupari, R., Sieving, Pamela C., & Lalitha,

Prajna(https://journals.lww.com/ijo/Fulltext/2010/58040) using PubMed source published from 2001-2006 related to Indian ophthalmic studied the trends, collaboration, productivity, findings, publication types on the area. And the study proved to be helpful to know that all the parameters have increased.

22.5 Methodology/Material Used:

The paper is confined to be secondary research. So, electronically available data sources and databases- Scopus, Web of Science and Google Scholar are taken up for comparison then other databases for their area coverage and comprehensive citation databases which helps researchers in manifold aspects. Thus, various secondary literature/sources related to the area are read/used and sources are cited in the content of the paper and in references.

22.6 Need /Significance of Bibliometric Study:

Tremendous and turbulent growth of literature and locating the same is a challenge before the researchers in present scenario. So, to abridged themselves with different advances and publications on the field, bibliometric study can be taken as an effective tool. Emergence of different bibliometric tools and software's such as VOSviewer, R Studio, BibExcel. Site Space, etc. and different indexing and abstracting databases has proved to be instrumental in bibliometric study. These tools have eased the work of researcher or information monger to have the detail/comprehensive data on the field for further research, development

prospects, loop holes and many more aspects which is need to know by the seekers based on the level of depth of the study using the tools. Bibliometric study has now become a standard approach in academic to unearth the various aspects of the particular field/subject area and is applied to study different trends such as publication, collaboration, funding's/sponsorship, author's area of focus, institutional contributions, etc. Thus, it helps in ascertaining fund allocations, recruitment/promotion and also in research endorsement. Moreover, bibliometric study helps:

- In assessing upcoming research area, institution ranking-national or international
- To provides systematic approach tool in finding information.
- Gives a way for retrospective search.
- Saves time and effort of researchers.
- Bridge a gap between existing knowledge and prospect of new knowledge.
- To analyse different parameters of information and better visual presentation of the result

22.7 Bibliometric Approaches/Indicators:

Bibliometric study is basically base on three indicators-quantity relates to productivity, quality relates to performance/research output and structural relates to relationship/connection in terms of subject domain, authors & publications. According to Naveen Danthu, et al, bibliometric analysis can be carried out in two different ways-performance analysis (focuses on contributions) and science mapping (focuses on relationship among research). Citation analysis is the mostly opt science mapping. While carrying out bibliometric study we come across different metrics:

Table 22.1: Bibliometric Approaches/Indicators

Performance analysis	Science mapping
Publication related metrics--- Total Publication (TP), Number of Contributing Authors (NCA), Sole Authored publications (SA), Co-authored publications (CA), Number of Active Years of publication (NAY), Productivity per Active Year of publication (PAY).	**Citation Analysis---** Relationships among publications, most influential publications
Citation related metrics--- Total Citations (TA), Overall Citations (OC)	**Co-citation Analysis---** Relationships among cited publications, Foundational themes
Citation and publication related matrix--- Collaborative Index (CI), Collaborative Co-efficient (CC), Number of Cited Publications (NCP), Proportion of Cited Publications (PCP), Citations per Cited	**Bibliographic Coupling ---** Relationships among citing publications, periodical or present themes

Performance analysis	Science mapping
Publications (CCP), h-index (h), g-index(g), i-index (i-10, i-100, i-200)	**Co-word Analysis---** Existing or future relationships among topics, Written contents (words)
	Co- authorship Analysis--- Social interactions or relationships among authors, Authors and author affiliations (institutions, countries)

Source: (https://www.sciencedirect.com/science/article/pii/S0148296321003155)

To execute the bibliometric study, we need well designed databases some of which are:

Table 22.2: Bibliometric Designed Databases

Sr. No.	Indexing Database	Subject Area	Records/Collections
1	Web of science	Cross-disciplinary within scientific discipline. Science Citation Index (SCI) as the core collection	6 core databases, 160 million records, 1.7 billion cited references
2	Scopus	Scientific, technical and medical disciplines	75 million records, 1.4 billion cited references
3.	Google scholar	Index scholarly literature-journals, books, patents, conference papers, theses, dissertations, technical reports, etc.	More than 160 million documents.
4	MEDLINE	Biomedicine and health focuses on life sciences, behavioural sciences, chemical sciences and bioengineering	25 million references
5	PubMed Central (PMC)	Bio-medical and life sciences	Full text 5.9 million articles
6	Directory of Open Access Journals (DOAJ)	Science, technology, medicine, social science and humanities.	More than 14,000 open access journals from 133 countries and 4.6 million open access articles.
7	EiCompendex (Engineering Index-	190 engineering disciplines	20 million records from 77 countries

Sr. No.	Indexing Database	Subject Area	Records/Collections
	COMPuterized ENgineering index)		
8	PubMed	Biomedical and life sciences	30 million citations and abstracts
9	Portico	Digital preservation of e-journals, e-books, and digital collections.	88 million journals articles, 1 million books, and 4 million other digital items.
10	China National Knowledge Infrastructure (CNKI)	Contains China's digitised knowledge resources-economics and management	Full text articles from more than 2000 Chinese journals.
11	Wanfang Data	Databases related to Chinese culture, medicine, business, science engineering etc.	43 million journal articles, 5 million dissertations and theses, 4 million conference papers, Chinese patents etc,
12	Dblp computer science bibliography (1993)	Computer science publications.	5.1 million publications by over 2.5 million authors
13	Ulrichsweb	Online directory for journals, magazines, newspaper, etc	Covering 977 subjects' area in 200 different languages having 383,000 serials from 90,000 publishers.

Besides, Microsoft Academic, Dimensions, ProQuest, CrossRef., NLM (US National library of Medicine), Emerald, Wiley, ERIC, EBSCO etc. are also other abstracting and indexing databases to be referred or use for the study.

Every database encompasses search features using different indicators provided by the developer, importing of searched data, and use of filters to remove the non-relevant data, export of filtered data for analysis, use of metrics for analysis in Spreadsheet or Excel sheet or any other application which accepts tabbed data.

22.8 Bibliometric Tools and Software:

For better visualization, clarity, inference, relationship various software and tools can be used to assist bibliometric analysis and to organize the retrieved data. Regarding the use of software tools many factors are need to be considered. All tools and software cannot be used in all data source/databases. To use any software tools for either performance analysis or science mapping, some of the points come into considerations. Before using any software tools some salient features need to uphold:

- Data source/Database for analysis
- Need of hardware requirement/operating system to support the analysis.

- Base of user interface-web or desktop.
- Data export/import.
- Compatibility of software with data source for analysis.
- Ethical and publishing standards/code.

It is noteworthy that one tool used in one particular database may not go well or support/compatible with other databases. Moreover, in some databases software/tools are made inbuilt/incorporated/embedded to do different analysis.

Table 22.3: Bibliometrics Tools and Software

Sr. No	Database	Software/Tools
1.	Scopus (2004)	Journal Level Metrices CiteScore Metrics (8 indicators for serial titles) SCImago Journal Rank (citation-books, journals, series, conference proceedings) Source-Normalized Impact Per Paper (SNIP) for citation impact. Article Level Metrics Measures-total number of citations by a date range of the user's choosing, citations per year for a range, citation benchmarking (percentile), Field-weighted Citation Impact and views count **PlumX Metrics, 5 item-level metrics indicates citations**, usage, captures, mentions, and social media. It is also used for book chapters, conference proceedings. Authors Metrics H-index, H-graph Citation Overview tracker Visual analysis tools
2.	Web of Science (1997)	InCites-for analysing institutional productivity and research output Journal Citation Report- part of web of science highly cited journal data Essential Science Indicators-used for ranking-journals, institutions, scientists, and country
3.	Google Scholar (2004)	Dimensions Google Scholar Universal Gadget-for cite and citation count. Scholar H-Index Calculator Scholarometer Publish or Perish Google Scholar Citations.

