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Identifying and Mapping the Information Science and Scientometrics Analysis Studies in India (2005-2009): A Bibliometric Study

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Introduction

Information science is primarily concerned with the analysis of collection, classification, manipulation, storage, retrieval and dissemination of information. However, it is actually a broad, interdisciplinary field, incorporating not only aspects of computer science, but also diverse fields of all branches of knowledge. Since Vassily V. Nalimov coined the term 'scientometrics' in the 1960s, this term has grown in popularity and is used to describe the study of science growth, structure, interrelationships and productivity of literature (Hood & Wilson, 2001). Scientometrics is the science of measuring and analyzing science. In practice, scientometrics is often done using bibliometrics which is a measurement of the impact of publications. Bibliometrics and Scientometrics are a set of methods for measuring the production and dissemination of knowledge (Wikipedia, 2010). In recent days there are many articles have been written on bibliometrics. The researchers writing articles in professional manner means of reporting their research activities to the scientific world, this mode provides the latest knowledge to the research community and helps them in preparing their research proposals. Research productivity is assessed in terms of publications. The productivity of ISS has undergone significant change in multidisciplinary and interdisciplinary research activities. Some of the notable studies from India in the fields were Kademani and Kalyane (1996), Gupta, Suresh, Sangam and Karisiddappa (2002), Sangam, Gupta and Kumar (2007), Ramesh (2007), Ravi and Kumar (2008), Modak and Madras (2008), Surwase, Kademani and Kumar (2008), Kaliyaperumal and Natarajan (2009), Maheswaran, Kumar and Sridharan (2009), Joshi, Kshitij and Garg (2010), Hazarika, Sarma and Sen (2010), Patra, Swapan and Chand (2009). In this present study the growth of literature in ISS were derived from the Indian Science Abstract (ISA) database for the period 2005-2009.

Literature Study

This article aims to reveals the information science and scientometrics literature published, however only a few relevant bibliometric studies have been covered for

reviewing the past literature on the field. Levitt and Thelwall (2009) were examined the 82 most highly cited information science and library science articles in the Web of Science from the perspectives of disciplinarily, annual citation patterns, and author citation profiles shows that high quality ideas and methods are often deployed many years after being published (Levitt & Thelwall, 2009). However, Doug Way (2010) studied the open access availability of Library and Information Science research, a study was conducted using Google Scholar to search for articles from 20 top journals. Further examine whether Google Scholar was able to find any links to full text, if open access versions of the articles were available and where these articles were being hosted (Doug Way, 2010). Another study was carried by Egghe, Goovaerts and Kretschmer (2008) were investigated the formulations of the relation between collaboration and production of two different data set that consisting of articles published in journal and the institutional repository of the University Hasselt. The study reveals that, the high collaboration was found in the University Hasselt repository than in the Scientometrics journal. (Egghe, Goovaerts & Kretschmer (2008). Anyi, Zainab & Anuar (2009) analyzed bibliometric studies cover journals in various fields which are considered important i.e., Arts, Humanities and Social Sciences; Medical and Health Sciences; Sciences and Technology; Library and Information Sciences. A Asian and African contribution was high and number of bibliometricists from Indians and as such coverage of Indian journals was high; the quality of the journals and their importance either nationally or internationally inferred from their indexation status.

