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**Library and Information Science Research on Web of Science Database from 2014 to 2018:  
An Overview**

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**Abstract**

*A country's progress in all aspects like economic, educational, medical, defense, living standards of citizens is possible only through research and the platform for quality research is a university. The generation of knowledge and its transmission has been a requirement for long term progress of a university which is having a direct impact on a nation's development. Universities through research make the highest contribution to a nation's industrial and business growth than any other academic institutions. Library Science evolving as an interdisciplinary or multidisciplinary field applying the practices, perspectives, and tools of management, information technology, education, in two broad perspectives - to libraries' collection, organization, preservation, and dissemination of information resources and the political economy of information. This study presents an overview of LIS research on certain parameters namely, geographically prominent region in LIS research, prominent language, most prolific author, most prevalent research areas and most productive year with highest research productivity in the time span 2014 to 2018.*

**Keywords:** Library Science, Research, Web of Science

## **Introduction:**

For social, economic and technological up gradation of people and society as a whole discovery and addition of new knowledge to the existing is indispensable. This is possible only through research which channelizes the pathways to discoveries and inventions. It is evident that in ancient days also kings and elites patronized and sponsored research works and people involved in these works were given high dignities and scholarships. The pace of research has accelerated after the industrial revolution and it was demand of time to meet the thirst of the society for attaining maximum technological advancement. Planned and organized research at national and international levels were initiated by different nations after the industrial revolution due to factors like increasing population and consumers, rigorous depletion of natural resources, changing climatic conditions, perceiving the need to have military and defense infrastructure, need for curing diseases to prolong human life, need to save space and time. Library Science evolving as an interdisciplinary or multidisciplinary field applying the practices, perspectives, and tools of management, information technology, education, in two broad perspectives - to libraries' collection, organization, preservation, and dissemination of information resources and the political economy of information. The first American School for Library Science was founded by Melvil Dewey at Columbia University in 1887, where the inception of imparting Library Science education took place. Martin Schrettinger, a Bavarian librarian coined the discipline in the name of his work during 1808 to 1828. Historically speaking Library Science has also been included in archival science. This incorporates the process of information acquisition, evaluation, application by people in-situ and ex-situ libraries with diverse cultures, training people for careers in libraries, ethical aspects guiding library service and organization, legal aspects of library and information resources, application of computer and information technology in documentation and records management, people's interaction with classification system and technology, organization of information resources to serve the need of specific selected user groups.

## **Literature Review**

**Sagar et al. (2014)** mapped the agricultural research publications in India during 1993 to 2012 based on Web of Science database using parameters growth of publications and citations, domainwise distribution of publications and citations, activity index, international collaboration, highly productive institutions, highly preferred journals, and highly cited publications. The study

reveals that a total of 22615 publications were published in Agriculture during 1993-2012 and these publications received 98954 citations. The highest number of publications 1917 (8.48 %) were published in 2008. The highest number of citations 8714 (8.81 %) were received in 2007. The highest average citations per publication 8.29 were in 2002. There were 10428 (46.11 %) publications with no citations during the period under study. The highest total impact factor (1865.33) was in 2008. The highest average impact factor per publications (1.29) was in 2006. India had 1744 (7.71 %) international collaborative publications with 104 countries in Agriculture.

**Singh et al. (2015)** mapped analyzed scientometrically the research on “Big Data” during 2010-2014 indexed in both the Web of Knowledge (WoK) and Scopus using parameters total output, growth of output, authorship and country-level collaboration patterns, major contributors (countries, institutions and individuals), top publication sources, thematic trends and emerging topics in the field. Findings reveals that the number of research publications in 19 different broader disciplines along with their percentage contribution to the total research output indexed in WoK for the 5-year period depicts that Computer Science contributes a total of 708 out of 1,415 publications, which constitutes approximately 50% of the total output. Thus, in contrary about 50% of the ‘Big Data’ research output is from disciplines other than Computer Science. Electrical, Electronics and Telecommunication Engineering, Biological Sciences, Medical Sciences, Management and Healthcare are some of the major contributing disciplines to ‘Big Data’ research.

