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Journal of Documentation : a Bibliometric Study

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JOURNAL OF DOCUMENTATION: A BIBLIOMETRIC STUDY

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Abstract

Bibliometrics is the discipline where quantitative methods were employed to probe scientific communication process by measuring and analyzing various aspects of written documents. It helps to monitor growth of literature and patterns of research. This paper examines the articles published in Journal of Documentation for authorship pattern, degree of collaboration, geographical distribution of papers and citation analysis. The studies carried out for this paper found that majority of papers are multi- authored. The degree of collaboration is found to be 0.51. The geographical distribution reveals that the contribution by United Kingdom is the highest. The average citations per paper are 43.

Keywords: *Bibliometrics, Journal of Documentation, Authorship pattern, Degree of Collaboration, ACP, Self-citation*

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00 Introduction

The term 'Bibliometrics' was first used by Alan Pritchard¹ in 1969 to denote a new discipline where quantitative methods were employed to probe scientific communication process by measuring and analyzing various aspects of written documents. Bibliometrics is an emerging thrust area of research from different branches of human knowledge. Bibliometrics has become a standard tool of science policy and research management in the last decades. All significant compilations of science indicators heavily rely on publication and citation statistics and other, more sophisticated bibliometric techniques.

Bibliometrics is a quantitative evaluation of publication patterns of all macro and micro communication along with their authorship by mathematical and statistical calculation.[Sengupta,1985]

Bibliometrics can be applied to any subject area and to most of the problems concerned with written communication. It helps to monitor growth of literature and patterns of research. This paper studies the bibliometric analysis of the literature published in the Journal of Documentation.

01 Source Journal

The Journal of Documentation is a double-blind peer-reviewed, academic journal publishing on theories, concepts, models, frameworks, and philosophies in information science. The journal provides a forum for the dissemination of scholarly articles, research reports and critical reviews. The scope of the *Journal of Documentation* is broadly information sciences, encompassing all of the academic and professional disciplines which deal with recorded information. These include, but are certainly not limited to information science, library science, and related disciplines, information and knowledge management, information and knowledge organization, information seeking, information retrieval, human information behaviour, and information and digital literacy. It published quarterly between 1945 - 1996, expanding to five issues per year between 1997-1999. Since 2000, it continues to publish six issues per year. It is currently edited by Professor David Bawden of the City University London. The journal's editorial board consists of researchers from Europe and the United States.[Wikipedia]

02 Objectives

The main objectives of this study are:

1. To find out volume wise contributions;
2. To find out the authorship pattern;
3. To calculate the degree of collaboration;
4. To find out the statistics of distribution of contributions in various fields of library and information science;
5. To determine the geographical distributions of contributions in the journal;
6. To display volume wise dispersion of references;
7. To find out the author self citation ratio.

03 Reviews of Literatures

The following are some of the relevant studies worthy of examinations:

Hazarika and others⁴ state in their paper on Bibliometric analysis of Indian Forester: 1991-2000, the multiple authorship is predominant in forestry and team research has always been favoured by scientists. These observations clearly state that research work is collaborative in nature. Kalyane and Sen⁵ in their work on the Journal of Oilseeds Research observed that the authorship pattern in various fields as agriculture, anthropology, business and economics, medicine, etc show consistently increase in the number of two or more authored papers. Dhiman⁶ evaluated "Ethnobotany Journal" for authorship pattern, year-wise distribution of articles, institution and country-wise distribution and range of references cited. Shokeen and Kaushik⁷ in their study of Indian Journal of Plant Physiology, revealed

that journal articles are predominant with more than two thirds of total citations. Jena ⁸ made an exhaustive bibliometric study of Fibre and Textile Research and unfolded the publication trend of this Indian journal from 1996 to 2004. Bharvi et al.⁹ analyzed 1,317 papers published in the first fifty volumes from 1978 to 2001 of the international journal *Scientometrics* and found that the US share of the papers is constantly on the decline while that of the Netherlands, India, France and Japan is on the rise and that the scientometric output is dominated by the single-authored papers. Zainab et al.¹⁰ in their bibliometric study of *Malayasian Journal of Computer Science*, reported their findings regarding the article productivity, authorship collaboration, and journal impact factor of MJCS. Serenko et al.¹¹ conducted a bibliometric analysis of a body of literature contained in 11 major knowledge management and intellectual capital peer-reviewed journals and revealed the institutional and individual productivity, co-operation patterns, publication frequency, and other related parameters. Hussain and Fatima¹² evaluated the characteristics of the Chinese Librarianship: an International Electronic Journal from 2006 to 2010 through a bibliometric analysis.