Another bibliometrics study was carried by Gupta, Kumar, Sangam and Karisiddappa (2002) were analyzed the applicability of selected publications growth in six sub-disciplines of social sciences, namely anthropology, economics, history, political science, psychology, and sociology in the world and verify the criteria for selecting the most appropriate growth model suggested by Egghe and Rao (1992) (Gupta, Kumar, Sangam & Karisiddappa, 2002). Similarly Dinesh (2007) investigated on the history and growth of library and information science marketing literature, it classifies library and information science marketing literature in to review publications and bibliographies, books (include conference publication), journals and news letters and web based literature. These four sources represent principle outlets for disseminating knowledge of library and information science marketing (Dinesh, 2007). Sangam and Meera (2008) analyzed the growth pattern of Chemical Science literature and describe the year wise growth of Indian research papers in the 13 fields of Chemical sciences. They investigated the pattern of authorship, degree of collaboration and type of collaboration linkages in subfields (Sangam & Meera, 2008). Another study was carried by Girap, Surwase, Sagar, Kademani and Kumar (2009) analyzed the publications of TPPED at Bhabha Atomic Research Centre. The study reveals that year wise highest publications average number of publications, most prolific authors and preferred journals for publishing the articles. Collaboration trend was multi-authored publications, were more of total publications (Girap, Surwase, Sagar, Kademani and Kumar, 2009). However, Basak and Sathyanaray (2010) analyzed the original papers was undertaken to assess the different aspects of community pharmacy practice in India. The MEDLINE, Index Copernicus, IndMed, DOAJ databases and the journals such as Indian Journal of Pharmaceutical Sciences and Indian Journal of Hospital Pharmacy was used as data sources. Type of papers, type of journals, category of papers, production indicators and impact factor of the journals were analyzed (Basak & Sathyanaray, 2010).

Objectives of the Study

The main objectives of the present study are:

- To sketch the frequency of articles volume and year wise
- To examine the distribution of articles by contributors
- To assess the authorship pattern volume wise
- To observe the length of papers

- To study the degree of collaboration among the authors
- To know the types of the documents
- To understand the degree of collaboration among co-authors
- To analyze the degree of collaboration among different category of authors
- To discover the contributors by geographical location
- To discover the core journals for publishing papers

Materials and Methods

The present study is based on the analysis of bibliographic details of documents in the field of ISS published as various journal articles, thesis reports, patents and standards. The data was obtained from the ISA for the period of 2005 to 2009 was collected from the Website of [NISCAIR's](#) online of ISA Journal. All the bibliometric details of publications were scanned and all the data elements were transferred to spread sheet application. After validation, the data was analyzed as per the objectives of the study. The bibliographic fields were analyzed by normal count procedure and it covers the following items of information like names, year wise distribution of articles, types of document, length of the papers, institution wise distribution of articles, country wise distribution of contributions, state wise distribution of contributions, journal wise distribution of articles, etc. The following succeeding sections were analyses the collected data for this study.

Results and Discussion

Growth of publications

This paper traces the growth of publications in ISS since 2005-2009. The collected data were analyzed and interpreted in Table 1.

Table 1 Year wise distribution of articles

| Sl. No. | Years | Total | Percentage |
|---------|-------|-------|------------|
| 1 | 2005 | 101 | 10.12 |
| 2 | 2006 | 216 | 21.64 |
| 3 | 2007 | 162 | 16.23 |
| 4 | 2008 | 190 | 19.04 |
| 5 | 2009 | 329 | 32.97 |
| Total | | 998 | 100.00 |

Table one and Figure one depicted year-wise publication productivity trend of literature published in ISS. During these 5 years, a total of 998 publications were published. The highest number of publications was 329 (32.97%) in 2009. Least number of articles were published (101, 10.12%) in 2005. The average number of publications per year was 199.6.

Types of documents

The various types of resources were published by different authors in the field of ISS, so collected data were analyzed and tabulated in Table 2.

Table 2 Distribution of types of document

| Sl. No. | Volumes* | Journals | Thesis | Standards | Total | Percentage |
|-------------------------|----------|----------|--------|-----------|--------|------------|
| 1 | 41 | 88 | 12 | 1 | 101 | 10.12 |
| 2 | 42 | 210 | 6 | -- | 216 | 21.64 |
| 3 | 43 | 152 | 8 | 2 | 162 | 16.23 |
| 4 | 44 | 172 | 18 | -- | 190 | 19.04 |
| 5 | 45 | 296 | 33 | -- | 329 | 32.97 |
| Total | | 918 | 77 | 2 | 998 | 100.00 |
| % of types of documents | | 91.98 | 7.72 | 0.30 | 100.00 | |

* Per volume 24 issues of ISA journal

Journal articles were the most important form of publication in the information science and scientometrics. Table 2 shows volume-wise break-up of the resources. Among the total contributions, majority (918, 91.98%) of article were published in journals. The least percent was (7.72%) in thesis and (0.30%) standards.