**Leydesdorff and Milojević (2015)** studied current trends and issues on scientometric research giving an overview of the field since 1960s till today and discuss its relationship with the sociology of scientific knowledge, the library and information sciences, and science policy issues such as indicator development. The study reveals that the modeling of knowledge exchanges in scientific discourses cannot be reduced to the exchanges of information in co-authorship, co-word, or citation relations. Models as entertained in the sciences enable researchers both to provide meaning to possible future states and to specify uncertainty. The measurement of the communication sharing of meaning among frames of reference, the (re)constructions and their interactions update and reinforce the knowledge bases of the evolving societies and their economies. Authors in scientometrics are able to contribute to the study of science, technology, and innovation from a quantitative perspective by modeling and measuring these developments. The study also highlights the areas in which major issues or challenges are faced which includes measurement of impact,

delineation of a reference set, choosing theories of citation, policy and management context. **Gupta (2016)** mapped research on Library Consortia based on bibliographic records from the Web of Science on literature published during 1980 to 2015. The study reveals that out of 87 articles in the field of Library Consortia, a total number of 23 articles (26.44%) are written during 1980 to 2015 by the top ten authors. Geographical analysis indicates that the field has evolved considerably in different regions of the world. USA is found to be the highest country that contributed 30 articles. Furthermore, chronological analysis discloses that the scientific production in the field of Library Consortia shows a slow increase from 1991 to 1996. Majority of the documents are published in English. Information Technology and Libraries has the highest number of publication with 79 articles and 213 citations followed by articles on Computer Science (24.14%).

**Rathinasabapathy and Veeranjanyulu (2017)** did scientometric mapping of 50 years of global research productivity in food science and technology as reflected by CAB direct online database from 1966 to 2016 using MS-Excel to analyze the data. Findings reveals that during the year 1938 to 2016, a total of 144942 documents were published in the field of Food Science and Technology (FST) out of which 6649 were published in online mode which is about 4.59% of the total publication output. The highest number of publications is 8048 in 2015 and a total of 18 publications were indexed up to 1966. The study also reveals that about 258.30% growth was observed during the decade 1977-86 over 1967-76, 118.67% growth rate during the decade 1987-1996 over 1977-1986, 152.09% growth rate during the decade 1997-2006 over 1987-1996 and 70% growth rate during the decade 2007-2016 over 1997-2006.

**Dziaugyte et al. (2017)** mapped “interpreting” topics in Scopus database during 1990 to 2016 which gave 2931 unique records in multiple languages and documents and these data were analyzed using parameters like publication citation, word co-occurrence, and co-authorship and affiliation geo-location analysis. Findings reveals that the majority of publications are related to healthcare industry, there have not been many collaborations between authors and very little citations considering the scope of “interpreting” field. Despite increasing number of publications over the years, it still lacks significant collaboration between Institutions and authors.

**Gupta et al. (2017)** examined 12104 global publications on digital library research indexed in Scopus database during 2007-16 using bibliographical indicators growth rate, number of publications and international collaborative publications, citation per paper, h-index, activity index and relative citation index have been used. The results of data interpretation reveals that Digital

library research registered annual average growth rate of 7.83% and averaged 4.40 citations per paper. Digital library research is dominated by top 15 most productive countries accounting for 81.61% global publications share in 10 years during 2007-16. USA accounted for the highest global publications share (26.89%), followed by China (10.42%), etc. Computer Science accounts for the largest publication share (62.48%) in global digital library research, followed by Social Sciences and Engineering (30.86% and 19.75%), Mathematics (15.74%), etc. The top 20 most productive research organizations and productive authors contributed 13.64% and 6.90% global publication share respectively and 15.98% and 10.05% global citation share respectively during 2007-16. The top 30 journals contributed 35.15% share to the global journal output during 2007-16.

**Kim and Zhu (2018)** mapped thematic patterns and emerging trends of the published literature in scientometrics during 1990 to 2017 using a variety of tools and techniques, including CiteSpace, VOSviewer, and dynamic topic modeling. A total of 8098 bibliographic records were published and domain-level citation paths, subject category assignment, keyword co-occurrence, topic models, and document co-citation network were examined in these articles. Findings reveal that the domain is multidisciplinary in that a wide range of disciplines contribute to the growth of literature, but only partially interdisciplinary as some works heavily cite from similar domains. Early literature was interested in measuring the impact of a science and evaluating research performance and productivity. Total number of articles published in bibliometrics is 6352, in scientometrics it's is 1779, infometrics, webometric, altmetric, cybermetric and entity metric are 382, 288, 261, 28, 3 respectively.

