CHAPTER-II

REVIEW OF LITERAUTRE

2. INTRODUCTION:

Bibliometrics is a well-established discipline of qualitative and quantitative study of the various aspects of literature in given a subject. The basic principles of Bibliometrics lies on sound theoretical foundations laid most effectively by such pioneers viz., as Lotka, Gross, Bradford, Zipf, Derek J de Solla Price, Bookstien, Mandelbort, Brookes, Narin, Garfield, Vickery, Cole brothers Pritchard, Hulme, Fair throne and many others, and its techniques are capable of throwing light on various complicated problems faced by information scientists to quantify the process of written communication.

The literature of Bibliometric is now growing rapidly, and this chapter attempts to review the related literature and summarize the important research findings related to various aspects of the present study. The first review of Bibliometric empirical Laws was written by Fairthorne in 1969. Hjerppee complied a bibliography of more than 2020 items (upto1979) arranged alphabetically by first author. Sen and Narendra Kumar (1986) reviewed of Indian contributions relating to Bibliometrics for the period 1958-1984. The study covered 164 published articles cited as references which are appended in Indians and foreign journals.

Bibliometrics analysis of citation data from the literature of the humanities is limited. Even today due to the subject limitation of most Bibliometric researchers. The review of literature conducted by the present researcher based on the Journals available at the Andhra University Library and covered articles published between the year’s 2000-2011. The review observed that the Bibliometric studies and citation analyses are distributed and spread over various subject areas.

The Doctoral Dissertations in Library and information Science in India 1997-2003; a study carried out by R.K.Mahapatra and Jyotshna Shaho (Annals of library and information science Vol. 51 June 2004 shows that out of total of 164 PhDs covering
various specialisations out of which, 19, were related to Bibliometrics and citation analysis which shows the emphasis given to this area of study and research in India.

2.1. Reviews on Thesis of Bibliographies awarded by different Universities:

Many bibliometric studies based on citations appended to theses and dissertations have been carried out by various researchers. La Borie and Halperin (1976)\(^1\) studied the citations in Library and Information Science dissertations to find out the adequacy of Drexel University library in supporting research programmes in Library Science.

Maheswarappa and Prakash (1982)\(^2\) analyzed the literature use pattern by researchers in the field of botany by analyzing 2,726 citations appended to 15 doctoral theses accepted by the University of Mysore during 1973-1980.

De Oliveira (1984)\(^3\) studied citation patterns in the Veterinary Sciences by analyzing 495 citations in 14 master degree theses submitted to the Universidade Federal de Vicosa, Brazil. The bibliographic form-wise, country-wise distribution of citation, half-life of Veterinary literature was about 12 year and the literature did not conform to Bradford’s law of scattering.

Nweke (1988)\(^4\) studied 964 citations in eight theses in Zoology submitted to the Ibadan University, Nigeria, during the period 1970 to 1975. The bibliographic form-wise distribution of citations reveled that journals are the major source of information. English was the most preferred language of communication of research.\(^4\)

Arjunlal (1989)\(^5\) studied the citation analysis of doctoral dissertations in the field of Agricultural Science in Bihar. The bibliographic form-wise distribution of citations showed that journals are important source for scholarly communication.

Sangam and Biradar (1990)\(^6\) analyzed 7,576 citations appended to 145 M.S. dissertations in Surgery accepted by the Gulbarga University, Gulbarga, during the period 1982 to 1989. out of total citations are distributed into bibliographic from wise, Language-wise geo-graphical form-wise. The half-life of the cited journals literature was observed to be 12 years.
Lancaster (1992)\textsuperscript{7} has studied a bibliometric analysis of the citations to Ranganthan’s writings over the period 1956-1990. The findings indicate that his influence has not diminished over the years.

Madkey and Rajyalakshmi (1994)\textsuperscript{8} studied citations appended to doctoral dissertation in the field of environmental science and engineering, which were consulted by the scientists working at National Environmental Engineering Research Institute, Nagapur, during 1977-1991. The results revealed that the single author papers were most in number, geographical distributions of citations and the half-life period for books and journals was found to be 17 to 18 years.

Vimala (1997)\textsuperscript{9} studied the information use pattern of researcher in Biology Sciences by analyzing the citations in 200 doctoral theses in Biological Sciences, submitted by Sri Venkateswara University, Tirupathi. The citations are distributed into the bibliographic from-wise, country-wise. The study of the authorship pattern and half-life period of journal citations was found to be 11.43 years and 12.79 years of book citations.\textsuperscript{8}

Vagiswari (1997)\textsuperscript{10} studied the publishing patterns of Indian Astronomers and Astrophysicists for the years 1969-1988. The results showed that the average productivity of foreign Ph.D holders differs significantly from that of Indian Ph.D holders.

Lee (2000)\textsuperscript{11} studied the publication rate of successful doctoral students in the fields of analytical chemistry, experimental psychology and American Literature. The results showed that there was a decline in solo authorship in many fields, participation rates for chemistry and literature showed initial increases, while the participation rate in Psychological has remained between 40 and 60 percent.\textsuperscript{11}

Dorasamy and Pulla Reddy (2001)\textsuperscript{12} studied in doctoral theses in Geography accepted by Sri Venkateswara University, Tirupathi during the period 1991 to 2000. The findings showed that books were highly cited sources. The country-wise scatter of citations showed that India occupied first position. The result revealed that the single author papers were highest in number.
Hirwade and Dankhade (2002)\textsuperscript{13} carried out a citation analysis of 23 doctoral dissertations in the field of economics, submitted to Nagpur University during the period 1996 to 1999. The bibliographic form-wise distribution of citations showed that books are most cited sources. The results revealed that the single author papers were most in number.

Ashu shokeen and Sanjay (2003)\textsuperscript{14} the citation study on Indian Journal of Economics is to find out the authorship pattern and citation pattern of articles appeared in IJE published between January to December 2002. Total 37 articles, 701 citations and 1038 authors have been published. The results revealed that single authored is predominant. In the half-literature 358 articles are less than 10 years old, 102 citations are less than 20 years, majority of documents cited in journals were published not more than 20 years ago.

2.2. Theses awarded in the area of Bibliometrics by Andhra University

Valasayya,G. (1997)\textsuperscript{15} “Literature use patterns of scholars in Telugu Language and Literature: A Bibliometric study: conducted a Literature use pattern among the Research Scholars in Telugu Language and Literature., during 1945-1992, at Andhra University. The questionnaire method has been used to collect data about the information use patterns of the Research scholars, arrived the bibliographic form in Telugu Languae and Literature in the conclusion.

Aruna Prasad Reddy (1999)\textsuperscript{16} studied the citations appended to 186 doctoral dissertations in the field of Chemistry accepted by the Sri Venkateswara University, Tirupathi. The bibliographic form-wise distribution of citations revealed that journals literature was most preferred source of information. The study of the authorship pattern showed that papers with multi-authors were the highest in number. The half-life period for journals citations was found to be 17.84 and 17.68 years for book citations.\textsuperscript{10}

Siva Pradas,G. (2003)\textsuperscript{17} carried out a citation analysis of 165 doctoral dissertations in the field of Geology, accepted by Andhra University, Visakhapatnam during the period 1954 to 2001 The bibliographic form-wise distribution of citations
showed that books are most cited sources. The results revealed that the Multi authored collaborative papers high in journal literature in the field of Geology.

Andhra Matha (2004) The study is concerned with the analysis of citations cited in 263 doctoral theses awarded by Andhra University during the period from 1943-2002, in the field of Physics and its sub disciplines. The present investigation was concentrated on the type and characteristics of literature used by researchers in the field of physics as a whole and in 9 sub disciplines of Physics. Different categories of documents Viz. Books, Conferences proceedings, Journals, Manuals memories, Monographs, Theses, Patents, Reports and few unpublished documents references by the researchers are covered in the citation analysis. The total numbers of theses awarded were 263 during the above said period. The subjects involved were classified and grouped into 7 sub disciplines of Physics.

Govinda Raju, N.(2007) The study is concerned with the analysis of citations appended in 192 doctoral dissertations in Economics awarded by the Andhra University, Visakhapatnam, during the period 1950 to 2002. The results revealed that the literature used by the researchers in Economics and Sub-disciplines by bibliographic form-wise, subject-wise, country-wise and also discussed half-life literature Bradford’s law of scattering, availability of literature in the Dr.V.S.Krishna Library,Visakhahapatnam.

Surayanarayana,V.V.V (2007) Bibliometric study of doctoral theses in Library and Information Science awarded by different Universities of Andhra Pradesh (1982-2004). The bibliometric analysis can be applied in many areas such as selection of books, periodicals and other subject literature in the libraries. The citations appended to this thesis have been analyzed to draw conclusions and inferences identify the different forms of literature used by LIS researchers.

2.3. BIBLIOMETRICS, SCIENTOMETRICS AND INFORMETRICS

The characteristic and source of data for Bibliometric studies, most of which come from references, bibliographies, citations and patent literature have been reviewed Bultter (1991) analyzed 16 Library periodicals with respect to various characteristics of subject covered and research methodologies Qui (1991) quantitatively analyzed the
trends of LIS research subjects in China and again compared the subject trends of Sino-American LIS research. Citation analysis of 1906 citations collected from the marathwada University Journal covering the period 1975-84; was made to by Deo (1991) determine the use pattern of the literature by the scholars in the field of Zoology. Subramanian and Navaneetham (1992) discussed various features of the issues of the quarterly Library Science with a Slant to Documentation and ‘Information Studies’ published during 1981-90. The studies identified the variation in content analysis which emphasizes on information technology and quantitative studies, author-affiliation, which emphasizes the dominance of in Indian authors, single-authorship and belonging to research centers. Application books of inferential statistic like ANOVA (Analysis of Variance) the Correlation and Regression, techniques used in the Library situation was discussed in detail. Amba (1993) Humayoon Kabir (1994), studied the authorship pattern and the extent of research collaboration in the field of bibliometric literature based on the data collected from LISA (1964-1990). The study revealed that solo research is more favorable than the collaborative research. Gayatri, Mahapatra (1994) presented a Bibliometric analysis of 187 citation classics published in Current Contents (Agriculture, Biology and Environmental Sciences) during 1986 and 1991. It was concluded that environmental sciences is the most popular fields of research and most of the classics have expressive titles.

