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Management Information Systems Quarterly (MISQ): A Bibliometric Study

Basudev Mohanty

Indian Institute of Technology, Bhubaneswar, basudev mohanty@rediffmail.com

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Central Library, Indian Institute of Technology (IIT), Bhubaneswar; Email: basudev_mohanty@rediffmail.com

Keywords: Bibliometrics, Management Information System (MIS), MISQ, Scientometrics, SJR, SNIP

Abstract:

The present study reveals the publication pattern of the articles published during the period 1995 – 2009 of "Management Information Systems Quarterly" (MISQ) Journal. The study also encompasses the scientometrics sketch not only of 596 research papers during the period of study but also the various journal parameters like SJR (SCImago Journal Rank), SNIP (Source Normalized Impact per Paper), total number of citations received by the journal in the year as well as percentage not cited (i.e. % of documents published in a year that have never been cited to date) etc. from the SCOPOUS database. Further, it analyzes various other bibliometrics angles such as: growth of literature, authorship patterns, degree of collaboration, geographical distribution of publications, distribution of article types by journal, and ranking pattern etc.

Introduction:

The Management Information Systems Quarterly (MISQ) is a peer reviewed academic scholarly journal published by the Management Information Systems Research Center, Carlson School of Management, University of Minnesota. MISQ is widely regarded as one of the most prestigious journals in the information systems discipline across the globe since its inception i.e. 1977. It covers research in the areas of management information systems, management science and information technology. The journal had the highest impact factor among all the peer-reviewed academic journals in the field of Business Management. According to the Journal Citation Report, the journal has an impact factor of 4.659 during the year 2012.

Literature Review:

Management information system is a relatively new academic discipline and scholarly field of study with its own cumulative tradition and history (Culnan and Swanson 1986). It is an applied field concentrating on strategic, managerial and operational usage of various types of information technologies at societal, organizational, and individual levels. It draws upon several reference disciplines such as cognitive psychology, computer science, behavioral science, decision science, economics, operation management, organization theory and engineering (Culnan 1987; Baskerville and Myers 2002; Katerattanakul et al. 2006). Since its birth, MIS scholars have explored the past, present and future development of the field.



(Dearden 1972; Mason and Mitroff 1973) In the 1980s, frameworks guiding MIS research appeared and MIS being defined as a "computer based organisational information system which provides support for management activities and functions" (Ives et al. 1980). The progressive development of the ideas represented by published research in MIS based on an author co-citation analysis were studied (Culnan Mary J 1986; 1987) In the 1990s, the field of MIS became proved as a more formalized discipline with the development of a keyword classification scheme for MIS literature (Barki et al. 1993). However, despite its history of over 30 years, the field has not acquired a distinct identity as a well-established reference discipline (Benbasat and Zmud 2003) that is partially due to the relatively frequent change of research directions and technological advancements. The trends of publication of MIS research were attempted and the results indicate that the focus of efforts of researchers is on Information System Usage and IS Resource Management. The increasing use of more rigorous research methods like mathematical models and laboratory experiments proved that the field is attaining maturity (Palvia et al. 2004). With a quest to unfold the academic identity for the IS discipline with regard to two specific attributes like IT Artifact and IS theme reveals that the academic identity is indicated by two central and enduring intellectual cores associated with a handful of IT Artifacts and IS theme (Nevo et al 2009) Recently, some researchers also started exploring the body of knowledge published in conference proceedings. The identity and development of MIS field through a scientometric lens applied to three major global, regional and national conferences of MIS revealed that MIS field has been evolving in terms of collaborative research and scholarly output has been gradually moving towards academic maturity and the leading conference contributors tend to establish loyalty to a limited number of academic meetings (Cocosila et al. 2011) In a study to assess the reciprocal and shared impact of LIS/MIS fields unmask that the impact of MIS on LIS is greater than the reverse(Sugimoto et al.2011).

Scope and Objectives:

The scope of the study delimits the area with measuring the Management information system research productivity from the period 1995 - 2009. The study includes a total of 596 papers from MISQ journal. The present study has been undertaken with the following objectives.

