CHAPTER - I

INTRODUCTION

1.1 BIBLIOMETRICS: AN INTRODUCTION

Bibliometrics is the statistical analysis of bibliographic data, which is a research method used in Library and Information science. Bibliometric studies include studies of literature growth of specific subjects, how much literature is contributed by various individual researchers, groups, institutions or countries. In an era of information explosion, bibliometric techniques help the researchers to quantify the process of written communication. Researchers use mathematical and statistical tools to analyse and measure scattering of literature output of a particular subject, measuring the literature output through language wise, geographical wise, document type wise, institution wise etc.

Bibliometrics is an interdisciplinary and multi-disciplinary science. As an interdisciplinary subject, the science of bibliometrics measures different fields in the discipline of library and Information science. As a multi-disciplinary subject, the science of bibliometrics borrows the concepts from statistical methods, sociological themes like survey studies and concepts of information technology for processing data.

Bibliometrics is a research area in which, the researcher studies “information processes and information handling in libraries and information centres by quantitatively analyzing the characteristics and behavior of documents, library staff and library users”.

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1.2 HISTORICAL OVERVIEW OF BIBLIOMETRICS

Cole and Eales (1917) presented the first recorded study on bibliometrics in the journal *Science Progresses*. This study which was termed as Statistical analysis of literature, analyzed publications in comparative anatomy by simply counting the number of titles, books and journal articles and publications in comparative anatomy from 1543-1860. Later Hulme (1923) introduced the term ‘Statistical Bibliography’ by analyzing the journal articles in English International Catalogue of Scientific literature and the analysis was made with the productivity of countries. This is considered as the second reported work on bibliometrics. The first recorded study of citation data and a third in a bibliometric study was brought out by (Gross & Gross, 1927). Finally in 1969 it was Alan Pritchard, who introduced the term ‘bibliometrics’ to replace the earlier word ‘Statistical bibliography’ used for the same concept. Meanwhile in 1948, S R Ranganathan introduced the term ‘Librametry’ to study various library operations by applying statistics (Amudhavalli, 1997). In 1970s, Russian concept ‘Scientometrics’ and FID’s ‘Informetrics’ were also applied almost for the same concept as bibliometrics. In 1969 Vassily V Nalimov and Z M Mulchenko coined the term in Russian as ‘Scientometrics’ (Naukometriya) which is used to describe study of science, its growth, structure, interrelationships and productivity. The term Scientometrics gained wide recognition by the publication of the journal ‘Scientometrics’ by Tibor Braun in Hungary in 1978. Much of the scientometric studies are indistinguishable from bibliometrics and much bibliometric researches are published in the journal ‘Scientometrics’.
Nacke (1979) introduced a term ‘informetrics’ which is also closely related to bibliometrics and scientometrics. In 1984 the All-Union institute of Scientific and Technical information (VINITI) established a Federation Internationale de la Documentation (FID) committee on Informetrics. Under Nacke’s chairmanship, informetrics was taken as a generic term for bibliometrics and scientometrics. Four conferences were held from 1988 to 1990 and in the final conference titled ‘International Conference on Bibliometrics, Informetrics and Scientometrics’, a special issue in informetrics appeared in the journal *Information Processing and Management*. In early 1990s the term informetrics enjoyed widespread recognition but the confusion in the use of the three closely related terms- bibliometrics, scientometrics and informetrics was not solved. After the advent of internet, additional metric terms entered into the literature of information science. In 1995 Bossy introduced the term ‘Netometrics’ to describe the scholarly interaction with internet media. In 1997 Almind and Ingwerson suggested ‘Webometrics’ for the study of World Wide Web and all network based communications, followed by ‘altmetrics’ to measure diverse products like datasets and blog posts.

1.3 DEFINITION AND MEANING OF BIBLIOMETRICS

The word ‘bibliometrics’ is a combination of two words i.e. ‘Biblio’ and ‘Metrics’. Biblio is derived from Latin/Greek word ‘biblion’ means books, Metrics is derived from Latin/Greek word ‘Metricus’ or Metrikos which means measurement.

