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IS Journal Rankings Versus Citation Analysis: Consistency and Concerns

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Abstract

This study investigates relationship between the journal ranking lists reported in previous studies on IS journal quality and the rankings derived based on citation data. Journals are categorized into pure, hybrid, partial, and non-IS journals. A total of 8,023 articles published in 38 journals are analyzed and 27,567 citations made to these articles are collected. Five citation-based indices are derived from the collected citation data. Correlation analyses are conducted to examine the relationship and results show strong relationships only for pure IS journals. Then, a concern regarding which journals should be included on IS journal ranking lists, practical implication, further research, and limitations are discussed.

Keyword: Journal ranking, citation analysis, IS discipline, IS research

Introduction

As known, the quality ratings of journals are of a particular interest to academicians since publications in prestigious journals have significant influence on academic peer recognition, departmental and institutional rankings**,** tenure and promotion decisions, and the merit increase of faculty compensation (Mylonopoulos and Theoharakis 2001; Walstrom and Hardgrave 2001). Therefore, quality of IS journals has been evaluated for almost two decades. Vogel and Wetherbe (1984) studied journal preferences for publication of research results among top publishing universities. Cooper *et al*. (1993) identified a group of highly influential journals that can be reasonably called an MIS core. Holsapple *et al*. (1993) and Nord and Nord (1995) proposed the first and the second tiers of IS and IS-related journals based on their relative quality. In several other studies (e.g., Gillenson and Stutz 1991; Hardgrave and Walstrom 1997; Mylonopoulos and Theoharakis 2001; Walstrom *et al*. 1995; Walstrom and Hardgrave 2001), IS and IS-related journals were ranked based on faculty opinion.

In those previous studies, *Questionnaire Survey* and *Citation Analysis* are the two major research approaches used to analyze quality and ranking of IS and IS-related journals. Unfortunately, none of any previous research on quality of IS journals has studied how the results of these two different approaches are related. Therefore, in this study, we conduct a citation analysis and rank 38 well-recognized journals included in the ranking results of several previous studies (e.g., Mylonopoulos and Theoharakis 2001; Walstrom and Hardgrave 2001; Whitman *et al*. 1999). Then, we compare our ranking results to those reported in four previous studies. Finally, based on the comparison results, we draw our conclusion and provide the discussion on what we should concern when conducting a study about IS journal quality and when using the ranking result from this study.

This article is organized into five sections. The following section discusses essential concept of citation analysis and presents the citation-based indices for journal quality. Research methodology is in the third section. Study results and discussion are presented in the fourth section. Conclusion are presented in the fifth section.

Citation Analysis and Citation-Based Indices for Journal Quality

Since "research firmly based upon one or more past scientific achievements… as supplying the foundation for its further practice" (Kuhn 1996, p.10), journal quality should be derived from their knowledge contributions or the actual use of the journals and their articles (Cooper *et al*. 1993). Citation analysis allows the contributions of disciplines, journals, articles, or scholars to be evaluated by giving substantive expression to the use and diffusion of knowledge (Jackson and Rushton 1987). However, the use of citation analysis in most past research might be better termed "reference analysis" since unit of analysis has been the references in, rather than the citations of, an article (Cote *et al*. 1991). Examining the references provided in a single journal is useful for identifying what disciplines influence that journal, but not for identifying that journal's contributions on others (Cote *et al*. 1991). Whom we reference may indicate where our own knowledge base comes from (Leong 1989); conversely, where the research is cited may provide insights into its contributions. Journal quality can be identified with the quality of articles published, which in turn can be related to the impact of these articles – how many people read them and utilize the concepts and conclusions described (Franke *et al*. 1990). Thus, this study employs the citation analysis by examining the number of citations received by the articles published in the journals to assess their qualities or knowledge contributions.

Citation data are available in *Social Science Citation Index (SSCI)* and *Science Citation Index (SCI)* for broad range of publications. Based on these citation data, we propose that the following five citation-based indices of journal quality are derived since journal quality is a multifaceted concept and could be reflected by different measures (Mylonopoulos and Theoharakis 2001; Zinkhan and Leigh 1999).

Citations per article **(CPA):** This index is the average number of citations received per target article published in each year since it is appropriate to discount the effect of size (number of articles published) when using citation data to assess journal quality (Garfield 1979).