04 Methodology

A total number of 36 issues of the journal ‘Journal of Documentation’ (from 2005 to 2010) have been taken for this study. The details regarding each published article such as title of the article, number of authors, their institutional affiliations and addresses, number of references with list, page number, number of tables and figures etc., were recorded and analyzed for making observations. Tables are filled by tally mark system counting one by one reference and other data. The data has been calculated and represented in tables. The citation analysis conducted by using various statistical tools and techniques.

05 Data Analysis & Interpretation

I. Distribution of contributions

| | | | | | | |
|-----------------|------|------|------|------|------|------|
| Volume | 61 | 62 | 63 | 64 | 65 | 66 |
| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| Number of paper | 42 | 36 | 41 | 43 | 42 | 42 |
| Percentage | 17 | 15 | 17 | 17 | 17 | 17 |

Table 1: Volume- and Year-wise distribution

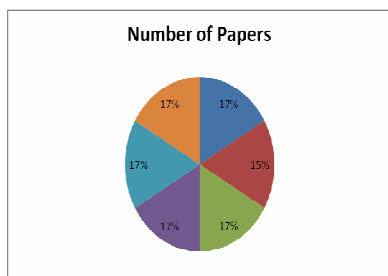


Fig. 1: Year wise distribution

Table 1 and adjacent figure shows that volume 64 (year 2008) has the highest number of papers and the volume 62 (year 2006) has least number.

II. Authorship pattern

| Authorship | Single | Two | Three | Four | More than four |
|------------|--------|-------|-------|------|----------------|
| Number | 122 | 77 | 25 | 17 | 5 |
| Percentage | 49.5% | 31.3% | 10% | 7% | 2% |

Table-2: Authorship pattern

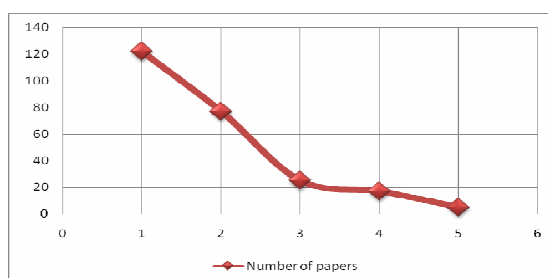


Fig.2: Authorship pattern

Table-2 Fig.2 shows that the multiple authorship pattern has the most productive publications i.e. 124 (50.5%) papers while the single authorship pattern has 122 (49.5%) papers. The multiple authorship patterns are further analyzed to shed more light on the pattern of collaboration. Publication with two authors are 77 (31.3%) papers followed by three authorship pattern with 25(10%) papers, four authorship pattern with 17(7%) papers and, more than four authorship pattern have 5 (2%) papers. The average number of authors per paper is 1.81 i.e. 447 authors written 246 papers. This shows a trend that more researchers and library professionals are coming together to execute the research projects and studies in library and information science field.

Most prolific Authors:

| Name | Contribution (no. of papers) |
|-----------------|------------------------------|
| Nigel Ford | 8 |
| Birger Hjørland | 6 |
| David Nicholas | 6 |
| Paul Huntington | 5 |
| Paul Struges | 4 |

Table 3: Prolific Authors

III. Degree of collaboration

It is clear from the above analysis that the percentage of single authored papers is less than that of multi-authored papers.

To determine the extent of collaboration in quantitative terms, the formula given by K. Subramanyam¹³ is used. The formula is as follows-

$$C = \frac{Nm}{Nm + Ns} \text{ Where,}$$

C=Degree of Collaboration

Nm=Number of Multi Authored Contributions

Ns= Number of Single Authored Contributions

| Volume(Year) | Degree of Collaboration |
|--------------|-------------------------|
| 61(2005) | 0.357 |
| 62(2006) | 0.472 |
| 63(2007) | 0.658 |
| 64(2008) | 0.581 |
| 65(2009) | 0.380 |
| 66(2010) | 0.571 |

Table 4: Volume wise Degree of Collaboration

In the present study the value of C is: $124/246=0.51$

Table 4 shows that the degree of collaboration is highest in volume 63 (2007) and lowest in volume 61 (2005). It can be seen that the degree of collaboration in the journal “Journal of Documentation” is 0.51. This brings out clearly the prevalence of team research in library and information science field.