Pritchard (1969) stated that bibliometrics deals with application of mathematics and statistical methods to books and other media of communication. Fairthorne (1969) defined the same as quantitative treatment of properties of recorded discourse and behavior appearing to it.
Bibliometrics is the most useful method for assessing the macro research output. Research sustains innovation and innovation is one of the main driving forces behind economic growth. Therefore the ability to estimate research performance is vital for Government to know the real worth of their research investments. Two different methods of evaluating research output are in practice by counting the number and share of publications and measuring citations of authors and their publications. These methods of measurement are widely implemented internationally also for the recognition of the contribution of authors even for recommendation of Nobel Prizes.

Mapping of science is the second procedure in evaluative bibliometrics, focusing the displaying of structural aspects of the research (Braam, Moed, & Raan, 1991). Co-citation technique was introduced by Henry Small at the Institute of Scientific Information and developed further in the seventies (Small, 1973). In the beginning of early eighties co-word technique was introduced and developed (Callon et al., 1983). At the start of nineties, combination of both co-citation and co-word were developed to use one technique to validate the results obtained by others (Peters & Raan, 1993).

1.4 BIBLIOMETRIC LAWS

The three fundamental laws which laid the formation of bibliometric laws are

1. Lotka’s inverse Square Law of Scattering of productivity
2. Bradford’s law of Scattering of Scientific papers and
3. Zipf’s Law of Word Occurrence
1.4.1 Application of Bibliometric Laws

Lotka’s Law

Lotka (1926) proposed his inverse square law, correlating contributors of scientific papers to their number of contributions. His law provided fundamental theoretical base for authorship pattern. Lotka checked the decennial index of ‘Chemical Abstracts’ 1907-1916 and counted number of names against which appeared 1,2,3 etc. entries. He tabulated the data for 6,891 names, beginning with letter ‘A’ and ‘B’. A graph was plotted on a logarithmic scale, the number of authors against the number of contributions made by each other and it was found that in each case the points were closely scattered about a straight line, having a slope approximately two to one. On the basis of the data, Lotka deduced an equation, for the relation between the frequency ‘y’ of persons making ‘x’ contributions as $x^ny = \text{Constant}$.

And for the special case $n=2$, the constant is 0.6079, it was summarized as for every 100 authors contributing one article, 25 will contribute two articles, about 11 will contribute 3 articles and 6 will contribute 4 articles and so on.

Bradford’s Law of Scattering

Bradford (1934) examined two bibliographies prepared in the Science Library on Applied Geophysics (1928-31) and Lubrication (1931-32) and he prepared lists of journals arranged by decreasing order of source items contributed by the journals to the bibliographies. He noticed that in each subject there were a few productive sources, large number of sources which were moderately productive and still a large number of sources of constantly diminishing productivity. In the list of
periodicals ranked by diminishing productivity Bradford identified three groups of periodicals, produced approximately the same number of articles on the subject, but the number of periodicals in these three equiproductive zones increased by a constant factor. Based on this the law was stated, “If scientific periodicals are arranged in the order of decreasing productivity of articles on a given subject that may be divided into a nucleus of periodicals more particularly devoted to the subject and several groups or zones containing the same number of articles as the nucleus when the number of periodicals in the nucleus and succeeding zones will be as 1: n: n^2, 39.”

Zipf’s law of Word occurrence

Zipf (1949) stated that a relation between the rank of a word and the frequency of its appearance in a long text. If ‘r’ is the rank of a word and ‘f’ is its frequency, then mathematically Zipf’s law can be stated as,

\[ rf = c \]

where ‘c’ is a constant

The law described that in a long textual matter, if words are arranged in their decreasing order of frequency, then the rank of any given word of the text will be inversely proportional to the frequency of occurrence of the word.

1.5 BIBLIOMETRIC INDICATORS

Bibliometric indicators are tools, used to measure and assess the quantity and impact of scientific publications as a proxy for the overall output of scientific research and are based on a count of scientific papers and the citations they receive.
There are two types of bibliometric indicators:

1.5.1 Quantitative Indicators

Authorship pattern, author productivity, collaborative index, science production index, activity index, productivity index, participative index are some of the quantitative indicators, which measure the productivity of particular research like counting the publications of a given country, publication types etc.

