

A Scientometric Mapping of Contributions to Journal of Computer Science and Technology during 2012-2016

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Abstract - The paper presents a Scientometrics mapping of papers published in Journal of Computer Science and Technology, during 2012 to 2016 as reflected in Web of Science database. It attempts to analyze the growth and development of publications output of Journal of Computer Science and Technology as reflected. Data for a total of 485 have been downloaded and analysed according to objectives. The study reveals that the year wise growth rate reveals that the highest no. of papers published in 2015, No. of Papers: 106 (21.86%). Authorship pattern data reveals that most of the authors like to publish papers in collaborations and most preferred authorship pattern was four author i.e. no. publications for four authors were 125 (25.77 %). The Degree of Collaboration (DC) reveals that DC is found highest in 0.95 Co-Authoring Publication. The highly prolific authors and their publications reveal that Zhang L, published highest numbers of papers (11 nos.), the geographical distribution contributions (International) reveals that Peoples R China is in the top with no. of publications is 371 (76.50%), it is found from institution-wise distribution of papers that highest contributed institutions was Chinese Academy of Sciences with 93 Publications (19.18%) is placed at 1st rank and the average of citations per year (2012-2016) were 205.

Keywords: Research output, Scientometrics analysis, publication output of Journal of Computer Science and Technology

I. INTRODUCTION

Journal of Computer Science and Technology (JCST), with ISSN: 1000-9000 (print version) ISSN: 1860-4749 (electronic version), it is a first journal of English language in the field of computer Science which were published in China, for publication of high quality papers and refereed papers in the all aspects of computer science and technology the international forum of scientist and engineers involved for this journal, it is sponsored by Chinese Academy of Sciences (CAS), Institute of Computing Technology (ICT) and China Computer Federation (CCF) and it is jointly published by Press of China and Springer on a bimonthly basis, the Coverage of journal includes, artificial intelligence, pattern recognition, computer networks and distributed computing, computer architecture and systems, computer graphics and multimedia, theory and algorithms, software systems, emerging areas, data management and data mining and more. and it is also focus on publication of previously unpublished materials, conference papers with exceptional merit that require wider exposure are, at the discretion of the editors. The journal also published clearly

written survey and review articles from experts in the field, to promote insightful understanding of the state-of-the-art and technology trends. The journals is abstract/indexed in by various indexing/abstracting agencies the some are given below: Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, Mathematical Reviews, OCLC, SCImago, Summon by ProQuest SCOPUS, INSPEC, Zentralblatt Math, CSA Environmental Sciences, DBLP, EI-Compendex, Gale, Computer Abstracts International Database io-port.net Google Scholar, EBSCO Discovery Service, ProQuest, Academic OneFile, Chinese Science Citation Database, Computer Science Index, etc.

II. REVIEW OF LITERATURE

Few quantitative studies have been carried to analyzing institutions research outputs of the country by using scientometrics analysis. The following study has been reviewed in view of better understanding of research productivity using scientometrics analysis:-

B. D. Kumbhar, Rohit R. Patil & Manohar B. Lamani (2015)¹ The paper deal with the publications of New England Journal of Medicine. A total of 43694 publications were published during 1989-2014, with 3262469 citations with 74.68 average citations per paper. Out of the total publication majority 24280 (55.56%) publications published in the form of letters. Mark E. J. has highest publications (266) to his credit, whereas Yusuf, S. received highest (29777) citations. Highest publications from United States i.e. 28820 (65.95%)

Imran Khan, (2016)² made study of DESIDOC Journal of Library & Information Technology from 2010 to 2014 of the publication of 307 contributions in the five volumes (from Volume No. 30 to 34). The study shows a trend of gradual growth in contributions, with an average number of 61 contributions per volume of the journal. Maximum number of contributions/research papers (70) were found to be published in the year 2012, whereas the minimum (50) in the year 2010. Maximum number of contributions during the period of study are from joint authors, with a total of 188 (61.24 per cent). A maximum number of contributions are from India, with a total of 273 (88.93 per cent).

Jayendra Kumar Singh, (2014)³ "This study focus on 657 papers of the journal Indian Journal of Pure and Applied

Physics 2006 to 2010 period taken for this study The study reveal that most of the papers (93.46%) were contributed jointly CSIR is a top collaborative institution, 1.87 was a average citation per paper and overall 5.37 mean page length of the papers”.MadhuBala, and Mahender Pratap Singh(2014)⁴ this study coverage of 316 scholarly communications of the Indian Journal of Biochemistry and Bio-Physics. Study find that Multi authors published 162 (51.3%) articles. The contributions from the India is in top.