**Shukla et al. (2018)** made a scientometric assessment of scholarly communication of Mizoram University based on Web of Science in Global perspective from 2007 to 2017 using MS-Excel for processing and analyzing data. The findings reveals that total of 404 scholarly communications have been retrieved with the highest share in 2016 (28.21 %), analyzing the forms of scholarly communications it has been found that "Article" is the most prevalent form (93.56%) followed by "Review" (3.46%) and "Proceedings Paper" (2.22%) with "Physics" and "Chemistry" being the top area of communication. 58% scholarly communications have been published with the support of funding agencies and out of total scholarly communications DST, India funded projects have produced more than 14% scholarly communications followed by UGC, New Delhi (12.87%).

Korea Government funded projects have produced 8.16% scholarly communications out of total scholarly communications.

**Velmurugan (2019)** mapped research productivity on Nanotechnology in Canada by examining annual growth rate of publications, collaborative countries and territories, preferred subject areas and research work, prolific organizations and institutions and top ranked journals and highly productive papers based on Web of Science database using Excel spreadsheet for further statistical analysis and also used the VOS viewer visualization software to screenshot the publication. The study reveals that during the period between 1994 and 2014, a total 576 scientific research papers along with cited references are 34955 were published in the field in Canada average number of literature output were published per year was 33.88 and the greatest number of publications were published in 2013 and 2014 respectively a total number of authors 2213 were identified and the maximum number of authors i.e. 364 and the mean value of 4.77 were in the year 2014. Out of 15804 citations, the greatest number of 2791 citations in the year 2008 (52 papers, 23 h-index) and highest average citation per paper were 60.74 in the year 2007.

**B.S. et al. (2019)** mapped scientific articles on Leukemia research in India during 2009 to 2018 based on the Web of Science database using MS Excel, Histcite software package examining growth of publications, document-wise distribution of records, country-wise distribution of publications, identification of most prolific authors, highly preferred journals and highly productive institutions. Findings reveals that 16794 of records were published in 2016 and 575 of records were published in India. Analysis of forms reveals that they were “articles”, “meeting Abstracts”, “review” and “letter”. Geographic analysis reveals that USA was the most productive country on Leukemia. The study also found that only 4 authors were contributed above 100 numbers of articles and the author Bakhshi a with 121 publication has occupied the first position. The All India Institute of Medical Sciences was top most contributed institution on Leukemia research with 349 records.

### **Scope of the study**

This study will cover only the data available in Web of Science database and specifically from the years 2014 to 2018.

## Objectives of the study

1. To specify the geographically most active region in LIS research.
2. To reveal the most used language in LIS research communication.
3. To know the most prolific author in the mentioned time frame
4. To know the most prevalent research area along with most productive year.
5. To map co-authorship among authors.

## Methodology

Data for this study is collected from Web of Science database using the search string SU= (Information and Library Science), *Indexes= SCI-EXPANDED, SSCI, A&HCI, Time Span=20142018*. The data collected is tabulated and analyzed with MS-EXCEL. Mapping is done using VosViewer software.