- 1. To find the chronological distribution of publications and ranking of volumes in terms of highest numbers publication of articles in the journal;
- 2. To find out the Growth Rate (GR) and Doubling Time (DT) of publication;
- 3. To find the publication pattern of the articles in the journal;
- 4. To study the journal metrics in terms of SJR and SNIP;
- 5. To find out the Authorship pattern of the articles;
- 6. To find out the Degree of collaboration of authors;



- 7. To prepare a ranked list of productive countries and institutions of affiliation;
- 8. To find out the pagination pattern of the articles;
- 9. To study the pattern of illustrations of the articles;
- 10. To find the distribution of citations by years;
- 11. To find out percentage not cited by years.

The Data and the Method:

For carrying out the present work, "EBSCOhost Research Databases" and "SCOPUS" are used as the source databases for the MISQ journal literature. EBSCOhost offers a variety of proprietary full text databases as well as popular databases from leading information providers ranging from general reference collections to specially designed, subject-specific databases for libraries and academic community as a whole on the other hand SCOPUS MISQ was preferred than other available MIS periodicals from the "Business Source Corporate" database through a precise evaluation criteria and the parameters for discarding the others are: (i) Availability of Bibliographic Records, (ii) Peer reviewed or not (iii) Full Text availability, (iii) Availability of Subjects Description, (v) Regularity of the publication (Ceased or not), (vi) Availability of Journal Information in Bibliographical Databases like SCOPUS / WOS, (vii) Availability of Information like Publisher, Publication Type like Academic or not etc.

All the papers published from the year 1995 - 2009 are included in this study, comprising of 15 volumes, a total of 60 issues and 596 articles. For each volume and issue of MISQ the *titles, names of authors, number of authorship, number of references, author's institutional affiliation and country, type of article, subject of article, length (pages) of article, author supplied keywords and abstracts were downloaded from EBSCOhost while SJR (SCImago Journal Rank), SNIP (Source Normalized Impact per Paper), total number of citations received by a journal in the year considering all documents, percentage of documents published in a year that have never been cited to date and percentage of documents in the year that are review articles etc. were collected from the SCOPOUS database. Further, all the necessary information collected from EBSCOhost and SCOPUS were recorded in a specific designed template in MS excel, compiled, tabulated and analyzed for making observations.*



Data analysis and Interpretation:

A. Chronological Distribution, Relative GR and DT of articles in MISQ:

Table – 1 shows the number of papers published in the MISQ Journal during 1995 to 2009 along with respective cumulative figures and percentage, relative growth rate (GR) and doubling time (DT). The rank list in table 1 reflects that the highest number of articles published during 1999 which is 52 (8.72%) and lowest in 2003 which is 27 (4.53%). Further the second and third highest no. of articles i.e., 50 and 49 are published during the year 1998 and 2000 respectively. This indicates that the publication pattern is stable with respect to the average number of papers published per year (volume) i.e. 39.73.

Table 1 - Chronological Distribution of Papers in MISQ:

SL. No.	Years	Vol. No.	Number of Papers	%	Rank	Cumulative No. of Papers	Cumulative %	Log	Growth Rate (GR)	Doubling Time (DT)
1	1995	19	38	6.37	7	38	6.38	3.64		
2	1996	20	45	7.55	5	83	13.93	4.42	0.78	0.89
3	1997	21	34	5.7	10	117	19.63	4.76	0.34	2.02
4	1998	22	50	8.38	2	167	28.02	5.12	0.36	1.95
5	1999	23	52 (Highest)	8.72	1	219	36.74	5.39	0.27	2.56
6	2000	24	49	8.22	3	268	44.97	5.59	0.20	3.43
7	2001	25	33	5.53	11	301	50.50	5.71	0.12	5.97
8	2002	26	28	4.69	13	329	55.20	5.80	0.09	7.79
9	2003	27	27 (Lowest)	4.53	14	356	59.73	5.87	0.08	8.79
10	2004	28	31	5.2	12	387	64.93	5.96	0.08	8.30
11	2005	29	36	6.04	9	423	70.97	6.05	0.09	7.79
12	2006	30	48	8.05	4	471	79.03	6.15	0.11	6.45
13	2007	31	37	6.2	8	508	85.23	6.23	0.08	9.17
14	2008	32	40	6.71	6	548	91.95	6.31	0.08	9.15
15	2009	33	48	8.05	4	596	100.00	6.39	0.08	8.26
Total	15 Years	15 Vol.	596	100	*			Mean	0.20	5.89