Gayatri Paul and Swapan Deoghuria (2014)⁵made study of Indian Journal of Physics to analyze different scientometric data for a period of ten years 2004-2013 study reveal that that almost all physics journals (total 163) cite articles published in IJP. Notable among them are Physical Review.

R. Poonkothai (2012)⁶. This study focus on Journal of Biosciences, ,coverage of 394 articles for the period of 2001 to 2010..The highest Contributions from Single Author and from India found highest Contributions.

III. OBJECTIVES OF THE STUDY

1. To study and analyze year wise research output in terms of total paper.
2. To find out the top most productive authors and authorship pattern.
3. To know degree of collaborations amongst authors
4. To analyze distribution of publications according to type.
5. To find out the top participant institutions national and international levels.
6. To study and analyze global distribution pattern of papers according to number of papers
7. To find out year wise distribution of citations and average

IV. DATA COLLECTION

For collection of the publication data, the source Web of Science (WoS) a bibliographic and citation database was used which covers a selected group of journals and conferences. The data was collected for the period 2012-2016. The 5 years period is a good period to know publication output of a journal. The search has been made for the collection of data was publication name as “Journal of Computer Science and Technology” Timespan=2012-2016.The full record downloaded in the excel format i.e. article, proceedings paper, editorial material, titles, author records, afflation and citation references etc.

V. METHODOLOGY

For Scientometrics analysis of publication data of Journal of Computer Science and Technology, the standard form of methodologies were used to analysis of various parameters like year wise growth rate of papers, geographical distribution of Papers,Institutions-wise distribution of

papers,Highly Prolific Authors, authorship pattern of papers, Degree of collaborations, the top productive authors were find out and their performances were analysis based on their publications productivity. The most contributively institutions and countries have been recognized using extraction of information from affiliation text.

VI. DATA ANALYSIS AND INTERPRETATION

A. Growth of Literature

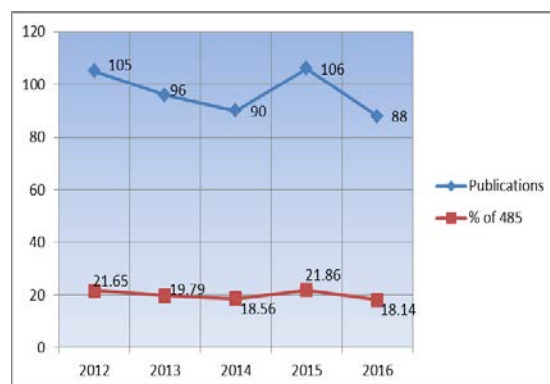


Fig. 1 Year-wise research growth in terms of Total papers

The year wise research growth in terms of TP (Total papers) are given in figure 1, it is shows that no. of research papers are decreasing & increasing year to year basic from 2012 to 2016. It reveal that highest no. papers published in 2015, No. of Papers: 106 (21.86%) and lowest in 2016 total No. of papers: 88(18.14%).

B. Authorship Pattern of Papers Published

TABLE I AUTHORSHIP PATTERN OF PAPERS PUBLISHED

Year	One Author	Two Author	Three Author	Four Author	Five Author	Six Author	Seven Author	Eight Author	Nine+ Author	Total
2012	6	26	27	28	11	4	3	0	0	105
2013	3	14	25	27	13	10	3	1	0	96
2014	5	18	17	22	13	7	4	1	3	90
2015	5	10	26	28	19	12	3	2	1	106
2016	6	12	24	20	16	8	1	0	1	88
5 year	25	80	119	125	72	41	14	4	5	485
%>	5.15	16.49	24.54	25.77	14.85	8.45	2.89	0.82	1.03	100.00

Table I shows the authorship pattern of papers in Out of 485 papers, the maximum number of papers were 125 (25.77 %) from four authors followed by three authors 119 (24.54 %), two authors 80 (16.49%), and so on. Data reveals that most of the authors like to publish papers in collaborations and most preferred authorship pattern was four authors.