IV. Subject wise distribution

| Name | Number of Paper | Rank | % |
|---|-----------------|------|-------|
| Information Retrieval | 58 | 1 | 22.76 |
| Information Science | 29 | 2 | 11.78 |
| Cataloging & Classification | 25 | 3 | 10.16 |
| Knowledge management & Information Management | 22 | 4 | 8.94 |
| Digital Libraries, ICT, Internet | 21 | 5 | 8.53 |
| Information Literacy | 14 | | |
| Information Seeking Behavior | 13 | | |
| Library and Society | 11 | | |
| User Studies | 10 | | |
| Information Services + Reference services | 8 | | |
| Others | 8 | | |

| | | | |
|----------------------|---|--|--|
| Bibliometrics | 6 | | |
| Information System | 6 | | |
| E-publishing | 5 | | |
| Research Methodology | 5 | | |
| Library Management | 5 | | |

Table 5: Subject wise distribution

Table-5 display that among the various fields of subjects in library and information science, Information retrieval is dominating over other subjects.

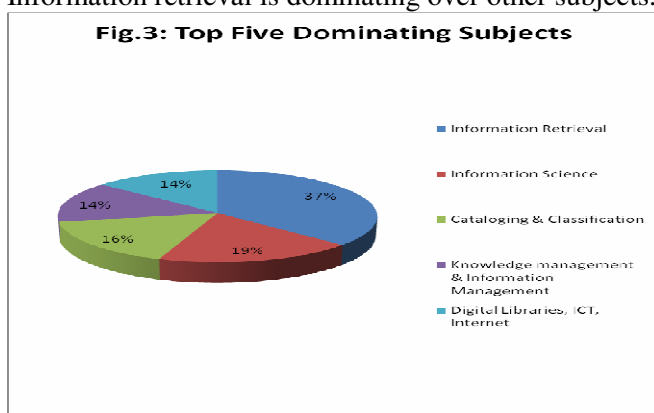


Figure .3 shows the top five most dominating subjects under this study. These are Information Retrieval with 58 (22.76%) papers, Information Science (philosophy and theory) with 29 (11.78%) papers, Cataloging and Classification with 25(10.16%) papers, Knowledge & Information Management with 22 (8.94%) papers and ICT, Digital libraries & Web Technologies with 21 (8.52%) papers respectively.

V. Geographical distribution

| Name | Contribution (papers) | Rank | % |
|--------------------------|------------------------|------|-------|
| United Kingdom | 79 | 1 | 32.11 |
| United States of America | 44 | 2 | 17.88 |
| Finland | 16 | 3 | 6.5 |
| Australia | 15 | 4 | 6.09 |
| Denmark | 13 | 5 | 5.28 |

Table 6: Top Five Prolific Countries

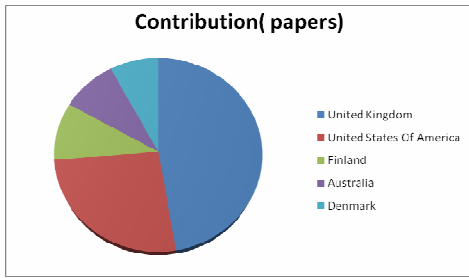


Fig: Geographical distribution

Table-6 and the adjacent graph depict the geographical distribution of contributions of the journal under study. Out of 246 contributions, the highest number i.e. 79 (32.11%) has been contributed by United Kingdom followed by USA, Finland, Australia and Denmark are on second, third, fourth and fifth place having 44 (17.88%), 16 (6.54%), 15(6%) and 13 (5.28%) contributions respectively.

VI. Citation Analysis

Vla. Distribution of citations (volume wise)

| YEAR | Issue No.1 | Issue No.2 | Issue No.3 | Issue No.4 | Issue No.5 | Issue No.6 | Total |
|------------|------------|------------|------------|------------|------------|------------|-------|
| 2005(V.61) | 474 | 243 | 243 | 198 | 158 | 299 | 1615 |
| 2006(V.62) | 199 | 307 | 298 | 197 | 120 | 197 | 1318 |
| 2007(V.63) | 294 | 198 | 209 | 214 | 376 | 333 | 1624 |
| 2008(V.64) | 442 | 199 | 329 | 277 | 328 | 327 | 1902 |
| 2009(V.65) | 327 | 335 | 431 | 404 | 305 | 297 | 2099 |
| 2010(V.66) | 309 | 322 | 279 | 383 | 341 | 409 | 2043 |