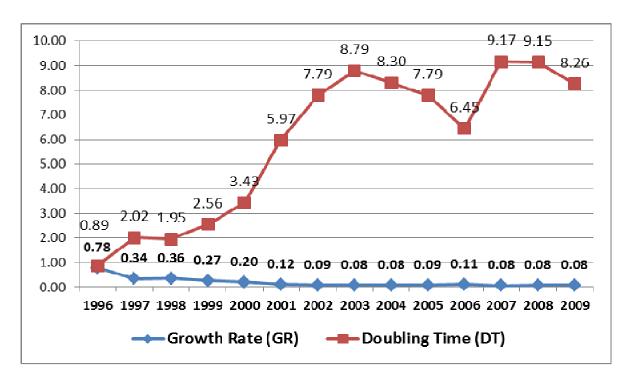


Figure 1 – Distribution of relative GR and DT of articles in MISQ

Figure – 1 reflects chronological distribution of relative GR as well as DT of articles in MISQ journal. The GR has shown a decreasing trend from 1996 to 2009 excluding 2005 and 2006 from 0.78 to 0.08. Correspondingly, the DT has increased from 0.89 to 9.17 till 2007 excluding 2005 and 2006. The mean relative growth rate is 0.20 while mean doubling time is 5.89.

B. Journal Metrics:

Table 2 indicates journal metrics of MISQ in terms of SJR (SCImago Journal Rank), SNIP (Source-Normalized Impact per Paper), total number of citations received in the year, percentage of documents published in the year that have never been cited to date and percentage of documents in the year that are review articles. The SJR indicator presents the average number of weighted citations received in the selected year by the documents published in MISQ journal in the three previous years i.e., weighted citations received in the year 1999 to documents published in 1998, 1997 and 1996. On the other hand SNIP measures contextual citation impact by weighting citations based on the total number of citations in a subject field. The impact of a single citation is given higher value in subject areas where citations are less likely and vise versa. SNIP provides more contextual information, as a result bibliometricians can use to create more refined and objective analyses including quality of research output. It not only helps editors to



evaluate their journals with respect to others but also to the researchers to identify which journals are performing better within their subject field. The mean values of SJR and SNIP are 4.652 and 4.129 respectively during the period of study. It is further observed that total number of citations including Journal Self Citations received by the MISQ is in increasing trend and the mean citation received is 3859.

Table 2 – SCOPUS Journal Analyzer for MISQ (with Journal Self Citations):

Journal	Year	SJR	SNIP	Citations	% not cited
MIS Quarterly	1996	-	-	1136	0.00
MIS Quarterly	1997	-	-	1207	4.76
MIS Quarterly	1998	-	-	1094	0.00
MIS Quarterly	1999	1.336	2.909	1141	0.00
MIS Quarterly	2000	2.094	2.503	1326	0.00
MIS Quarterly	2001	2.007	3.146	1337	0.00
MIS Quarterly	2002	3.080	3.270	1625	0.00
MIS Quarterly	2003	4.530	5.114	2271	0.00
MIS Quarterly	2004	4.486	4.039	2574	0.00
MIS Quarterly	2005	7.029	4.774	4701	3.13
MIS Quarterly	2006	7.366	5.559	6638	2.17
MIS Quarterly	2007	8.737	4.514	8197	2.86
MIS Quarterly	2008	5.378	5.522	9452	2.50
MIS Quarterly	2009	5.128	4.068	11335	2.13
	Mean	4.652	4.129	3859	

Table 3 represents the Journal analyzer metrics with out Journal Self Citations while metrics in table 2 represents with Journal Self Citations. Table 3 Journal analyzer metrics which extracted from without Journal Self Citations follows the same pattern observed in case of with Journal Self Citations as reflected in Table 2. In this case the mean citation is 3741 which is approximately 3% less than the previous one. Though there is no impact in case of SJR and SNIP but a very little variation in case of % of documents published in a year that has never been cited. In both cases all the articles are cited during the years 1998 to 2004 and 1996 while % not cited for the rest of the years varies from 2 to 6 %.