Kalyane (1994) was considered as a successful role model scientist. His 254 research publications were analyzed by year, domain, journal title and the collaboration pattern highlighting his research style. Citation analysis of authors and journal in Indian library and information literature Gayatri Mahapatra (1994) showed, that the Indian authors and journals occupied heights rank, whereas books published from USA, ranked as the top core books.Sarala (1995) analyzed the citation to papers published in the Journal of Tropical Agriculture from 1989-94. To find the most frequently cited periodicals by agricultural scientist of Kerala. A list of 30 most commonly cited periodicals has been prepared. A bibliometric study on Bibliometrics literature is reported; by Kabir (1995). based on the entries noticed in LISA from the year 1964 to 1990. It is observed that solo research predominates, with 65 percent of the total with single authors and the proportion with multi-authors is 2:2:1.
Pillai and Kumari (1995)\textsuperscript{32} traced the origin, development and applications of informatics in the field of information science. Acceptance of the generic term “informatics” to denote various studies applying quantitative methods is suggested. Chen and others (1995)\textsuperscript{33} examine two problems associated with Bradford’s law: first since empirical data deviate from the law in many applications what are the significant factors influencing the Bradford graphs. And second what will be the evaluation overtime of the Bradford graphs a computational analysis of the two problems is made based on Herbert Simons model. Several significant findings about the dynamic behavior of Bradford’s law are identified. Dalai and Ramesh (1995)\textsuperscript{34} analyzed the citations to papers published in the Journal of scientific and Industrial Research (JSIR) during the year 1988 to 1993.

Deo (1995)\textsuperscript{35} has carried out bibliometric analysis of 4,066 citations collected from the doctoral dissertations on the English Language and Literature accepted by Dr. Babasaheb Ambedkar Marathwada university to determine the use pattern of the literature by the researchers in English. Kulkarni(1996)\textsuperscript{36} presented an elementary study on growth of research yoga, literature ,trends in collaboration, authorship pattern, identify core journals and the different area of research

Asundi and Humayoon Kabir (1996)\textsuperscript{37} presents a new criterion evolved by experience to indentify a list of core and selected Indian periodical in Horticulture. A Study of citation from the doctoral and master’s degree dissertation in the field of horticultural from 1980-1989 as the main source of data is computed for this study. This process generated 95 percent of the citations from 85 percent of the Journals such additional criteria are identified in the study and rank journals for the selection of core items. Suresh and others (1996)\textsuperscript{38} present author productivity patterns of Indian Potato Research for the period 1900-1980 and applications of Lokta’s Law in its different forms. Jose and Korah (1997)\textsuperscript{39} conducted a Bibliomtric study of the natural rubber bibliographies published in India during the period 1983 to 1994. The authorship pattern, year wise distribution, subject wise analysis and bibliographic forms of literature in the 1037 entries were studied. Core journals and core authors were also identified.
Citation is a worldwide phenomenon. It needs to be considered in the international context. Liu (1997) examines four common modalities: physical accessibility, cognitive accessibility, perceives quality, and perceived importance underlying the complex citation practice by translation analysis. In an analysis of the Chinese literature in library and Information Sciences. A quantitative treatment of the characteristics and behavior of scientific research output in Kerala during 1979-94 has been carried out by Sudhier (1997) to find out the growth rate of literature, subject-wise distribution of publications, authorship pattern, relative contribution of institutions, comparison of research works of universities, and scientific productivity of different districts in the state.

Senapti and Chand (1998) present the findings of a bibliometric study on Journal of Family Welfare during the period 1990-97. It examines year-wise distribution of papers, distribution of papers country-wise and institution-wise, authorship pattern etc. It also shows subject-wise break-up of articles, average length of papers and study of references provided in the articles. Kumbar and Akhtary (1998) have conducted a bibliometric analysis of 7,451 citations appended to 322 articles published in American Journal of Ophthalmology, to determine the average number of citations per articles, types of literature cited, authorship pattern, obsolescence of literature, and ranked list of cited periodicals.

A study by Urbizagastegui-Alvarado (1999) testing Lotka’s law that in a particular field over a particular period a small proportion of authors produce the greater proportion of articles, with a negative relation to their productivity of about 2.199 articles by 1124 authors cited. Results confirmed the law in this particular field. Moseed and Raan. (1999) explore the possibility of combining the 2 main pillars of evaluative bibliometrics, performance analysis, and science mapping, both of which have their strengths and imperfections. Shows how the imperfections are dealt with by an integrated analysis.

Spantu. (1999) after a general presentation of bibliometrics at a national and international level, focuses on the creation by the first national bibliography of citations of Romanian scientific and technical articles published in the country and abroad.
According to Yepes. (1999) Bibliometrics offers an effective set of tools for establishing indicators but carries risks, such as excessive simplification and dependency on North American Scientific Imperialism. Yoshikane (2000) observed that Bibliometric phenomena often produce highly skewed distributions where most of the items (articles) are “concentrated” in a small population of sources (authors) while the remaining items are spread out over the rest of the population. While many measures of “concentration” have been proposed the notion of concentration is not clear. He reviews the notion of concentration from 2 viewpoints: viz absolute concentration and relative concentration. Analyses by linking the 2 viewpoints with the geometric expression of the Lorenz curve and the characteristics of concentration measures through the simulations using the geometric expression.

Nascimento (2000) reports the results of a bibliometric study on the subject of Brazilian doctoral theses at Spanish universities submitted between 1992 and 1995. A statistical analysis was conducted in 3 stages: identification of theses; features of doctoral students; and citation analysis of the most productive groups in the field of human sciences at Universidad Completteness and in the field of science and technology at the Universidad Polytechnic de Madrid. Findings revealed the extent of the Brazilian contribution to scientific output in Spain. Zhang (2000) compares the three fit methods of Lotka’s law, and implies that non regression analysis is the best of the three.

Anducika, Omez and Gomez (2000) presents a characterization of bibliometric output in Colombia resulting from research projects financed by colciencias between 1983 and 1994 in the following programmes, health sciences, basic science; energy and mining; agricultural sciences; technological, industrial and quality development; marine sciences; social sciences; education; environment and habitat: and electronics, tele-communications and information systems. Finds a low index of publication per project and a high tendency in the distribution of publications to concentrate on few actors (researchers, institutions, origin of the publication, journals, and human resources). Also finds a strong concentration of bibliometric output in the programme of basic sciences, in fields such as photochemistry and solid state physics (super and
Zainab (2000) presents a literature review covering various methods for studying and assessing academic research including: the estimation of publication output, citation counts, weighting publications, peer ratings, recognition and multiple indicators. The study also describes institutional correlates of publication productivity with factors such as funding, library resources and electronic support. Juznic (2000) opines that there is a need for an adequate citation theory is becoming an important theme in bibliometrics. It is important, when using bibliometrical methods such as citation analysis, that librarians do not perform only routine searches, but also offer their users more useful data.

Bordons, and Gomez (2001) conducted a case study in the area of chemistry, in which a series of different bibliometric indicators for measuring interdisciplinary are presented. They analyzed the indicators viz. ISI multi classification of journals in categories; patterns of citations and references outside category; and multi assignation of documents in Chemical Abstracts sections. Studies converge between the different indicators, determines the most appropriate indicators depending on the size of the unit analyzed (area, category of journal). White (2001) describes the ways of automatically generating 15 kinds of personal profiles of authors from bibliographic data on their publications in databases. According to Tsay (2001) citation analysis has been an important area of informatics or bibliometrics for several decades and mainly deals with the study of the relationship between citing and cited documents.

Kretschmer, and Rousseau. (2001) empirically shown that, even using the normal or total counting procedure. Lotka’s law breaks down when articles with a large i.e., more than a hundred, number of authors are included in the bibliography. Studying articles with many authors means dealing with items (the articles) having multiple sources (the authors), hence Egghe’s generalized success-breeds-success mode, leading to not necessarily decreasing distributions, explains the observed irregularities.

Lewison (2001) studied the output of female researchers in Iceland, relative to that of males, can be investigated because typically their “surnames” end in “dottir” whereas the names of males end in “son”. Over the 21 years from 1980 to 2000, there has been a rise in female: male output from 8 percent to about 30 percent. It is higher
in the life sciences (biomedical research, biology and clinical medicine) but where there is foreign co-authorship, suggesting that females are less able to make overseas contacts through travel. Belver, Henry and Small (2001)\textsuperscript{59} analyses the contribution to memorial issues in honor of the Belver, C Griffith (1931-1999) a key US figure in the early development of the intertwined fields of bibliometrics, Scientometrics and scientific communication. Gives a personal account of the author’s work with Griffith, which he describes as a creative and sometimes difficult collaboration and contrasts their views. Bensman’s. (2001)\textsuperscript{60} study was based on the faulty use of Spearman ranking Correlation Coefficient, and the controversy was instrumental in causing Brookes, B.C. to investigate bibliometric laws as probabilistic phenomena and begin to link the bibliometric which the biometric revolution. Concludes with a resolution of the controversy by means of a statistical technique.

Dore and Ojasoo (2001)\textsuperscript{61} compared the publication output patterns of 48 countries in 18 disciplines over a 12-year period, 1981-1992. Analyses how these output patterns evolved over the 12 years. The time scale that best fitted the data was not a linear but an elastic scale. Although different countries laid emphasis on publication in different disciplines, the overall tendency was toward greater uniformity in publication patterns with time.

Ivancheva (2001)\textsuperscript{62} attempts to answer the question: why do most bibliometric and scientometric laws reveal characters of Non-Gaussian distributions, i.e., have unduly long “tails” Tries to apply the approach of the “Universal Law” discovered by Stankovm,G., uses the basic principle of the reciprocity of energy and space. Propounds a new “wave concept” of scientific information for explaining the well known bibliometric and scientometric distributions. A corollary is that “alpha equals 1” is the most reasonable value for the family of Zipf laws applied to information or social phenomena. Burrell (2001)\textsuperscript{63} disputes the views of Abe Bookstein who advocates the central role of the classical Lotka Bradford Zipf “laws” in bibliometrics and, subsequently, scientometrics and informetrics. Kostoff (2002)\textsuperscript{64} describes a study whose objective was to gain a better understanding of control group requirements for credible normalization. Citation analysis was performed on the prior publications of two
proposing research units to help estimate team research quality. Citations of each unit’s publications were compared to citations received by thematically and temporally similar papers. Identification of thematically similar papers was complex and labour intensive. Even with the relatively few control papers selected. In conclusion, enumerates four components that a credible citation analysis for determining performer or team quality should have.