Un-cited ratio **(UNCITE):** It is the percentage of the target articles, published in the journal in each year, that have never been cited.

20+ Citations **(20+):** This index is the percentage of the target articles, published in the journal in each year, that have been cited at least 20 times.

Annual mean citation rate per article **(AMCPA):** The *Annual mean citation rate per article* is a normalize quality index of the articles based on the number of years since publication because older articles are likely to be cited more often than recent articles. This index is derived by dividing the *Citation per article* (see aforementioned definition) by the number of years elapsed since the publication of the target articles.

Current article impact **(CI):** This "impact factor," the ratio of current uses per recent article, is a measure of current article quality (Garfield 1979). That is, the index measures the frequency with which the articles in the journal have been cited over the most recent two-year period. The *Current article impact* for a reference year is derived by dividing the number of citations made to only the target articles published in the journal during two years prior to the reference year by the number of target articles that were published in the same time period.

Research Methodology and Analyses

Four latest IS journal quality studies: I&M 2001 (Walstrom and Hardgrave 2001), CACM 2001 (Mylonopoulos and Theoharakis 2001), ISR 1999 (Whitman *et al*. 1999), and CACM 1997 (Hardgrave and Walstrom 1997) are used as the analytical framework for this study. All of these four previous IS journal quality studies employed *Questionnaire Survey* methodology. Brief description of these four previous studies is in Table 1. We compile a list of well-recognized journals from the ranking results of these four previous studies. On this list, there are 57 journals that were ranked by at least two of these four previous studies. We record the ranking scores from these previous studies for each of the 57 journals (Appendix A).

From the list of well-recognized journals, citation data are available for only 38 journals on this list. We compile another list of the target articles published in these 38 journals during 1995-1998. Then, we collect the citations made to these target articles by the articles published during 1997-2000. We use a two-year lag time to collect the citation data to ensure a reasonable citation history for analysis because the modal elapsed time between IS article publication and citation was found to be approximately two years (Hamilton and Ives 1982). The publication period of 1995-1998 and the citation period of 1997-2000 are selected in order to match the estimated years when the four previous studies were conducted.

Table 1. Four Previous IS Journal Quality Studies

Previous Study	Estimated year when the study was conducted	Methodology and Respondents
I&M 2001	1998	Mail questionnaire sent to IS faculty members in U.S. and Canada; 364 respondents evaluated journals on scale 1 to 4
CACM 2001	1999	Online questionnaire sent to IS faculty members in North America, Europe, Asia, New Zealand, and Australia; 979 respondents voted journals as the first and the second tiers; ranking scores were based on the number of votes
ISR 1999	1996	Mail questionnaire sent to individuals in charge of departments of IS faculty; 184 respondents evaluated journals on scale 1 to 5
CACM 1997	1995	Mail questionnaire sent to IS faculty members from U.S. and Canada; 352 respondents evaluated journals on scale 1 to 4

Totally there are 8,023 target articles published in the 38 journals during 1995-1998 and 27,567 citations made to these 8,023 target articles by the articles published during 1997-2000. We also record number of the target articles, published in each year during 1995-1998, that had never been cited during 1997-2000 and that had been cited 20 times or more during the same time period. Appendix B summarizes the collected citation data. Based on these collected citation data, the five citation-based indices of journal quality are derived for each of the 38 journals. Appendix C presents the citation-based indices for each journal.

Then, we follow the journal emphasis reported in one previous study (Walstrom and Hardgrave 2001) to categorize the journals in this study into four groups: pure IS, hybrid IS, partial IS, and non-IS journals (Appendix A). We conduct correlation analyses to examine the relationship between the rankings reported in the four previous studies with *Questionnaire Survey* methodology and the rankings from the citation-based indices derived in this study. The correlation analyses are conducted for every journal in this study altogether, for pure IS journals, for hybrid IS journals, and for non-IS journals. Unfortunately, the correlation analysis is not conducted for partial IS journals because the limited number of journals in this category (i.e., only three journals) does not provide sufficient data for reliable correlation results. Finally, since the ranking scores from four previous studies and from citation-based indices are primarily used to rank the journals, these data are ordinal. Thus, Spearman's rho that correlates ranks between two ordered variables is more suitable and is used for the correlation analyses in this study.

