Chapter -1

**INTRODUCTION**

In the present age of electronic communication, the Internet is one of the most powerful tools across the world. Anywhere one goes, one can find the Internet. The Internet creates new ways for scholars to communicate and share information. There is a huge amount of information available on the Internet about every subject. In modern era growing web-based sources and emerging network technologies play a major role in the way people find and use information resources available on the Internet. The Web along with e-publishing has played a significant role in supporting research in all subjects. The technological developments and the availability of online information resources are changing the relationships between researchers and libraries. Both researchers and librarians have welcomed the benefits, these changes have brought, have adapted and are seeking to exploit their potential to the fullest. They both look forward for further change in the coming years.

The Internet has generated different information resources, which can be utilized, organized, distributed amongst different users in different contexts and countries. The World Wide Web thus constitutes an obvious research area for Library and Information Science. Today there are vast amounts of easily accessible information available to users. Some users may not be aware of the existence of useful material which is not readily accessible to them. With the introduction of new information technologies such as the Internet and desktop publishing software in the past decade, the character of literature with a “difficult” bibliographic identity is changing. In the past, such as literature, often dubbed “grey” or “fugitive” has been perceived by many as belonging to the primary sources of information.

The new technological developments and innovations come with new challenges and new expectations. But we have also sought to look forward, to gain a perspective from both researchers and librarians as to how they will contemplate library services developing in the future.

The World Wide Web- along with electronic publishing has become sources of Information for academics and researchers. With the emergence of the Internet and convergence of the information and communication technologies a change has come
in the accessibility of serials and periodicals. With the emergence of the Web and electronic publishing, scholars and researchers are able to publish their research material, papers or articles on-line without going to a publisher or a vendor and users can access information without going to the library.

According to Hawkins (2001) "The Internet has rapidly become a global publishing platform, and electronic journals covering a wide range of subject areas are now available. Information science is no exception, and we now find a significant portion of its literature appearing in e-journals."

Librarians and information workers obviously are interested in electronic journals as a means of providing information to their customers. At the same time, members of the profession are becoming increasingly interested in accessing electronic journals that relate to their own specialist concerns. Electronic journals promise to change the future of scholarly research -- both in their function as the distribution organ of research results and in their function as the basis for scholarly research and information. Turning away from the print version of a journal to the electronic version is based on ease of access because on the desktop round the clock there is the ease of downloading and citing elements and in particular the currency of the content.

1.1 Electronic Journals:

The most popular form of the study of knowledge is computer or the Internet or any intermediate medium such as CD-ROM. In electronic form, the text is available which can be read in digital format and/or printed form and the end user's computer rather than as printed form on paper. In online mode the data is downloaded directly from the host computer rather than through the Internet or CD-ROM which is the other intermediate medium.

Earlier the text was collected from the printed journals available in the market, the source of which was limited to the extent of available material only. Due to scarcity of funds or resources the library was not in a position to purchase all the journals for the study of researchers. On the other hand, these days electronic journal is available online and it may or may not be associated with a traditional printed journal. Other terms, such as online journal or e-publication, scholarly journals, electronic serials and electronic magazines are also used.
An "electronic journal" or "e-journal" is a journal which is available over the Internet in an electronic format or in the form of electronic documents. Sometimes there is an online version of a printed journal; sometimes the journal only exists in an electronic format. Some e-journals are available on the Internet for free and open access (requiring no subscription) and give full access of reading material on the Internet.

The majority of electronic journals (commonly known as e-journals) are electronic versions of print journals (e.g. Nature, New Scientist, The Economist, etc.) that one can access via the Internet. However, only new electronic journals, i.e. journals that are not produced in print, have been there for quite some time. E-Journals include all of the content that appears in the printed version of the journal, along with extra features such as links to related material, supplementary data, video clips, alerting services etc, that can't be included in a paper journal. E-Journals also tend to be more up-to-date than print journals as articles can be made available as soon as they are ready. Mostly electronic journals are available in two standard formats i.e. HTML and PDF.

With the advent of the Internet and World Wide Web, anyone with a home page can be regarded as a publisher, and even simple newsletters published erratically and infrequently might be regarded as "e-journals". At the other end of the publishing spectrum are high quality, properly edited, peer-reviewed scholarly publications that are freely available on the web. Some of these publications replicated existing publications; others exist only in electronic form.