Rowlands (2002)\textsuperscript{65} introduces a new bibliometric tool, the journal diffusion factor. Argues that the bibliometric indicators commonly used to measure the quality of research (journal impact factor, immediacy index and cited half-life) offer little insight into the transdisciplinary reception (thus the wider influence) of periodicals. The journal diffusion factor describes a neglected dynamic of citation reception and is intended as a complementary partial indicator for research evaluation purposes, to be read alongside existing well-established indicators. Abt and Garfield (2002)\textsuperscript{66} found that in 41 research journals in the physical, life, and social sciences there is a linear relationship between the average number of references and the normalized paper lengths. For most of the journals in a given field, the relationship is the same with in statistical errors. For papers of average lengths in different sciences the average number of references is the same within plus or minus 17 percent. Because papers of average length in various sciences have the same number of references, concludes that the citation counts to them can be inter-compared with in that accuracy. However, review journals are different: after scanning 18 review journals, found that those papers average twice the number of references as research papers of the same lengths.

Alvarado (2002)\textsuperscript{67} applies the results of the application of Lotka’s Law to 10 subject areas in Brazilian national literature using minimum square and maximum probability estimators. The subjects included medicine, iron and steel, library science and veterinary science and appeared to conform to different models. Qiu,J. and others. (2002)\textsuperscript{68} fully reviews and summarizes the progress of bibliometrics in China, in 3 phases: beginning, initial development, and further development. Examines the status quo, highlighting important progress made in 7 different areas. Concludes by looking at trends and prospects from 6 aspects, with optimism about future development.
Newby, Greenberg and Jones (2003)\textsuperscript{69} applies Lotka’s Law to metadata on open source software development. Lotka’s Law predicts the proportion of authors at different levels of productivity. Open source software development harnesses the creativity of thousands of programmers worldwide, is important to the progress of the Internet and many other computing environments. Examines metadata from the Linux Software Map (LSM) which documents many open source projects and Source forge, one of the largest resources for open source developers. Authoring patterns found are comparable to prior studies of Lotka’s Law for scientific and scholarly publishing. Lotka’s Law was found to be effective in understanding software development productivity patterns and offer promise in predicting aggregate behaviour of open source developers. Wiberley (2003)\textsuperscript{70} article outlines a methodological approach to developing bibliometric models of the sources used in different types of humanities scholarship. It identifies five types of scholarship: description of primary sources, editing of primary sources, historical studies, criticism, and theory. It illustrates the approach through an analysis of sources used in fifty-four monographs in literary studies and art scholarship. The article shows how the five types use combinations of sources that differ in format, age, and subject. Glanzel, and Bart . (2003)\textsuperscript{71} According to Garfield (1980), most scientists can name an example of an important discovery that had little initial impact on contemporary research. This study is focused on a large-scale analysis of the citation history of all papers indexed in the 1980 annual volume of the Science Citation Index. The objective is two-fold, particularly, to analyze whether the share of delayed recognition papers is significant and whether such papers are typical of the work of their authors at that time. In a first step, the background of advanced bibliometric models by Glanzel, Egghe, Rousseau and Burrell of stochastic citation processes and first-citation distributions is described briefly. The second part is devoted to the bibliometric analysis of first-citation statistics and of the phenomenon of citation delay. In a third step, finally, delayed reception publications have been studied individually. Their topics and the citation patterns of other papers by the same authors have been studied to uncover principles of regularity and exceptionality of delayed reception publication.
Debackere and Glanzel (2004)\textsuperscript{72} describe the development of a methodology and an instrument to support a major research funding allocation decision by the Flemish government. Finally, based on our current experience and interactions with the universities involved, we speculate on the future of the specific bibliometric approach that was now been adopted. More specifically, we hypothesize that the allocation method now developed and under further improvement will become more criticized if it turns out that it (1) also starts influencing intra-university research allocation decisions and, as a consequence (2) introduces adverse publication and citation behaviors at the universities involved. Gorman (2004)\textsuperscript{73} finds that citation counts and impact factors can be easily manipulated. He gives a strong view to controversial subject. Kurtz and other (2005)\textsuperscript{74} discusses about the easy accumulation of a new type of bibliometric measure, the number of electronic accesses (“reads”) of individual articles. They have explored various aspects of this new measure. They examined the obsolescence function as measured by actual reads and show that it can be well fit by the sum of four exponentials with very different time constants. They compare the obsolescence function as measured by readership with the obsolescence function as measured by citations.

Weingart (2005)\textsuperscript{75} considers bibliometric ranking as an answer to legitimating pressures on the higher education and research system. After years of hesitation by scientists, science administrators and even politicians in many of the industrialized countries, the implementation of bibliometrics based (and other types of) rankings for institutions of higher education and research is now being introduced on a full scale. Rousseau, (2005)\textsuperscript{76}. Analyses the article content, qualitative evaluation of its subsequent impact, citation analysis, and diffusion analysis. It was held that the content, further developments and influence on the field of informatics. A review is given of the contents of Fairthorne’s original article and its influence on the field of informatics. Its Transdisciplinary reception is measured through a diffusion analysis. Egghe (2005)\textsuperscript{77} had given a definition of systematic sampling in items and sources in the framework of an IPP in which we have continuous variables. We prove the theorem that in such IPPs we have a Lotkaian size-frequency function (i.e., a decreasing power function) and only if systematic sampling sources are the same as systematic sampling in items. In this proof we use the well-known characterization of power functions as scale-free functions.
Robert. (2005)\textsuperscript{78} present examples of hyperbolic distributions that have a bearing on the bibliometric application and discuss the characteristics of hyperbolic distributions and the Bradford distribution. The findings are Hyperbolic distributions are the inevitable result of combinational necessity and a tendency to short-term rational behavior. Originality/value: Supports Bradford’s conclusion from his law, i.e., that to know about one’s specialty, one must go outside it. Matsuyama and Terauchi (2005)\textsuperscript{79} tried to clarify bibliometrical characteristics of Japanese top 30 universities’, articles published in 1997 and 2003. For this study, authors used two JOIS files, JSTPlus and JMEDPlus. This study shows, number of articles published by each university, average numbers of authors and affiliations per article, how articles are concentrated in limited number of journal titles, and what to extent authors affiliated with universities are co-authored with industries, foreign organizations, or four particular research organizations. Sarasvathi and Raghavendra (2005)\textsuperscript{80} suggests that the periodical literature that are citing are mostly falling under different sub-disciplines. Citation analysis is needed in this study. The main objective of citation analysis is to evaluate and interpret citations received by articles, authors institutions and other aggregates of scientific literature. The periodical literature contributed towards the field is widely scattered both under subject and origin. Egghe (2005)\textsuperscript{81} describe the discrete Lotka power function describes the number of sources (e.g., authors) with n=1,2,3, …items (e.g., publications). As in econometrics, informetrics theory requires functions of a continuous variable “j”, replacing the discrete variable n. Now “j” represents item densities instead of number of items. The continuous Lotka power function describes the density of sources with item density “j”. The discrete Lotka function one obtains from data, obtained empirically; the continuous Lotka function is the one needed when one wants to apply Lotkaian informetrics, i.e., to determine properties that can be derived from the (continuous) model.

Bailon-Moreno and others. (2005)\textsuperscript{82} opined that bibliometric laws of Zipf. Bradford and Lotka, in their various mathematical expressions, frequently present difficulties in the fitting of empirical values. These modifications not only affect Bibliometrics and Scientometrics, but also, for the generality of the fractal model, apply to Economy, Demography, and even Natural Sciences in general. Glenisson, Glanzel, and Persson. (2005)\textsuperscript{83} concerned full-text analysis and traditional bibliometric methods are combined
to improve the efficiency of the individual methods in the mapping of science. The methodology is applied to map research papers from a special issue of Scientometrics. The outcomes substantiate the such hybrid methodology can be applied to both research evaluation and information retrieval. Thed, and Moed. (2005) show that these aspects of journal impact measurement play a significant role, and are strongly inter-related. Especially the separation between journals on the basis of the differences in output volume seems to be relevant, as can be concluded from the different results in the analysis of journal impact factors, the degree of uncitedness, and the share of a journal its contents above or below the impact factor value.

Jonathan (2005) addresses the objective of developing forward indicators of research performance using bibliometric information on the UK science base. Most research indicators rely primarily on historical time series relating to inputs to, activity within and outputs from the research system. Policy makers wish to be able to monitor changing research profiles in a more timely fashion, the better to determine where new investment is having the greatest effect.

Zitt, Ramanana-Rahary, and Bassecoulard. (2005) opine that citation practices strongly depend on fields; field normalization is recognized as necessary for fair comparison of figures in bibliometrics and evaluation studies. However fields may be defined at various levels, from small research areas to broad academic disciplines, and thus normalization values are expected to vary. The aim of this project was to test the stability of citation ratings of articles as the level of observation – hence the basis of normalization changes. Gauffriaux and Larsen. (2005) observed that rankings of countries research output based on number of publications or citations compared with population, GDP, P&D and public R&D expenses, and other national characteristics. The counting method is decisive. Total counting (full credit to a country when at least one of the authors is from this country) and Fractional Counting (a country receives a fraction of full credit for a publication equal to the fraction of authors from this country) of publications give widely different results. Counting methods must be stated, rankings based on different counting methods cannot be compared, and Fractional Counting is to be preferred. Alvarado. (2005) found that the generalized inverse power distribution by
the minimum least squared method and the Kolmogorov-Smirnov test was used to evaluate the fit of the observed and expected data. With \( n = -2.14 \) and \( C = 0.648715 \) at 0.01 level of significance, a critical value of 0.202177 with a maximum deviation of 0.151285, was observed. Therefore, the literature fits Lotka’s model. Lotka’s law of science productivity among authors and within institutions was examined Rai and Kumar. (2005)\(^8\) with the help of empirical data. Based on these findings an attempt is made to rationalize the law.

Patra, Bhattacharya And Verma. (2006)\(^9\) analyse growth pattern of core journals and authors’ distribution in the field of bibliometrics using data from Library and Information Science Abstracts (LISA). Growth of literature does not show any definite pattern. Bradford’s law of scattering is used to identify core journals and found “Scientometrics” as the core journals in this field. Lotka’s law was used to identify authors’ productivity patterns. It is observed that authors’ distributions do not follow original Lotka’s law. Study also identified 12 most productive authors with more than 20 publications in the field.

Lundberg and others (2006)\(^10\) have assessed the scientific production in two areas at one research institution during a ten year period. We explore the recall and precision of three article identification strategies: journal classifications, keywords and authors. Our results show that the different search strategies have varying recall (0.38-1.00) and precision (0.50 – 1.00). In conclusion, uncritical analysis based on rudimentary article identification strategies may lead to misinterpretation of the development of research areas, and thus provide incorrect data for decision-making. Must, (2006)\(^11\) observes to what extent research proprieties set in R&D policy strategy documents are supported with publication and citation data, delivered from ISI databases. As supporting background information the results of questionnaire sent to the Committee of Senior Officials of the Cooperation in the field of Scientific and Technical Research are used.