1.5.2 Qualitative or Performance Indicators

Journal performance indicators like journal impact factor, immediacy index for calculating the average number of times the article is cited, cited half-life, calculated from citation indices, Eigen factor, a rating of the total importance of a scientific journal, h-index, an author performance index which aims to overcome a bias against highly cited papers inherent in the h-index. Performance indicators include international collaborative index like, Affinity index, to identify the affinity of a country with another country by calculating the collaborating nature and internationalization index, to find particular country’s international collaboration.

1.6 LEVELS OF AGGREGATION IN BIBLIOMETRICS

The distinction between three levels of aggregation is important in the methodology of bibliometrics (Glanzel, 2002).

Micro level: Publication output of individuals and research groups

Meso level: Publication output of institutions, studies of scientific journals
Macro level: publication output of regions and countries

1.7 USES OF BIBLIOMETRIC STUDIES IN LIBRARIES

From the beginning of twentieth century, librarians were searching for a solution to the problem of ever expanding library collections to find out the suitable place to accommodate them. Quantitative assessments were taken by the professionals for future space requirements in large libraries and small libraries were facing the problem of limited funding. They are planning for purchasing of maximum reading materials with minimum fund. The reading materials here include particularly at journals, materials like databases or information services in the library collections. In this juncture bibliometric studies are identified as one of the best way in getting knowledge of scientific productivity of individual authors, scientists, institutions and journals, to ascertain the pattern of growth of literature and the nature of research publications. It also helps to identify the age of literature used and information needs of scientists etc.

There were not many articles seen in bibliometrics until 1968. However in late 1980’s more number of publications were made in the form of Journal articles. These studies helped librarians to make vital decisions for selecting a journal for the subscription in the library within the limited budget allowance. It enables a scientist for a national award or a prestigious fellowship and in turn makes the scientists realize the value of their own work particularly. Bibliometric studies are used in tourism research and growth of literature and to estimate the comprehensiveness of secondary periodicals in tourism (Srivastava, 2010).
One of the main uses of bibliometrics is the identification of key publications in the development of a discipline, where the importance of a publication is assumed to be approximately by number of citations to it (Willett, 2008).

1.8 LIBRARIES AND INFORMATION TECHNOLOGY

With the rise in annual price of serials and monographs, libraries generally experienced a decreasing purchasing power. But the increase in scholarly publishing continued unabated. Internet is playing a major role in the increase in publication of electronic journals, subject wise databases, preprint servers, abstract and indexing databases and general information sources.

E resource is an electronic information resource that can be accessed on the web, on or off campus. User can get the required information at right time. The types of content included in e resources are full text, images, primary research material, sound and films.

In recent decades, a wide variety of formats like CD-ROM is available in plenty. Advances in Information Technology have increased capabilities of libraries to store, process and retrieve large volume of information easily, speedily and more accurately at least cost in libraries. The technological tools for disseminating information have progressed from conventional books and journals to electronic journals and online databases making it possible to explore the world wide pool of knowledge while sitting at one’s desk (Bagley, 2013).
1.8.1 Types of Online Databases

Earlier obtaining access to printed indexes was a difficult task which consumed significant time of the researchers. The development of electronic information has significantly reduced the time and effort for this type of research.

The internet and printed matters are the two distinct kinds of information sources which are merged as single category. Internet is now a medium which provide access to print academic journals. The best organized print online texts are carefully selected, catalogued, indexed and stored in databases that allow sophisticated searches. With a commercial value, a single journal article is indexed in many online databases. Not only academic journals, syllabi of universities, reference sources are also available as an online database (Dochartaigh, 2012). The information available for searching is stored in the database system on direct-access storage devices that permit instantaneous response. The range of subject information available is one of the great advantages of online searching. Libraries, which cannot afford to purchase all the texts or printed indexes that are currently being published are benefitted from the availability of this facility.

Libraries are increasingly faced with acquisition choices between different versions of the same databases, with decisions based on their levels of usage of the different files and the types they most commonly perform. Many of popular databases are available with more than one vendor, often in slightly different forms and at different prices, so that it pays to do some comparison shopping and to analyze library use patterns over the years, though one also needs to be aware of how rapidly these are changing (Babu, 2013).
It is difficult to price a manual search in a realistic fashion, but it is clear that online searches save a lot of time because a single search covers the entire retrospective file. In some of the cases it is also cheaper than the print version (Tiwari, 2002). Originally it was feared that many libraries would cancel subscriptions to printed index publications as a result of having online access. In reality that has not happened and over the years online costs have risen slowly than print in general. Research libraries continuously subscribed to print journals, and they provide access to and preserve the bibliographic resources for continual support of research, teaching and learning needs of the academic communities.