4. Study Results and Discussion

Table 2 summarizes descriptive statistics of the ranking scores from each previous study and each citation-base index. Coefficients of variation (i.e., ratios of standard deviations to means) for the ranking scores from previous studies are about 15%-16%, except for CACM 2001 (69%), while coefficients of variation are ranging between 67% and 183% for the citation-based indices.

Although it appears that the citation-based indices show higher variation than the ranking scores from *Questionnaire Survey* methodology, this variation is the result of the scale used in data collection. Scale characteristics affect these variations. In three previous studies: I&M 2001, ISR 1999, and CACM 1997, respondents evaluated journals on scale either 1 – 4 or 1 – 5. In CACM 2001, ranking scores were the number of votes that could vary from 0 – 979 (i.e., number of respondents in the study). On the other hand, citation-based indices are derived from number of citations (unlimited; the maximum number of citations found in this study is 2,926 citations) and number of articles (up to 160 articles in one year). The wider range of possible data value leads to high variation in citation-based indices.

Table 2. Descriptive Statistics

	I&M 2001	CACM 2001	ISR 1999	CACM 1997	CPA	UNCITE	20+	AMCPA	CI
Mean	2.74	295.88	3.42	2.77	3.95	0.30	0.06	1.08	0.88
SD	0.41	204.14	0.55	0.44	4.07	0.20	0.11	1.09	0.79
N	49	42	36	44	38	38	38	38	38

N: Number of journals

Table 3, 4, 5, and 6 present the correlations for all journals, for pure IS journals, for hybrid IS journals, and for non-IS journals respectively. In all of these four correlation analyses, all correlations of the rankings among four previous studies are high (ranging from 0.75 to 1.00) and significant; similarly, all correlations among the citation-based indices are high (ranging from 0.61 to 0.99) and significant as well (see the non-shaded area on each table). Therefore, the *Questionnaire Survey* methodology conducted in previous studies provides consistent rankings; similarly the five citation-based indices derived in this study also provide consistent rankings.

When examining correlations between the rankings from four previous studies and from citation-based indices derived in this study, we find that only results from the analysis for pure IS journals (see the shaded area on Table 4) show high correlations (ranging from 0.64 to 0.99) and significant. For all journals (see the shaded area on Table 3), most of the correlations are significant, except those correlations related to CACM 2001; however, these significant correlations are in only moderate level (ranging from 0.44 to 0.82).

For hybrid IS journals (see the shaded area on Table 5), approximately half of the correlations (11 out of 20) between the rankings from four previous studies and from citation-based indices derived in this study are significant. These significant correlations are ranging from 0.62 to 0.88. Finally, for non-IS journals (see the shaded area on Table 6), only one correlation (0.68) between the ranking from CACM 2001 and from *Un-cited ratio* is significant (at p = 0.05). Note that, in this correlation analysis for non-IS journals, correlations between the ranking from ISR 1999 and the citation-based indices are not available. These unavailable correlations are because the limited number of non-IS journals (only three journals) included in ISR 1999 does not provide reliable correlation results.

Table 3. Correlations for All Journals

	I&M 2001	**CACM 2001**	**ISR 1999**	**CACM 1997**	**CPA**	**UNCITE**	**20+**	**AMCPA**
CACM 2001	.85** (34)							
ISR 1999	.94** (29)	.83** (31)						
CACM 1997	.97** (44)	.84** (31)	.96** (27)					
CPA	.62** (33)	.25 (33)	.76** (23)	.59** (30)				
UNCITE	-.48** (33)	-.15 (33)	-.63** (23)	-.44* (30)	-.94** (38)			
20+	.47** (33)	.22 (33)	.82** (23)	.50** (30)	.84** (38)	-.80** (38)		
AMCPA	.63** (33)	.24 (33)	.76** (23)	.60** (30)	.99** (38)	-.94** (38)	.84** (38)	
CI	.61** (33)	.22 (33)	.73** (23)	.56** (30)	.97** (38)	-.88** (38)	.77** (38)	.96** (38)

* significant at p = 0.05
** significant at p = 0.01
Note: Number of journals is in the parenthesis.