Some visualization tools are-Bibexcel, RStudio, VOSviewer, CiteNetExplorer, CiteSpace, Biblioshiny, etc. which are mostly available in open source.
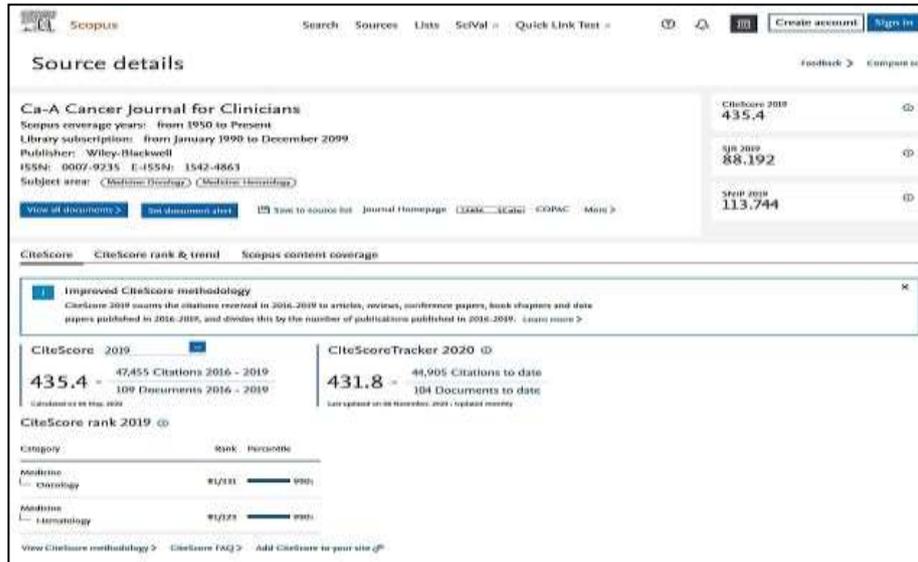
Figure 22.1: Source details screen web results at Scopus.com.

22.9 Article-Level Metrics:

Figure 22.2: Article-Level Metrics

More or less, databases are equipped with different composition. And slightly differs in terms of -coverage, accessing module of the database (subscription/free), provision of downloading/export/import, APIs (Application Programming Interfaces), available formats, presentation of data, focused area, etc. Researcher has to decide base on the depth and purpose of the study.

To complement the use of bibliometric study on the country ranking, it is worthwhile to mention the SCImago* Journal & Country Rank developed base on the data maintained in Scopus from 1996-2021(https://www.scimagojr.com › country rank):

Table 22.4: Article-Level Metrics

Sr. No.	Country	Region	Do-cuments	Citable do-cuments	Citations	Self-citations	Citations per do-cument	H index
1.	United States	Northern America	14408686	12662685	422381431	181255974	29.31	2711
2.	China	Asiatic Region	8254736	8081358	96129346	55619277	11.65	1112
3.	United Kingdom	Western Europe	4235739	3564646	114382158	24729307	27	1707
4.	Germany	Western Europe	3663812	3352795	89183196	20651732	24.34	1498
5.	Japan	Asiatic Region	3191326	3035507	58822810	14431511	18.43	1171
6.	France	Western Europe	2521133	2325263	61010667	11895280	24.2	1352
7.	India	Asiatic Region	2353482	2177268	26332969	8967838	11.19	745
8.	Italy	Western Europe	2197985	1983062	48803041	11022920	22.2	1189
9.	Canada	Northern America	2146402	1917712	58975462	9677796	27.48	1381
10.	Australia	Pacific Region	1747456	1538304	43564203	8366775	24.93	1193

*SCImago: it is a portal

United States rank 1st followed by China and United Kingdom while India holds the 7th position. According to Nature Index rank of Indian institutions based on research output from 1 April 2021 - 31 March 2022 (https://www.natureindex.com › Countries-India › All):

Table 22.5: Nature Index rank of Indian institutions based on research output from 1 April 2021 - 31 March 2022