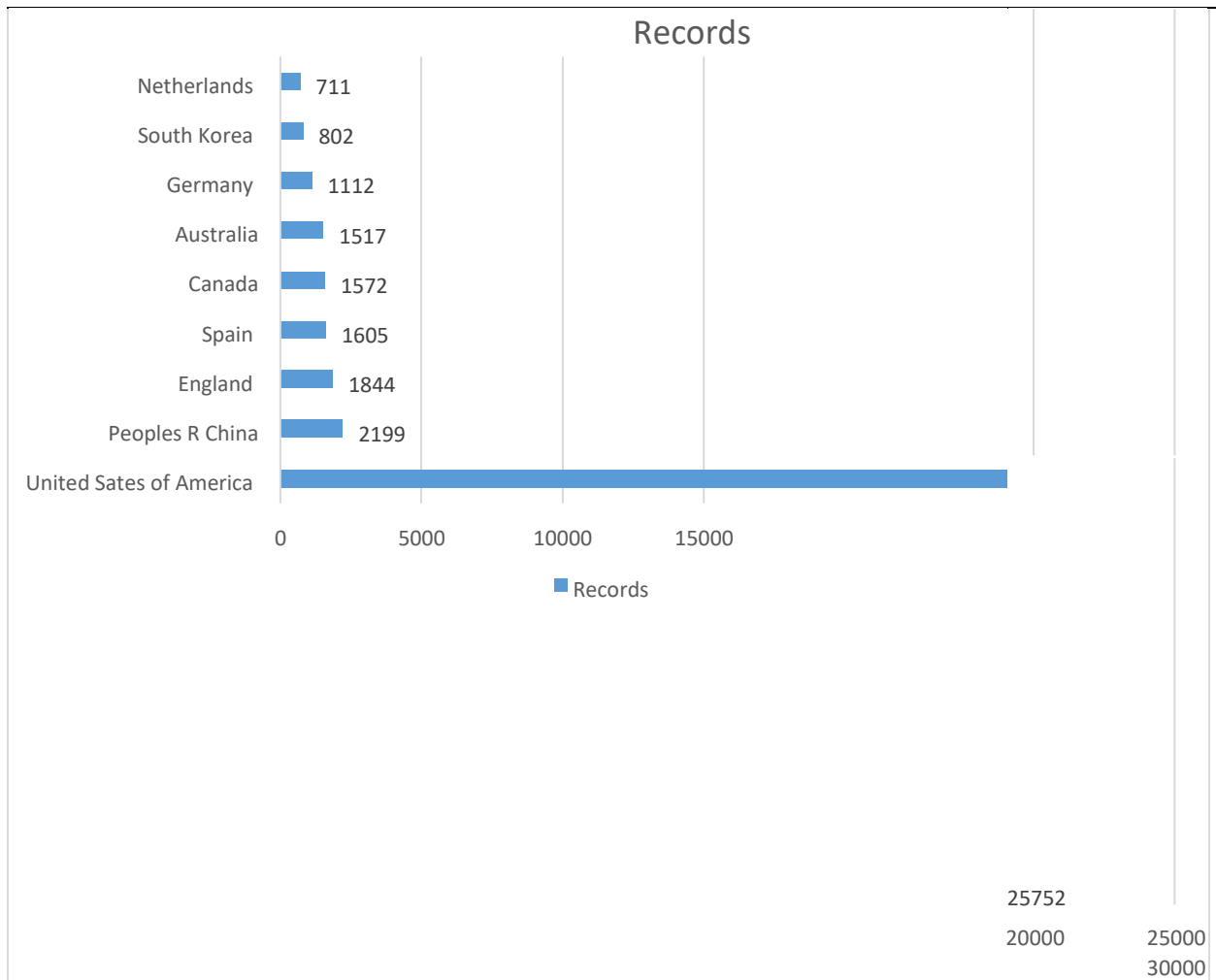
## Data Analysis

Total records found using the mentioned search string in WoS database is 50,595 in LIS in the time span 2014-2018. The data so found in respective parameters is tabulated and the percentage is calculated on 50,595 records.

### Geographical distribution of research publications

Region/Country	Number of Publications	% of 50595
USA	25752	50.898
Peoples Republic of China	2199	4.346
England	1844	3.645
Spain	1605	3.172
Canada	1572	3.107
Australia	1517	2.998
Germany	1112	2.198
South Korea	802	1.585
Netherlands	711	1.405