C. Degree of Collaboration (Dc)

TABLE II DEGREE OF COLLABORATION MEASURES (DC)

	No. of publications	Percentage (%) of total publications	Nm+N _s	DC
Total number of Single/Multi-Authored Publications	485	100.00		
No. of Co-Authored Publication (NM)	460	94.85	485	0.95
No. of Single-Authored Publication (NS)	25	5.15		
No. of two-Authored Publication(NM)	80	16.49	105	0.76
No. of three-Authored Publication(NM)	119	24.54	144	0.83
No. of four-Authored Publication(NM)	125	25.77	150	0.83
No. of five-Authored Publication(NM)	72	14.85	97	0.74
No. of six-Authored Publication(NM)	41	8.45	66	0.62
No. of seven-Authored Publication(NM)	14	2.89	39	0.36
No. of eight-Authored Publication(NM)	4	0.82	29	0.14
No. of nine & above Authored Publication(NM)	5	1.03	30	0.17

In order to better understanding of degree of collaboration, it is required to use the formula suggested by Subramanyam⁹ (1982) and used by Subhodip Bid¹⁰(2016), has been applied for this study, the Degree of Collaboration calculates the proportion of co-author publications among total publications an indicator, and results are formulated in above table II. The formula is $DC = Nm / Nm + Ns$ in which C is degree of collaboration in a discipline, “Nm” is number of multi-authored publications during specific period in some discipline, “Ns” is number of single authored publications in a discipline during the same period of time.

The data given in the column of the Table II shows 0.95 as the highest degree of collaboration (2012-16) and second highest of 0.83 four-authored and three author publications followed by 0.76 two-author publications. The value of Degree of Collaboration is lowest among eight authored publications that is 0.19, indicating the trend towards multi-authorship pattern papers as specified time of period in this study. Calculation: $DC = Nm / (Nm + Ns)$. As data given in Table-2, Degree of Collaboration (DC) for four authors publications; Nm = 125 & Ns = 25 $DC = 125 / (125 + 25) = 0.83$.

D. Highly Prolific Authors and Their Publications

TABLE III HIGHLY PROLIFIC AUTHORS AND THEIR PUBLICATIONS

S.No.	Authors	Publications/Records	% Percentage
1	Zhang L	11	2.27
2	Chen L	10	2.06
3	Liu Y	9	1.86
4	Yu G	8	1.65
5	Wu J	8	1.65
6	Zhang J	7	1.44
7	Zhang Y	6	1.24
8	Wang Z	6	1.24
9	Zhou Q	5	1.03
10	Zhao JY	5	1.03
11	Wang GR	5	1.03
12	Wang B	5	1.03
13	Shen DR	5	1.03
14	Park S	5	1.03
15	Nie TZ	5	1.03
16	Li Q	5	1.03
17	Han YH	5	1.03
18	Chen J	5	1.03
19	Zhu XY	4	0.83
20	Zhou B	4	0.83
21	Zhao L	4	0.83
22	Yuan Y	4	0.83
23	Wu Y	4	0.83
24	Wang Y	4	0.83
25	Wang L	4	0.83

Table II shows a list of most productive/ prolific authors was from 2012 to 2016. It has been reveal that Zhang L, published highest numbers of papers, i.e. 11 nos., followed by Chen L, published 10 nos. papers with second position, Liu Y published 09 nos. of papers with third position and etc.

E. Type of Publications

Figure -2 shows that Distribution of publications according to type it is find that research productivity in form of no. of article was 457 (94.23%) followed by no. of Editorial Material 27 (5.57%), Proceedings papers no. of papers were 26 (5.36%). it is reveal that research productivity in term of article find highest from 2012-2016..

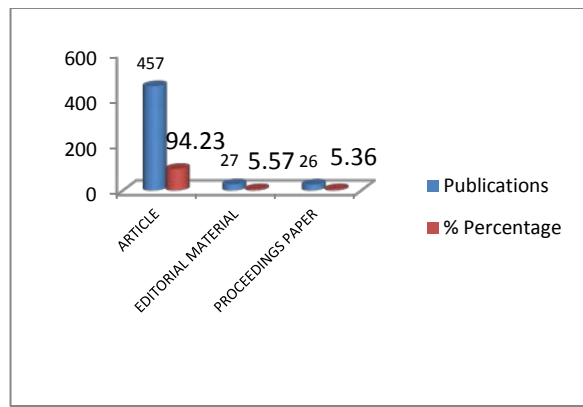


Fig. 2 Distribution of publications according to type

F. Geographical Distribution Contributions (International)

TABLE IV COLLABORATION OF PAPERS WITH OTHER COUNTRIES

S.No.	Countries/Territories	Records	%	Rank
1	Peoples R China	371	76.50	1st
2	USA	84	17.32	2nd
3	South Korea	21	4.33	3rd
4	Australia	18	3.71	4th
5	Canada	17	3.51	5th
6	Singapore	16	3.30	6th
7	Spain	10	2.06	7th
8	Saudi Arabia	8	1.65	8th
9	England	7	1.44	9th
10	Italy	6	1.24	10th
11	Iran	6	1.24	10th
12	Germany	6	1.24	10th
13	France	6	1.24	10th
14	Japan	5	1.03	11th
15	India	5	1.03	11th
16	Brazil	5	1.03	11th
17	Wales	4	0.83	12th
18	Taiwan	4	0.83	12th
19	Portugal	3	0.62	13th
20	Luxembourg	3	0.62	13th
21	Israel	3	0.62	13th
22	Denmark	3	0.62	13th
23	Belgium	3	0.62	13th
24	Thailand	2	0.41	14th
25	Switzerland	2	0.41	14th

Table IV shows that geographical distribution contributions (International) in Journal of Computer Science and Technology.