Anthony and Raan. (2006)\(^12\) present an empirical approach to the study of the statistical properties of bibliometric indicators on a very relevant but not simply “available” aggregation level of the research group. We focus on the distribution functions of a coherent set of indicators that are used frequently in the analysis of
research performance. In this sense, the coherent set of indicators acts as a measuring instrument. Better insight into the statistical properties of a measuring instrument is necessary to enable assessment of the instrument itself. The most basic distribution in bibliometric analysis is the distribution of citations over publications, and this distribution is much skewed. Buter and others. (2006)\(^94\) developed a tool that interfaces between a qualitative map and a bibliometric map which lets the user create a correspondence between the distinct vocabularies of the maps. They also conducted two user studies; the first explored the combined use of bibliometric and qualitative maps and the second the preferred format of the map and the word-usage in the description of its elements. According to Walthur and Nourohammadi. (2006)\(^95\) the relation of the number of citations per publication that Garfield considered in 1976 and 1998 as a constant, has increased significantly in the Science Citation Index. Measures such as impact factors, most cited articles and uncitedness play an important role in this context. Uncitedness does not increase because of the relation between Zipf’s force of unification in most cited journals and Zipf’s force of diversification in a growing number of low cited journals.

Journal Citation Identity, Journal Citation Image, and Internationalizations are methods for journal evaluation used by Bonnevie-Nebelong. (2006)\(^96\) for an analysis of the Journal of Documentation (JDOC) which is compared to JASIS (T) and the journal of Information Science (JIS). Comparing New Journal Diffusion Factor and Journal Impact Factor illustrates how new information has been added by the new indicator. Furthermore, JDOC is characterized by a higher rate of journal diversity in the references and has a lower number of scientific publications

Butler and Martun,(2006)\(^97\) the analysis is based on an extensive experimental database of over 30,000 publications, so the results can be viewed as strong pointers to possible generalized outcomes. We show that it is possible to mine ISI databases for references to a comprehensive cover of items from whole institutions. Many types of publications are visible in the ISI data-books, book chapters, journals not indexed by ISI, and some conference publications. When applied to the assessment of university departments, they can have a significant effect on rankings, though this does not follow
in all cases. Bart and Wolfgang, (2006)\textsuperscript{98} conducted study to answer the question on how far the influence of author self-citations on bibliometric meso-indicators deviates from that at the macro level and to what extent national reference standards can be used in bibliometric analyses. In order to study the situation at the institutional level, a selection of twelve European universities representing different countries and different research profiles have been made. The results show a quite complex situation at the mesh-level, therefore they suggested the usage of both indicators, including and excluding self-citations.

John (2006)\textsuperscript{99} expressed concern about higher education abound, and these include concerns about productivity. The present study extends two previous examinations of faculty publishing productivity covering the years 1991 to 1993 and 1995 to 1997. Both members of ARL and a group of institutions included in ACRL’s data set are included. Subito, and Gorraiz. (2006)\textsuperscript{100} published a report on the design and the results of a study, which covers major topics like distribution of article orders to journals; identification of the core journals which contribute to most article supplies; subject distribution of the most requested journals; relation between the most requested and the most cited journals (SCI); differences in age of ordered and cited articles, and dependency of journal requests on their subscription rates.

Gauffriau,. (2006)\textsuperscript{101} observed that librarians are increasingly involved in bibliometry as the need to measure research output in order to gain funding grows. Bibliometry, or analysis of publications and citations, demands knowledge of the subject and the databases which register the relevant publications, skills which librarians possess. Thomson Scientific databases are key to bibliometric analyses, but Google Scholar may eventually become a competitor. Distribution of resources on the basis of peer reviews is no longer satisfactory.

Yunjing and Hanqing (2006)\textsuperscript{102} studied the effect of journal self-citation on impact factor. For this purpose the data of some journals in a few subjects was collected from Chinese Science Journal Citation Reports (CSJCR) and then the impact factor and journal ranking were recalculated with journal self-citations removed. The recalculated rankings were compared to the original rankings to analyze the effect of self-citations.
The conclusion is that too much self-citation in some journals has made the ranking couldn’t reflect the truth of quality of journals. At least, the author made some suggestions about how to solve this problem. Patra and Mishra. (2006)\textsuperscript{103} analyzed the growth of the science literature in this area as available from ICBI Pub Med using standard bibliometric techniques. Bradford’s law of scattering was used to identify core journals and Lotka’s law employed to analyze author’s productivity pattern. Study also explored publication type, language and the country of publication. Twenty core journals were identified and the primary mode of dissemination of information was through journal articles. Authors with single publication were more predominant (73.58%) contrary to that predicted by Lotka’s law. The study provides useful information to scientists wishing to undertake work in this area.

Godin. (2006)\textsuperscript{104} opine that among the many statistics on science, called scientometrics, bibliometrics holds a privileged place. Bibliometrics is one of the few subfields concerned with measuring the output side of science. According to most “histories”, bibliometrics owes its systematic development mainly to D.J.D. Price and Eugene Garfield, as founders. The few works conducted before the 1950s are usually relegated to prehistory. This paper documents how to have systematic counting of publications originated with psychologists. In the year 1900s, psychologists began collecting statistics on their discipline. Publications came to be counted in addresses, reviews and histories of psychology for several decades. Kademiani, et.al (2007)\textsuperscript{105} discussed about scientometric analysis of 1044 papers published by the scientist of radiochemistry division of Bhabha Atomic Research Centre (BRAC) during 1958-2005 in diverse domains.

Nazim,M. and Ahmad,M.(2007)\textsuperscript{106} present a bibliometric analysis of scientific output in the area of ‘Information literacy’(IL), the aim being to offer an overview of research trends in this field and characterize its most important aspects and their evolution over the last quarter of the $20^{th}$ century. The analysis makes use of LISA plus database, the search being restricted to published journal articles and which contain the terms ‘information literacy’. The various analyses focus on the presentation of publication, frequencies and percentages, as well as the application of Bradford’s law of
scattering and Lotkas’s law. Shafi et.al (2007) examine the articles published in online D-Lib magazine for authorship trend, contribution of teaching and professionals, country-wise contribution, degree of collaboration and productivity within different facets of digital/electronic libraries. The study carried out for this paper found that collaborative research is given priority over solo research. The degree of collaboration is found to be 0.66. The study further reveals more contribution reveals that most of the contribution comes from the USA and Germany while facet-wise distribution of articles depicts that most of the articles over digital libraries and preservation followed by metadata/cataloguing. Biswas, Bidhan and, Enamul (2008). Studied the information use pattern of researchers in Veterinary Science and Animal husbandry by analyzing 3888 citations 26 Doctoral dissertations submitted by Bangladesh Agricultural University during the period 1990 to june 2005. The study reveals that researchers under study have primarily depended on periodicals of veterinary Science and allied branches of their source of information. The geographical and chronological scattering of citation has also been included the information inferred in the paper may be of help to Agricultural University Libraries to arrive at need based consideration in the selection and acquisition of Journals within the limited resources.

Keat, and, Kiran, (2008) applied citation analysis method to examine the use of Information resources by students of the MLIS at the University of Malaya in preparing their dissertations. References form the sample of 40 MLIS theses form the period 2000-2005 were examined for year of publication author sources title; bibliographic format; Language; subject category and place of publication core Journal tiles are compared with Journal citation report listing and also for availability at the university of Malaya Library. The study shows that journals and books are still the most used sources for information and there is a steady increase in the use of Electronic media by Library and information Science (LIS) researchers. Authorship pattern indicates preference for single authored works. Ashman, (2009) attempted to assess the variations and similarities in the stated research objectives of recent citation analysis studies. Eighty-eight citations studies published between January 1995 and March 2008 were categorized and selected examples of specific types were reviewed.
keatab (2009) reviews the citation status of communication PhD theses of the "Social Science and communication faculty of Allmec Tabatabaci university" form 1995-2005. The research aims to study the models for citation behavior of graduates and characteristics of using information resources in their research task. The research method is citation analysis of theses in the field of communication have 1118 citations. Books are the most cited resources (685 citations 58.9%). The average number of citations for each thesis is 139.75 citations. The linguistic distribution of citations shows that most of the cited resources are in Persian. The average half-life for all of the resources of this field is 11 years 2 months. In this research, the most frequently cited book is methods of press content analysis and the most frequently cited author. Asha, and Kumar (2010) have done bibliometric analysis of 4798 citations appended to 400 articles in five volumes 34 (2003) to 38 (2007) and Maiden volume 1970 of the Indian journal of pure and applied mathematics has been carried out to observe the number, authorship pattern, foreign and Indian authors contributions, citation analysis and number of pages used in each volume. A comparative study of articles published in 5 volumes vis-à-vis those in volume 1 has been made. Results indicate a decrease in the number of contributions in successive volumes. The most cited documents are articles from research journals. The number of foreign contributions in more than Indian contributor's growth and population of the journals in showing mixed trends i.e. upward and downward progress.

Dhanamajaya, and Talawar. (2010) conducted a study based on the citations cited in doctoral Dissertations of Engineering and Technology awarded by various general University of Karnataka. This paper comprising 541 Journals containing 7467 citations appeared in 137 Doctoral Dissertations awarded during 1961-2008. It was observed that more than 67% of the theses were awarded by the Bangalore University and University of Mysore. It also noted that Majority of 85% (62.04%) Doctoral Dissertations were awarded in between 1996-2008 and more Number of Ph.D Degree awarded in civil discipline. Further the characteristics of references cited by the Engineering and Technologists in their Ph.D theses were studied. The results and discussions with regard bibliographic form, languages, country subject, and authorship pattern and ranking of journals are present in different tables and figures with some
well-known statistical and bibliometric parameters have been applied for the study. Jinag, et. al. (2010)\textsuperscript{114} studies the correlation between peer review and citation indicators when evaluating research quality in library and information science (LIS) forty two LIS experts provided judgment on a 5 point Scale of the quality of research published by 101 scholars: the median rankings resulting from these judgments were then correlated with h.g. and H-Index values computed using three different sources of citations data. Web. Of science (WoS).