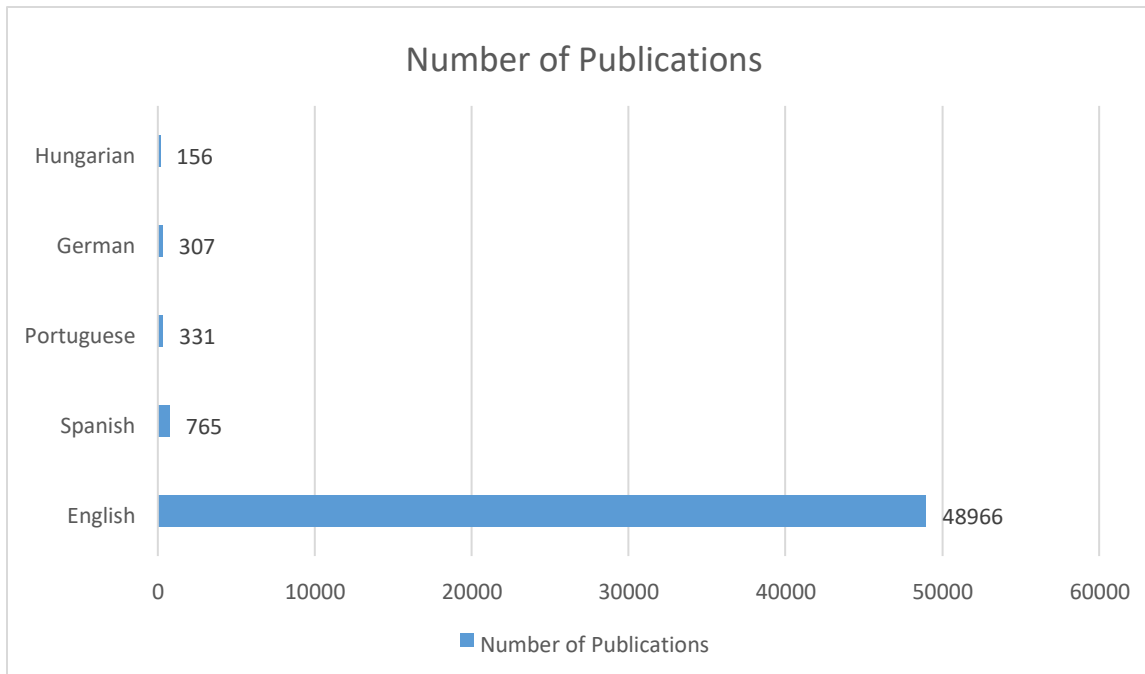




**Figure 1: Graphical Presentation of top 10 countries against records of research publications**

### **Language wise distribution of Research Publications**

Most of the research publications are written in English language followed by Spanish, Portuguese, German language. The distribution is shown below:

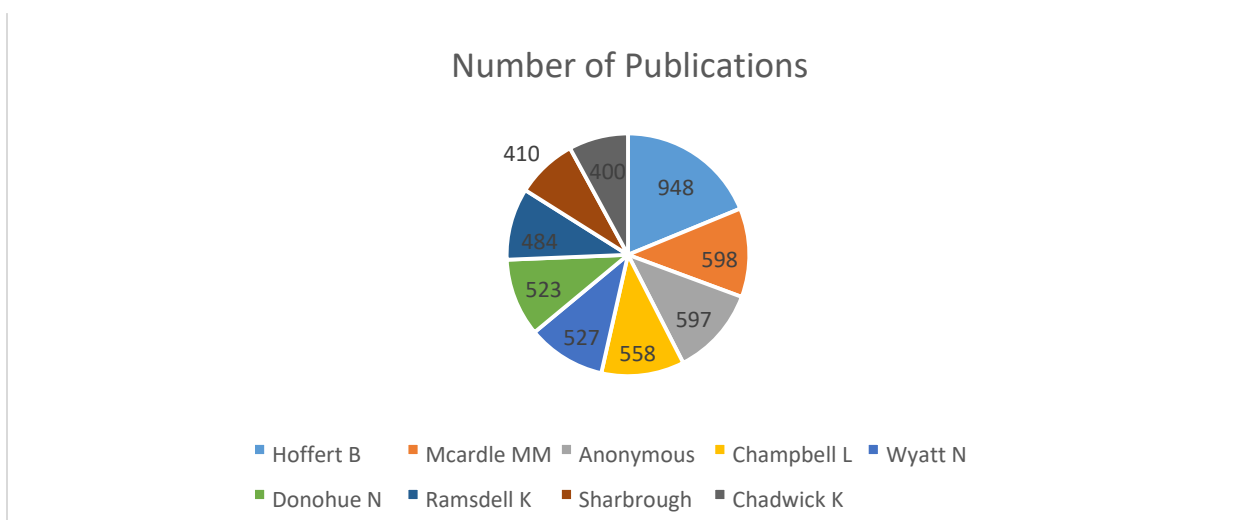


**Figure 2: Language wise distribution of research publications**

From the figure above it is clear that most of the Research publications are communicated in English language with 48966 publications.

**Author-wise distribution research publications – Most prolific author determination**

The distribution of top 10 authors in Web of Science(WoS) database and hence the most prolific author in LIS from 2014 to 2018 is shown below:



### Figure 3: Author-wise distribution of research publications

The above figure reveals that Hoffert B is the most productive author with 948 publications followed by Mcardle MM with 598 publications.