Table 3 – SCOPUS Journal Analyzer for MISQ (without Journal Self Citations):

Journal	Year	SJR	SNIP	Citations	% not cited
MIS Quarterly	1996	1	-	1123	0.00
MIS Quarterly	1997	-	-	1195	4.76
MIS Quarterly	1998	-	-	1080	0.00
MIS Quarterly	1999	1.336	2.909	1128	0.00
MIS Quarterly	2000	2.094	2.503	1313	0.00
MIS Quarterly	2001	2.007	3.146	1327	0.00
MIS Quarterly	2002	3.080	3.270	1540	0.00
MIS Quarterly	2003	4.530	5.114	2117	0.00
MIS Quarterly	2004	4.486	4.039	2420	0.00
MIS Quarterly	2005	7.029	4.774	4523	3.13
MIS Quarterly	2006	7.366	5.559	6431	2.17
MIS Quarterly	2007	8.737	4.514	7913	5.71
MIS Quarterly	2008	5.378	5.522	9218	2.50
MIS Quarterly	2009	5.128	4.068	11045	2.13
	Mean	4.652	4.129	3741	·

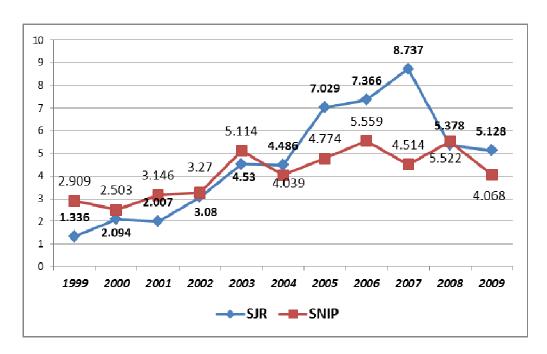


Figure 2 – Chronological Distribution of SJR with respect to SNIP of MISQ

Figure 2 depicts the comparative trends of SJR and SNIP of MISQ journal for the period taken for the study. It is observed that SJR in an increasing trend till the year 2007 excluding the year



2004 and declines in 2008 and further in the year 2009. Similarly, in case of SNIP, It is observed that values are in increasing trend till the year 2006 excluding the year 2004 and declines in 2007 and in the year 2009 excluding 2008.

Figure 3 shows the citation pattern with and without Journal Self Citations (JSC) of MISQ Journal during the period 1996 to 2009. The observed increasing trend is similar to each other in both the cases.

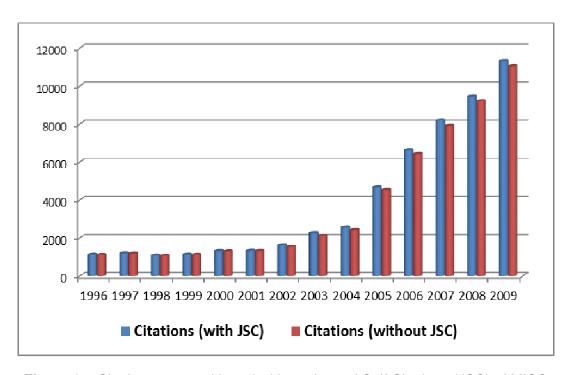


Figure 3 - Citation pattern with and without Journal Self Citations (JSC) of MISQ

C. Distribution and Ranking of Publication Pattern:

Considering all the papers, it is observed that "Research Articles" overshadow other form of publications with 87.24% (520 contributions), followed by "Abstracts" with 7.38% (44 contributions) and "Editorials" with 4.36% (26 contributions) respectively. Although, there are 3 other document categories such as: "Opinion", "Erratum" & "Essay" with 03 (0.50%), 02 (0.33%) and 01 (0.16%) contributions respectively but they are exiguous as figure - 2 asserts.