Maya, (2010)\textsuperscript{115} paper attempts to study the nature and pattern of citations to analyze how far library and Information professionals have made use of Web citation comparison to other sources (books Journals etc) on the basis of three Indian journals journal-wise distribution, author-wise distribution item-wise citation patterns, and citation occurrence have also been examined. it is observed that the trend of citation ha slowly changed towards the web citation, web citations occur more frequently in SRELS Journal of information Management. Rekha, et.al.(2010)\textsuperscript{116}. analyses the publications of Nuclear Physics divisions and Bhaba Atomic Research Centre. There are 257 research papers published during 2003-2008 in diverse domains of Nuclear physics, Nuclear Reactions and Spectroscopy (78) high energy physics and Quark Gluon plasma (58) Interdisciplinary Research and application (29) Intermediate Energy Reactions (27) Theoretical Research (23) Nuclear Fission (22) Detectors and Nuclear instrumentation (14) and Accelerations and Instrumentation (6). The highest number of publications (51) was in the year 2006. The average number of publications per year was 42.83. The most prolific authors were; Chowadary, (81) Mohanthy A.K.(60) Dutta,C.D(57) and Kailas,S.(45). The publications of Nuclear Physics division were spread over 42 journals. The leading journals preferred by the Scientist of Nuclear physics division were physical Review with 75 publications Physics with 22 publications pramana-Journal of Physics-Journal of physics with 18 publications, European Physical Journal-A with 11 Publications and Physics Letters-B with 10 publications collaboration trends was Mega authored publications. There were more than 70% Mega authored publications. Wlatman, and Noyons, (2010)\textsuperscript{117} identified that the analysis of Bibliometric Networks, researchers often use mapping and clustering techniques in a combined fashion. Typically, however, mapping and clustering technique that are used together
rely on very different ideas and assumptions. We propose a unified approach to mapping and clustering of Bibliometric networks. We show that the VOS mapping technique and a weighted and parameterized variant modularity-based clustering can both be derived from the same underlying principle. We illustrate our proposed approach by producing a combined mapping and clustering of the most frequently cited publication that appeared in the field of information science in the period 1999-2008.

Anil, and Mallikarjun, (2011)\textsuperscript{118} Conducted a citation study of the 49 Doctoral dissertations submitted at the Indian institute of management, Ahmadabad, during the period 2004-2009. The study reveals that journals are the most cited sources, and based on the pattern of citations, a local ranking list of journals has been developed. The study applies Braford’s law to identify the groups of journals differentiated by their use. Results indicated that the top 48 journals that were ranked among the 30 most used journals contributed to more than 55\% of the journal citations. Gupta, Avinash, and Verma, (2011)\textsuperscript{119} analyzed the research output of Indian in computer science Output 199-2008 using several parameters including total research output, its growth, rank and global publication share citation impact, share of international collaboration papers and major collaborative partner countries and patterns of research communications in most productive institutions, authors, and high-cited papers. The publications output and impact of India is also compared with China, South Korea, Taiwan and Brazil.

Husan, and Chin (2011)\textsuperscript{120}. examines citations of western journals in 8 Journals and Six history journals published in Taiwan. The findings show that both the Western Journals impact factor values and whether they are included. Jaya, and Varma, (2011)\textsuperscript{121} attempted to evaluate the library website of selected research institution in India both quantitatively and qualitatively on the basis of Web Impact Factor, pre-defined check list of indicators, and online questionnaire survey studies the exiting procedures and practices of evaluation indicators of website at national and international levels as reported in the literature. Reveals that there are many inconsistencies and terminological issues and many effective methodologies/technique for websites evaluation which are practiced at international level but are not being used in such studies in India. Two major quality components viz. usability and usefulness.
covering the various evaluation indicators at indicative and illustrative level have been examined. Concluded that there is scope of further research for developing and standardizing the indicators with multiple evaluation perspectives at various levels. Suggests the active and crucial role of library and information scientist in the evaluation process form design to content management in future.

Kannappanavar,. and Roopashire, (2011) discussed about the information use pattern of Indian Genetics. The study found that Journals are heavily cited as compared to other forms of documents. It is evident from the study that the trend is towards team research. Multi authors lead over single author. United States contributes more number of articles in this subject around 48% of the Journal cited is from the United States. It is observed from the study that numbers of journals cited are of the period between 1996 and 2000 followed by 2001-2006 and 1990-95. Therefore it can be deduced that current literature is more important for research in this subject field. It is observed from the study that Genetics is the most heavily cited journal followed by science both are from United States. The Indian Journal, Journal of Genetics is in the 14th Place Literature as old as 174 years have also been cited.

Tasy,(2011) Explored the of Bibliometric Characteristics of the Journal of Information science and the subject relationship with other discipline by citation analysis. The citation date were drawn from reference of each article of MS during 1998 and 2008 the Ulrich’s periodical directory. Library of congress subject headings, retrieved from the World Cat and LISA database were used identify the main class, subclass and subject of cited journal and books. The results of this study revealed that journal and books are the most cited documents.

2.4. BRADFORD’S LAW:

. Feicheng, and Rui (1999) by taking Bradford’s frequency rank analysis as the frame of reference, compares the scattering distribution of documents and of knowledge units, finding that scattering distribution of knowledge unit quantities, knowledge species and the core knowledge unit is greater and more complex than for document units. Bandyopadhyay (1999) reported the results of a study to determine the applicability
of Brodford’s Law of Scatter in different disciplines, involving 92 doctoral dissertations submitted to the Burdwan University, India, from 1981 to 1990 by the scholars of mathematics, physics, mechanical engineering, philosophy and political science as a source material. A total number of 11,228 references were appended to the 92 theses, of which, 6844 were periodical articles. Concludes that Bradford’s Law fits well for pure mathematics, statistics, solid state physics, mechanical engineering, philosophy as a whole, psychology, government and politics, sociology and political sociology. Narayana and Reddy. (2000)\textsuperscript{126} viewed Bradford’s law in bibliometrics as consisting of two aspects, that of distribution, which is purely a mathematical pattern, and the relevance of such a distribution to bibliometrics. Discusses the methodology for estimating Bradford groups within a given set of bibliometric data, and proposes a simple and easily adaptable statistical search method (SSM) together with illustrative applications.

Rousseau. (2000)\textsuperscript{127} Proposed a goodness of fit test for cumulative rank frequency distributions (Bradford curves). As the test is based on the correspondence of Gini indices and not on the curves themselves, there is a loss of information. Hence the procedure is referred to as a weak test. Confidence intervals for observed Gini indices are drawn using the jack-knife estimator for the variance. Techniques are illustrated by testing the fit for 30 data sets. Mini, (2008)\textsuperscript{128} highlights the significance of Bardford’s law is today information age. The classical law is applied to the Toxicology literature collected from the international database, Toxicology information online (Toxicology), and its validitaty on that data was tested. The data was found unfit for the law, hence a new formula is derived and applied which was found fit for the study.

Shenton, . (2009)\textsuperscript{129} Bardford’s Law has been the subject much discussion and analysis in library and information science since its formulation in the 1930s and remains frequently debated to this day. It has been applied to various practices within the discipline, especially with regard to collection development, but its relevance to researcher and the potential it offers for guiding them when literature searching in order to maintain their current awareness is still largely unexplored
2.5. ZIPF’S LAW:

Tsay (1999) mentions that Zipf’s Law describes the original Zipf’s Law, which is one of the three basic laws of bibliometrics. The Zipf’s Law explores the relationship between words and their frequency of occurrence in text. In addition, the following issues of the Zipf’s Law are also discussed: the analysis and modification of the Zipf’s Law itself; comparison with Bradford’s Law of Scatter; and applications and problems of the Law. Luhn’s model suggests that midrange terms are the best index terms and relevance discriminators. Losse (2001) suggests reasons for this principle based on the empirical relationships shown here between the rank of terms within phrases and the average mutual information between terms, referred to as the Inverse Representation – EMIM principle. Suggests an Inverse EMIM term weight for indexing or retrieval applications that is consistent with Luhn’s distribution. Provides an information theoretic interpretation of Zipf’s Law. Using the regularity noted here, suggests that Zipf’s Law is a consequence of the statistical dependencies that exist between terms, described here using information theoretic concepts. Developing the probability function to describe rank-size Zipfian phenomena has been an important problem in scientometrics and informetrics, Jiang and others. (2002) presents a new rank-size distribution of scientific productivities in Chinese universities. Simkin and Roychowdhury. (2005) presents empirical data on frequency and pattern of misprints in citations to twelve high-profile papers. They find that the distribution of misprints, ranked by frequency of their repetition, follows Zipf’s law. We propose a stochastic model of citation process, which explains these findings, and leads to the conclusion that about 70-90% of scientific citations are copied from the lists of references used in other papers. The standardization of distribution fitting procedures is recommended also in informetrics. Janos Izsak. (2006) examined the possibility of that standardization when fitting the Zipf-Mandelbrot (ZM) distribution. After propositions of possible steps of standardization, he stressed the unique role of maximum likelihood estimates concerning the chi-square goodness-of-fit tests. He touched upon the possible correlation between the parameters of the ZM distribution. A numerical example demonstrates the method and the results.
2.6. AUTHORSHIP PRODUCTIVITY:

Rousseau and Hooydonk. (2000)\textsuperscript{135}, observed that different scoring methods can yield totally different rankings. Consequently, a ranking between countries, research groups or authors, based on one accrediting method does not contain an absolute truth about their relative importance. Different counting methods should be used and compared. Finally, it is shown that some of these anomalies can be avoided by using geometric instead of arithmetic averages.

According to Bandyopadhyay (2000)\textsuperscript{136}, ranking studies are very popular but different authors have followed different methods in allotting rank numbers where there is a tie. Whenever journal titles from 2 or more ranked lists are taken for comparison, all the lists need to be ranked following the same procedure. When a sample of 2891 references from 309 journals were ranked using 3 different methods and compared, it was found that the rank position of the same last journal title was 43,176 and 309. This indicates the huge difference possible and demonstrates how misleading conclusions can be drawn if compared unknowingly. Guo (2000)\textsuperscript{137} presents a statistical analysis of 633 articles published in the Journal of the American Society for Information Science between 1994 and 1998, discusses co-authorship, system and regional distributed conditions, and prolific authors and units. Lange (2001)\textsuperscript{138} opines that primary citation indexing can be taken as an unbiased representation of all author indexing, the cited first author counts (straight counts) were compared with the cited all author counts (complete counts). In two psychological journals over two publication years. Although rather high correlations were found between straight counts and complete counts, correlations differ with journals of the same discipline, with different publication years of the same journal, and according to seniority of cited authors. No effect of alphabetical name ordering was found. The results against the background of the possible use of weighting process for all authors indexing.