Sr. No	Institute	Count	Share
1.	Indian Institute of Science (IISc)	194	94.44
2.	Homi Bhabha National Institute (HBNI)	215	70.92
3.	Council of Scientific and Industrial Research (CSIR)	151	66.26
4.	Indian Institute of Technology Bombay (IIT Bombay)	166	63.89
5.	Tata Institute of Fundamental Research (TIFR)	188	50.09
6.	Indian Institute of Science Education and Research Kolkata (IISER Kolkata)	64	41.34
7.	Indian Institute of Technology Madras (IIT Madras)	154	39.32

Sr. No	Institute	Count	Share
8.	Indian Institute of Technology Kanpur (IIT Kanpur)	78	38.83
9.	Indian Institute of Science Education and Research Pune (IISER Pune)	108	36.47
10.	Indian Association for the Cultivation of Science (IACS)	52	35.81

22.10 Scopus verses Web of Science verses Google Scholar:

Table 22.6: Scopus verses Web of Science verses Google Scholar:

Features/Attribute	Scopus	Web of Science	Google Scholar
Selection code/criteria for addition to the database	Rigorous selection criteria/policy by assigned experts.	Rigorous selection criteria/policy by assigned experts.	Automatically included by robots from academic publishers and repositories either free or paid basis.
Approach of selection	Selective	Selective	Inclusive
Subject Coverage	Physical Sciences, Life Sciences, Health Sciences, Social Sciences	Technology, Arts & Humanities, Life Sciences a& Biomedicine, Physical Sciences and Social Sciences	Includes broad area.
Items Indexed	Books, Scientific Journals, and Conference proceedings.	Journals, Books, Proceedings, patents, scientific data sets.	Only papers –journals, thesis, dissertation, technical reports, abstracts, scholar publications, reprints, etc.
Language	English	English	English and other than English
Time	1996-	1975-	
Database updated	Daily	Weekly	Every other day
Publisher	Elsevier	Clarivate Analytics	Google Scholar
Mode of Access	Mostly paid	Mostly paid	Free

22.11 Scopus Verses Web of Science:

According to Industrial Engineering and Operation Research (https://ieconferences.cikd.ca/scopus-vs-isi-wos-which-one/) "Scopus appears to have much broader journal coverage for the Social Sciences and Humanities than ISI and hence provides a fairer comparison." Further it has also been highlighted that Web of Science has
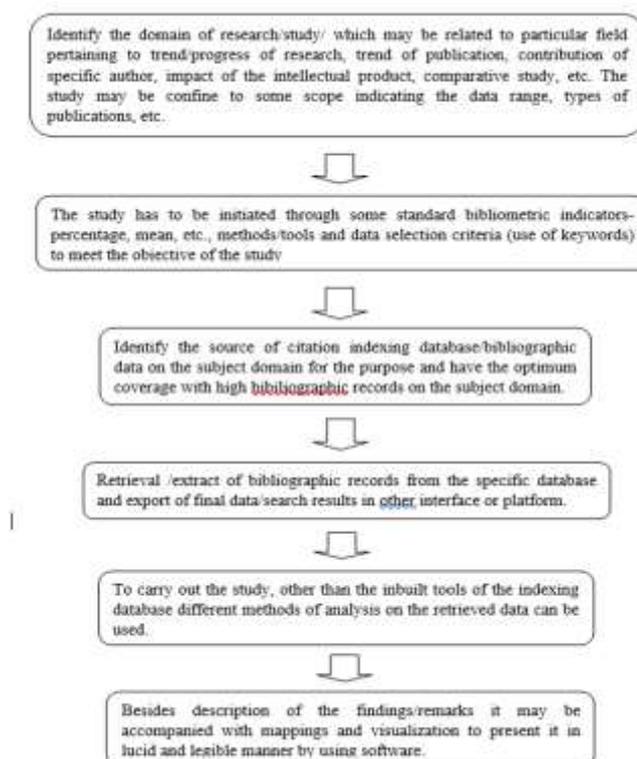
17.5 times more collection in science than Social Science and Humanities whereas in Scopus it is only 7.5 times. Thus, it is clearer that so far, the Social Science and Humanities are concern, Scopus can be considered as it has more citations.