Internet application in libraries includes information retrieval and downloading, communication which are used for posting messages in online bulletin boards, information transfer, information processing, e-mail, chat groups and collaboration resource sharing and screen sharing (Egghe & Rousseau, 1990). The introduction of electronic journals has transformed scholarly communication in extraordinary ways. OPAC (Online Public Access Catalogue) and Web OPAC are replaced with conventional catalogues in libraries.

Library professionals use the online databases for analyzing their own journal collections and for advising researchers on the selection of journals for publishing their findings, and for avoiding costly publications. In general the databases provide search facilities to users by subject, type of literature and other logic features. Bibliographic databases offered responsive services like literature search and bibliography compilation by downloading and these databases may be used for bibliometric analysis.
1.8.2 Bibliometric Analysis using Electronic Bibliographic Databases

Earlier sciences and medicine were the subjects which got more citation works. There were numerous reasons for this, ranging from the need of science policy to the central importance of journals in science. Later some valuable surveys relating to the literature of the social sciences appeared. These studies provide a solid basis for distinguishing between the characteristics of the different subjects that fall within the overall field of the Social sciences. Bibliographic databases normally contain the following relevant information.

Scientific publications

1. Source identification (journal title, publication year, volume, page)
2. Names of authors
3. Corporate addresses
4. References
5. Document type
6. Title, controlled terms, keywords, abstract, subject headings
7. Acknowledgements

1.9 SOFTWARE TOOLS AVAILABLE FOR BIBLIOMETRIC STUDIES

After the introduction of information technology, computerized data processing became popular among the researchers. This has prompted to develop the following bibliometric software tools like Bibliometrics Toolbox, Dataview, Bibexcel and BibtechMon.
The Bibliometrics toolbox was the first bibliometrics Programme package which was developed by Terrence A. Brookes. It helps to analyse the downloaded data for the preparation of statistics. Turbo Pascal program was used to write this programe for analysis and this freeware tool helps to measure the bibliometric aspects of the literature like productivity ranks, degree of clustering, indices of concentration and Bradford law of distribution.

Dataview, Bibliometrics software for analysis of downloaded data is commercial software. It acts as a bridge between various information sources and data analysis methods. Data view accepts various formats of information sources like online database and CD edition databases in order to help the researcher to develop their own statistical techniques.

BibTechMon is a commercial product developed at the Australian Research Centre Seibersdirf. It is used for documentation and structuring of external information from patent and bibliographic database available on the internet.

Bibexcel, a bibliometric toolbox, developed by OllePersson, Inforsk, Umea Univ (Sweden) is used for the analysis of this study. Bibliographic data in a textual nature can be analysed in this software. Number of tools, available in Bibexcel and some of them are visible and others hide behind the menus. Bibexcel also generates several maps for visualization of output, using multi-dimensional scaling techniques. Bibexcel helps in bibliometric analysis and citation studies.
1.10 NEED FOR THE STUDY

Eventhough the field of bibliometrics, which is useful for planning of information provision, belongs to the parent subject Library and Information science, it is found that the Librarians does not usually include bibliometrics in their practical work. Many reasons were analysed for the non-use of bibliometric applications in the library. Bibliometric studies are time consuming and give a simplified picture of a complex reality. While implementing bibliometric tools on a day today basis, the librarians must take more efforts to account many variables which are specific to the academic community to which they belong.

In general the volume of bibliometric studies reported in the literature is big and difficult to put together and compare. Bibliométric studies in libraries especially in research libraries should use refining techniques, to compare the results of one study with another. Bibliometric studies are becoming more important in research libraries where the service of describing the content, structure and development of research are the basis of collection development (Sternberg-Ungern, 1998).