Kannapanavar and Vijaya Kumar (2001)\textsuperscript{139} studied the authorship pattern in ‘International Monetary Fund Literature’ for the period 1991 to 1998. References appended to 92 Doctoral theses submitted to the Departments of Mathematics, Physics, Mechanical engineering, Philosophy and Political science, Burdwan University, India,
from 1981 to 1990 were studied Bandyopadhyay (2001)\textsuperscript{140}. Extent of multiple authorship, degree of authorship collaboration and their change with time were studied. With in broad subjects, multiple authored articles were found to be maximum in physics (62.24 per cent). While 36.6 per cent of the articles in mechanical engineering. 36.3 per cent of the articles in mathematics, 12.3 per cent of the articles in philosophy and only 3.85 per cent of the articles in political science are multiple authored. With in specific subjects, multiple authorship is highest in nuclear physics (75.52 per cent). The multiple authorship trends have increased steadily through decades (1950 to 1990) in physics, mathematics and psychology. In mechanical engineering philosophy excluding psychology and political science the multiple authorship trends has increased in the first few decades but then the trend has decreased for certain period.

White (2001)\textsuperscript{141} explores the tendency of authors to recite themselves and others in multiple works over time, explains how to retrieve citation identities from the Institute for Scientific Information’s files on Dialog and how to deal with idiosyncrasies of these files. Recitations are interpretable as symbols of a citer’s main substantive concerns. As illustrated by the top recites of 8 information scientists, identities are intelligible, individualized and wide ranging. Finds that citers economize on effort by frequently reciting only a relatively small core of names in their identities.

Shirabe and Tomizawa. (2002)\textsuperscript{142} proposes a new index for international scientific co authorship, based on a simple model of domestic and international co authorship. The index draws a modestly different picture of international collaboration concerning the effect of a country’s size on the likelihood of internationally co authored papers.

Egghe, and R. Ravichandra Rao, (2002)\textsuperscript{143} this model is checked on JASIS and JACS data, with success. The model involves the determination of three parameters and is a transformation of the lognormal distribution. However, also shows that the first-citation model, developed in an earlier paper, gives enough freedom to give close fits to the most-recent-reference data as well. Glanzel (2002)\textsuperscript{144} reports results of a study which aimed to describe both the common and the distinguishing features of co authorship trends and patterns in selected science fields. The relation between co authorship schemes and other bibliometric features, such as publication activity and
citation impact are analyzed. Besides universally valid tendencies, subject specific features can be found.

Pichappan and Sarasvady (2002) Viewed author self citations as a blend of experience and cognition of authors while assessing author self citations. Self citations is a common phenomenon of citation behaviour. It is also an important but controversial indicator of citation analysis by Hsia (2002) introduced the types and the source of citations tested and discusses the motivation and behaviour pattern of self-citation. By calculating the self-citation rate, and using research of the related studies, the features of journals and the characteristics of their authors can be observed by means of tested self citations. Libraries may take the result of this research as the basis of journal collection development, or the basis of providing periodical services. Udofia (2002) compares author collaboration in the periodical literature of African Trypanosomiasis. The study was based on the literature abstracted in the 1990-2000 articles of Tropical Diseases. It was found that both the annual rates and the cumulating of author collaboration for the period for each of the ten years was high although the figures obtained for 1992-1995 and 1998-2000 were higher than those for 1990-1991 and 1996-1997 concludes that, though author collaboration exists in African Trypanosomiasis literature for the ten years studied, it is generally high but each year's literature is dominated by multiple authorship and, in all, two and three authored papers were predominant. Nauchno and Ivanovo (2002) Analysed the flow of international communications using bibliographies of papers published by scientists. Shows that distribution of scientific papers in joint. examining self-citation in a wider context of self-mention it can be seen as part of a more comprehensive rhetorical strategy for emphasizing a writer’s personal contribution to a piece of research and strengthening knowledge claims, research credibility and wider standing in the discipline Hyland (2003) explores the use of self-citation and authorial mention in a corpus of 240 research articles and 800 abstracts in 8 disciplines. Shows how self-mention is used and the ways these uses reflect both the promotional strategies of individuals and the epistemological of their disciplines.
Howard (2003)\textsuperscript{150} his article “Requirements for a co-citation similarity measure, with special reference to Pearson’s correlation coefficient, Ahlgren, Jarneving, and Rousseau fault traditional author co-citation analysis (ACA) for using Pearson’s “r” as a measure of similarity between authors because it fails two tests of stability of measurement. The instabilities arise when “r”s are recalculated after a first coherent group of authors has been augmented by a second coherent group with whom the first has little or no co citation. However, AJ&R neither cluster nor map their data to demonstrate how fluctuations in “r”s will mislead the analyst, and the problem they pose is remote from both theory and practice in traditional ACA. Moreover, “r” produces clusters and maps very like those based on other coefficients that AJ&R mention as possible replacements, such as a cosine similarity measure or a chi-square dissimilarity measure. Thus, “r” performs well enough for the purposes of ACA. Accordingly he argue that qualitative information revealing why authors are co-cited is more important than the cautions proposed in the AJ&R critique.

Ahlgren, and Ronald (2003)\textsuperscript{151} Criticises the use of Pearson’s coefficient (Pearson’s r), which is often used as a similarity measure in author co-citation analysis (ACA), and sets out two natural requirements that a similarity measure applied in ACA should satisfy. Pearson’s ‘r’ does not satisfy these requirements. Pearson’s ‘r’ is probably not an optimal choice of a similarity measure in ACA. Further empirical research is needed to show if and in that case to what extent, the use of similarity measures in ACA that fulfil these requirements would lead to objectively better results in full-scale studies. Yoshikane, Kageura, and Tsuji. (2003)\textsuperscript{152} discussed about the statistical peculiarity of author productivity data and explains the method using developmental profiles, which takes into account the sample size dependency of statistical measures. By applying it to actual data, demonstrates the usefulness of the proposed method.

Ming-Yue , and Chia-Wen   (2003)\textsuperscript{153} gathered author samples from the INSPEC database from 1978 to 1997. The relatively low author co-citation frequencies indicate that there is a low connection among authors who publish in semiconductor journals and big differences among authors’ research areas. This shows that some
authors with high positive correlations are related in certain ways and co-cited, while other authors with high negative correlations may be rarely or never related and co-cited. Cluster analysis and multi-dimensional scaling are employed to create two-dimensional maps of author relationships in the cross-citation networks. It is found that the authors fall fairly clearly into three clusters. The first cluster covers authors in physics and its applications. The authors in the second group are experts in electrical and electronic engineering. The third group includes specialists in materials science. Because of its interdisciplinary nature and diverse subjects, semiconductor literature lacks a strong group of core authors. The field consists of several specialities around a weak centre. Shirbe and Tomizawa. (2004) generalized the concept of their previous paper (SHIRABE & TOMIZAWA, 2002), which proposed an index for international scientific co-authorship. Based on a simple model of domestic and international co-authorships, they focussed on likelihood of overseas access to co-authorships in the paper. The indices can draw a reasonably clear picture of international co-authorship, with regard to difference in patterns of international co-authorship among countries. Ming-yueh study employed the Perl program, Excel software, and some bibliometric techniques to investigate growth pattern, journal characteristics, and author productivity of the subject indexing literature from 1977 to 2000, based on the subject search of a descriptor field in the Library and Information Science Abstracts (LISA) database. The literature growth from 1977 to 2000 in subject indexing could be fitted well by the logistic curve. The Bradford plot of journal literature fits the typical Bradford-Zipf S-shaped curve. Twenty core journals making a significant contribution could be identified from the Bradford-Zipf distribution. Four major research topics in the area of subject indexing were identified as: (1) information organization, (2) information processing, (3) information storage and retrieval, and (4) information systems and services. It was also found that a vast majority of authors (76.7%) contributed only one article, which is a much larger percentage than the 60% of original Lot-ka’s data. The 15 most productive authors and the key concepts of their research were identified. Thomas The analysis of this author’s lifetime citation record, which was compiled through the ISI database, searching the literature for nearly fifteen years, and through various Web search engines. It was found that (with self-citations disregarded)
the ISI captured 28.8 percent of the total citations, 42.2 percent of point citations, 20.3 percent of citations from outside the United States, and 2.3 percent of non-English citations.

Gupta and Mohinder Singh. (2004) This paper attempts to study the research collaboration of India with Latin America, with the following objectives: (i) To study the nature of Indian collaboration with Latin American countries in S&T, as reflected in co-authored research papers, (ii) To identify the specific subject areas of India collaboration with Latin America, (iii) To study the impact of Indian collaborative research with Latin America in different fields, and (iv) to identify the major Indian institutions involved in this collaborative research with institutions in Latin America. Margin Meyer and Sujit Bhattacharya. (2004) Co-authorship analysis is a well-established tool in bibliometric analysis. It can be used at various levels to trace collaborative links between individuals, organisations, or countries. Increasingly, informatics methods are applied to patent data. It has been shown for another method that bibliometric tools can be applied without difficulty. This is due to the different process in which a patent is filed, examined, and granted and a scientific paper is submitted, referred and published. Christoffersen. (2004) A method to identify core documents within a given subject domain has been developed by the author. The method builds on the concept of poly representation by using different search rationales in several databases and isolating the overlaps between them. This paper delineates the ideas behind the method and describes the study done to measure its effectiveness.

Uzun, (2004) Findings from a study of patterns of foreign authorship of articles, and international composition of journal editorial boards in five leading journals in the field of information science, and scientometrics. The study covers an American journal and four European journals. Bibliographic data about foreign authors and their national affiliation from five selected years of publication were analyzed for all journals. The foreign input of articles was extremely high in Information Processing & Management, and Scientometrics, and was relatively low in the other three journals. The numbers of foreign countries contributing in all journals have increased rapidly since 1996. Canada, England, Belgium, Netherlands, China and Spain were the countries with high
contributions in JASIST. The authors from the USA have dominated the foreign authored articles in all European journals.