Table 7: Citation Distribution

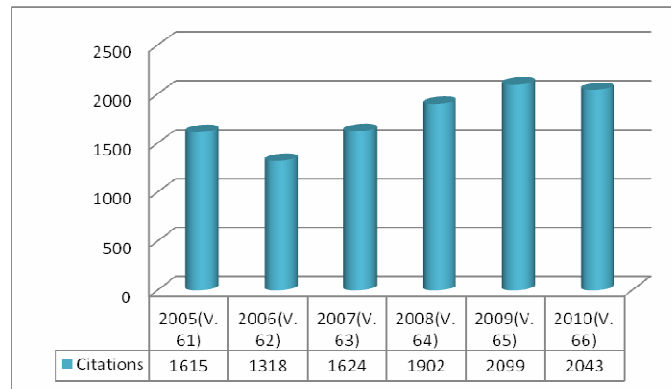


Fig: Citation distribution

It can be seen from the table 7 & adjacent graph that there are 10601 citations provided over six years for the total contributions of 246 papers. The above figures also show that volume 65 has highest number of share (19.8%) in the total citation i.e. 10601 received during the study. While least citations has been recorded in volume number 62 with 12.4% citations.

Vlb. Average Citations per Paper (ACP)

| Yea | Volum | Citatio | Pape | ACP |
|-----|-------|---------|------|-----|
|-----|-------|---------|------|-----|

| r | e | ns | rs | |
|------|----|------|----|-------|
| 2005 | 61 | 1615 | 42 | 38.45 |
| 2006 | 62 | 1318 | 36 | 36.61 |
| 2007 | 63 | 1624 | 41 | 39.6 |
| 2008 | 64 | 1902 | 43 | 44.23 |
| 2009 | 65 | 2099 | 42 | 49.97 |
| 2010 | 66 | 2043 | 42 | 48.64 |

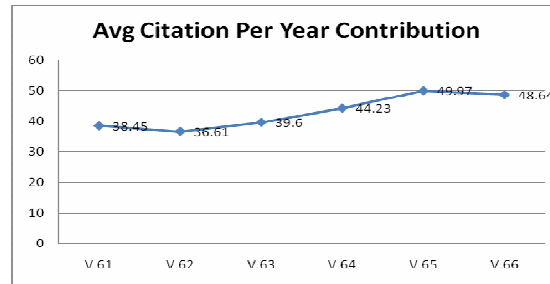


Table 8: Average citations per Paper
Fig: Average citation per paper

In the table 8 & adjacent figure, it can be seen that the average number of citations per contribution is 43 which is very good.

Vlc. Author Self-Citation analysis

The ratio between self-citations and total number of citations is 1:16 i.e. about 6.21% citations are self-citations. The highly self cited paper is from volume 61, no 1 entitled 'Empiricism, rationalism and positivism in library and information science' by Birger Hjørland containing 13 self-citations. The most prolific authors are Birger Hjørland with 34 citations followed by Nigel Ford (27 citations), David Nicholas and Paul Huntington (23 citations) respectively.

06 Results and Findings

The followings are some interesting facts found out from the analysis of the journal 'Journal of Documentation (2005-2010)' such as,

- This study shows a trend of growth in contributions published during 2005 to 2010 and average number of contributions per volume is 41.
- The Degree of collaboration is 0.51 i.e. Majority of the library and information scientists prefers to contribute their papers jointly.
- Most of the contributions are on Information Retrieval (22.76%). Information Science (philosophy and theory) (11.78%), Cataloguing and Classification (10.16%), Knowledge & Information Management with (8.94%) and ICT, Digital libraries & Web Technologies (8.52%) has too good share in the papers published during 2005-2010.
- Most of the contributions in this journal are from United Kingdom (32.11%) followed by USA, Finland, Australia, etc respectively.
- All the contributions are with a good number of citations.
- At about 6.21% citations are self-cited by the respective authors.

07 Limitations

This bibliometric study is based on data collected from volume 61- volume 66 of the journal "Journal of Documentation" therefore its results may vary on different times for the different journals. Sometimes author's designation and affiliations changes which may cause a little deviation in actual results of geographical distribution of contributions. Editorials, book reviews, note from the publishers and communications are excluded from the study. The validity of the result depends upon the sample size and as this study is based on only 36 issues therefore it may not be fully representative in

all the result but it gives a trend about what is happening in the publication arena of library and information science.

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