

## MANAGEMENT INFORMATION SYSTEM RESEARCH OUTPUT : A SCIENTOMETRIC STUDY

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### ABSTRACT

In this study we have made an attempt to quantitatively analyze the research trends in Management Information System with the help of scientific publications reflected in the popular database web of science during the period 1989 to 2013 (totally 25 years). This paper presents a study of productivity, characteristics and various aspects of global publication in the field of Management Information System research output. The active author is "Huang GH" from China Agricultural University. Majority of articles from the two, three and four authors team which are really a positive aspect in collaboration. Highest contributing authors in three authors team. The highest exponential growth rate is 4.32 percents found during the year 1991.

**Keywords :** Scientometric / bibliometric, h-Index, Authorship Pattern, Degree of Collaboration

### 1. INTRODUCTION

Management Information System is a superset of Boolean logic that handles the concept of partial truth, which is a truth value between "completely true" and "completely false". Management Information System is multivalve. It deals with degrees of membership and degrees of truth. 'Scientometrics' is the branch science of science that describes the output traits in terms of organizational research structure, resource inputs and outputs, develops benchmarks to evaluate the quality of information output. Scientometric research publications are a quantitative measure for the basic research activity in a country.

### 2. OBJECTIVES OF THE STUDY

- 1 To measure the Authors productivity
- 2 To examine the year wise productivity and authorship patterns and the nature of collaborative research.
- 3 To identify the degree of collaboration

### 3. DATA ANALYSIS AND METHODOLOGY

The present study attempts to find out the publication pattern of researchers in the field of Management Information System. The study is based on the references and aims to analyze quantitatively the growth and development of Management Information System in global level in terms of publication output as reflected in Web of Science database during years, 1989 - 2013. Web of Science is the largest abstract and citation database

of research literature and quality web only journals. It's designed to enable not only the researchers for accessing scientific information but provide the information scientists to study the literature for different information analyses purposes. Quick, easy and comprehensive, Web of Science provides superior support of the literature research process. The study period 1989 to 2013 is selected as the database is available. A total of 45355 records were downloaded and analyzed by using the Histcite software application analyzed and tabulated for making observations as per the objectives of the study.

**Table 1**  
**Management Information System Research Output during 1989 to 2013**

1	Records	45355
2	Time Span	1989 - 2013
3	Contributed authors	156817
4	Contributed journals	6637
5	Document types	19
6	Languages	30
7	Contributing countries	182
8	Institutions	23486
9	Local References	14344
10	Global references	1184907
11	Local citations	56970
12	Global citations	601598
13	H - index	1447

The table 1 reveals that the brief description about the MIS research output during the sample period from the web of science database. the total time span is 25 years, 453555 records were downloaded. among those records were earned 601598 citation scores and 1447 h-index values. 30 different types of languages were produced through 19 different types of document were produced the sample records, among those 6637 are in the type of journal format. 182 countries were contributed through 23486 different types of institutions about the MIS research output.

### 3.1 . Relative Growth Rate and Doubling Time

The analysis of growth rate in MIS research output is one of the important aspects of discussion. Hence the provision of information to information seekers is the prime duty of library professionals, who have to meet the information needs of scientists in various disciplines and policy making. In this connection, the published literature is taken as a target to measure the knowledge in a discipline, and the growth rate study of publications would provide some useful results.

**Table 2**  
**Relative Growth Rate and Doubling time of the**  
**Research Output in Management Information System**

Year	R. o/p	$\log_e I^p$	$\log_e 2^p$	Rt(P)	Dt(P)
1989	49	-	3.892	-	-
1990	129	3.892	5.182	1.290	0.54
1991	557	5.182	6.531	1.349	0.51
1992	684	6.531	7.124	0.593	1.17
1993	725	7.124	7.251	0.127	5.46
1994	935	7.251	7.415	0.164	4.23
1995	910	7.415	7.520	0.106	6.56
1996	978	7.520	7.543	0.023	30.08
1997	1051	7.543	7.615	0.072	9.62
1998	1083	7.615	7.666	0.050	13.73
1999	1238	7.666	7.750	0.084	8.25
2000	1382	7.750	7.871	0.121	5.72
2001	1377	7.871	7.923	0.052	13.41
2002	1558	7.923	7.984	0.062	11.21
2003	1861	7.984	8.137	0.153	4.54
2004	1998	8.137	8.258	0.121	5.72
2005	2136	8.258	8.327	0.069	10.07
2006	2399	8.327	8.420	0.093	7.49
2007	2579	8.420	8.513	0.093	7.44
2008	2898	8.513	8.608	0.096	7.25
2009	3273	8.608	8.728	0.119	5.81
2010	3439	8.728	8.812	0.084	8.25
2011	3815	8.812	8.889	0.078	8.92
2012	4000	8.889	8.964	0.074	9.30
2013	4301	8.964	9.024	0.060	11.49
<b>Total</b>	<b>45355</b>			<b>5.132</b> <b>(0.21)</b>	<b>196.76</b> <b>(7.87)</b>

