Chapter -I

INTRODUCTION
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1.0 Introduction

The exponential development of scientific literature, interdisciplinary feature of research, and development in the direction of specialization have numerous difficulties both to the scientists and librarians. The wide surveys and the plenty of resources being published and donated to huge growth of cost for the libraries, as the purchase of published literature turn out to be gradually difficult task. To keep a sensible collection of periodicals, at least in broad fields, it is essential for the librarians to see the features of subject literature used by the users. Data is not only growing exponentially but the development rates also vary from one discipline to another.

A library is a gathering of sources of data and related resources, made available to a defined community for references or borrowing. Library is a public organization that carries the relations from writers to publishers to librarians and finally the readers. The library is considered as a best effective and economic medium for extent of education and distribution of information. Education denotes cultivation of the intellect. Library is one of the part and parcel of the society.

Bibliometric methods are used for a many similar purpose of several scientific indicators, assessment of scientific output, choice of journals for libraries and even predicting potential Nobel Laureates. Bibliometric analysis has developed a well-recognized part of information research. The most observable usage of bibliometric information is to increase bibliographic control, as it is obviously not possible to offer well-organized secondary facilities without knowing the quantity and features of a literature. Bibliometrics has developed out of the understanding that literature is increasing and varying at an amount which no librarian or information worker armed without dated bibliographic methods and services could keep abreast.

In any research work references plays a very important role as they act as bridge between the researchers and the resources. In all kind of research, writing of
References and reporting becomes very important part of research. It shows the
direction to the readers for additional information relating to an idea which is opened
for discussion. Citation analysis is a section of Bibliometrics and Scientometrics.
While the scholar explained the term Bibliometry “the application of mathematics and
statistical methods to books, articles and other means of communications”.

Citation analysis is a method of gagging the position or influence of an author,
an article or a publication by including the amount of times that author, article, or
publication has been quoted by other works. This type of analysis is useful when you
want to do a comprehensive literature review in your area of work. The primary and
important purpose or aim of citation is the evaluating the ranking of journals and
assessment of scientific work of a journal article.

However citation analysis work is to track the origins and distribution of data
and thoughts, thereby indirectly acknowledging the implication of specific work,
persons, and institutions. To search right information at the right time citation analysis
evaluation type gives one of the best methods to search the useful resources by the
user community.

In 1948 the conference which was held in Lamington Spa it was said that it is
necessary for the Librarian to develop “Librametry” on the appearances of biometry,
econometry and psychometry. Librametry the term was well defined, but hardly used
by library professional or in the field of library science. In the 2nd National
Conference which was held in Canada, the founder of Bradford’s law addresses by
saying that “Had I known of Ranganathan’s term in time, I would have adopted
“librametry” for information studies and “bibliometrics” for information science;
librametry and bibliometrics show that librametry primarily aims at the quantitative
analysis of the management of libraries and bibliometrics is limited to the recorded
knowledge. The publications in both the fields suggest that in librametry and
bibliometrics, one examines the statistical distributions of the processes relating to the
utilization of documents, book selection, administration, library staff, and library
users, to establish a theory for the structural aspects of library”.

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1.1 The Concept of Citation

Citation is a list in alphabetical order in an end section, which is regularly called "end-text citations" "references," "reference list", or "works cited". A reference is derived from Middle English referen, from Middle French référer, from Latin referre, "to carry back" formed from a prefix re- and ferre, "to bear". Referee, References and Referendum are some of the words derived from this root. All this words recalls the root meaning of the Latin as "A point, place or source of origin". It is said that the citation is not just a bibliographical data which is in the paper as an end notes. As Martyn (1975) rightly states, that the primary function of these citations is to provide a connection between two documents, one which cites and other which is cited. The Citation represents a relationship between cited document and Citations.

The references have many forms like thought, a physical observation that can be heard (onomatopoeia), graphic (text) expressive state, relationship with other, representative, alpha-numeric or energy projection. Bibliographies are exceptional works that are used to identify number of published work on any given subject and help other researchers or author.