Electronic –journals are becoming quite popular because the cost of electronic equipment is falling down considerably, thereby making e-publishing cost effective. The cost of electronic publishing and distribution has also become more economical than paper printing.

According to Jones and Cook (2000) an e-journal is a digital periodical that publishes on the Internet or WWW. An e-journal may not be all that different from a print journal in the fundamental editorial process. Articles submitted by individuals in the research journals, are peer reviewed by editorial board members of the journal to be accepted or rejected, and are subsequently published. It is the digital medium that is different.
Harrod's Librarians' Glossary and Reference Book (Prytherch, 2000) defines "electronic journal" as "Strictly a journal in which all aspects of preparation, refereeing, assembly and distribution are carried out electronically".

The Encyclopedic Dictionary of Library and Information Science define, a journal as "the record of proceedings of transactions of a learned society".

According to Pullinger and Schkel (1990) "e- journal is one whose input text may be entered directly by a computer or by other file transfer mechanisms in a machine readable form, whose editorial processing is facilitated by a computer and whose articles are thus made available in electronic form to readers."

According to Lancaster (1995) "e-journals are those journals which are available in an electronic medium and is available only in this medium."

In general a journal that is available in electronic form through an online host is called e-journals or we can say Electronic serials may be defined very broadly as any journal, magazine or newsletter which is available on the internet.

1.2 Types of E-journals

E-journals can be grouped under the following three broad categories:

- **Online Journals**: where the texts are in read on or digital format and are available on paid or cost-per-access basis via online databases such as Knight-Rider Information Inc. (Dialog), EBSCO Information Services etc. (Woodward and McKnight (1995)). Such databases have been found very useful for providing various types of library services. A researcher is in direct communication with the database. The research is conducted in a two way interaction between the researcher and with the computer. A PC, modem, STD line and, subscriber password code (Thiruvarasu (1998)) are the main ingredients of an online setup. Some of the online services can be accessed locally from three major telecommunication carriers TYRNE, TELNET and UNINET.

- **CD-ROM Journals**: Some examples of CD-ROM journals are published by various commercial publishers such as Elsevier's etc. These published journals may be bibliographical or full-text. They vary in frequency and are distributed along with search software to access and print. These days a number of publishers have started publishing some of their core journals on CD-ROMS because of the fact that these are more economical than online journals. Once they are acquired by the library, a number of users can be provided unlimited access to these CD-ROM journals.
• **Network E-Journals**: Network e-journals are electronic journals, available over a network, such as Internet, BITNET or any other commercial network. Examples of network e-journals- e-newsletters, e-discussion lists, un-moderated bulletin boards, peer reviewed journals and popular magazines etc. Many of the networked e-journals are based on mailing list software, such as LISTSERV, ListProc etc. (Kumbar and Sangam (1997)).

1.3 Access Types of E-Journals

According to John and Cook (2000) the publishers provide the following different types of access to electronic journals.

• **Free Access**: In which publishers sometimes provide access to those e-journals, which are subscribed in print format.

• **Exclusive Subscription**: It refers to those subscriptions where institutions can obtain complete access to all the journals brought out by the publisher, without the facility of subscription to the print counterpart of the issue.

• **Selective Access**: In which the subscriber chooses a few e-journals from the publisher and pay for them as per agreed terms and conditions.

• **Fee-Based Access**: Through which for the payment of an access fee, which is a certain percentage of the cost of the print journals being subscribed, the publisher provides access to its complete e-holdings. The subscriber will have to maintain the print level subscription throughout the period of the agreement.

• **Institution Vs Consortium Access**: Through which a few institutions having common interests and requirement can form a consortia for e-journal access.

• **Consortium-Based Access Model**: In which the member institutions need not subscribe to journals on ownership basis, but could access them on the Internet on payment of access.