Table 4. Correlations for Pure IS Journals

	I&M 2001	CACM 2001	ISR 1999	CACM 1997	CPA	UNCITE	20+	AMCPA
CACM 2001	.90** (14)							
ISR 1999	.92** (15)	.91** (13)						
CACM 1997	.98** (13)	.91** (11)	.95** (13)					
CPA	.89** (10)	.83** (10)	.88** (9)	.89** (7)				
UNCITE	.90** (10)	-.84** (10)	-.88** (9)	-.89** (7)	-.98** (11)			
20+	.78** (10)	.64* (10)	.83** (9)	.77* (7)	.85** (11)	-.81** (11)		
AMCPA	.89** (10)	.83** (10)	.88** (9)	.89** (7)	1.0** (11)	-.98** (11)	.85** (11)	
CI	.85** (10)	.79** (10)	.88** (9)	.89** (7)	.96** (11)	-.95** (11)	.85** (11)	.96** (11)

* significant at p = 0.05
** significant at p = 0.01
Note: Number of journals is in the parenthesis.

Table 5. Correlations for Hybrid IS Journals

	I&M 2001	CACM 2001	ISR 1999	CACM 1997	CPA	UNCITE	20+	AMCPA
CACM 2001	.89** (8)							
ISR 1999	.90** (8)	.75** (12)						
CACM 1997	.98** (16)	.93** (8)	.96** (8)					
CPA	.83** (11)	.39 (12)	.73* (9)	.84** (11)				
UNCITE	-.58 (11)	-.31 (12)	-.63 (9)	-.62* (11)	-.88** (15)			
20+	.38 (11)	.24 (12)	.76* (9)	.46 (11)	.69** (15)	-.69** (15)		
AMCPA	.88** (11)	.43 (12)	.73* (9)	.86** (11)	.98** (15)	-.83** (15)	.61* (15)	
CI	.87** (11)	.35 (12)	.73* (9)	.83** (11)	.96** (15)	-.83** (15)	.70** (15)	.93** (15)

* significant at p = 0.05
** significant at p = 0.01
Note: Number of journals is in the parenthesis.

Table 6. Correlations for Non-IS Journals

	I&M 2001	CACM 2001	ISR 1999	CACM 1997	CPA	UNCITE	20+	AMCPA
CACM 2001	.88** (10)							
ISR 1999	1.0** (4)	1.0** (4)						
CACM 1997	.96** (12)	.90** (10)	1.0** (4)					
CPA	-.30 (9)	-.53 (9)	NA	-.47 (9)				
UNCITE	.43 (9)	.68* (9)	NA	.58 (9)	-.87** (9)			
20+	.02 (9)	-.20 (9)	NA	-.20 (9)	.92** (9)	-.72* (9)		
AMCPA	-.27 (9)	-.52 (9)	NA	-.43 (9)	.98** (9)	-.88** (9)	.88** (9)	
CI	-.20 (9)	-.43 (9)	NA	-.40 (9)	.98** (9)	-.83** (9)	.97** (9)	.95** (9)

* significant at p = 0.05
** significant at p = 0.01
Note: Number of journals is in the parenthesis.

A useful view of IS is to conceive of its growth from its foundational fields in Computer Science, Management Science, and Organization Science and IS research traditionally borrowed ideas from these foundations (Culnan and Swanson 1986). In return, IS faculty may publish in the journals of these foundational fields. Thus, an objective of including hybrid IS, partial IS, and non-IS journals on the ranking list is to cover, if not all, as many as possible the publication outlets for IS researchers.

However, in the fast growing field with rapidly advancing technology like IS, possible publication outlets are always expanding. For example, with the Internet and the popularity of E-commerce, we see more IS researchers publish in the journals of marketing and advertising (e.g., Balasubramanian *et al*. 2002). Thus, trying to cover possible publication outlets for IS researchers could result in IS journal ranking list with many journals from other disciplines (e.g., strategic management, accounting, marketing).

Unfortunately, results of this study show that IS faculty's evaluation of quality of the journals of other disciplines is not really consistent with how often the journals are cited and their knowledge contributions. Correlation results between the rankings from four previous studies and from citation-based indices derived in this study suggest that the rankings from previous studies and from citation-based indices are highly consistent only for pure IS Journals and somewhat consistent for hybrid IS Journals. The questionnaire surveys conducted in four previous studies included pure IS, hybrid IS, partial IS, and non-IS Journals, whereas the respondents were only IS faculty. These hybrid IS, partial IS, and non-IS Journals include some interdisciplinary journals that are read by faculty from many other disciplines (e.g., Management, Computer Science, Production and Operation Management). Rankings of these interdisciplinary journals evaluated by only IS faculty may be inconsistent with the actual use of these journals and their quality perceived by the faculty of other disciplines.