22.12 Flowchart of Bibliometric Study:

To carry a bibliometric study, the researcher, need some kind of preparation and planning to pursue the study in a correct manner. Thus, bibliometric study requires a systematic planning throughout. It is worth mentioning that the flow chart given underneath are not the rigid steps to be undertaken but it will be helpful in some extend and will provide some basic idea related to bibliometric study. Further, these steps may vary based on the source of data taken for the study. Herewith, the steps are as follows:

Amalgamation of different stages results to a good, purposive, and extensive / intensive result. As an initial step, researcher has to decide the specific field to be covered for data extraction using keywords focusing on different indicators. While selecting the database source-coverage of data/data range and collections should be considered. Patiently data extraction and data export is carried out for analysis using software and the final results can be used for different purposes.

Steps for bibliometric study:

Identify the domain of research/study/ which may be related to particular field pertaining to trend/progress of research, trend of publication, contribution of specific author, impact of the intellectual product, comparative study, etc. The study may be confine to some scope indicating the data range, types of publications, etc.

The study has to be instiated through some standard bibliometric indicators-percentage, mean, etc., methods/tools and data selection criteria (use of keywords) to meet the objective of the study

Identify the source of citation indexing database/bibliographic data on the subject domain for the purpose and have the optimum coverage with high bibliliographic records on the subject domain.

Retrieval /extract of bibliographic records from the specific database and export of final data/search results in other interface or platform.

To carry out the study, other than the inbuilt tools of the indexing database different methods of analysis on the retrieved data can be used.

Besides description of the findings/remarks it may be accompanied with mappings and visualization to present it in lucid and legible manner by using software.

22.13 Conclusion:

"Bibliomatric has become an essential tool for assessing and analyzing the productivity and impact of academics and technology"

(https://revista.profesionaldelainformacion.com/index.php/EPI/article/view/epi.2020.ene.03/47883). It enables to track the growth and development of publication/research in different dimensions and also the advancement of tools and methods with advanced/developed alternatives to carry out the same.

Every analysis has its own purpose, so before using /selecting any data source which is pre-requisite for bibliographic study should be based on the coverage of database, compatibility of hardware and software, language, metrics/parameters, etc. All data sources have its own publishing codes/standards which are much related to its coverage of the data. It is evident that, if one data source is extensive/comprehensive in some area than it may be less coverage in other area. Every data source differs in some extend depending on its characteristics or purpose of its existence. Henceforth, one should prefer such data sources which comply with the purpose or need of the study to be undertaken.

22.14 References:

1. Mishra, D., Luo, Z., Jiang, S., Papadopoulos, T., & Dubey, R. (2017). A bibliographic study on big data: concepts, trends and challenges. *Business Process Management Journal*, *23*(3), 555-573. (Retrieved on June 20, 2022)
2. Scopus vs ISI WOS; Which one? (n.d.). Retrieved from https://ieconferences.cikd.ca/scopus-vs-isi-wos-which-one/ (Retrieved on June 15, 2022)
3. Google Scholar, Web of Science, and Scopus: Which is best for me? (2019). Retrieved from https://blogs.lse.ac.uk/impactofsocialsciences/2019/12/03/google-scholar-web-of-science-and-scopus-which-is-best-for-me/ (Retrieved on June 15, 2022)
4. Bibliometrics and citation analysis: Google Scholar. (n.d.). Retrieved from https://libguides.sun.ac.za/c.php?g=742955&p=5316859 (Retrieved on June 15, 2022)
5. Citations-Gadget. (n.d.). Retrieved from https://code.google.com/archive/p/citations-gadget/ (Retrieved on June 15, 2022)
6. Web of Science. (n.d.). Retrieved from https://library-guides.ucl.ac.uk/web-of-science/incites (Retrieved on June 15, 2022)
7. Bibliometrics basics. (n.d.). Retrieved from https://www.ucl.ac.uk/library/research-support-open-science/bibliometrics/bibliometrics-basics (Retrieved on June 14, 2022)
8. Science mapping and visualization tools used for bibliometric and scientometric studies: A comparative study. (n.d.). Retrieved from https://www.researchgate.net/publication/331533266_Science_Mapping_and_Visualization_Tools_Used_for_Bibliometric_and_Scientometric_Studies_A_Comparative_Study (Retrieved on June 14, 2022)
9. Ebrahim, N. A. (2016). Essential steps to write a Bibliometric paper. (Retrieved on May 21, 2022)
10. Software tools for conducting bibliometric analysis in science: An up-to-date review. (n.d.). Retrieved from