Table 2 predicts data of relative growth rate and doubling time for total research output on MIS. The analysis of MIS research output at International visual aid provides the following facts: It is observed that its relative growth rates have contradicted progressively from 1.290 at 1990 to 0.06 in the year 2013. During the whole study period sample mean relative growth rate is 5.132 and its average value is 0.21. Contrary to this, the 'Doubling Time' for publication of all sources in MIS research output has decreased from 0.54 years at 1990 to 11.49 years at 2013. During the study period doubling time value is 7.87 years. Hence the doubling of research literature is of 8 years in MIS.

### 3.2. Authorship Pattern

Table 3 reflects the collaborative pattern of authors involved in Management Information System research. totally 45355 articles were taken for this study; among those only 7174 articles were produced by single authors; 11306 articles were produced by two authors team; 10334 articles were produced by three authors team; 6667 articles were produced by four authors team; 3877 articles were produced by five authors team; 2148 articles were produced by six authors team; 1322 articles were produced by seven authors team; 813 articles were produced by eight authors team; 489 articles were produced by nine authors team; and 1225 articles were produced by ten above authors team.

**Table 3**  
**Authorship Patterns of Management Information System Research Output during 1989 to 2013**

Author/Year	1 Author	2 Author	3 Author	4 Author	5 Author	6 Author	7 Author	8 Author	9 Author	10 & above	TOTAL
1989	26	10	9	1	2	0	0	0	1	0	49
1990	54	39	20	8	5	2	1	0	0	0	129
1991	196	158	109	50	21	10	4	4	1	4	557
1992	235	211	124	61	24	9	7	4	0	9	684
1993	238	235	133	51	27	16	7	6	2	10	725
1994	281	276	186	84	53	25	16	2	5	7	935
1995	300	253	191	75	37	24	13	8	5	4	910
1996	280	297	203	94	48	26	10	7	3	10	978
1997	278	309	227	117	52	27	10	10	8	13	1051
1998	244	317	230	122	83	38	21	14	0	14	1083
1999	285	388	247	149	88	39	18	9	2	13	1238
2000	318	373	302	157	100	57	19	20	14	22	1382
2001	290	389	297	171	103	46	27	18	15	21	1377
2002	312	425	361	206	96	61	36	26	11	24	1558
2003	350	490	416	245	124	77	59	35	21	44	1861
2004	303	532	466	291	162	95	54	30	19	46	1998
2005	299	566	513	326	182	81	59	40	16	54	2136
2006	340	641	540	348	189	130	73	49	23	66	2399
2007	354	662	611	358	211	125	99	66	25	68	2579
2008	380	713	649	459	263	153	79	58	47	97	2898
2009	372	794	769	543	298	181	97	67	47	105	3273
2010	386	777	806	575	336	191	117	65	44	142	3439
2011	410	766	901	669	405	218	147	85	60	154	3815
2012	319	824	997	724	445	238	169	96	55	133	4000
2013	324	861	1027	783	523	279	180	94	65	165	4301
<b>Total (articles)</b>	<b>7174</b>	<b>11306</b>	<b>10334</b>	<b>6667</b>	<b>3877</b>	<b>2148</b>	<b>1322</b>	<b>813</b>	<b>489</b>	<b>1225</b>	<b>45355</b>
<b>Authors</b>	<b>7174</b>	<b>22612</b>	<b>31002</b>	<b>26668</b>	<b>19385</b>	<b>12888</b>	<b>9254</b>	<b>6504</b>	<b>4401</b>	<b>16929</b>	<b>156817</b>

From the above table, the researcher has identified the two authors team has produced highest number of articles. The table shows that more than 50 percent of the contribution came from double, three and four authors which are really a positive aspect in collaboration.

### 3.3 Most Productive Authors

The below table shows that the most productive authors in the field of MIS research output during 1989 to 2013. Table 4 reveals the contribution of top 10 most productive authors in Management Information System research.