The twentieth century may be described as the century of the development of metric sciences. In this century itself we have seen the development of librametrics, bibliometrics, scientometrics, webometrics and recently coming term Almetrics.
1.4 Bibliometrics:

The term bibliometrics was first introduced by Pritchard (1969). Bibliometric study provides careful evaluation of periodical literature by providing a complete picture of the core publications of any specific subject (Davarpanah and Asleki, 2008). "Bibliometrics" is a type of research method used in Library and Information Science. It utilizes quantitative analysis and statistics to describe patterns of publications within a given field or body of literature. Researchers may use bibliometric methods of evaluation to determine the influence of a single writer, for example, or to describe the relationship between two or more writers or works. One common way of conducting bibliometric research is to use the Social Science Citation Index, the Science Citation Index or the Arts and Humanities Citation Index to trace citations. Historically bibliometric methods have been used to trace relationships amongst academic journal citations. Citation analysis, which involves examining an item's referring documents, is used in searching for materials and analyzing their merit.

Bibliometrics can be defined as the performance analysis of science and technology performance. It utilizes quantitative analysis and science mapping to describe patterns of publication within a given field or body of literature.

The term bibliometric indicators are often used for the results of a bibliometric analysis. One of the definitions of the term indicated in the Oxford English Dictionary is “That which serves to indicate or give a suggestion of something; an indication of” (Oxford English Dictionary 2000).

Lancaster (1977) defined the Bibliometrics as “the discipline of measuring the performance of a researcher, a collection of articles, a journal, a research discipline or an institution”. This process involves the ‘application of statistical analyses to study patterns of authorship, publication and literature use’.

In 1983 the ALA Glossary of Library and Information Science, has defended the use of statistical methods in the analysis of a body of literature to reveal the historical development of subject fields and patterns of authorship, publication, and use. It was earlier called statistical bibliography.

According to Online Dictionary of Library and Information Science (ODLIS) "Bibliometrics" is the "use of mathematical and statistical methods to study the usage of materials and services within a library or to analyze the historical development of a specific body of literature particularly its authorship, publication, and use. Prior to the
mid-20th century, the quantitative study of bibliographic data and usage was known as statistical bibliography."

According to Powell and Connaway (2004) "Bibliometrics is a method for describing patterns of publications within a body of literature. It has been used in librarianship to identify core literature, classify literatures, predict publishing trends, describe patterns of book use, and chart the dissemination of ideas".

Bibliometrics (Biblio+metrics) simply means the quantitative analysis of bibliographies with the use of mathematical and statistical methods.

1.5 Scientometrics:

Scientometrics, as the name would imply, this term is mainly used for the study of all aspects of the literature of science and technology. Scientometrics is concerned with the quantitative features and characteristics of science and scientific research. Emphasis is placed on investigations in which the development and mechanism of science are studied by statistical mathematical methods. So, Scientometrics has typically been defined as the “quantitative study of science and technology” or Scientometrics- the science of measuring the quality of science.

The typical scientometrics indicator is based on measurements of scientific communications, such as bibliometrics about scientific publications (journals, patents); administrative communications concerning science and technology (patents, grants, financials); or some other observable and scientific relationship that can be analyzed and counted (Glänzel, 2010).

According to Tague-Sutclifffé (1992) “Scientometrics is the study of the quantitative aspects of science as a discipline or economic activity. It is part of the sociology of science and has application to science policy-making. It involves quantitative studies of scientific activities, including, among others, publication, and so overlaps bibliometrics to some extent”.

Other terms such as "Haukometrijia' 'Scientometrics' (used primarily in the USSR) (Kabir 1993) are also used in the literature.

1.6 Informetrics:

Brookes (1990) has suggested the word 'Informetrics' to describe quantitative studies related to all aspects of information in all forms recorded or transient.

The term ‘informetrics’ is perhaps the most general of the three terms. Informetrics may subsume scientometrics and more especially, bibliometrics;
however, workers in the three metric areas will continue to use the term they feel most closely describes their understanding of their work. In particular, researchers outside the information science discipline will continue to use the more familiar (and established) term, bibliometrics.

A brief definition is provided by Egghe and Rousseau (1990) in the subtitle of their book:


According to Wilson (2001) “… informetrics is the quantitative study of collections of moderate-sized units of potentially informative text, directed to the scientific understanding of informing processes at the social level.”