There are many resources and many types of references in digital or readable from. In electronic from the Digital Object Identifier that is DOI and in books and journals ISBN and ISSN are gaining significance. The citation is an expression of alphanumeric abbreviations.

Citations have many vital purposes to support academic honesty to attribute prior or unoriginal work and thoughts to the accurate sources, to let the users to decide independently whether the referenced data supports the author's argument in the demanded way, and the validity of the data the author has used.

1.1.1 Origin of the Citation

The use of citation counts for ranking of journals was a method used in the initial part of the nineteenth century then the systematic continuing processes of these counts for scientific journals was started at the Institute for Scientific Information by Eugene Garfield who also founded the use of these counts to rank papers and authors. In 1965, a landmark paper he and Irving Sher displayed the connection between
citation frequency and distinction in representing that the paper of Nobel Prize winners was published five times the normal number though their work was cited 30 to 50 times the average.

In 1965 paper, Derek J. De Solla Price defined the inherent connecting representative of the SCI as "Networks of Scientific Papers". The relations among citing and cited documents turn out to be active when the SCI started to be published online. The Social Sciences Citation Index developed as one of the first databases to be fixed on the Dialog system in 1972. With the beginning of the CD-ROM edition, connecting became even easier and allowed the use of bibliographic link for searching the related records. In 1973, Henry Small printed his classic work on Co-Citation analysis which turned into a self-establishing classification scheme that led to the document grouping trials and finally an "Atlas of Science" in future which was called as the "Research Reviews".

In 1998 by Lee Giles, Kurt Bollacker and Steve Lawrence the automatic citation indexing was introduced. This enabled the extraction and grouping of automatic algorithmic of citation for digital and scientific documents. Before this there was only a manual process where there was no proper scaling for scholarly and scientific fields and documents. This made an attempt to introduce the new method of automatic citation indexing, CitSeer was first followed by Cora basically meant for computer Science and Information Science. In future Google Scholar and Microsoft Academic was followed in large scale.

1.1.2 Meaning of Citation

The word citation in generic sense, includes written records like journals, books, reports etc. are chosen in accordance to the stages of collection for example articles of journals which are suitable for further studies. The document term is used for briefness however in case of articles it mentions only a portion of the document. The document by itself is too wide and challenging to handle in huge quantity.

Citation is said to serve as a tag for intellectual property in all kinds of academic literature. In the field of library and Information science it has drawn the attention of many LIS professionals. According to the great Garfield (1965) there are around fifteen issues why authors cite, they are.
1. Giving respect to pioneers
2. Giving credit for linked work
3. Classifying methodology, equipment etc.
4. Providing related reading
5. Modifying one’s own work
6. Revising the work of others
7. Assessing previous work
8. Alerting upcoming work
9. Verifying claims
10. Giving tips to poorly distributed, poorly indexed, or un-cited work
11. Confirming data and classes of fact- physical, constants etc.
12. Recognizing the original publications in which an idea or idea was debated
13. Identifying original publications or other work describing a concept or term
14. Denying work or ideas of others (negative claims)
15. Arguing importance claims of others (negative homage)

In difference of opinion, ‘reference’ means ‘the acknowledgement one document given (in the form of document representation) to another’. Citation is the “acknowledgement one document receives from another’. So citations are the greatest significant component in citation analysis.

1.1.3 Types of Citation

In any references, the footnotes are common and the citations of sources are likely to be taken from the idea. In other way these citations also support the content. It becomes important to think before writing a citation or footnote because the sources do not fit in the text where there is extreme importance on the thoughts that are being obtainable to the reader.

The standards for adaptation of citations which may be followed are

- American Psychology Association (APA) style,
- Modern Language Association style (MLA),
- Chicago University style manual.
APA, Chicago, MLA, and Turbine style are familiar in system operation Microsoft word. In the current days latest edition of Microsoft word default inbuilt citations and bibliography format and reference manager software automatically change the bibliographical format.