The attempt to identifying journals as pure IS, non-IS journals, etc. (Walstrom and Hardgrave 2001), is useful; however, including non-IS journals on the ranking lists to evaluate quality of IS publications could lead to the incorrect perception of quality of these publications. We propose that IS journal ranking lists exclude these non-IS journals. When needed, IS publications appearing in non-IS journals should be evaluated based on journal ranking lists of each corresponding disciplines. Although this may cause the evaluators (e.g., dean, tenure/promotion committee) to learn about quality of journals of many disciplines, it results in more precise evaluation of our IS publications.

Conclusion

This study employs a citation analysis to derive five citation-based indices for journal quality from the number of citations made to the articles published in the journals. Then, the journal rankings based on these citation-based indices are compared to the rankings reported in four previous journal quality studies. The comparison results show that rankings from the previous studies with *Questionnaire Survey* methodology are consistent with those rankings from citation analysis only for pure IS and closely-related IS journal. For non-IS journals, rankings from these two different methodologies provide inconsistent results. Ranking both IS journals and non-IS journals together as one big intellectual group may lead to incorrect perceptions of quality and knowledge contributions for non-IS journals. Thus, we propose that IS journal ranking lists should not include any non-IS journal. When evaluating IS publications in these non-IS journals, one should use the journal rankings reported in the corresponding disciplines.

A concern that non-IS journals are imprecisely evaluated by previously reported IS journal rankings and our propose to evaluate IS publications in non-IS journals by using the rankings developed by corresponding disciplines will provide fair evaluation for IS research published in non-IS journals. Therefore, main practical implication of this study is to be a guideline for improving the validity and relevancy of IS journal ranking lists used in evaluating quality of IS publications.

Additionally, several implications for further research emerge from this study. First, it will be interesting to examine the relationship between the rankings of non-IS journals based on their citation-based indices derived in this study and their rankings based on perceptions of the faculty in corresponding disciplines. Results of this examination will help validating this study. Second, perceptions of journal quality among respondents may be affected by who and where the respondents are. As seen from results of this study, the correlations (see Table 3, 4, and 5) related to CACM 2001 that surveyed respondents from North America, Europe, and Australia are lower than similar correlations related to other three previous studies. How significant these differences are and whether these differences are related to geographical locations (e.g., North America, Europe, Asia, Australia) of the respondents and/or any other reasons (e.g., availability of journals, popularity of local academic journals) should be investigated.

Despite its extensive use, citation analysis is not without its drawbacks. First, the number of citations made to a specific article could be affected by some other factors, for example, number of researchers working in the areas related to that article, number of journals publishing the related research, self-citations, age of the journal, etc. Second, citations may be negative (i.e., as the examples of the errors or poor research). However, negative citations are relatively infrequent, accounting for less than 10% of all citations (Moravcsik and Murugesan 1975). Finally, although SSCI and SCI have the most extensive citation coverage available for more than 7,000 journals, they are by no means complete. However, as few as 150 journals account for half of what is cited and a core of only approximately 2,000 journals account for about 85% of published articles and 95% of cited articles (Garfield 1996). Thus, the citation data available in *SSCI* and *SCI* should provide a valid picture of the knowledge contributions of journals.

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Appendix A. Ranking Scores from Previous Studies and Journal Category