Glanzel and Thus. (2004)\(^{161}\) have studied basic regularities of author self-citations. The regularities are related to the ageing, to the relation between self-citations and foreign citations and to the interdependence of self-citations with other bibliometric indicators. The results of the present paper confirm the common notion of such effects only in part. The author’s show that the macro level multi-authorship does not result in any exaggerates extent of self-citations. Scientometric and network analysis of linkages are presented and discussed by Wagner. (2005)\(^{162}\) for each of the six cases: astrophysics, geophysics, mathematical logic, polymers, soil science and virology. Visualizations of the cosine matrices within each field are compared for 1990 and 2000. The research shows that international collaboration grew in all the fields at rates higher than the international average. The possibility that rapid increases in international collaboration in science can be attributed in part to certain drivers related to access to resources or equipment sharing could not be upheld by the data. Other possible explanations for the rapid growth of collaboration are offered, including the possibility that weak ties evidenced by geographically remote collaboration can promote new knowledge creation. Kademani,B.S. and others.(2005)\(^{163}\) highlighted the scientific productivity, productivity age, collaboration trend, domains of contributions of eight Nobel laureates of past and present belonging to different domains in research in science. Also attempts to document the various factors that affect productivity of scientists. No Nobel laureates can be compared with other Nobel laureates as they are an altogether different class of scientific elites and each piece of research is unique by it. Wang and others derived (2005)\(^{164}\) co-authorship patterns derived from 1997-2001 data in the CSTPC Database (Chinese Science and Technology papers and Citations Database) and are analyzed to show the status of science and technology collaboration in China. Four different collaborative types, namely papers co-authored by the authors in the same institution (SI), in different institution located in the same region (SR), in different regions (DR) of China, and in different countries or regions of the world (DC) are discussed. It is concluded that, for all four collaborative types, collaboration science and technology has increased in China. Different regions have different collaborative
patterns corresponding to economic, technological and scientific development levels. Differences in collaborative patterns in terms of subjects are explained by different characteristics of the subjects themselves.

Accordingly Linqing (2005)\textsuperscript{165} the concept of paradigm has been widely used in theoretical research, Kuhn never gave us clear empirical guidelines for defining exactly what a paradigm was, paradigms have remained mostly a philosophic construct, and his discussion remained mostly on a philosophic level. Lately, the emerging bibliometric method, especially co-citation analysis, provides a new method for empirical study of paradigm, moreover we can visualize it through modern statistic technique. Liping Song (2005)\textsuperscript{166} opines that method for displaying intellectual structure, Author Co-Citation Analysis (ACA) was widely used and generally accepted, but it was, and is still labour intensive and time consuming work. Information Visualization (IV) provides a new tool for ACA. In this article, it introduces the results applying IV into ACA.

Liu (2005)\textsuperscript{167} described that the intellectual structure of urban studies through a co-citation analysis of its thirty eight representative journals from 1992 to 2000. Relevant journal co-citation data were retrieved from Social Science research, and were subjected to cluster analysis, multidimensional scaling, and factor analysis. A cluster-enhanced two-dimensional map was created, showing a noticeable subject variation along the horizontal axis depicting four clusters of journals differentiated into mainstream urban studies, regional science and urban economics, transportation, and real estate finance. The cluster of the mainstream urban studies journals revealed a higher degree of inter-disciplinarily than other clusters. The four-factor solution, though not a perfect match for the cluster solution, demonstrated the inter-relationships among the overlapping journals loaded high on different factors. The results also showed a strong negative correlation between the coordinates of the horizontal axis and the mean journal correlation coefficients reflecting the subject variation, and a less revealing positive correlation between the coordinates of the vertical axis and the mean journal correlation coefficients.

Kostoff and Wendy, (2005)\textsuperscript{168} opines that the citation characteristics became increasingly satisfied as the clusters were reduced in size, raising serious questions
about the credibility of a selected denominator for normalization studies. An interesting side result occurred when all the retrieved articles were sorted by number of citations. Thirteen of the fifty most highly cited research articles had 100 or more references, whereas zero of the fifty least cited research articles had 100 or more references. As a first element of a macro-level country-by-country cross-reference and cross-citation analysis, domestic/international character of reference and citation behaviour of 36 countries is studied and compared with international co-authorship pattern by Glanzel and Schubert. (2005) Science policy relevance of these indicators is discussed and examples deserving science policy attention are pinpointed. Large scale bibliometric analysis is often hindered by the presence of homonyms, or name sakes, of the researchers of interest in literature databases. Co-author inclusion is a novel algorithmic method based on co-authorship for dealing with problems of homonyms in large bibliometric surveys Wooding and others. (2006) compared co-author inclusion and subject and funding based filter against the manual assignment of papers by a subject expert (which we assumed to be correct). The subject and funding based filtering identifies only 75% as many papers as assigned by manual scoring. By using co-author inclusion once we increase this to 95%, two further rounds produces 99% as many papers as manual filtering. Although the number of papers identified that were not assigned to the papers identified manually also increases, the absolute number is low: rising from 0.2% papers with subject and funding filtering, to 3% papers for three rounds of co-author inclusion. The Science and technology activities in China are rapidly growing since 90s Sen. and others. (2006) analyze the production of scientific papers and the factor of increasing papers, and Japan-China relationship in co-authored papers. The growth rate of papers production became the sixth place in the world, the world share of papers increased by more than three times, and the papers production has concentrated on priority universities since the implementation of the top priority policy. Clustering algorithms are used prominently in co-citation analysis by analysts aiming to reveal research streams with in a field. However, clustering of widely cited articles is not robust to small variations in citation patterns. Schildt and Juha (2006) proposed an alternative algorithm, dense network sub-grouping, which identifies dense groups of co-cited references. We demonstrate the algorithm using a
data set from the field of family business research and compare it to two alternative methods, multidimensional scaling and clustering. Scholarly communication in arts and humanities differs from that in the sciences. Arts and humanities scholars rely primarily on monographs as a medium of publication whereas scientists consider articles that appear in scholarly journals as the single most important publication outlet. The number of journal citation studies in arts and humanities is therefore limited. The bibliometric characteristics of 507 arts and humanities journal articles written by authors affiliated with Turkish institutions and indexed in the Arts & Humanities Citation Index (A&HCI) between the years 1975-2003 were analysed Sahiner, and Yasar (2006)¹⁷³

Journal articles constituted more than 60% of all publications. One third of all contributions were published during the last 4 years (1999-2003) and appeared in 16 different journals. An overwhelming majority of contributions (91%) were written in English, and 83% of them had single authorship. Researchers based at Turkish universities produced 90% of all publications. Two thirds of references in publications were to monographs. The median age of all references was 12 years. Eighty percent of publications authored by Turkish arts and humanities scholars were not cited at all while the remaining 20% (or 99 publications) were cited 304 items (an average of three citations per publication). Self-citation ratio was 31%. Two thirds of the cited publications were cited for the first time within 2 years of their publications. The method, however, does not take into account the weight of self-citing authors among co-authors of both the cited and citing papers. The objective of the Schubert, Wolfgang and Bart. (2006)¹⁷⁴ is to quantify the weight of self-citations with respect to co-authorship. The analysis is conducted at two levels: at the macro level, namely, for fifteen subject fields.

Harinarayana, and others (2008)¹⁷⁵ conducted a study of Indian authors contribution in foreign Journals in library and information Science during 1970-2005 the data were collected form 18 foreign Journals. It is found form the study that 303 articles were published in various foreign in the field of Library and Information Science. Scientometric found to be the preferred foreign journals for Indian authors. Almost 44% of the articles published by them were reported in scientometrics. While going through the Indian contributions in 18 international journals during the span of 36 years, it was
found that only three authors have contributed more than 20 articles. This situation cases more attention from Indian authors to increase their level of productivity in foreign periodicals. The sigh relief is that during present decade 131 articles (43.23%) have already been published showing that the tends of publishing in foreign journals is increasing. Research publications over a ten years period from 1992-2002 are analyzed Kunwar, and others (2011)\textsuperscript{176} to assess the trends in the publication pattern in DESIDOC Bulletin of Information Technology by Library and Information Professionals. The data collected from the 10 volumes is summarized in ten tables; volume wise distribution of contributors, authorship pattern of contributors, geographical distribution of contributors, Institution wise published in the 60 issues of the journals out of the 145 publications 97 (66.90%) articles published by the single author, the study also reveals that 128 items (88.28%) were contributes from Indian and rest 17 items (11.72%) were contributed from the rest of the countries.

Kumbar. and Kumar.,(2011)\textsuperscript{177} attempted to identify authorship trend and collaborative research in Genetic and plant breeding based on the data collected from the Indian Journal of Genetic and plant breeding published during 1998-2002. The study revealed that two authorship papers attributed and minimum 215 (44.24%). The degree of collaboration in research is0.87 in genetic and plant breeding as a whole and ranged between 0.86 to 0.89 during 1998-2002. The contribution from research institution and laboratories i.e. 216 (44.08%) is vividly ahead of the segments such a universities and colleges, 475 articles contributed by the Indian authors and a significant percent i.e. 107 (22.49%) is reported from the Delhi state.

2.7 LANGUAGE & LITERATURE:

A significant portion of scientometrics research involves studies of relative citation rates to groups of citable terms Bookstein and Yitzhaki (1999)\textsuperscript{179} Examines the relative citation rates to own language as compared to foreign language materials. Defines a simple probabilistic model of citation behavior which suggests a natural measure of relative citation rate. Unlike earlier indicators, the measure is independent of the size of the base population.

Bracho-Riquelme and others (1999)\textsuperscript{180} Reports results of a citation analysis study to determine the effect of the change from French to English on the impact of the Annales de l’Institut Pasteur. A year by year analysis, from 1974 to 1992, was conducted, using simple regression between percentage of articles published in English and both their impact factor and their ranking among periodicals of the same field. The overall determination coefficient between the percentage in English and the impact factor was 0.108. By series, the coefficient factor between percentage in English and the periodical’s rank among similar publications was 0.178 for Annals de Microbiologic, 0.045 for Annals d’Immunologie and 0.122 for Annals de Virologie. Concludes, that the change of language did not increase the impact factor of the French periodicals or improve their ranking among publications of the same discipline.

Zainab (1999)\textsuperscript{181} reports a state of the art review of the published literature covering research productivity under two broad categories: general measures of research productivity; and correlates of publication productivity. In the latter’s case, studies are covered with embrace three broad determinants comprising: personal correlates; academic correlates; and departmental correlates considered to be related to academic publication productivity. The results of a bibliometric study of the publications of Jack Meadows are reported Jack Meadows. Brittain. (2000)\textsuperscript{182}; in particular, the cumulative growth in the number of publications and citations received over a 40-year period. Citations made to two articles and monographs are examined in detail, particularly the context of citations in order to explain the reasons why authors appear to have for citing his work. There is a brief discussion of the methodology of identifying and categorizing context of citations, as this is an area of Bibliometrics relatively unexplored.
According to Egghe and Rousseau (2000)\textsuperscript{183} relative own-language preference depends on two parameters; the publication share of the language and the self-citing rate. Openness of language L with respect to language J depends on three parameters: the publication share of language L, the publication share of language J and the citation share of language J among all citations given by language L. The relative own-language preference and the openness of one language with respect to another one can be presented by a partial order. This partial order can be represented by a polygonal line or a 3-dimensional solid somewhat in the same spirit as the Lorenz curve for concentration and evenness. Any function used to measure relative own-language preference or openness of one language with respect to another one should at least respect the corresponding partial orders. This is a minimum requirement for such measures. A logarithmic dependence on the language share is an additional requirement. This would correspond with the logarithm behavior of psychophysical sensations. Gives examples of normalized functions satisfying this additional requirement. Investigates if openness partial orders can lead to measures for relative own-language preference. Gives some examples related to the language use in some sociological journals.