1.1.4 Citation Analysis

The Garfield (1972) defines citation analysis as “analysis by the citations or references, or both as part of the scholarly apparatus of primary communications”. The citation is effectively used as reading lists and in arrangements of bibliographies and it is well accepted in Science Citation Index (SCI), Social Science Citation Index (SSCI), and Art & Humanities Citation Index (AHCI).

The citation analysis is also defined as, “one of the branch of bibliometrics where the unit of analysis is document, which is being cited as a bibliographic reference or as a foot note in a citing document”.

The preliminary research document or article for citation analysis is the document presentation differently recognizing the document. This document representation is generally called (Bibliographic) “references” or “citations”.

In scientific communication, the use of bibliographic references plays a very essential part. Citation analysis is a well-known research tool of bibliometric study. In libraries it is used in many different ways. In any particular scientific subject community the identification of core journal becomes possible by using the popular method that is citation analysis in any geographical area. It is a method of listing of references affixed to articles in journals and including the frequency with which journals are cited. This method indicates that the journals are the most necessary library collections, which are frequently used by the scientists.

Citation analysis gives a number of interesting and valuable visions of journals that acts as a preliminary communication medium of science. It also acts as a major method of bibliometric that considers the citations (both to and from documents). However, the study of citation emphasis on the document with their authors with cited or citing sources of publication along with place from where these documents are produced.
In the past, the study on citation was based on the number of references of articles present in limited number of journals. Here citations had to be recorded and operated manually to get the results. This made it difficult to handle huge amount of information for citation analysis. In addition, due to the tediousness process, the importance of many studies became limited in nature. Now the scenario has changed due to the introduction of computers. This has made possible to create computer printed indexes, containing citation information from hundreds and hundreds of documents along with machine readable form. This is the reason where citation analysis is considered has one of the liked field of studies in bibliometric where citation plays an important role.

To study the developments in scientific research of past and present year’s the techniques usually used was citation analysis. The scholar Garfield (1977) defined “citation analysis as an analytical tool which uses references citations of a scientific paper”. Le Pair (1988) “Citation analysis is probably a fair evaluation tool for those scientific sub fields whose journals are the formal channels of communications”. Lancaster (1991) represented citation analysis as very important branch of bibliometric studies, which tells from which journals the author have cited, the literature of a specific discipline and so forth. Citation analysis uses bibliographic references and their count to recognize the information that relates to a particular topic and is value reading. On the other hand it helps in learning how a scientist interacts with these colleagues.

By 1920’s the idea of citation analysis has documented many of citation studies. Mainly the word “citation analysis” was not seen till 1956. Till then the attempt was made to rank the journals on basis of number of average references cited in research papers.

The growth of citation analysis is marked by the creation of new methods and measures. These tools have given a quick evolution in development of number of studies using citation analysis. In any particular journal the count is applied to the appearing articles and by calculating the impact factor and the average citation received by journals articles published in a specified period. This help to compare the
“impact” of journals were different articles are published. Later it was discovered the advance improvements of citations counts were the consideration is taken into account in length of paper.

On the other side Citation analysis, is assessed as secondary methods in use of library materials. The importance of citation analysis, as a user study is also tested. The very first difficulty raised by the critics is to term the word “use”. The terminology used in library for the word “use” defines as distribution or borrowing frequency. These frequencies have no connection with those two measures. It can be said that borrowing need is not always read and what is read is not necessary need to be cited. The researchers analyses the previous and future method for example “an author need not read what he cites, nor cite what he reads”. The researcher who is greatly critical of citation analysis and defines that the research or study on citation count are ‘only suggestive’. Later the test on research such as articles of journal or thesis is done rather than the process of research. Hence their ‘findings cannot be conclusive’.

The researchers assess citation analysis as the data cited can vary in many part of the paper. In any paper the references added may not be related to the entire topic. Any Research paper will include introduction, objective, methodology and analysis. In any research citations referred in methodology part may not necessarily be in other part. Similarly, in introduction part the citation referred will usually refer to the entire article. On the other hand in experimental part the data cited in the articles will be used in some parts. This kind of uneven use and distribution of data is a control and imposed upon the citation analysis.