1.7 Librametrics:

Ranganathan proposed the term 'librametry' in 1948 as the application of mathematical and statistical techniques to library problems (Sengupta, 1992). Ranganathan used 'Librametry' to refer to quantitative aspects in libraries. Gopinath (1992) informed that Ranganathan practically used a discipline called Librametry for design and development of library building, furniture and Library service. However, Wilson (2001) indicates that:

“There may be value in retaining the terms ‘librametrics’ or ‘librametry’ for such studies not specifically analyzing literatures, or at least not specifically directed to the goals of bibliometrics and of information retrieval. These include analyses of book circulation…, of library collection overlap … , of library acquisitions … , of fines policy … , and of shelf allocation … – frequently using optimization techniques from operations research.”

1.8 Webometrics:

Webometrics is a study of World Wide Web, and all network-based communication, by informetric methods. The latest terminology has been used as 'Cybermetrics' 'Webometrics' for the quantitative analysis on the information on Cyber media and webs.

Webometrics is the quantitative analysis of web-related phenomena, drawing upon informetric methods (Björneborn and Ingwersen, 2004), and typically addressing problems related to bibliometrics.
1.9 Altmetrics:

In "The Altmetrics Collection," Priem, Groth, and Taraborelli (2012) define altmetrics as- "Altmetrics is the study and use of scholarly impact measures based on activity in online tools and environments. The term has also been used to describe the metrics themselves—one could propose in plural a "set of new altmetrics." Altmetrics is in most cases a subset of both scientometrics and webometrics; it is a subset of the latter in that it focuses more narrowly on scholarly influence as measured in online tools and environments, rather than on the Web more generally."

Online Collins Dictionary described altmetrics as- "A new form of measuring research impact by adding on a wider set of metrics to traditional bibliographic rankings based on academic journal citation analysis".

The inclusion of webometrics expands the field of bibliometrics because webometrics will inevitably contribute further methodological developments. As ideas rooted in bibliometrics, scientometrics, and informetrics have contributed to the emergence of webometrics, insights from webometrics will likely contribute to the development of these more established fields (Thelwall, Vaughan and Bjorneborn, 2005). The inter-relation of all these metrics has been shown in the picture given below:

![Diagram of metrics relationships]

Source: Thelwall, Vaughan and Bjorneborn 2005
1.10 Bibliometrics in Information Science

An early definition is provided by Pritchard (1969):

“to shed light on the processes of written communication and of the nature and course of development of a discipline, by means of counting and analysing the various facets of written communication … the application of mathematics and statistical methods to books and other media of communication ...”.

Broadus (1987) reviews various other definitions, and then provides the following:

“... the quantitative study of physical published units, or of bibliographic units, or of surrogates of either ...”.

White and McCain (1989) have the following definition and explanation:

“Bibliometrics is the quantitative study of literatures as they are reflected in bibliographies. Its task, immodestly enough, is to provide evolutionary models of science, technology, and scholarship”.

In contrast to the other two terms (scientometrics and informetrics), Brookes(1990) says:

“I have no doubt that bibliometrics must now be conceded to library studies only. Its work is not yet ended as libraries continue to adapt to the changing world around them. And bibliometrics itself needs the continued interest of outside experts, statisticians and others, in developing and refining its techniques”.

Egghe and Rousseau (1990) Bibliometrics is the study of documents and their bibliographic reference and citation structures.

According to Powell and Connaway (2004):

"Bibliometrics is a method for describing patterns of publication within a body of literature. It has been used in librarianship to identify core literatures, classify literatures, predict publishing trends, describe patterns of book use, and chart the dissemination of ideas". in bibliographic control, database evaluation, and collection development.

Though these definitions could apply to the study of any kind of literature — from novels to newspapers —, bibliometrics is generally used for the measurement of science and technology (Moed, 2005)
Thanuskodi (2010) defines bibliometrics as "a research method used in Library and Information Science. It is a quantitative study of various aspects of literature on a topic and is used to identify the pattern of publication, authorship, and secondary journal coverage to gain insight into the dynamics of growth of knowledge in the areas under consideration".

There are many other definitions of the term ‘bibliometrics’ in the literature; only a few have been taken. Some other important definitions given by Fairthorne (1969), Hawkins (1977), Khawaja (1987), Burton (1988), Egghe (1988) and Khurshid and Sahai (1991) have not been included here.