By examining the consumers of leadership literature, it is demonstrated Newman and Chaharbaghi. (2000)\textsuperscript{184} that the providers are satisfying their wants. Any weaknesses in the medium and the failure of developing a leadership technology are acceptable to the consumers. It is shown that identity, technology and leadership are strongly interrelated and that the new form of leadership which is evolving in the emerging era of discontinuous change emphasizes identity creation.

Luwel and Moed. (2001)\textsuperscript{185} described a study in which methods were developed to allow quality assessment of academic research in linguistics in all sub disciplines. Data were obtained from samples of respondents from Flanders, the Netherlands, as well as a worldwide sample, evaluated journals, publishers and scholars. Describes several methods by which journals and publishers were ranked, and then discusses limitations and potentials for the application of bibliometric methods in output assessments. Kodama, (2002)\textsuperscript{186} Information on nearly 1.7 million articles published in
Japan between 1995 and 1999 was analyzed according to article type. Although the number of papers covered by the Japanese medical indexing journal Igaku Chuo Zasshi has increased since 1996, much of this is due to conference paper abstracts. Numbers of original papers have declined, from 69,394 in 1995 to 46,260 in 1999. A Medline search showed 19,661 Japanese authors published in foreign journals in 1995 compared with 24,492 in 1999. A methodology was developed Hood and Wilson. (2002)\textsuperscript{187} to trim this list of phrases to a list of high frequency phrases relevant to fuzzy set theory. This list of phrases was in turn used to extract records from the original downloaded set, which were (algorithmically) relevant to fuzzy set theory. This set of records was then analyzed to show the development of the topic of fuzzy set theory, the distribution of the fuzzy phrases over time, and the frequency distribution of the Fuzzy phrases. In addition, the field of the bibliographic record in which the phrase occurred was examined, as well as the first appearance of a particular fuzzy phrase.

Moed and Nederhof (2002)\textsuperscript{188} described a general methodology for developing, Bibliometric performance indicators. Such a description provides a frame work or paradigm for application-oriented research in the field of evaluative quantitative science and technology studies, particularly in the humanities and social sciences. The methodology is based on the authors' state of scholarly output in the field of law at the four major universities in Flanders, Belgium. The study illustrates that Bibliometrics is much more than conducting citation analyses based on the indexes produced by the Institute for Scientific Information (ISI), since citation data do not play a role in the study. Interaction with scholars in the fields under consideration and openness in the presentation of the quantitative outcomes are the basic features of the methodology. Bibliometrics should be used as an instrument to create a mirror. This aim provides a criterion of “productivity” of the development process. We further contend that librarians are not infrequently requested to provide assistance in collecting data related to research performance assessments, and that the methodology described in the paper aims at offering a general framework for such activities and can be used by librarians as a line of action whenever they become involved.
Visser and Leeuwen. (2002)\textsuperscript{189} introduced a citation based “systems approach” for analyzing the various institutional and cognitive dimensions of scientific excellence within national research systems. The methodology, covering several aggregate levels, focuses on the most highly cited research papers in the international journal literature. The findings indicate that these high performance papers provide a useful analytical framework, providing new indicators for identifying “world class” scientific excellence at the aggregate level.

Yoong. and Zainab. (2002)\textsuperscript{190} reported results of an analysis of 68 unique titles of Baba translated works published between 1889 and 1959, titles held in the libraries of the University of Malaya (UM), Science University Malaysia (USM), National University of Malaysia (UKM), the Dewan Bahasa dan Pustaka (DBP), National University of Singapore (NUS), National Library of Singapore (NLS) and the British Library (BL). The results reveal three periods of active publication of Baba translated works. A total of 18 works were translated before World War-I, followed by 10 just after the war, 39 titles were published before the break of the World War-2 and one was identified in 1950. There were 103 persons involved in the 68 translated works, some of whom are responsible for more than one title. The most prominent translators were

Many Chinese academic journals began to be published in English when China opened its doors to the world more than 20 years ago. Tsinghua University started publishing an academic journal, Tsinghua Science and Technology, in 1996. A statistical analysis was made of the regional distribution of the authors and of the references cited by the articles in the journal between 1996 and 2002 by Li and Fengliang (2003)\textsuperscript{191}. Results show that although the authors are mainly from Tsinghua University, the number of authors from other regions, especially the number of overseas authors, has increased in recent years. Also, the average number of citations per article has increased from 6.9 in 1996 to 13.4 in 2002. Charlene and Jennifer (2004)\textsuperscript{192} counted 16,138 citations with in 468 articles found in four journals from history, classics, linguistics, and philosophy in the years 1962, 1972, 1982, 1992 and 2002 in order to identify trends in foreign language citation behavior of humanities scholars over time. The number of foreign language sources cited in the four subjects has not declined over time. Consistent
levels of foreign language citation from humanities scholars indicate a need for U.S. research libraries to continue to purchase foreign language materials and to recruit catalogers and collections development specialists with foreign-language knowledge.

Shengli and Rousseau (2004)\textsuperscript{193} observed that between 1929 and 2002 over 200 English-language scientific journals were founded in China. The number of China’s English edition journals in each discipline is, however, not correlated to the corresponding output of China’s articles listed in the ISI’s Science Citation Index. Clearly, the goal of these journals is to be internationally recognized. It is shown that this goal is rarely achieved. We think that lack of good-quality papers, low international visibility and a citation ‘Mathew effect’ are the main causes for the small role played by China’s English-language journals. Kniznica (2004)\textsuperscript{194} presents a bibliographic analysis of the coverage of Czech literature in Slovak periodicals during 1918-1928. 667 items of prose, 15 plays and 563 bibliographies were among the 2,641 items published. The well-known anti-elitist ‘Ortega Hypothesis’ published just over 30 years ago in Science was constructed and named by two science sociologists, and refuted by themselves on the basis of a quantitative author ‘citation analysis’ investigation carried out by Szava-Kovats. (2004)\textsuperscript{195} in the physics literature. Textual evidence presented here proves that the construction of this so-called ‘Ortega Hypothesis’ with its anti-elitist meaning was based on falsification of the quoted text and misinterpretation of the doctrine of the eminent elitist Spanish philosopher. Faber Frandsen and Rousseau. (2005)\textsuperscript{196} addressed the various formulations of impact of articles, usually groups of articles as gauged by citations that these articles receive over a certain period of time. The journal impact factor, as published by ISI (Philadelphia, PA), is the best-known example of a formulation of impact of journals (considered as a set of articles) but many others have been defined in the literature. Monawwer and Masoom Raza. (2005)\textsuperscript{197} through their study tried to identify country, language, form, year-wise distribution and authorship pattern, ranking of authors and journals. Data was collected from Psychological Abstracts published from 1992-2001. The study reveals that USA has contributed highest number of papers, i.e., 59.53% and most dominant language was English and maximum numbers of articles were written by two authors. Most productive journal was
Journal of Organizational Behavior and maximum number of articles were published in 1992 and most of the article dealt with Organization Behavior.

Eric (2005) examined the bibliometrics of the controversial scientific literature of Polyester research, focusing on publication types (books, journal publications, conference proceedings, and technical reports). Publication (P) frequently is used to measure publication “shape” or pattern and output, citations per publication (CPP) for impact, author self-citations (SC) and incited publications (UP) for their effect on P and CPP. Findings show an epidemic publication pattern, journal publications with the highest P, books with the highest CPP, and insignificant SC and UP. Comparisons to several non-controversial scientific literatures suggest that these findings may be common to other controversial scientific literatures. Taiwanese literary studies have been flourishing in mainland China since 1979. And there are a lot of research results presented in a variety of formats of publications, such as articles, monographs, thesis, journals, etc. In order to realize the interpretation of Taiwanese literature, and the state-of-art of activities on Taiwan literary studies in mainland China, 40 journals, 615 articles and 6,456 citations issued in the Fukien and Canton areas between 1979 and 2002 are chosen for study by Fang. (2005) Owing to the special neighboring situation among Fukien, Canton and Taiwan areas, this paper intends to use the journals and articles issued in the Fukien and Canton areas between 1979 and 2002.

Anwar (2005) carried out a Bibliometric analysis of the literature on Nigella sativa (Habbat al-barakah or Back seed). The purpose was to study the periodic growth of literature, author patterns, topical focus and geographic origin of literature on the subject. Twenty related databases and several online catalogues of libraries were searched to identify a final list of 530 citations. This data set was analyzed using various bibliographic characteristics. The findings show the increase in the volume of literature from 1971 onwards starting from one citation per year growing to 46 papers per year during the late 1990s. Most of the literature comes from Medical Sciences and Chemistry. A small core of authors contributed about one-third of the citations. Four-fifths of the citations are the result of collaborative work. About two-fifths of the papers
are published by only 36 journals. India and Egypt are the leading contributors to this literature English is the dominant language.

Georgas and Cullars, (2005) by analyzing the citation patterns of the linguistics literature, the authors provide a Bibliometric description of the discipline that will help librarians who have reference, instruction, or collection development responsibilities in this area understand it better. One important aspect of such an understanding is determining where linguistics classifies within the human.

2.8. SUMMARY:

In this chapter about 201 articles published in periodicals the reviewed articles are arranged in helpful sequence, and more or less related to the present study of Bibliometrics.

The Bibliometrics and Scientometrics are part of a chain, leading from a multiplicity of information sources to strategic information upon which desirous can be taken. The main objective of citation analysis is to evaluate and interpret, citations received by articles, authors institutions, and other aggregates of scientific literature. The periodical literature contributed towards the field is widely scattered both under the subject of origin. The discipline of Bibliometrics will help the librarians, for Journal collection development, to provide better information services. Bibilometrics should be used in the institutions to create a mirror of library collection development. It provides a citation of productivity and the development process of the library and in library routines. The basic distribution in Bibilometric analysis and the distribution of citations in our publications and this distribution is skewed.

While reviewing the literature, various approaches of research, statistical applications methodology and their approaches are taken into account. And the following statistics and mathematical techniques are applied in the study, according to its need and purpose of this study. This review helped in design and formation of the present study.
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