Researcher has raised the question on conventions and approaches of study of many citation analysis literatures. And it is also criticized on the role of citation analysis in science. The researcher states that “the citations analysis plays a peripheral role”. In his view the use of citation analysis is “formal communication channels” and deriving “empirical data”. The following reasons make the citation analysis important part of intellectual work.
1. Citation is vital for the users who have keen interest in getting more and more data about the related topics.

2. There is a change of information available on the internet and many people only download the reliable information. Therefore, in order to provide information to such people citation is very important.

3. Citation also show the efforts you made in the research and it also exhibit the innovation of your research without any plagiarism.

4. Citation gives an external support to your ideas and also increases your arguments strength.

1.2 Need for the study

The most challenging task faced by any library is the procurement of journals. In most of the university libraries in India the subscription of journals have stopped due to the shrinking budget allocations. This is making the librarians to go for other alternative methods for collection development and render quality resources to the user community.

In India agriculture is considered as a back bone to the Indian economy and the education in agriculture was started very early since ages. Now the research in agriculture is flourishing and in most of the agricultural universities awareness in research activities are reported. In turn it becomes necessary now to know the trends in agriculture research and development made in this filed. This further gives an idea for conducting a research.

The two main broad applications of citation analysis are to find out the literature usage of documents, author, subject, journals and its origin etc., and to study the use of research output in a field of study. In any particular subject to find out the core journal the citation analysis plays most important part. This makes the most important reason for studying citation analysis.

The citation analysis carried out between the specific times is useful to compare the research work carried in different departments in the field of Agricultural Science subjects. The study tries to focus on data used by researchers and helps the
librarians for better collection development and their better services. Further this kind of study helps the GKVK university library to develop a resource sharing or create consortia. Hence the study is necessary. Here the study of citation analysis is considered as best method to analyze these various attributes and it is the most essential and needful study.

1.3 Statement of the Problem

The present research study is convened under the title “Citation Analysis of Doctoral Theses Submitted to The University of Agricultural Sciences, Gandhi Krishi Vignyan Kendra (GKV), Bangalore”

1.3.1 Definition of related key concepts

In order to define the meaning of the terms in the title of the study the following definitions are given for the key terms, “Citation analysis”, “Bibliometrics”, “Scientometrics” “Ph.D. thesis”, and ‘GKVK’.

1.3.1.1 Citation analysis

Osareh (1996) defines citation analysis as “When one author cites another author, a relationship is established. Citation analysis uses citations in scholarly works to establish links. Many different links can be ascertained, such as links between authors, between scholarly works, between journals, between fields, or even between countries. One very common use of citation analysis is to determine the impact of a single author on a given field by counting the number of times the author has been cited by others”.

1.3.1.2 Bibliometrics

Potter (1981) defines bibliometrics as “the study and measurement of the publication pattern of all forms of written communication and their author”.

1.3.1.3 Scientometrics

Pouris (1989) defines Scientometrics is a application of quantitative techniques(system analysis, mathematical and statistical techniques etc.) to scientific communication(science output, science policy, science administration etc.)
1.3.1.4 Doctoral Thesis

Sengupta (1991) defined thesis as “A thesis is a statement of investigation of research presenting the authors findings and any conclusions reached, submitted by the author in support of his candidate for a Ph.D. degree in Science”.

1.4 Objectives of the Study

The specific objectives of the study are as follows:

1. To determine department-wise distribution of citations.
2. To determine bibliographical form wise distribution of citations.
3. To determine publisher-wise distribution of citations.
4. To assess the authorship pattern and execute the theory of authors collaboration.
5. To determine the consultation frequency of print-citations and web resources.
6. To study the chronological and department wise distribution of citations.
7. To establish the language wise distribution of citations.
8. To study the geographical distribution of citations.
9. To accumulate the journals ranking of doctoral theses.
10. To determine whether the supply of journal citations confirms the Bradford’s law of scattering.
11. To study the obsolescence of journal literature and study the half-life of journal citations.