https://revista.profesionaldelainformacion.com/index.php/EPI/article/view/epi.2020.en e.03/47883 (Retrieved on May 23, 2022)

11. Bibliometrics. (n.d.). Retrieved from https://www.merriam-webster.com/dictionary/bibliometrics (Retrieved on May 25, 2022)

12. Bibliometrics. (n.d.). Retrieved from https://en.wikipedia.org/wiki/Bibliometrics (Retrieved on June 4, 2022)

13. How to conduct a bibliometric analysis: An overview and guidelines? (n.d.). Retrieved from https://www.sciencedirect.com/science/article/pii/S0148296321003155 (Retrieved on June 6, 2022)

14. Bibliometrics: Tools and software. (n.d.). Retrieved from https://liu.cwp.libguides.com/c.php?g=225325&p=4966525 (Retrieved on June 6, 2022)

15. Bibliometric indicators: Quality measurements of scientific publication. (n.d.). Retrieved from https://pubs.rsna.org/doi/10.1148/radiol.09090626 (Retrieved on June 13, 2022)

16. Institution research output table | Nature Index. (n.d.). Retrieved from https://www.natureindex.com/countries-India (Retrieved on July 14, 2022)

17. A bibliometric analysis of the scientific literature on Fairtrade labeling. (n.d.). Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1111/ijcs.12492 (Retrieved on June 24, 2022)

18. International Science Ranking – SJR. (n.d.). Retrieved from https://www.scimagojr.com/countryrank (Retrieved on July 14, 2022)

19. A bibliometric study of publications by Indian ophthalmologists and vision researchers, 2001-06. (n.d.). Retrieved from https://journals.lww.com/ijo/Fulltext/2010/58040/A_bibliometric_study_of_publicatio ns_by_Indian.2.aspx (Retrieved on June 28, 2022)

20. Contributions of Bidhan Chandra Krishi Viswavidyalaya to agricultural research: A bibliometric study. (n.d.). Retrieved from http://nopr.niscpr.res.in/bitstream/123456789/11052/4/ALIS%2057%284%29%20348 -355.pdf (Retrieved on June 25, 2022)

21. A bibliometric study of scientific literature on obesity research in PubMed (1988– 2007). (n.d.). Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467- 789X.2009.00647.x (Retrieved on June 25, 2022)

22. Bibliometric study of cancer research in India. (n.d.). Retrieved from http://eprints.rclis.org/19350/ (Retrieved on June 25, 2022)

23. A bibliometric study of the world's research activity in sustainable development and its sub-areas using scientific literature. (n.d.). Retrieved from https://link.springer.com/article/10.1007/s11192-013-1193-3 (Retrieved on June 25, 2022)

24. Phytotherapy and psychiatry: Bibliometric study of the scientific literature from the last 20 years. (n.d.). Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0944711308000895 (Retrieved on June 25, 2022)

25. Indexing databases. (n.d.). Retrieved from https://www.atlantis-press.com/industry- affiliations/indexing-databases (Retrieved on May 21, 2022)

26. Scopus: Metrics to show journal, article & author influence. (n.d.). Retrieved from https://www.elsevier.com/solutions/scopus/how-scopus-works/metrics (Retrieved on June 14, 2022)
27. A bibliometric approach to tracking big data research trends. (n.d.). Retrieved from https://journalofbigdata.springeropen.com/articles/10.1186/s40537-017-0088-1 (Retrieved on May 18, 2022).