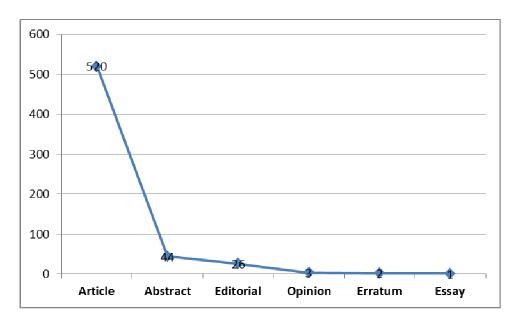


Figure 4 - Distribution of types of publications

D. Authorship pattern and Degree of Collaboration:

Table 4 deals with authorship pattern in the journal. It was observed that total 1185 number of authors contributed 596 no. of articles in MISQ during the year 1995 to 2009 which reflects that the average number of papers per author is 0.50. Further it is observed that, the total 596 papers are produced by 228 numbers of single authors and 368 numbers of multiple authors during the year 1995 to 2009. The total time period of study i.e. 1995 to 2009 was divided into 3 zones and each having 5 year durations like 1995-1999, 2000-2004 and 2005-2009. It was observed that during the period of 1995-1999 highest numbers of articles were published i.e. 219 with 116 numbers of single and 103 numbers of multiple authorship. Similarly during the period 2000-2004 and 2005-2009 number of articles published are 168 and 209 respectively with single and multiple authorship 76, 92 and 36, 173. It indicates that the collaborative research is at the front. The degree of collaboration among authors was calculated using Subramanian's formula (Subramanian, 1983) and depicted in Table 4. It is deduced that multi-authored contributions occupy the prominent position. It is also observed that the degree of collaboration (DC) is increasing the vear range under study. The distribution Degree Collaboration/collaborative co-efficient over 3 time zones (i.e. 1995 -99, 2000 -04 and 2005-09) is 0.47, 0.54 and 0.82 respectively. The increasing degree of collaboration indicates that MISQ has accommodated more number of collaborative works than single authored ones over time.



Table 4 - Authorship pattern and Degree of Collaboration:

	MISQ (Authorship Pattern of Papers)								
Year	No. of Single Author	No. of Multiple Authors	No. of Authors Considering 1st Author	No. of Authors Considering all Authors	No. of Papers	Degree of Collaboration	Average Papers per Author		
1995-1999	116	103	219	382	219	0.47	0.57		
2000-2004	76	92	168	313	168	0.54	0.54		
2005-2009	36	173	209	490	209	0.82	0.43		
Total	228	368	596	1185	596	0.61	0.50		

E. Application of Lotka's inverse Square Law of Scientific Productivity:

The total number of authors y in a given subject, each producing x publications, is inversely proportional to some exponential function n of x. It states that the number of authors making n contributions is about $1/n^a$ of those making one contribution, where a nearly equals to two. More plainly, the number of authors publishing a certain number of articles is a fixed ratio to the number of authors publishing a single article. As the number of published articles increases, authors producing that many publications become less frequent. There are 1/4 as many authors publishing two articles within a specified time period, 1/9 as many publishing three articles, 1/16 as many publishing four articles, etc. with respect to total single-publication authors. Lotka's law: $X^nY = C$ where:

s law: $\Lambda I = C$ where:

x = number of publications

y = relative frequency of authors with X publications

n = constant depending on the specific field ($n \approx 2$)

C = constant

Measuring of author productivity is a vital part of the metric study is induced for the present research as promulgated in table 6. It envisages that, a highest 336 number of authors out of 418 have contributed single paper each and its proportion is 80.38. Besides, from the observation it is clear that, the number of authors contributed 2, 3 4, 5, and 6 number of papers each are not significantly fit to the Lotka's inverse Square Law of Scientific Productivity, because there is huge gap between number of authors observed and number of authors expected in relation to

their productivity pattern. Supplementing to the study the researcher has also accounted all the contributing authors and their productivity pattern which procreate a value adding domain to the present research and demonstrates that, a majority 713 number of authors out of a total of 1185 authors produce single paper each whose proportion 60.17% is dominating overall productivity pattern. As regards to Lotka's inverse law, the productivity pattern of contributors is somehow matches in this case than the previous one.