Invention of printing machine by Gutenberg in 1452 is one of the revolutions of human knowledge development. All human knowledge and information are easily available through print media in the form of books, journals and other form of documents. But nowadays information generation is growing so fast in respect of time and cost, space is also a vital problem in the library. At the same time information technology, computer and telecommunication developed tremendously which directly affects the publishing industry and now society is increasingly becoming a paperless society. It is widely accepted that bibliometric data helps in
taking management decisions in selecting specific primary and secondary journals and helps in planning future staff, building needs and improving library services. Bibliometric study also provides information about the structure of knowledge and pattern of communication (Mahapatra, 2009). In this context the researcher, being an information professional in the field of Tourism, has undertaken a study on how the bibliometric tools and techniques can be implemented in the literature of tourism research, as there are not many studies in this area.

1.11 TOURISM

Tourism is a people to people business. The term travel and tourism is used to describe human and business activities associated with one or more aspects of the temporary movement of person away from their immediate home communities and daily work environments for business, pleasure and personal reasons (Dann, Nash, & Pearce, 2010). The main resources of tourism such as climate, beaches, scenic views, host culture and certain other intangible products are inherently non-industrial. The invention of motor car, advance in rail transport together with construction of networks of highways gave a boost to domestic and international tourism (Cooper et al., 2008). The first fifty years of 20th century made tourism a major worldwide industry. A large number of people were moving out both for leisure and business purpose. Tourism covers expansive spread of activities and these activities make tourism one of the major income generating industry.

1.11.1 Tourism Development

Academic research has played an important role in the development of Tourism. (Jennings, 2010; O’Conner & Baum, 2008). Now Tourism is recognized as a
powerful economic and social force worldwide. Tourism development in India received little importance during the initial years of Indian planning. In the first five year economic plan (1951-56) no allocation was made for the tourism sector development. Since the seventh plan (1985-90) onwards, a considerable importance was allotted to the sector. However the real take off of Indian tourism started only in the mid-nineties. During the period, Indian tourism received proper dynamism of growth with the adoption of the policy of economic liberalization (Bhatia, 2006). As an income generating industry, future of Tourism in India depends largely on human resources and how we train them. The National Committee on Tourism set up by Government of India in 1988 has observed that we may spend crores of rupees on building infrastructure but it is the service personnel who alone can make them come alive. The National Tourism Policy 2002 of Government of India emphasizes that tourism has enormous potential for creating jobs for the unemployed youths. The employment potential is the highest in the tourism sector as compared to any other sector which require tourism education (Bhardwaj, 2006). Tourism education contributes to the industry and society in several ways. It involves teaching, training, advising and developing mass awareness about the critical tourism issues, concepts, tools and techniques. Tourism is a unique discipline which connects the industry and academic research in a big way. On the basis of that the last twenty years have witnessed a virtual information explosion related to tourism, travel, recreation and leisure with the advent of internet.
1.11.2 Development of Tourism Literature Resources

Tradition of writing travel accounts and publishing travel-tourism literature is not a new phenomenon. Tourism literature can be traced to the early second century. Through the centuries styles, forms, formats, subject matter, motivation of writings, market demands, and concepts etc have changed widely (Ray, 2011). Even in the absence of formal definitions, the literature on tourism flourished consisting of informative writings and scholarly articles. A competent tourism researcher must be well acquainted with the available resources and should acknowledge the ways of acquiring them. For example, tourism economic information is collected from all over the world, year after year to track the levels and changes in tourism activities. Many companies and industrial organizations routinely collect information in their business or industry and then disseminate this information to decision makers of the company (Cook, Yale, & Marqua, 2006).

In vast majority of cases tourism literature will be text, including figures, tables, and diagrams. Scholarly literature was produced to prove that Tourism is the industry which should serve the community first and the tourist should be served second. The development of Tourism is dependent on activities like tourism research and support of local communities. The Journal of Travel Research, the first North American scholarly journal in the field of tourism was published in 1972. It was followed by Annals of Tourism Research in 1973. Prior to 1972, only five journals related to tourism existed. The Switzerland based International Association of Scientific experts in Tourism published the first tourism journal, ‘Tourism Review’ in 1946. Turizam, later known as Tourism was published in Croatia in 1956. The World Leisure Journalis, a scholarly journal was published

Internet is also replacing many other forms of information sources. People today use internet like how they have used Encyclopedias, magazines, newspapers, catalogues, etc, earlier (Theobald & Dunsmore, 2000).