1.5 Hypotheses

The following hypotheses has been framed after considering the objectives of the study,

1. The researchers use grey literature to a considerable extent.
2. The journals receives more citations than the other sources of information.
3. The researchers depend more on the current literature.
4. The multiple authorship sources recevies more citations than the sources of single authorship.
5. The Indian journals receives more citations when compared to journals of other countires.
1.6 Methodology

The institutional repository and annual report of the University of Agricultural Sciences, Gandhi Krishi Vignyan Kendra (GKVK) was searched to prepare the list of all doctoral theses submitted for the award of PhD degree between 2001 to 2011. It was found that 434 PhD theses were submitted during the period. The 11-years period (from the latest) was selected in order to keep the sample size manageable but also substantial and current.

The data was extracted from the reference pages and reference lists by taking photocopy. The total number of 56360 citations was collected from 434 theses. After the data collection the investigator generated the data worksheets using MS Excel format which was used for data entry of the citations from all theses. Citations were entered in each row with columns indicating many features of analysis include year of thesis submission, year of publication, bibliographic forms wise distribution, geographical scattering of citation, authorship pattern, ranking of authors, language wise distribution, publisher wise distribution etc. Bradford’s Law of Scattering is applied for ranking of journals, for degree of authorship collaboration K. Subramanyam’s formula is applied. The citation analysis involved an examination of the references included within each thesis.

After tabulating the data the same was analyzed in the light of the objectives. After completion of the analysis the finding are drawn and they are presented in the form of report. In doing so statistical graphs, chart and figures are drawn for clarity and simplicity of presentation.

1.7 Scope and Limitations of the Study

The scope of the study is the Citation Analysis of the Doctoral Theses Submitted to the University of Agricultural Sciences, Gandhi Krishi Vignyan Kendra (GKVK), Bangalore. The study covered a period of eleven years, from 2001 to 2011. The researcher collected 434 theses from all the fourteen departments of GKVK. During the time of data collection the Ph.D. programme was only in the fourteen departments. The main purpose of the study is to find out the current citation trends of the doctoral theses in Agricultural sciences. The researcher was able to trace the
theses which were both in the department and library for the study. The agriculture university is contributing to an overall development in the field of agriculture sciences and GKVK is supporting to the growth of research activities. So, the scope of the study is restricted to the research work carried out in the GKVK, Bangalore.

1.8 Schema of the Study
The reports of the study will be presented in five chapters.

Chapter I: Introduction
This chapter introduces the topic of the research, conveying the importance of the present study. It covers the significance of the study, statement of the problem, definitions of key concepts, objectives of the study, scope and limitations of the study and methodology adopted for data collections and data analysis.

Chapter II: Review of Literature
Chapter two presents the review of the literature on the citation analysis, studies done on Humanities and Social Science, Science and Technology and Agricultural Sciences aspect covering collaborative research, authorship pattern, scattering and ranking of journals and obsolescence of literature.

Chapter III: A Brief out Look of University of Agricultural Sciences (GKVK) and its Library Resources, Facilities and Services
This chapter presents the history and development of University of Agricultural Sciences, GKVK. It also provides brief information about facilities and services of the library.

Chapter IV: Analysis and Interpretation of the Data
This chapter gives the analysis and interpretation of data covering distribution of data, authorship pattern, degree of collaboration, ranking of authors, distribution of bibliographical form, year wise distribution, country wise distribution, language wise, publisher wise and department wise distribution, along with ranking of journals applying Bradford’s law scattering.
Chapter V: Summary of Findings, Suggestions and Conclusion

This chapter presents summary of findings of the investigation, further giving the suggestion to library for improving the situation, gives further scope for research. Later discussing and concluding the research work.

1.9 Conclusion

The outline of this chapter details the title of the research, objectives, hypotheses, scope, limitations and methodology of the study. This chapter is further followed by the Chapter II Review of literature
References


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