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AN APPROACH TOWARDS CITATION TRACKING: SPECIAL REFERENCE TO ACADEMIC AND RESEARCH LIBRARIES

Netai Mandal
Librarian
Midnapore College
Email: netaimandal1987@gmail.com

Abstract: Citation tracking indicates the direction that any discipline or research area is taking, bringing out new areas for investigation and also identify research trends and response of the research community to published research articles. Citation tracking explore academic research activity evaluation, that can be used as a decision support tool by the university knowledge management system for planning future research activities.This paper presents the definition of citation tracking and why tracking citation and importance of citation tracking and also describe that the laws of citation tracking and this paper also describe the methods and platforms be used for citation tracking.

Keywords: Bibliometrics, Lotka's law, Bradford's law, Zipf's law, GoogleScholar, Web of Science

1.0 Definition of Citation Tracking:

Citation tracking refers to a method of measuring the impact of research studies and/or for identifying leading scholars in a particular discipline based upon a systematic analysis of who has cited a particular study, how often a specific research study has been cited by others, and by exploring what disciplines are represented by those subsequent citations.

Citation tracking refers to the discovery of how many times a particular article has been cited by other articles. It belongs to the measuring and analyzing science known as scientometrics, which, according to the Bibliometrics.

1.1 Why track citations?

Citation tracking is used to discover how many times a particular article has been cited by other articles. As a general rule, high quality articles attract a greater number of citations.

Citation counts are not perfect. They are influenced by a number of factors. Review articles (which survey a broad field of knowledge) are sometimes more often cited than their quality would warrant. Poor quality papers can be cited while being criticised or refuted. Conversely, high quality articles can languish, uncited and unread.

- Attribution serves as a fact-checking tool.

The very act of looking up a reference for verification serves as an accuracy check, e.g., to double check a direct quote, to ensure the fidelity of a passage that you paraphrased, or to cite another study that is related to your study.

- Citation makes you a better researcher.
- Good citation practices make you a better writer.
- A good bibliography shows off your scientific knowledge.
- Careful citation practices will build your credibility as a scientist or scholar.
- Citation enables better verification of your work.

1.2 The importance of citation tracking

The standard tool used in citation tracking is a citation index. Citation indexes allow you to search the academic literature in ways that show the progress of academic debate in your field. With a citation index, you can easily identify the most influential articles and the leading academics in your field. You can track backwards (using lists of cited articles) and forwards (using lists of articles which cite a particular article). This means that you can determine the position of academic debate at any time in the past.

Citation tracking is an excellent means of identifying the response of the academic community to individual articles. You can easily find refutations, criticisms, corrections and retractions of published articles. In addition, citation tracking provides you with a means of analysing the direction and pace of research trends. This method can identify emerging areas of research.

1.3 Citation tracking laws

There are three laws of bibliometrics, one that deals with the frequency distribution of scientific productivity, another pertaining to scattering of literature, and the third concerning word frequency in the literature.

1.3.0 Lotka's law:

Lotka's **law**, named after Alfred J. Lotka, is one of a variety of special applications of Zipf's law. It describes the frequency of publication by authors in any given field. It states that the number of authors making contributions in a given period is a fraction of the number making a single contribution, following the formula where *a* nearly always equals two, i.e., an approximate inverse-square law, where the number of authors publishing a certain number of articles is a fixed ratio to the number of authors publishing a single article.

1.3.1 Bradford's law: Bradford's law is a pattern first described by Samuel C. Bradford in 1934 that estimates the exponentially diminishing returns of searching for references in science journals, it relevant to journal productivity, that is, scattering of the literature.

1.3.2 Zipf's law: Zipf's word frequency law is the third. Different disciplines see the value of the laws differently and it is an empirical law formulated using mathematical statistics that refers to the fact that many types of data studied in the physical and social sciences can be approximated with a Zipfian distribution, one of a family of related discrete power law probability distributions.

1.3.3 Citation Tracking Methods: Tracking is facilitated by data sources such as Scopus (Elsevier), Google Scholar, and Web of Science (Thompson Reuters), with the result that metrics are expressed.

1.3.4 Scopus (From Elsevier): Scopus has traditionally been covering mainly the fields of health, life, physical and social sciences by making available how many citations an author or articles have received, the main journals that publish in specific disciplines, and citation information for particular journals. Traditional metrics are expressed as SNIP (Elsevier, 2016), that is, the weighting of citations based on the total number of citations in a subject field; IPP, that is, the ratio of citations per article published in the journal; and SJR (Elsevier, 2016), that is, a measure of scientific influence of scholarly journals that accounts for both the number of citations received by a journal and the importance or prestige of the journals where such citations come from.

1.3.5 Web of Science(From Thomson Scientific): The Web of Science (Thomson Reuters, 2015) includes the Science Citation Index Expanded (SCI-Expanded), Social Sciences Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), Conference Proceedings Citation Index- Science CPCI—Science (CPCI-S), and CPCI—Social Science & Humanities (CPCI-SSH) and also includes the indexing of conference proceedings—an area that Scopus is fast advancing toward.

1.3.6Google Scholar(From Google): Google Scholar covers all subject areas (including a lot of gray literature that is not typically in the domain of academic publisher control), but one has to always bear in mind that none of the indexing resources are exhaustive. Citation indexing is a representation of various subjects, and the indexes change with additional data about new citations becoming available. For this reason, it is beneficial to use various citation counting resources to get a picture that is close to accurate.

Mainstream citation tracking and analysis is achieved through Thompson Reuters (Web of Science) journal citation reports and Elsevier (Scopus) citation analysis platforms. The Scopus (Elsevier) index covers titles from international publishers, including peer-reviewed journals in the scientific, technical, medical science, social sciences, arts, and humanities.

Google Scholar uses a creation of Hirsch (2005, p. 16572) coined as the h-index which "gives an estimate of the importance, significance, and broad impact of a scientist's cumulative research contributions." While originally intended for evaluating citations of scholars in the sciences, its application has expanded to include a broad spectrum of other research areas. It indicates the number of papers (h) that have been cited at least h times. That means an h-index of 7 means that 7 papers have been cited at least 7 times each. This metric does not control for the age of documents or citations, and can be calculated from any citation database. What this implies is that the Google Scholar h-index does not necessarily coincide with that of other indexes, but at least it gives an idea of the activity surrounding a scholar's works over time.

2.0 What is in for researchers

The reason that tracking is important for researchers is that they sometimes need information on spaces that enable or guide them to prepare research funding proposals, analyze data, where they can archive their publications so that they become accessible quickly for the benefit of their visibility, provide metrics that indicate the character or quality of their intended publishing space, and tools that are disciplinespecific for efficiency.

Due to the influence of social media, the discussion relating to alternative metrics (altmetrics) has become prevalent as they are remarkably inclusive, for example, reflecting the use of course packs and reading lists, and even gray literature. The later refers to unpublished conference proceedings, nongovernment organizations annual reports, an array of unpublished and semi-published reports, policy documents, etc. (Frater, Myohanen, Taylor, & Keith, 2007). These metrics arise from mentions that happen in social networking platforms, but have not been counted as relevant in traditional citation tracking platforms. As such, they can best complement the impact factor which is one of the ways used to benchmark the quality of a journal, and are more meaningful if used in context.

3.0 Citation Tracking Platforms

Some citation tracking resources include the Research Information Center (announced as an open source platform of Microsoft Research (2016), in collaboration with the British Library using the Microsoft Academic Graph), Altmetrics, Social Science Research Network (SSRN) to track its own publications, Wiley Online Library, and even more that are less general in discipline coverage. The following list is not exhaustive but indicates some examples of Altmetric platforms/ tools in use:

3.1 Scholarly Research Networks:

3.1.0 Academia.edu: for academics to share their research papers. It provides analytics and allows users to follow the research of other academics. Price (2012) from academia.edu suggests that citation counts are verifiable on Google Scholar.

3.1.1 Research Gate: is a platform one joins for free. It allows sharing of publications between users, and tracks views, downloads, and citations. Researchers are connected with publications available in PubMed, arXiv, IEEE, RePEC, and CiteSeer. Full-text publications uploaded here are indexed by Google.

3.1.2 Social Science Research Network (SSRN): Is a website devoted to the rapid dissemination of scholarly resesrch in the social science and humanities.

3.2 Online Reference Managers:

- CiteULike tracks citations and allows users to review articles they have read, and is also a citation management tool.
- RefWorks and Mendeley operate similarly to what CiteULike does.

3.2.0 Altmetrics.org (Altmetrics, n.d.):

is an altmetrics service provider which seeks to track and analyze the online activity around scholarly literature. It uses apps listed on http://altmetrics.org/tools/ that include:

3.2.1PaperCritic: A nonprofit service that allows users to share and review scholarly publications and tracks mentions of articles on Twitter.

3.2.2 Impact Story: A nonprofit service which shows the impact of research products in journal articles, blogs, datasets, and software.

3.2.3 Crowdometer: A not-for-profit service that analyzes the semantic content of tweets linking to scholarly papers.

3.2.4 ReaderMeter: A free service that shows papers related to a tweet.

3.2.5 ScienceCard: is a nonprofit web service that collects article-level metrics for scientific articles. Anyone can register via their Twitter account and can then add articles from PubMed via the DOI or PubMed ID. Registered users can also link their account to their ORCID account.

3.2.6 PLoS Impact Explorer: displays altmetric information for recently published articles in the Public Library of Science.

3.3 Figshare: it supported by Digital Science (a MacMillan Company), is a repository where users can make their research available and tracks views and shares on a few social media platforms, and plans to implement citation tracking.

3.4 Altmetric.com: is focuses on article level metrics. It is also supported by Digital Science. According to the Elsevier website (2015)

3.5 Plum Analytics (PlumX): is a subscription-based service available through Ebsco that is intended for universities, but still in the development stages. Users are able to sign up for the beta version of the service, and the site provides a lot of detail on how it gathers data.

3.6 Scholarometer: is a browser plug-in that provides smart interface for Google Scholar to provide citation analysis data.

3.6.0 Social impact measure:

Klout.com which is a website that basically gives a number (between 0 and 100) indicating how much "impact" an individual has on various social media platforms.

4.0 Metrics to be Used for Citation Tracking

- Article metrics are tracked and expressed through Web of Science index, Scopus index, Google Scholar, Plum Analytics, altmetrics.
- Author metrics are tracked and expressed through Web of Science index, Scopus index, Google Scholar, ORCID, ResearcherID, Impact Story, Plum Analytics, altmetrics.
- Journal metrics are tracked and expressed through journal citation reports, SJR, Eigenfactor, Scopus index, Google Scholar, altmetrics.

5.0 Conclusion

Researchers turn to citation tracking to find the most influential articles for a practicular topic and to see how often their own published paper are cited. Citation indexing is a representation of various subjects, and the indexes change with additional data about new citations becoming available. For this reason, it is beneficial to use various citation counting resources to get a picture that is close to accurate. However, discussions and studies still continue surrounding citation metrics and scholars from underrepresented regions of the world need to be involved as the research world examines solid laws, standards, and theories around which to base practice.

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