Length of articles

While collecting the data for preparing the Table 3 'Length of an article' totals 998 contributions out of which 918 articles are considered. The remaining 79 documents (thesis and standards) was not mentioned its length, only journal articles data was consider for further succeeding study.

Table 3 Length of papers

| Sl. No. | No. of Pages | 2005 | 2006 | 2007 | 2008 | 2009 | Total | Percentage |
|---------|----------------|------|------|------|------|------|-------|------------|
| 1 | Less than five | 20 | 19 | 21 | 17 | 30 | 107 | 11.65 |
| 2 | 5 to 10 | 47 | 126 | 88 | 107 | 205 | 573 | 62.42 |
| 3 | 11 to 15 | 16 | 41 | 32 | 33 | 41 | 163 | 17.76 |
| 4 | 16 to 20 | 5 | 18 | 9 | 7 | 11 | 50 | 5.45 |
| 5 | More than 20 | -- | 6 | 2 | 8 | 9 | 25 | 2.72 |
| Total | | 88 | 210 | 152 | 172 | 296 | 918 | 100.00 |

Table three deals with the length of the articles, major portion of articles i.e., 573 (62.42%) were written between in 5 to10 pages, followed by 11 to 15 pages it has 163 (17.76%) articles. Whereas 107 papers are having less than 5 pages and 50 articles are having between 16 to 20 pages, only twenty six articles are having more than 20 pages with 11.65%, 5.45% and 2.72% respectively.

Authorship Pattern

Table 4 and Figure 2 gives the details about the authorship pattern with number of articles contributed by authors in the field of ISS.

Table 4 Authorship pattern

| Sl. No. | No. of Authors | Total articles | Percentage | Total authors | Percentage |
|------------------------------|------------------------|----------------|------------|---------------|------------|
| 1 | One author | 370 | 40.31 | 370 | 21.72 |
| 2 | Two authors | 376 | 40.96 | 752 | 44.15 |
| 3 | Three authors | 131 | 14.27 | 393 | 23.08 |
| 4 | Four author | 28 | 3.05 | 112 | 6.58 |
| 5 | Five authors | 7 | 0.76 | 35 | 2.06 |
| 6 | More than five authors | 6 | 0.65 | 41 | 2.41 |
| Total | | 918 | 100.00 | 1703 | 100.00 |
| Average authorship per paper | | 1.86 | | | |

Table four and Figure two reveals that there was a very strong trend in the field of ISS towards multi authored papers showing 548 (59.69%) articles. Out of which 376 (40.96%) two authorship articles, this is followed by 131 (14.27%) three authorship articles, further four authorship (28 articles; 3.05%), five authorship (67 articles; 2.97%), more than five authors collaboration is very low it shows only 6 (0.65%) articles. Whereas 370 (40.31%) articles was single authored. The average authorship per paper was 1.86.

Degree of collaboration

The extent of collaboration in research can apparently be measured with the help of multi authorship of papers. K.S. Subramanyam has given a formula for determining the degree of collaboration in a discipline.

The formula is as follows: NM

$$C = \frac{NM}{NM+NS}$$

$NM+NS$

NM = number of multi-authored papers

NS = number of single- authored papers

Where, C= Degree of collaboration in a discipline.

Using the formula, the degree of collaboration in the field of Information science and scientometrics has been determined and given in Table 4 to 7.