Tourism information can be accessed from websites of libraries around the world like ‘The Library of Congress’ and the ‘British Library’. Apart from library catalogues, various databases sponsored by other organizations with a reference value are available. In addition to books and periodicals, many online catalogues are available to retrieve the information related to Tourism Publications.

### 1.11.3 Process of Tourism Research

For every human being, information is the basis for decision making and it is the task of travel research to gather and analyse data to help travel managers make decisions. Tourism managers got information base from travel research for effective planning and decision making. Availability of adequate facts allows managers to develop policy, plan, operate and control more efficiently and decreases the risk in decision making process.

Useful travel research depends on precise identification of the problem, a thorough situation analysis supplemented by an informal investigation of the problem, careful research design and meticulous collection. Travel research helps the
systematic impartial designing and conducting of investigations to solve travel problems. Although travel research does not make decisions, it does help travel decision makers operate more effectively. Apart from statistical data and market trends, it produces incomes, jobs and taxes. This positive phenomenon stimulated public and private sector to expand research activity in developing and promoting tourism.

1.11.4 Electronic Tourism Databases

Tourism research is facilitated by Electronic communications and the most popular tourism research bulletin board is TRINET. It was Prof. Pauline Sheldon from the University of Hawaii, who established the Electronic Bulletin Board, where hundreds of tourism practitioners, academicians and researchers are exchanging their views, exploring issues and getting professional help in research. The introduction of sharing the knowledge electronically encourages the collaborative research globally.

‘The International Centre for Research and Study on Tourism’ (CIRET) in France is the largest database on Tourism. The research and documentation center of CIRET is collecting, cataloguing, annotating, and distributing the literature of Tourism, outdoor recreation and hospitality literature around the world. The documentation centre at present contains 1,55,844 documents. The documents are classified by theme and by country with the geographical index. The website lists over 773 research centers located in 106 countries and 4,594 researchers in 118 countries. More than 290 publishers are listed in this database. The services are
available free to researchers and students in order to encourage networking among research community globally (Goeldner & Ritchie, 2012).

*The United Nations World Tourism Organization (UNWTO) e-library* facility offers wide coverage of Tourism literature, market trends and statistical barometers. The *e-UNWTO* is a fully cross-searchable interactive database offering a vast number of high-quality *UNWTO* publications including books, journals, and statistics in their respective languages. In addition to more than 1100 books in English, French, Spanish, Russian or Arabic, the *e-UNWTO* also provides access to a growing number of documents which can be defined as ‘Gray Literature’. The latest statistical information and aggregated data on inbound and outbound tourism are very conveniently presented within the ‘Tourism Fact Book’.

Hospitality and Tourism index is a comprehensive index that combines the records of Cornell University's former Hospitality database, Articles in Hospitality and Tourism (AHT) formerly co-produced by the Universities of Surrey and Oxford Brookes; and the Lodging, Restaurant & Tourism Index (LRTI), formerly produced by Purdue University. Domestic and international sources are included in range and scope, with material collected from countries and regions such as Asia, Australia, Canada and Europe. This bibliographic database focusing scholarly literature in hospitality and Tourism covers more than 1 million records with 860 publications with the coverage dating back to 1930. The subjects included in this database are Culinary Arts, Demographics & Statistics, Development & Investment, Food & Beverage Management, Hospitality Law, Hotel Management

Leisure Tourism database contains Leisure, Recreation & Tourism Abstracts (CABI) and CAB e books Leisure Tourism collection, including extensive information from the leisure, recreation, sports, hospitality, tourism and culture sectors. Along with many Reports, many travel Guide books like *Fodor* and *Frommer, Berlitz Pocket guides, The Lonely Planet, Access and Michelin Green Guides, Insight and Eyewitness Guides, Let’s Go, Rough Guide, Time Out and Moon* are available electronically (Mancini, 2010).

**1.11.5 Tourism Research through Bibliometric Studies**

Tremendous growth of tourism as a field of study, coupled with increasing demand for tourism education has led to a heightened focus on research and publications, which require bibliometric skills along with subject knowledge (Chon et al., 2005). Earlier tourism research was conducted in elaborate and descriptive manner. Today travel research runs from simple facts gathering to complex mathematical models (Chawla, 2004). Tourism researchers utilize virtually every quantitative and qualitative technique available. The study of tourism or tourism research was undertaken for the determination of economic benefit. The tourism industry was viewed as an economic development tool globally, particularly for those nations with minimal or no primary or technological resources. Dating from 1950s and 1960s, the economic tradition is the predominant planning approaches adopted for tourism development (Hall, 2000). Economic information is collected from all over the world, year after year to track the levels and changes in tourism activities.
(Brotherton, 2008). As a consequence economic advantage research focused on tourism as an economic activity, in particular to the advantage and disadvantages of tourism.

Moreover tourism research is conducted for the sake of the public policy makers, those who make decisions in Governmental bodies, public/private organizations, and those making informed decisions. Many companies and industrial organizations routinely collect information in their business or industry and disseminate information to decision makers of the company (Walker & Walker, 2011). Tourism infrastructure like water, police, fire protection, attractions and waste management is developed by Government for which they need facts so that they can initiate policies and actions. Commercial enterprises need inputs from studies on traveller trends as well factors influencing business success. Non-Profit Organizations require greater information on their role as developers and managers of important parts of tourism such as museums, festivals and cultural events. The need for tourism research arose later as there took place promotion of tourism through large funding without much for research.

The knowledge of scholarly literature has been augmented by a considerable body of statistical research. The exponential growth of tourism literature on information science coupled with the availability of sophisticated computer based statistical software packages for data analysis have encouraged further collection of quantitative and qualitative data. This science is being referred to as ‘Bibliometrics/Scientometrics/Informetrics’.
1.11.6 Mapping of Tourism Research

Application of mapping in bibliometrics tries to focus on bibliometric measurements like direct citation analysis, co-citation analysis, bibliographic coupling, co word analysis using high-frequency keywords and it uses variety of mathematical and statistical methods to analyse scholarly articles in scientific journals and books (Zheng, Hu, & Ma, 2013). This study enables researchers to understand various dimensions of the particular subject and the analysis of keywords may also be used for the building of Thesaurus in a given subject. This study also focuses to extract the high-frequency keywords from the literature and to further explore scholarly research in depth.

The aim of this study was to adopt a bibliometric analysis of visualized knowledge mapping along with a statistical literature analysis of research in tourism.

1.12 STATEMENT OF THE PROBLEM

Earlier librarianship meant the acquisition and organization of library collection and helping the library users with information retrieval systems. Online access to search tools made researchers do the research without the help of librarians. So the need for redefining the role of librarianship emerged. The behavioral and social aspects of Information seeking and usage has increased and system oriented information retrieval research has decreased.

Today, the exponential growth of literature promotes the librarians to introduce bibliometric studies in various disciplines especially to evaluate research performance. Bibliometric study is identified as one of the best way in getting
knowledge of scientific productivity of individual authors, scientists, institutions and top ranked journals to study the pattern of growth of literature and the nature of research publications. In the genuine attempt of finding the growth of tourism literature by using various bibliometric indicators, the following questions emerge which need to be reconciled.

After 1980 when most articles are published in the form of Journal articles, this helps the librarian to make vital decisions for selecting the core journal for the subscription in the library. The librarian is confronted with questions and issues like, what is the total tourism literature output? What is the percentage level of Indian contribution in the total tourism output? What is the relative growth rate of Tourism literature? What will be the Tourism literature growth after ten years? In which document type, the tourism researchers prefer to publish their articles? Identifying the top tourism International institutions, their contributions and international collaborations, how to find the h-index of a particular researcher? Finding appropriate answers to these questions made the researcher focus on the topic ‘Mapping of Scholarly Literature in Tourism: A Bibliometric Analysis’.

1.13 OBJECTIVES

The specific objectives of the study were:

1. To identify and analyze the rate of growth of scholarly publications in the field of Tourism.

2. To identify relative growth rate and doubling time for scholarly publications in Tourism.
3. To identify document types and preference of publications among International/Indian researchers.