Bibliometrics - as a truly interdisciplinary field - has strong links with related research fields and fields of applications and services. Bibliometrics has become a standard tool of science policy and research management in the last decades. Bibliometrics is traditionally strongly related with library science, information retrieval and sociology of science, on the other hand, results of bibliometric research and technology are applied as services for librarianship, scientific information and science policy.

Bibliometrics evolved from a sub-discipline of library and information science to an instrument for evaluating and measuring the output of works or can say that Bibliometrics is one of the few subfields concerned with measuring the output of works. This tool traditionally used by the library and information science professionals for studying the communication process, information flows the others for better understanding and effective management and dissemination of information.

1.11 Uses of Bibliometric Studies:

Historically bibliometric methods have been used to trace relationships amongst journal citations. The bibliometric research uses various methods of citation analysis in order to establish relationships between authors or their work. The Bibliometrics studies are used in

i) Measuring the scattering of articles on a subject in various periodicals (Bradford).

ii) Measuring the productivity of an author based on the number of published articles. (Lotka).

iii) Ranking of words in a text based on frequency of occurrence of words.
iv) Productivity count of literature.

v) To identify the peers, social change and the core journal, etc.

vi) Indexing and Thesaurus;

vii) Research;

viii) Formulating search strategies in case of automated system;

ix) Comparative assessment of the secondary services;

x) Bibliographic control;

xi) Preparation of retrospective bibliographic; and,

xii) Library Management.

1.12 Bibliometric Laws:

There are three main classical laws used in bibliometrics. These are Lotka’s law of scientific productivity (1926), Zipf’s law of word occurrence (1933) and Bradford’s law of scatter (1934).

1.12.1 Lokta’s law:

It describes the frequency of publication by authors in any given field. It states that the number of authors making "n" contributions is about $1/n^\alpha$ of those making one contribution, where $\alpha$ nearly always equals two.

Lokta's law, which describes the productivity distribution among scientists, as, for example, how many scientists will author ten or more paper?

1.12.2 Zipf's Law:

Zipf’s law was concerned with word frequency or occurrences (Zipf, 1949). The Law states that in a relatively lengthy text, if you "list the words occurring within that text in order of decreasing frequency, the rank of a word on that list multiplied by its frequency will equal a constant. The equation for this relationship is: $r \times f = k$ where $r$ is the rank of the word, $f$ is the frequency, and $k$ is the constant (Potter 1988).

1.12.3 Bradford's Law:

Bradford's law, describes how literature in a subject is scattered or Distributed in journals. This law is also known as Bradford's Law of Scattering and Bradford distribution. The phenomenon of publication is increasing because of electronic journals, so the information is not scattered in literature only, it also scattered in e-
journals. According to Bradford's law of scattering one third of the articles on the subject are printed in the journals devoted to that subject, another one third is published in a larger number of journals devoted to related subjects, and the remaining are in an even larger number of journals in which such articles, normally, would not be expected to be published. Bradford's law is perhaps the best known of all the bibliometric concepts. This law is also useful for the librarians because it helps in identifying the core sets of journals, which publish the most contents of a given field. So in modern day financial crunches, a typical Bradford analysis suggests which journals will be included in a library collection.

1.13 Statement of the Problem

Bibliometric studies are used to identify the pattern of publication, authorship, citations and secondary journal coverage in the hope that such regularities can give an insight into the dynamics of the area under consideration and consequently lead to a better organization of the literature.

Bibliographical information in the field of periodical literature in Library and Information Science is not properly controlled. Due to this, duplication in research occurs for want of proper bibliographical control. Although a few researchers have compiled bibliographies on electronic journals in various subject fields, but a comprehensive bibliometric analysis has not been done. Therefore, researchers working in Library and Information Science are not being in a position to use the original electronic journal literature effectively.

Therefore, this research study on ‘Electronic journals in library and information science: a bibliometric study’ was taken up.

1.14 Objectives of the Study

The study was undertaken with the following objectives:

1. to determine authorship affiliation and collaborative pattern in electronic journals,

2. to find out institutional and national parameters in electronic journals,

3. to find out subject diversity of electronic journals in Library and Information Science,
1.15 Need and Purpose

Today, technology plays a significant role in society which is dramatically influencing modern day life. The desire for important and reliable information has lead to a continually increasing interest in the public for electronic materials, which is easily available through the Internet.