It is reveal that Peoples R Chinais in the top with no. of publications is 371 (76.50%), followed by USA84 (17.32%) as a second position and South Koreawith no. of publication is 21 (04.33%) in third position and other top 25 author is given in table-4

G. Institutions-Wise Distribution of Papers Published During (2012-2016)

TABLE V INSTITUTION-WISE DISTRIBUTION OF PAPERS IN JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY

S.No.	Name of the Institution/Establishment	No. of Papers	%	Rank
1	Chinese Academy of Sciences	93	19.18	1st
2	Tsinghua University	60	12.37	2nd
3	University of Chinese Academy of Sciences	41	8.45	3rd
4	Zhejiang University	28	5.77	4th
5	Peking University	17	3.51	5th
6	MinistEduc	17	3.51	6th
7	Beihang University	16	3.30	7th
8	University Of Science Technology Of China	15	3.09	8th
9	Northeastern University China	15	3.09	8th
10	Microsoft	14	2.89	9th
11	Shanghai Jiao Tong University	12	2.47	10th
12	National University of Defence Technology China	12	2.47	10th
13	Nanjing University	11	2.27	11th
14	Microsoft Research Asia	11	2.27	11th
15	Hong Kong University of Science Technology	11	2.27	11th
16	University of Illinois System	9	1.86	12th
17	Shandong University	9	1.86	12th
18	University of Electronic Science Technology of China	8	1.65	13th
19	Renmin University of China	8	1.65	13th
20	Fudan University	8	1.65	13th
21	Beijing University of Posts Telecommunications	8	1.65	13th
22	Beijing Institute of Technology	8	1.65	13th
23	University Town of Shenzhen	7	1.44	14th

Table -5 shows the Institution-Wise Distribution of Papers in Journal of Computer Science and Technology. It is revel from the above Table 5 that authors/contributors of many Institutions are publishing their papers in this journals, It has been found that from 2012 to 2016 highest contributed institutions wasChinese Academy Of Scienceswith no. of Publications was 93(19.18%) is placed at 1st rank, Tsinghua Universitywith no. of Publications were 60 (12.37%) place at 2nd rank &University of Chinese Academy of Sciences with no. of Publications 41 (8.45%) placed at 3rdrank, total

23 institutions rank with publication and percentages are given above table.

H. Year Wise Distribution of Citations of Papers Published During 2012-2016

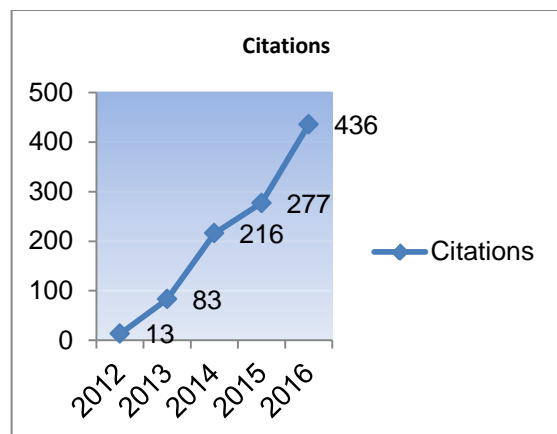


Fig. 2 Year wise distribution of Citations of papers

Figure 2 it is reveal that citations were highest in 2016 as no. of citations 436 and lowest in 2012 no. of publication were 13 and it is find that the average of citations from 2010 to 2016 per year was 205, it is reveal from above table that citations are in increasing trends year to year basis in five years.

V. FINDINGS AND CONCLUSION

The study analyzes that Journal of Computer Science and Technology has published 485 papers in the period of 2012 to 2016. The year wise growth rate reveal that highest no. papers published in 2015, No. of Papers: 106 (21.86%) and lowest in 2016 total No. of papers: 88(18.14%). Authorship pattern data reveals that most of the authors like to publish papers in collaborations and most preferred authorship pattern was four author i.e. No. publications for four author

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