### Analysis of most prevalent research area with most productive year

A total of 22 most prevalent research areas are observed in WoS database. The distribution along with most productive year is shown below:

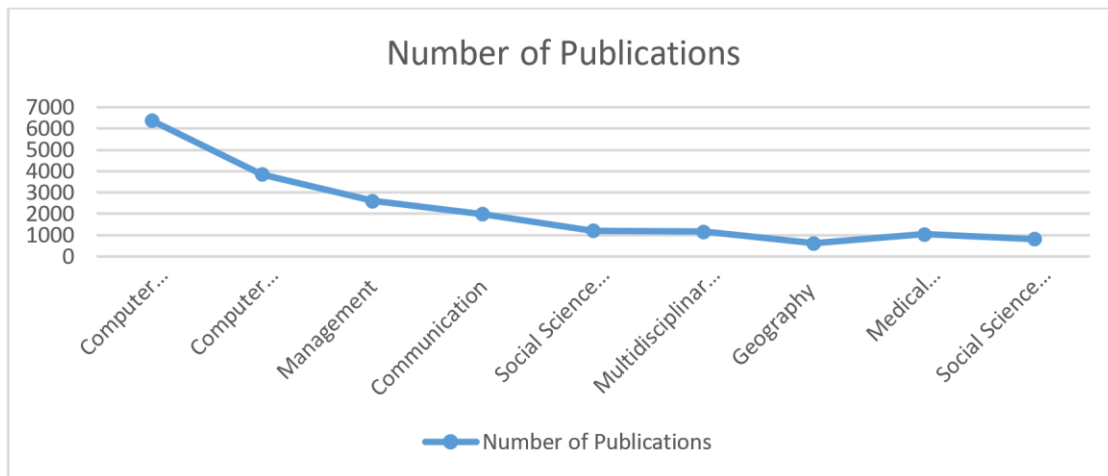
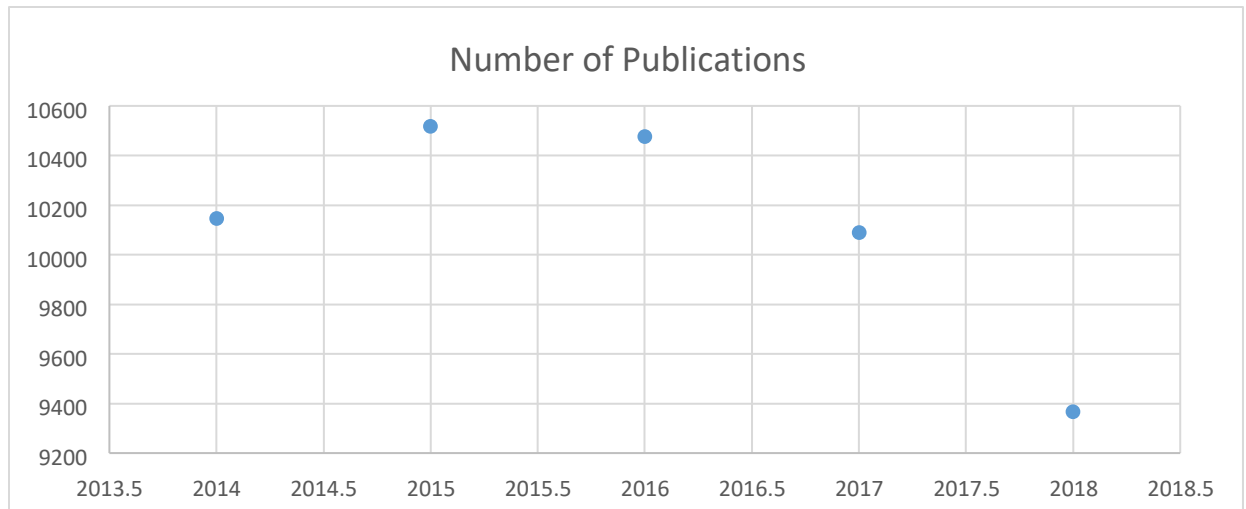


Figure 4: Graphical representation of most Prevalent Research Area.

The Computer Science Information Systems is the most prevalent research area as indexed in WoS database from 2014 to 2018 with 6376 number of publications related to this area.