**Table 4**  
**Top 10 Most Productive Authors in Management Information System Research Output**

S.No	Author	Records	TLCS	TGCS	h-Index
1	Huang GH	119	568	3016	26
2	Lee S	76	133	677	13
3	Lee J	60	60	470	12
4	Kim S	57	32	358	9
5	[Anonymous]	50	0	0	0
6	Li L	47	165	584	15
7	Liu Y	47	28	206	8
8	Klein G	46	217	535	14
9	Zhang L	46	30	636	12
10	Liu L	45	72	633	12

“Huang GH”, College of Water Resources & Civil Engineering, China Agricultural University, has the top list with the contribution of 119 records, h-Index (26), TLCS and TGCS are 568 and 3016 citations respectively. Followed by “Lee S”, has second highest productivity of Management Information System output 76 records, h-Index (13), TLCS and TGCS 133 and 677 citations respectively. The researcher has identified the active author is “Huang GH”.

### 3.4 Degree of Collaboration

A study of data from the above table 5 indicates the degree of collaboration in research output of Management Information System. The degree of collaboration is 0.84 during the study period 1989 to 2013. i.e., out of the total 45355 literature published 38181 are from multiple authors which 84.18 percent is of total output and 7174 papers are published by single author which is 15.8 percent of total output.

Table 5  
Degree of collaboration in Management Information System research output

Year	Single Author		Multi Authors		Total	Degrees of Collaboration
	Articles	%	Articles	%		
1989	26	0.36	23	0.06	49	0.47
1990	54	0.75	75	0.20	129	0.58
1991	196	2.73	361	0.95	557	0.65
1992	235	3.28	449	1.18	684	0.66
1993	238	3.32	487	1.28	725	0.67
1994	281	3.92	654	1.71	935	0.70
1995	300	4.18	610	1.60	910	0.67
1996	280	3.90	698	1.83	978	0.71
1997	278	3.88	773	2.02	1051	0.74
1998	244	3.40	839	2.20	1083	0.77
1999	285	3.97	953	2.50	1238	0.77
2000	318	4.43	1064	2.79	1382	0.77
2001	290	4.04	1087	2.85	1377	0.79
2002	312	4.35	1246	3.26	1558	0.80
2003	350	4.88	1511	3.96	1861	0.81
2004	303	4.22	1695	4.44	1998	0.85
2005	299	4.17	1837	4.81	2136	0.86
2006	340	4.74	2059	5.39	2399	0.86
2007	354	4.93	2225	5.83	2579	0.86
2008	380	5.30	2518	6.59	2898	0.87
2009	372	5.19	2901	7.60	3273	0.89
2010	386	5.38	3053	8.00	3439	0.89
2011	410	5.72	3405	8.92	3815	0.89
2012	319	4.45	3681	9.64	4000	0.92
2013	324	4.52	3977	10.42	4301	0.92
Total	7174	100.00	38181	100.00	45355	84.18

It could be seen clearly from the above table that the degree of collaboration in producing research output on Management Information System research has shown in Increasing trend during the study period; because the researcher has identified the selection area of Management Information System is a new discipline. Based on this study, the result of the degree of collaboration  $C = 0.84$ , i.e. 84 percent of collaborative authors' articles published during the study periods.

Table 6  
Prolific Journals (10) according to highest research productivity

S. No	Journal	Recs.	%	TLCS	TGCS	TLCR
1	Expert Systems With Applications	380	0.8	502	3926	820
2	Information & Management	342	0.8	2200	8123	1171
3	Decision Support Systems	289	0.6	947	4247	984
4	Industrial Management & Data Systems	274	0.6	782	2969	1057
5	International Journal of Production Research	255	0.6	460	2836	923
6	International Journal of Information Management	249	0.5	641	2566	851
7	International Journal of Medical Informatics	248	0.5	609	4086	583
8	MIS Quarterly	248	0.5	<b>5556</b>	<b>19623</b>	<b>1351</b>
9	Journal of The American Medical Informatics Association	237	0.5	675	5410	449
10	European Journal of Operational Research	231	0.5	937	6633	438

The table 6 reveals that the top ten prolific journals of MIS research output during the sample time span. the journal of "Expert Systems with Applications" has produced 380 records, TLCS 302 & TGCS 3926 and being the first rank position, followed by the journal of "Information & Management" has produced highest number of articles and stood in second place as per the above table. The journal of "MIS Quarterly" has earned the highest TLCS, TGCS and TPCR and stood in the first position based these values.

During the twenty five years time span publication is significantly increased. The collaborative work has been recognized compare to individual contribution, particularly two authors team has produced highest number of articles in MIS research. The individual scientist may be stimulated to distribute more number of contributions as an alternative of single contributions. the active authors is "Huang GH" from China. The most productive journal is " Expert Systems With Applications".

#### 4. CONCLUSIONS

This paper has discussed the contributions made by Management Information System researchers during 1989 - 2013 as reflected in Web of Science Database.

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