Table 5 Degree of collaboration among authors

| Sl. No. | No. of Authors | 2005 | 2006 | 2007 | 2008 | 2009 | Authors | Percentage |
|--------------------------|------------------------|------|------|------|------|------|---------|------------|
| 1 | One author | 33 | 86 | 71 | 74 | 106 | 370 | 21.72 |
| 2 | Two authors | 80 | 182 | 108 | 140 | 242 | 752 | 44.15 |
| 3 | Three authors | 24 | 78 | 60 | 69 | 162 | 393 | 23.08 |
| 4 | Four author | 16 | 16 | 12 | 12 | 56 | 112 | 6.58 |
| 5 | Five authors | 10 | 5 | 15 | -- | -- | 35 | 2.06 |
| 6 | More than five authors | 7 | 14 | 6 | 14 | -- | 41 | 2.41 |
| Total | | 170 | 381 | 272 | 309 | 571 | 1703 | 100.00 |
| Authorship collaboration | | 0.81 | 0.77 | 0.74 | 0.76 | 0.81 | 0.78 | |

In the present case the value of 'C' is 1333

$$C = \frac{1333}{1333+370} = 0.78$$

1333+370

Thus the degree of collaboration in ISS was 0.78. This brings out clearly the prevalence of team research in this field. The distribution of degree of collaboration during the years 2005 to 2009 was presented in Table five. Out of the total papers 78.27% of contributions were collaborated with multi authorship and 21.72% of contributions were collaboration with single authors.

Table 6 Degree of collaboration among co-authors

| Volumes* | Years | No. of co-authors | Percentage | collaboration |
|----------|-------|-------------------|------------|---------------|
| 41 | 2005 | 137 | 80.59 | 0.81 |
| 42 | 2006 | 295 | 77.43 | 0.77 |
| 43 | 2007 | 201 | 73.90 | 0.74 |
| 44 | 2008 | 235 | 76.05 | 0.76 |
| 45 | 2009 | 465 | 81.44 | 0.81 |

* Per volume 24 issues of ISA journal

Table 6 reveals that the value of the highest degree of collaboration was 0.81 during the period 2005 and 2009. It is followed by 0.77 in 2006; there is 0.76 in 2008 least degree of collaboration among the co-authors is 0.74 in 2007.

Table 7 Degree of collaboration among different category of authors

| Sl. No. | Years | Degree of collaboration in two author publications | Degree of collaboration in three author publications | Degree of collaboration in four author publications | Degree of collaboration in five author publications | Degree of collaboration in more than five author publications |
|---------|-------|--|--|---|---|---|
| 1 | 2005 | 0.47 | 0.14 | 0.10 | 0.06 | 0.04 |
| 2 | 2006 | 0.48 | 0.20 | 0.04 | 0.01 | 0.04 |
| 3 | 2007 | 0.40 | 0.22 | 0.04 | 0.06 | 0.02 |
| 4 | 2008 | 0.45 | 0.22 | 0.04 | 0.00 | 0.05 |
| 5 | 2009 | 0.42 | 0.28 | 0.10 | 0.01 | 0.00 |

Table 7 shows that, the degree of collaboration among two author publications 0.48 was highest and least was 0.40. In three authors collaboration 0.28 highest and least was 0.14. Similarly in four authors collaboration 0.10 was highest and least was 0.04. Followed by five authors' collaboration 0.06 was highest and least was 0.01. Whereas more than five authors collaboration 0.05 was highest and least was 0.02. It is noted that 0.48 was highest among the collaboration in different category of authors.

Rank wise distribution of collaborators

The collaboration of contributor is important in bibliometric study as such the rank wise distribution of collaborators has been analyzed and presented in the Table 8.

Table 8 Rank wise distribution of collaborators

| Sl. No. | Rank | Collaborators name | Total | Percentage |
|---------|------|--------------------|-------|------------|
| | 1 | Gupta B M, | 16 | 0.94 |
| | 2 | Ramesh L S R C V, | 14 | 0.82 |
| | | Satija M P, | 14 | 0.82 |
| | 3 | Sen B K | 13 | 0.76 |
| | 4 | Neelameghan A, | 11 | 0.65 |
| | 5 | Kademani B S, | 10 | 0.59 |
| | | Vijai Kumar, | 10 | 0.59 |

| | | | | |
|--|-------------------|--------------------|------|------|
| | 6 | Sharma A K, | 9 | 0.53 |
| | 7 | Anil Kumar, | 8 | 0.47 |
| | | Kumbar M, | 8 | 0.47 |
| | | Mudhol M V, | 8 | 0.47 |
| | | Surwase G, | 8 | 0.47 |
| | 8 | Ahmad N, | 7 | 0.41 |
| | | Bhandi M K | 7 | 0.41 |
| | | Dutta U, | 7 | 0.41 |
| | | Jeevan V K J, | 7 | 0.41 |
| | | Kannappanavar B U, | 7 | 0.41 |
| | | Krishna K M, | 7 | 0.41 |
| | | Lohar M S, | 7 | 0.41 |
| | 9 | Mallaiah T Y, | 7 | 0.41 |
| | | Panigrahi P, | 7 | 0.41 |
| | | Amritpal Kaur, | 6 | 0.36 |
| | | Kanthimathi S, | 6 | 0.36 |
| | | Kumbar B D, | 6 | 0.36 |
| | | Natarajan M, | 6 | 0.36 |
| | | Nikam K, | 6 | 0.36 |
| | | Prasad A R D, | 6 | 0.36 |
| | Raghavan K S | 6 | 0.36 | |
| | Veeranjaneyulu K, | 6 | 0.36 | |
| | | Ashok Kumar, | 5 | 0.29 |
| | | Biradar S, | 5 | 0.29 |

| | | | | |
|--|----|---------------------------------------|-----|-------|
| | | Chandrashekara M | 5 | 0.29 |
| | | Dhiman A K, | 5 | 0.29 |
| | | Gopinath M A | 5 | 0.29 |
| | | Harinaryana N S, | 5 | 0.29 |
| | | Karisiddappa C R, | 5 | 0.29 |
| | | Koovakkai D, | 5 | 0.29 |
| | | Kretschmer H | 5 | 0.29 |
| | | Krishnamurthy M | 5 | 0.29 |
| | | Kumar S, | 5 | 0.29 |
| | 10 | Lalit Mohan, | 5 | 0.29 |
| | | Lawrence Mary A | 5 | 0.29 |
| | | Mohindersingh | 5 | 0.29 |
| | | Nazim Md., | 5 | 0.29 |
| | | Pujar S M, | 5 | 0.29 |
| | | Rajendiran P, | 5 | 0.29 |
| | | Rajyalakshmi D, | 5 | 0.29 |
| | | Ramesh Babu B, | 5 | 0.29 |
| | | Sagar A, | 5 | 0.29 |
| | | Sangam S L, | 5 | 0.29 |
| | | Suresh Kumar | 5 | 0.29 |
| | | 25 Authors Contributed 4 Papers Each | 100 | 5.87 |
| | | 71 Authors Contributed 3 Papers Each | 213 | 12.52 |
| | | 143 Authors Contributed 2 Papers Each | 286 | 16.80 |
| | | 754 Authors Contributed 1 Papers Each | 754 | 44.28 |
| | | | | |

| | | |
|-------|------|--------|
| Total | 1703 | 100.00 |
|-------|------|--------|

Table eight shows that the ranking of the authors, it is observed from the data that B M Gupta stands first rank with 16 (0.94%) papers, and second rank shared by LSRCV Ramesh and M P Satija with 14 (0.82%) papers each. B K Sen stands in third rank with 13 (0.76%) papers. A Neelameghan stands forth rank with 11 (0.65%) papers; fifth rank shared B S Kademani and Vijai Kumar with 10 (0.59%) papers each. A K .Sharma stands in sixth rank with 9 (0.53%) papers; seventh rank shared by four authors Anil Kumar, M Kumbar, M V Mudhol and G Surwase with 8 (0.47%) papers each. Similarly eighth rank shared by nine authors, ninth rank shared by eight authors and followed by 22 authors shared tenth rank with 5 (0.29%) papers each. Remaining 25, 71, 143 and 754 authors have contributed 4, 3, 2 and 1 paper each respectively.

Institution wise distribution of documents

The distribution of articles published with sponsoring parental institutions where from the collaborators were contributed articles was analyzed and interpreted in the Table 9.

Table 9 Institution wise distribution of articles

| Sl. No. | Institutes wise | Total | Percentage |
|---------|---------------------|-------|------------|
| 1 | Universities | 399 | 43.46 |
| 2 | Colleges | 168 | 18.30 |
| 3 | Research Institutes | 152 | 16.56 |
| 4 | NITs | 38 | 4.14 |
| 5 | Associations | 35 | 3.81 |
| 6 | Deemed Universities | 26 | 2.83 |
| 7 | IIMs | 12 | 1.31 |
| 8 | INFLIBNET | 10 | 1.09 |
| 9 | IITs | 9 | 0.98 |
| 10 | IISc | 8 | 0.87 |
| 11 | Others | 61 | 6.65 |
| Total | | 918 | 100.00 |

The distribution of published papers by institution wise the table nine reveals that, out of 918 contribution, the highest number (399, 43.46%) of articles were contributed by the Universities. The various types of colleges stand the second place with 168 (18.30%) articles. The research institutions stand on third place

with 152 (16.56%) papers. The NITs with 4.14%, Associations with 3.81%, deemed Universities with 2.83%, IIMs with 1.31%, INFLIBNET with 1.09%, IITs with 0.98%, IISc and other institutions have contributed with 0.87% and 6.65% of articles respectively.

Country-wise distribution of collaborations

The country wise distribution details about the collaborations with number of articles contributed by authors in the field of ISS was depicted in Table 10.

Table 10 Country wise distribution of contributions

| Sl. No. | Rank | Country | Total | Percentage |
|---------|--------------|-------------|--------|------------|
| 1 | 1 | India | 771 | 83.99 |
| 2 | 2 | Nigeria | 14 | 1.53 |
| 3 | 3 | U.S.A. | 13 | 1.42 |
| 4 | 4 | U.K. | 10 | 1.09 |
| 5 | 5 | Iran | 6 | 0.65 |
| 6 | 6 | Netherlands | 5 | 0.54 |
| 7 | 7 | Sri Lanka | 4 | 0.44 |
| 8 | 8 | Bangladesh | 3 | 0.32 |
| 9 | | Germany | 3 | 0.32 |
| 10 | | Singapore | 3 | 0.32 |
| 11 | | Spain | 3 | 0.32 |
| 12 | | Taiwan | 3 | 0.32 |
| 13 | | 9 | Canada | 2 |
| 14 | France | | 2 | 0.22 |
| 15 | Greece | | 2 | 0.22 |
| 16 | Mexico | | 2 | 0.22 |
| 17 | Saudi Arabia | | 2 | 0.22 |
| 18 | Swaziland | | 2 | 0.22 |

| | | | | |
|-------|----|------------|-----|--------|
| 19 | | Sweden | 2 | 0.22 |
| 20 | | Tanzania | 2 | 0.22 |
| 21 | 10 | Bahrain | 1 | 0.11 |
| 22 | | Botswana | 1 | 0.11 |
| 23 | | Egypt | 1 | 0.11 |
| 24 | | Hungary | 1 | 0.11 |
| 25 | | Italy | 1 | 0.11 |
| 26 | | Japan | 1 | 0.11 |
| 27 | | Jordan | 1 | 0.11 |
| 28 | | Luxemburg | 1 | 0.11 |
| 29 | | Pakistan | 1 | 0.11 |
| 30 | | Turkey | 1 | 0.11 |
| 31 | | Not Traced | 54 | 5.88 |
| Total | | | 918 | 100.00 |

Table 10 shows the country-wise distribution of papers, out of the total (918) articles, majority (771, 83.99%) of articles have been published by Indian contributors. 14 (1.53%) articles have been published, authors have the affiliation belonging to Nigeria. Similarly 13 (1.42%) articles have been published from USA, and 10 (1.09%) articles have been published from UK. The remaining 56 articles have been published from 25 countries authors have the affiliation and 54 articles were not traced the authors affiliation belonging to which country.

State-wise distribution of contribution

The state wise distributions of contribution in ISS, collected data were analyzed and presented in Table 11.

Table 11 State wise distribution of contributions

| Sl. No. | Rank | State | Total | Percentage |
|---------|------|------------|-------|------------|
| 1 | 1 | Karnataka | 139 | 18.03 |
| 2 | 2 | Tamil Nadu | 88 | 11.41 |
| 3 | 3 | Delhi | 85 | 11.02 |

| | | | | |
|-------|----|-------------------|-----|--------|
| 4 | 4 | Maharashtra | 72 | 9.33 |
| 5 | 5 | Kerala | 56 | 7.26 |
| 6 | 6 | Uttar Pradesh | 53 | 6.87 |
| 7 | | West Bengal | 53 | 6.87 |
| 8 | 7 | Andhra Pradesh | 48 | 6.23 |
| 9 | 8 | Madhya Pradesh | 32 | 4.15 |
| 10 | | Punjab | 32 | 4.15 |
| 11 | 9 | Haryana | 21 | 2.72 |
| 12 | 10 | Gujarat | 15 | 1.95 |
| 13 | 11 | Orissa | 14 | 1.82 |
| 14 | 12 | Manipur | 11 | 1.43 |
| 15 | 13 | Rajasthan | 10 | 1.30 |
| 16 | 14 | Uttarakhand | 9 | 1.17 |
| 17 | 15 | Jammu and Kashmir | 5 | 0.65 |
| 18 | 16 | Assam | 4 | 0.52 |
| 19 | | Himachal Pradesh | 4 | 0.52 |
| 20 | | Jharkhand | 4 | 0.52 |
| 21 | | Meghalaya | 4 | 0.52 |
| 22 | | Uttaranchal | 4 | 0.52 |
| 23 | 17 | Chandigarh | 3 | 0.39 |
| 24 | 18 | Goa | 2 | 0.26 |
| 25 | | Pondicherry | 2 | 0.26 |
| 26 | 19 | Chhattisgarh | 1 | 0.13 |
| Total | | | 771 | 100.00 |

Table eleven shows that, the state-wise distribution of papers published in information science and scientometrics literature from India. The majority of papers were published from Karnataka (18.03%) followed by Tamil Nadu with 11.41% of total papers, Delhi comes next with 11.02%, and Maharashtra stands in fourth position with 9.33% of papers contribution. Kerala stands fifth with 7.26%, Uttar Pradesh and West Bengal shared each sixth positions with 6.87%, Andhra Pradesh with 6.23%, Madhya Pradesh and Punjab are each with 4.15% articles, Haryana with 2.72%, Gujarat with 1.95%, Orissa with 1.82%, Manipur with 1.43, Rajasthan with 1.30%, Uttarakhand with 1.7%, Jammu Kashmir with 0.65% and Assam, Himachal Pradesh, Jharkhand, Meghalaya, Uttaranchal stands in sixteenth rank each with 0.52% of papers, Chandigarh with 0.39%, Goa and Pondicherry are each with 0.26% and Chhattisgarh stands last with 0.13% of articles.

Ranking of journals

One of the objectives of the present study is to discover core journals by counting number of papers related to ISS was published during the year 2005 to 2009. The papers were obtained from 55 journals. The journals were arranged as per their rank and journals showing the same number of papers was arranged.

Table 12 Journal wise distribution of articles

| Sl. No. | Rank | Names of the Journals | # of articles | Percentage |
|---------|------|---|---------------|------------|
| 1. | 1 | SRELS Journal of Information Management | 134 | 14.60 |
| 2. | 2 | ANNALS of Library and Information Studies | 124 | 13.51 |
| 3. | 3 | DESIDOC Journal of Library Information Technology | 104 | 11.33 |
| 4. | 4 | Indian Journal of Information and Library Society | 84 | 9.15 |
| 5. | 5 | IASLIC Bulletin | 68 | 7.41 |
| 6. | 6 | ILA Bulletin | 57 | 6.21 |
| 7. | 7 | International Library Movement | 53 | 5.77 |
| 8. | 8 | KELPRO Bulletin | 46 | 5.01 |
| 9. | 9 | Information Studies | 43 | 4.68 |
| 10. | 10 | Library Programme | 31 | 3.38 |
| 11. | 11 | Journal of Information Management Scientometrics | 24 | 2.61 |
| 12. | 12 | Journal of Library Information Technology | 20 | 2.18 |
| 13. | 13 | Current Science | 19 | 2.07 |
| 14. | 14 | International Information Communication Education | 15 | 1.63 |

| | | | | |
|-------|----|---|-----|--------|
| 15. | 15 | Indian Journal of Library and Information Science | 14 | 1.53 |
| 16. | 16 | Herald Library Science | 9 | 0.98 |
| 17. | 17 | Journal of Library and Information Science | 8 | 0.87 |
| 18. | 18 | COLLINET Journal of Scientometrics and Information Management | 6 | 0.65 |
| 19. | 19 | Journal of Digital Information Management | 5 | 0.54 |
| 20. | 20 | IETE Journal of Research | 4 | 0.44 |
| 21. | | 3 Journals in which 03 articles each were published | 9 | 0.98 |
| 22. | | 9 Journals in which 02 articles each were published | 18 | 1.96 |
| 23. | | 23 Journals in which 01 articles each were published | 23 | 2.51 |
| Total | | | 918 | 100.00 |

Table 12 demonstrate a rank list of journals, the study reveals that "SRELS Journal of Information Management" scores the first rank which account to 134 (14.64%) of the total papers. "ANNALS of Library and Information Studies" scored second rank with 124 (13.51%) papers and "DESIDOC Journal of Library Information Technology" scored third rank in the rank list containing for 104 (11.33%) papers. This rank list may serve as an aid in the development of journals collections in the literature of information science and scientometrics.

Findings

a) The productivity trends of literature published on information science and scientometrics in ISA database during five years, a total of 998 publications were traced.

b) The researchers preferred to publish their research articles in journals. The study reveals that, majority (91.98%) of articles were published in journals. In the length of articles 62.42% of articles were between in 5 to10 pages.

c) The study reveals that, trend in multi authored papers was sturdily increased with 59.69% compared with (40.31%) single authored papers, whereas average authorship was 1.86 per paper and degree of collaboration was noted 0.78. It also noted that value of the highest degree of collaboration was 0.81 in 2005 and 2009.

d) In the ranking of authors, B M Gupta stands first rank with 0.94% of papers, and second rank shared by LSRCV Ramesh and M P Satija with 0.82% of papers each. B K Sen stands in third rank with 0.76% of papers. A Neelameghan stands forth rank with 0.65% of papers and remaining authors stands with different ranks according their contribution.

e) The distribution of published papers by institution wise Universities stand first rank with 43.46% of papers.

f) In the country-wise distribution of papers in the field of information science and scientometrics, majority (83.99%) of articles have been published from India,

followed by other country. As such in the state-wise distribution of papers Karnataka stands first with 18.03%, followed by other states in India

g) The study reveals that rank wise distribution of journals "SRELS Journal of Information Management" stands first rank with 14.64% of the total papers and "ANNALS of Library and Information Studies" scored second rank with 13.51%, followed by other journals

Conclusion

The purpose of this study is to measure the number of contributions and highlight quantitatively the contributions made by the researchers in the field of information science and scientometrics published on ISA during 2005 to 2009. The analysis showed that 998 papers were published in the field of information science and scientometrics. The highest number of publications (329) was produced in 2009. The average number of publications per year was 199.6. Major channel of communication used by the researchers was journals during these five years of period. The trend in multi authored papers was sturdily increased (59.69%) compared to (40.31%) single authored papers. The average authorship (1.86) per paper and degree of collaboration (0.78) is noted significantly. It also noted that value of the highest degree of collaboration was (0.81) high in 2005 and 2009. The publication behaviour of researchers shows that they were highly selective in publishing their research results in highly specialized journals. The SRELS Journal of Information Management and ANNALS of Library and Information Studies, stands first and second place respectively. B M Gupta, LSRCV Ramesh, M P Satija, B K Sen and A Neelameghan contributed more numbers of papers in the domain of ISS. It would be quite interesting to study other qualitative indicators based on citations analysis of these publication.

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