### Analysis of most productive year

The data is collected for five years i.e. 2014 to 2018 as mentioned above and the number of publications in each year is shown in the following figure:



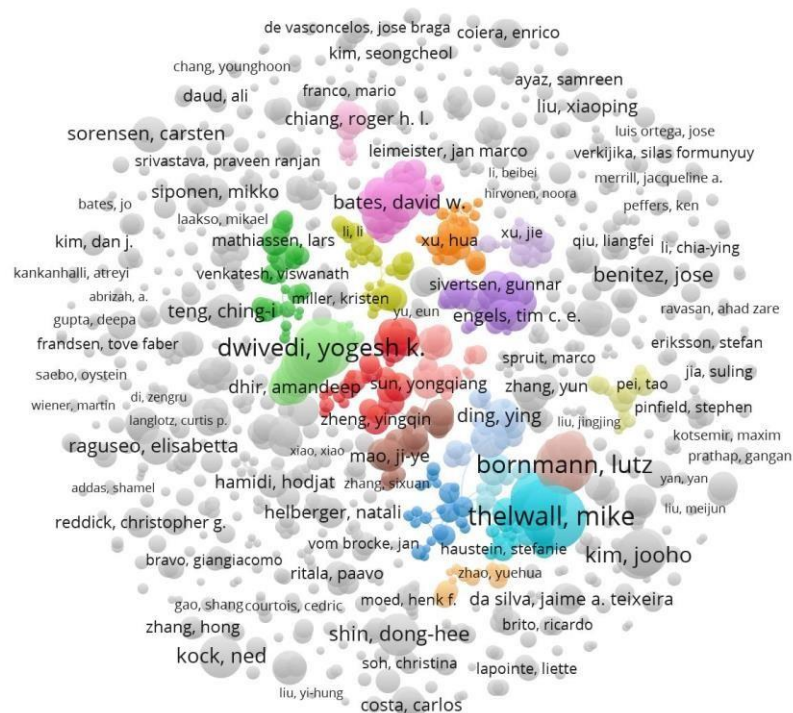
**Figure 5: Number of Publications in each year in the period of 2014 to 2018**

This figure reveals that the number of publications are maximum in 2015 which accounts to 10518 and least in 2018 which is 9367.

### **Mapping co-authorship among authors**

The data downloaded from Web of Science database is analyzed to determine co-authorship pattern among the authors. Thereby, the highest link strength and highest number of members in the cluster is known.

There are total 1031 authors, the total strength of co-authorship links with other authors is calculated.



**Figure 6- Mapping Co-authorship pattern among 1031 authors.**

Using full counting method, choosing minimum number of documents of an author as 2 and minimum number of citations of an author as 2 in Vos-viewer Network visualization platform, the data downloaded from WoS database is entered. Total of 1031 authors are counted, the authors with greatest total link strength, cluster and citations is tabulated below-

Name of the author	Total Link strength	Citations	Cluster
Dwivedi, Yogesh K	4	100	11
Bornmann, Lutz	29	92	17
Thelwall, Mike	9	113	6
Bates, David	15	44	9
Ding, Ying	23	36	12
Raguseo, Elisabetta	0	35	346
Mathiassen, Lacs	4	22	2
Chiang, Roger H.I	6	25	18
Benitez, Jose	6	48	45

Sorensen, Carsten	1	36	157
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The table above reveals the top 10 authors showing co-authorship with citations, clusters and total link strength. Thelwall, Mike tops the list on the basis of citations with 113 citations, Raguseo, Elisabetta tops with 346 clusters on the basis of cluster and Bornmann Lutz tops with 29 local link strength on the basis of total link strength.

## Conclusion

Library and Information Science (LIS) research has been multi-dimensional, interdisciplinary and diverse since its inception as a discipline of study. Due to this reason, the research in LIS is applicable to parent and established disciplines of the universe of knowledge. This study clearly, reveals that India has been at the back of nations like USA, China, Canada, Australia, England and not able to find its place in the top 10 nations. Author Hoffert B with 948 publications is the most productive author in the time period 2014 to 2018 and the year 2015 being the most productive year with 10518 publications. Most publications are in the area Computer Science Information System with 6376 publications, this gives an indication that LIS research in the ensuing future is merging towards Computer Science and application of computer in information management and least publications are related to the area Medical Ethics with a single publication. Most communicated language is English though some publications are also in Spanish, Portuguese, German and Hungarian language.

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