Table 5: Number of expected Authors derived with the value of $\alpha = 2$ using Lotka's inverse Square Law of Scientific Productivity

	C	Considering 1st A	Authors (uni	que)	Considering all Authors				
No. of Papers	No. of Authors Observed	% of Observed Authors w.r.t. their no. of contribution	No. of Authors Expected	% of Expected Authors w.r.t. their no. of contribution	No. of Authors Observed	% of Observed Authors w.r.t. their no. of contribution	No. of Authors Expected	% of Expected Authors w.r.t. their no. of contribution	
1	336	80.38	336	63.40	713	60.17	713	63.04	
2	59	14.11	84	15.85	264	22.28	178	15.74	
3	8	1.91	37	6.98	56	4.73	79	6.98	
4	2	0.48	21	3.96	13	1.10	45	3.98	
5	2	0.48	13	2.45	18	1.52	29	2.56	
6	4	0.96	9	1.70	37	3.12	20	1.77	
7	0	0.00	7	1.32	0	0.00	15	1.33	
8	2	0.48	5	0.94	24	2.03	11	0.97	
9	0	0.00	4	0.75	0	0.00	9	0.80	
10	1	0.24	3	0.57	10	0.84	7	0.62	
11	3	0.72	3	0.57	34	2.87	6	0.53	
12	0	0.00	2	0.38	0	0.00	5	0.44	
13	0	0.00	2	0.38	0	0.00	4	0.35	
14	0	0.00	2	0.38	0	0.00	4	0.35	
15	0	0.00	1	0.19	0	0.00	3	0.27	
16	1	0.24	1	0.19	16	1.35	3	0.27	
Total	418	100	530	100	1185	100	1131	100	

F. Collaborative Pattern and Ranking of Productive countries in MIS journal Literature: The collaboration pattern which was observed during the period of the study is shown in table - 6.

Table 6 - Collaboration Pattern of Literature:



Sl			Collaborati	Total Literature				
No	Country	Inter- Institutional	Intra- Institutional	Inter- Country	Intra- country	Production	%	Rank
1	USA	224	63	43	244	287	48.15	1
2	Canada	27	08	12	23	35	5.87	2
3	UK	10	03	08	05	13	2.18	3
4	Hong Kong	09	01	07	03	10	1.67	4
5	Australia	05	03	04	04	08	1.34	5
6	Singapore	08	0	08	0	08	1.34	5
7	Netherlands	03	03	02	04	06	1.00	6
8	Israel	01	03	01	03	04	0.67	7
9	New Zealand	02	01	02	01	03	0.50	8
10	Norman	03	0	02	01	03	0.50	8
11	Norway	01	02	0	03	03	0.50	8
12	Finland	01	01	01	01	02	0.33	9
13	France	02	0	01	01	02	0.33	9
14	Germany	01	01	0	02	02	0.33	9
15	Ireland	01	01	01	01	02	0.33	9
16	Korea	02	0	02	0	02	0.33	9
17	Sweden	02	0	02	0	02	0.33	9
18	Austin	0	01	0	01	01	0.16	10
19	Denmark	01	0	01	0	01	0.16	10
20	Georgia	01	0	01	0	01	0.16	10
21	Italy	01	0	01	0	01	0.16	10
22	Los Angles	0	01	o	01	01	0.16	10
23	Saudi Arabia	0	01	0	01	01	0.16	10
	Others	*	*	*	*	198	33.22	*
	Total	305	93	99	299	596	100	*
Grand Total		305+93+	198=596	99+299+	198=596	-		