The phenomenon of publication is increasing because of electronic journals, so the information is not scattered only in literature but it is also scattered in e-journals. For the fulfillment of the stated purposes of this study to accumulate all the bibliographic information of published literature at one place to create as a database to facilitate the future researchers, and conduct a bibliometric study to do quantitative analysis of different aspects of the research output to facilitate further the policy makers and the administrator for research funding.

There is inadequate bibliometric analysis and bibliographical control of printed and electronic journals in LIS. Bibliographic control and analysis of research literature are time consuming and require concerted efforts on the part of researchers. Bibliometric analysis of existing literature acknowledges the efforts made by people and organizations involved in the research process. It also provides useful guidance for future research as it points out the areas which need further consideration. Therefore, this study is undertaken to bridge the gap in bibliometric analysis and bibliographical control. The purpose of this study is to provide an analysis of the distribution, authorship patterns, and growth of electronic journal literature in Library and Information Science. This study attempts to accumulate all the bibliographic information of published literature at one place to create as a database to facilitate researchers in Library and Information Science.

Literature on any subject or discipline is a mirror of its development, which help to analyze the growth of the discipline and to overcome its weaknesses if any. Bibliometric methods have been widely used in LIS research to analyze the growth of literature of the subject.
1.16 Research Methodology

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry, especially through the search for new facts in any branch of knowledge."

Electronic Journals in Library and Information Science were identified on the following parameters:

- Electronic only
- Peer-reviewed contents

Searching of electronic journals was carried out using directories such as Directory of Open Access Journals (DOAJ) (www.doaj.org); DMOZ Open Directory Project (www.dmoz.org), LISA (LISA: Library and Information Science Abstracts) (www.csa.com/factsheets/lisa-set-c.php), and other web-based and printed scholarly sources. Peer-reviewed contents of selected journals were downloaded and their peer-review articles their bibliographic details etc. were analyzed on different bibliometric parameters set out in the objectives; viz

- authorship pattern
- institutional and national pattern
- subject diversity of e-journals
- Country-wise distribution
- Prolific authorship pattern

In this study, the subject of cited journals was examined to identify the main class, subclass and subject diversity of e-journals for LIS by Library and Information Science Abstracts (LISA).

The methodology used in the present study is bibliometric analysis, which is used to study, in fact, the bibliographic attributes of the articles published in ten electronic journals in Library and Information Science for the period 2004-2012. Total 1965 articles in these journals have been taken up for the study. The information
has been extracted from the website and then used MS Excel to organize, tabulate and analyze the data for the study in the form of tables, figures and pie charts.

1.17 Scope and limitation of the study

The scope of bibliometrics includes the study of relationships within literature and describing the literature. Bibliometric studies are generally based on quantitative measurements without any qualitative evaluation. They are, therefore, considered only as partial indicators of scientific progress. The scope of bibliometrics includes studying the relationship with citation studies or describing literature typically. Such descriptions focus on consistent patterns, involving authors, monographs, journals or subject / language. It is a quantitative science and is divided into two basic categories. Descriptive and Evaluative bibliometrics. The descriptive bibliometrics further includes the study of the number of publications in a given field or productivity of literature in the field for the purpose of comparing the amount of production during different periods or different subdivisions of the field. This kind of study is made by a count of the papers, books and other writings in the field or often by a count of these writings which have been abstracted in specialized abstracting journals. Evaluative Bibliometrics includes the study of literature used by research worker in a given field. Such a study is often made by counting the references cited by a large number of research workers in their papers.

Accessing electronic publications over the Internet was unacceptably slow, and incorrect or out-of-date electronic addresses turned locating documents into an extremely time-consuming task. Reliable links are the backbone of electronic services. If electronic journals are to be effectively used, the reliability of electronic references must stabilize. In fact, the bibliometric rankings correlate fairly well with the expert rankings.

Keeping in view scope of Bibliometric studies in general, this study of ten electronic journals in Library and Information Science was conducted. The study includes year-wise distribution of articles, thematic issues, authorship pattern, subject diversity, institutional affiliations, country-wise contribution and prolific authorship etc.

This study is limited to 10 electronic journals in Library and Information Science covering research articles, reviewed papers, case studies published in these journals.
References:


