A Scientometric Study on "Ieee Transactions on Fuzzy Systems"

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ABSTRACT   In this article, the scientometric study has been conducted with 451 contributions published in "IEEE Transactions on Fuzzy Systems" during the year (2004-2008).The study has observed 451 articles with 1128 authors, 5083 pages in the study period. The range of articles published per volume is between 76 to 128 ; the average number of authors per article is 3; the average number of pages per article is 11pages and this study confirms the prediction of De Solla Price that team research is a common trend in scientific activities.

1.Introduction:

Scientometrics is the study of measuring and analyzing science research.Scientometrics is a branch of library and information science. Scientometric tools can be used to measure and compare the scientific activities at various levels of aggregation including institutions, sectors, provinces and countries. They can also be used to measure research collaborations, to map scientific networks and to monitor the evolution of scientific fields.

2 .Objectives of the Study:

The objectives of the study are as follows:

1. To know the Overall Distribution pattern of contributions.
2. To know the Year-Wise Distribution of Total Number of pages.
3. Year wise Distribution of Total number of Contributions Vs Total Number of Pages.
4. Authorship pattern of Contribution.
5. Single Authored v/s Multi Authored Papers.
6. Degree of Collaboration.

3. Methodology:

The data has been compiled from online journal articles. For each article following data has been noted: Number of articles, Number of authorship, Number of references, Length (pages) of article and other data required for the study. All the necessary information were compiled, recorded, tabulated and analyzed for making observations as indicated in the objectives of the study.

4.Data Analysis & Interpretation:

Table 4. 1 Overall Distribution Pattern of Contributions

S. No	Year	Volume number	No of Issues	Number of Articles/Contributions						Total No. of Articles	% of Articles
				IssueNo 1	Issue No 2	Issue No 3	Issue No 4	Issue No 5	Issue No 6		
1	2004	12	6	12	12	12	16	14	10	76	16.85
2	2005	13	6	15	10	12	12	12	11	72	15.96
3	2006	14	6	11	16	12	9	9	16	73	16.19
4	2007	15	6	9	16	17	16	20	24	102	22.62
5	2008	16	6	22	20	20	25	21	20	128	28.38
				69	74	73	78	76	81	451	100

Table 4.1 shows the total number of articles published from 2004 to 2008.On the whole from the 5 volumes and 30 issues of the journal understudy, the total number of articles published is 451. The distribution of articles by volume shows that the number of articles was highest in 2008, with 128 articles. It was noted that there is an increasing trend and decreasing trend in the quantum of publications from 2004.

Table 4.2 Year Wise Distribution of Total Number of Pages

SL.No	Year	Number of Pages						Total	Percentage
		1	2	3	4	5	6		
1	2004	138	118	120	140	151	111	778	15.31
2	2005	161	96	118	128	148	126	777	15.29
3	2006	154	171	109	100	104	188	826	16.25
4	2007	119	183	180	203	244	256	1185	23.32
5	2008	253	239	264	260	251	250	1517	29.85
		825	807	791	831	898	931	5083	100

Table 4.2 shows the analysis of the number of pages of publication is one of the most important factor in Scientometric analysis. From the table it is observed that there is an increasing trend in the quantum of publications from 2004. From this analysis we know that the year 2008 records the first place in highest number of publication with 1517 pages and the year 2005 records the lowest number of pages with 777pages.

4.3 Year wise Distribution of Total No. of Contributions Vs Total No. of Pages

For more understanding the total number of articles is also compared with their pages. It is observed from table 4.3 there is a fluctuation in the number of contributions. The average number of pages are 11 per article.

Table 4.3
Year wise Distribution of Total Number of Contributions Vs Total Number of Pages

S.No	Year	Quantum of Contributions	Quantum of Total Pages	Average Number of Pages Per Contribution
1	2004	76	778	10
2	2005	72	777	11
3	2006	73	826	11

4	2007	102	1185	12
5	2008	128	1517	12
		451	5083	11

Year wise Distribution of Total Number of Contributions Vs Total Number of Pages

4.4 LENGTH OF ARTICLES

In length of articles analysis above ten pages in length gets the first position by sharing 59.87 percent. Second position is by ten pages sharing 11.97 %.Third position is by nine pages by sharing 7.76%. Two page articlesget the last position by sharing 0.44 %.From the above analysis above ten page articles are highly contributed than other and two page articles have minimum contributed by the scientists during the study period.

Table 4.4 Length of Articles

Number of Pages	2004	2005	2006	2007	2008	Total	Percentage
One	2	4	2	0	0	8	1.77
Two	1	0	0	0	1	2	0.44
Three	1	1	0	0	1	3	0.67
Four	2	0	3	3	1	9	2.00
Five	2	1	0	0	2	5	1.11
Six	4	0	2	4	2	12	2.66
Seven	7	4	3	5	5	24	5.32
Eight	7	3	4	6	9	29	6.43
Nine	8	9	7	5	6	35	7.76
Ten	10	7	9	12	16	54	11.97
Above Ten	32	43	43	67	85	270	59.87
Total	76	72	73	102	128	451	100

4.5 Year Wise Distribution of Articles Vs Number of Authors

Table 4.5 indicates year wise distribution of articles Vs Number of Authors. The highest number of authors contributed in the year 2008. In this year the contribution is also in highest level and it is lowest in 2006.The average number of author is calculated as 3 per contribution. This below average value is attained in 2006& 2008. The above average value is attained in 2004, 2005 & 2007.

4.5 Year Wise Distribution of Articles Vs Number of Authors

S.No	Year	No. of Contributions	No of Authors	Average no of authors per contributions
1	2004	76	200	3
2	2005	72	181	3
3	2006	73	176	2
4	2007	102	256	3
5	2008	128	315	2
		451	1128	3

Year Wise Distribution of Articles Vs Number of Authors
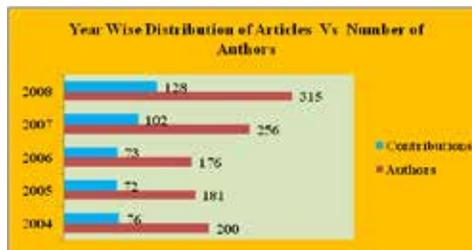
4.6 Authorship pattern of Contribution:

Authorship is the prime factor to discuss in journal articles during the study period 2004-2008.Table- 4.6 shows that the contributions of above two authors are more than the single authors. The multiple authorship patterns have the most productive publications i.e. above two authors with 189(41.69%) papers while the single authorship pattern has 62 (13.75 %).From this table we know that the single author contribution is very low during the study period.

**Table 4.6 :Authorship Pattern of Contributions**

PATTERN	2004	2005	2006	2007	2008	TOTAL	%
Single	10	9	14	13	16	62	13.75
Two	30	32	27	43	57	189	41.69
Three	21	17	22	31	37	128	28.60
Four	11	11	8	11	16	57	12.64
Five	2	3	2	4	2	13	2.88
Above 5	2	0	0	0	0	2	0.44
total	76	72	73	102	128	451	100

4.7 Single Authored V/S Multi Authored Papers:

Generally authorship of a paper has become important for scientists and researchers and remarkably this topic has become an important area for study and subject discussion in current journals and publications. Table 4.7 shows the distribution of single Vs Multiple authors in the field of IEEE. This confirms the prediction of de Solla Price that team research is a common trend in scientific activities.

Table 4.7: Single Authored V/S Multi Authored Papers

YEAR	WITH SINGLE AUTHOR		WITH MULTI AUTHORS		TOTAL NO. OF CONTRIBUTIONS
	No of Contributions	percentage	No of Contributions	percentage	
2004	10	16.13	66	16.97	76
2005	9	14.52	63	16.20	72
2006	14	22.58	59	15.17	73
2007	13	20.97	89	22.88	102
2008	16	25.81	112	28.79	128
	62	100	389	100	451

Single Authored V/S Multi Authored Papers
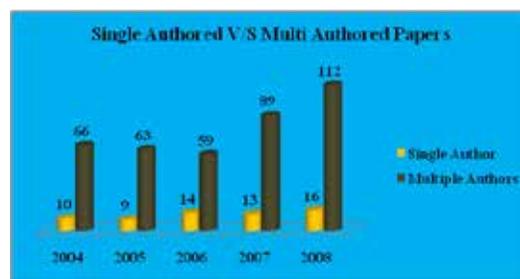
4.8 Degree of Collaboration

In order to determine the collaboration in quantitative forms, the formula suggested by K.Subramaniyam was tested. Table 4.8 explains the degree of collaboration in publications during the study period. Thus the degree of collaboration in 'IEEE Transactions on Fuzzy Systems' is 0.86. This brings out clearly the prevalence of team research in the field of Engineering and technology

Degree of Collboration
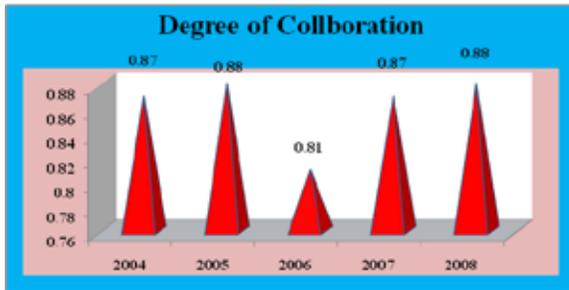
Overall Degree of Collaboration = Nm/Ns + Nm = 389 / 62+389 = 0.86

5. Conclusion:

Scientometrics can be used to develop and provide tools to be applied to research evaluation but is not designed to evaluate research results. Moreover, scientometrics does not aim at replacing qualitative methods by quantitative approaches and Scientometricsis not designed to override or even to substitute peer reviews or evaluation by experts but qualitative and quantitative methods in science studies should complement each other. This study forecasts that the subject of scientometrics is a progressing one not only measuring the field of science and technology but also in other fields. Moreover, the present study will serve as a beacon light to information seekers. This study is relevant to those interested in scientometrics and provides a comprehensive over-view of authorship pattern in science community.

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