4. To identify highly productive Institutions and their International collaboration.

5. To assess Indian scenario in Tourism research.

6. To identify levels of productivity of Tourism literature available in various subject categories.

7. To analyze authorship pattern and examine the extent of research collaboration in Tourism Literature.

8. To examine country wise distribution of research output and the nature of collaboration amongst highly productive countries.

9. To visualize results, by applying various mapping tools.

1.14 HYPOTHESES

In accordance with the objectives of the study, the following hypotheses were formulated

1. Growth of publications in the field of Tourism is exponential

2. Research productivity of Tourism follows logistic/linear growth pattern

3. Research productivity of Tourism conforms to Lotka’s inverse Square law of author productivity
4. Tourism literature conforms to that of the Bradford’s law of Scattering

5. Subject-wise category distribution of Tourism publications differs among various countries

1.15 SIGNIFICANCE OF THE STUDY

This study focuses on the assessment of important aspects of research productivity in Tourism using bibliometric techniques. Not only libraries and Universities, but policy makers in Tourism may perform bibliometric analyses to evaluate research in different departments. Smaller libraries also tended to emphasize disseminating information on bibliometrics and bibliometric indicators, to individual scholars and research groups among the academic community. This expanded role has increased the visibility of libraries in an institution. The academic community also experiences an increase in systematic evaluation of research systems and allocation of funds. New possibilities and expectations have been attributed to academic libraries. Making studies on bibliometrics of the particular discipline increased the competencies of librarians in an academic context. It also makes a scientist for National award or a prestigious fellowship which makes the scientist aware of the value of the research work.

Bibliometric studies demonstrate the value of an individual research to the University in the academic arena. The bibliometric studies identify future research priorities by analysing the strength and weakness of research. It also helps to decide in which journal the articles should get published and helps in identifying top researchers in a subject area by locating potential collaborators and informing recruitment process.
1.16 SCOPE OF THE STUDY

This study focuses on the assessment of important aspects of research productivity in Tourism using bibliometric techniques. This study aims to quantify tourism research and growth of literature and to estimate the comprehensiveness of secondary resources. The coverage of the study is restricted to the data downloaded from ‘Scopus’ database for a period of 30 years from 1984-2013. Scope of the study also includes information, concepts of statistical aspects of language, word and phrase frequencies in both natural language, measuring author productivity by number of papers or other means, degree of collaboration, characteristics of publication types, sources, citation analysis through visualization techniques and mapping tools. With respect to subjects, language, documents and their content the evaluation techniques were applied.

1.17 LIMITATIONS OF THE STUDY

1. This study does not include the informal publications and communications.

2. The data used for this study were downloaded only from the database Scopus. When downloading the data from the database for various analyses in different periods, slight modifications were identified in the total collection of data during the research period.

3. Techniques of bibliometrics are vast, only selected major indicators have been used in the study.
1.18 CITATION STYLE USED IN THE THESIS

As per the guidelines given in the style manual, being a social science research, the researcher has adopted APA style manual for citing the references. Two methods of citation systems, enumerated and author date system are followed in the research field. In the study the author date system is followed.

1.19 ORGANIZATION OF CHAPTERS

Chapter 1: Introduction

It gives a clear picture of application of information technology and bibliometrics in libraries. Objectives, hypotheses, scope, relevance and significance of the study are also discussed in this chapter.

Chapter 2: Review of Literature

An attempt has been made in this chapter to review important studies in the area of bibliometrics of research productivity.

Chapter 3: Research Methodology

This chapter is devoted to research design consists of area of study, sources of data, period of Study, framework of analysis and operational definitions of concepts used in the study.

Chapter 4: Data Analysis and Interpretation

This chapter analyse the data and interpretation, demonstrates with tables and graphs derived from the data downloaded from Scopus.
Chapter 5: Testing of Hypotheses

This chapter tested the hypotheses cast, with the application of Chi-square test, f-test and ANOVA test.

Chapter 6: Mapping of Tourism Literature

This chapter visualizes the results of co authorship, co-citation analysis and word count analysis by applying mapping tools like VosViewer, PAJEK and GPS Visualizer.

Chapter 7: Findings and Conclusion

This chapter gives the findings and conclusion of the study in detail.

Bibliography

Appendix
REFERENCES


http://listserv.lub.lu.se/mailman/listinfo/metrics, retrieved on 22.1.2015