Inter Institutional, Intra Institutional, Inter Country and Intra Country pattern of collaboration which was observed along with country wise ranking were also presented in table - 6. USA topped the list with 287 (48.15%) numbers of articles and the productive counts for Inter-Institutional and Intra-Institutional collaboration were 224 and 63 respectively. On the other hand the Inter-Country and Intra-Country collaborations were 43 and 244 respectively which reflects a reverse trend than Inter / Intra Institutional productivity. The second and third rank goes to Canada and UK respectively in terms of MIS literature production with productive counts of 35 (5.87%) and 13 (2.18%) respectively. As large numbers of papers are published from USA, it reflects the contribution and dominance of USA over its other counterparts. All total, 305 inter-institutional and 93 intra-institutional collaborations and 99 inter-country and 299 intra-country modes of collaborations were observed. There is a clear indication of author preference of collaboration with the peers.

G. Ranking Pattern of Prolific Institutions:

Table 7 - Ranking Pattern of 25 Prolific Institutions:

Sl. No.	Name of Institutions	Country of Origin	Literature Production	%	Rank
1	Indiana University	USA	11	1.84	1
2	Georgia State University	USA	10	1.67	2
3	University of Maryland	USA	10	1.67	2
4	University of South Florida	USA	08	1.34	3
5	University of Georgia	USA	08	1.34	3
7	University of California	USA	07	1.17	4
8	University of Texas	USA	07	1.17	4
9	Florida State University	USA	06	1.00	5
10	University of Hawaii	USA	06	1.00	5
11	University of Minnesota	USA	06	1.00	5
12	University of Oklahoma	USA	06	1.00	5
13	Carnegie Mellon University	USA	05	0.83	6
14	Drexel University	USA	05	0.83	6
15	Nanyang Technological University	Singapore	05	0.83	6



16	National University of Singapore	Singapore	05	0.83	6
17	New York University	USA	05	0.83	6
19	Southern Methodist University	USA	05	0.83	6
20	Texas A&M University	USA	05	0.83	6
21	University of British Columbia	Canada	05	0.83	6
22	University of Calgary	Canada	05	0.83	6
23	University of Colorado	USA	05	0.83	6
24	University of Houston	USA	05	0.83	6
25	University of Oslo	Norway	05	0.83	6

The table-7, list out the most prolific institutions in the field of MIS research output. Indiana University (USA) tops the list with 11 articles, whereas Georgia State University and University of Maryland both ranked 2^{nd} in the list. The clear indication of dominance of universities belonging to USA is reflected in the area of research in MIS.

Conclusion:

The present paper attempts to identify the bibliometric characteristics of MISQ articles. On the basis of our observation the following findings are drawn from the study.

- I. The publication of articles per volume is stable in MISQ journal with respect to the average number of papers published per year (i.e. 39.73).
- II. The GR has shown a decreasing trend from 1996 to 2009 excluding 2005 and 2006 from 0.78 to 0.08. Correspondingly, the DT has increased from 0.89 to 9.17 till 2007 excluding 2005 and 2006. The mean relative growth rate is 0.20 while mean doubling time is 5.89.
- III. The mean values of SJR and SNIP are 4.652 and 4.129 respectively during the period of study.
- IV. It is observed that total number of citations (with Journal Self Citations) received by the MISQ is in increasing trend and the mean citation received is 3859 while in case of without Journal Self Citations the mean citation is 3741 which is approximately 3% less than the previous one. There is a very little variation in case of % of documents published



- in a year that has never been cited. In both cases all the articles are cited during the years 1998 to 2004 and 1996 while % not cited for the rest of the years varies from 2 to 6 %.
- V. Authorship pattern and Degree of Collaboration (0.61) suggests that the collaborative research is at the front.
- VI. The chronological increasing degree of collaboration indicates that MISQ has accommodated more number of collaborative works rather than single authored works over time which reflects research is a collaborative effort.
- VII. As large numbers of papers are published from USA, it reflects the contribution and dominance of USA over its other counterparts. Similarly the ranking of productive Institutions represent dominance of universities belonging to USA in the area of research in MIS.
- VIII. All total 305 inter-institutional along with 93 intra institutional collaboration and 99 intercountry and 299 intra-country mode of collaboration was observed. There is a clear indication of author preference of collaboration with the peers.

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