Journal	I&M 2001	CACM 2001	ISR 1999	CACM 1997	Journal category
MISQ	3.76	850.00	4.57	3.72	Pure IS
ISR	3.71	728.00	4.13	3.71	Pure IS
JMIS	3.42	581.00	3.95	3.32	Pure IS
ACM T. on Information Systems	3.08	358.00	3.58	2.94	Pure IS
Decision Support Systems	3.03	466.00	3.57	3.06	Pure IS
Information & Management	2.92	442.00	3.45	2.87	Pure IS
EJIS	2.79	429.00	NA	NA	Pure IS
J. of Strategic Information Systems	2.70	228.00	3.03	2.66	Pure IS
Organ. Computing and E-Commerce	2.70	150.00	NA	NA	Pure IS
Information Systems	2.68	NA	3.01	NA	Pure IS
Information Systems Management	2.66	139.00	3.10	NA	Pure IS
J.of Computer Information Systems	2.66	110.00	3.20	2.58	Pure IS
J.of Database Management	2.65	NA	3.28	2.66	Pure IS
DATA BASE for Advances in IS.	2.64	354.00	3.31	2.56	Pure IS
Information Resources Management J.	2.60	126.00	3.02	2.47	Pure IS
J. of End-User Computing	2.58	132.00	2.89	2.23	Pure IS
J. of Information Technology Management	2.46	NA	2.91	NA	Pure IS
J. of Information Systems Education	2.31	NA	2.92	2.37	Pure IS
Information Systems J.	NA	268.00	3.45	NA	Pure IS
CACM	3.44	803.00	4.37	3.49	Hybrid IS
IEEE T. on Software Engineering	3.06	492.00	3.79	3.19	Hybrid IS
ACM T. on Database Systems	3.04	358.00	3.58	3.04	Hybrid IS

ACM Computing Surveys	2.93	199.00	3.52	2.97	Hybrid IS
IEEE T. on Knowledge and Data Engin.	2.92	492.00	3.79	3.02	Hybrid IS
Human-Computer Interaction	2.71	149.00	NA	2.74	Hybrid IS
Inter. J. of Human-Computer Studies	2.71	100.00	NA	2.78	Hybrid IS
Expert Systems with Applications	2.54	NA	NA	2.47	Hybrid IS
J. of Systems and Software	2.43	NA	NA	2.50	Hybrid IS
Knowledge-Based Systems	2.41	NA	NA	2.52	Hybrid IS
J. of Information Systems (Accounting)	2.40	NA	NA	2.39	Hybrid IS
Behaviour & Information Technology	2.35	87.00	2.64	2.44	Hybrid IS
Computers in Human Behavior	2.32	NA	2.61	2.32	Hybrid IS
J. of Software Maintenance	2.30	NA	NA	2.19	Hybrid IS
IBSCUG Quarterly	1.92	NA	NA	1.96	Hybrid IS
Datamation	1.81	NA	2.60	1.84	Hybrid IS
IEEE Computer	NA	234.00	3.74	NA	Hybrid IS
ACM SIG Publications	NA	165.00	2.99	NA	Hybrid IS
IBM Systems J.	NA	164.00	2.97	NA	Hybrid IS
International J. of Man-Machine Studies	NA	136.00	3.15	NA	Hybrid IS
The Information Society	NA	132.00	2.62	NA	Hybrid IS
J. of the ACM	NA	99.00	3.79	NA	Hybrid IS
Computer J.	NA	79.00	2.77	NA	Hybrid IS
Decision Sciences	3.16	469.00	4.10	3.28	Partial IS
Interfaces	2.51	116.00	3.23	2.57	Partial IS
INFOR	2.39	NA	NA	2.40	Partial IS
Management Science	3.41	547.00	4.44	3.58	Non-IS
Organization Science	3.03	287.00	NA	3.14	Non-IS
Harvard Business Review	3.02	490.00	4.08	3.12	Non-IS
Academy of Management J.	2.96	260.00	NA	2.96	Non-IS
Sloan Management Review	2.95	422.00	3.85	3.01	Non-IS
Academy of Management Review	2.90	211.00	NA	2.88	Non-IS
Administrative Science Quarterly	2.84	218.00	NA	2.94	Non-IS
Organ. Behavior and Human Decision	2.70	97.00	NA	2.79	Non-IS
Operations Research	2.67	108.00	NA	2.92	Non-IS
OMEGA	2.50	152.00	3.02	2.70	Non-IS
Communication Research	2.23	NA	NA	2.27	Non-IS
Simulation	2.21	NA	NA	2.23	Non-IS
Mean	2.74	295.88	3.42	2.77	
SD	0.41	204.14	0.55	0.44	
Number of journals	49	42	36	44	

NA: The journal was not evaluated in the particular previous study.

Appendix B. The Collected Citation Data

Journal	A	B	C	D
MISQ	83	667	7	5
ISR	86	505	7	8
CACM	598	2619	25	143
Management Science	526	2054	34	67
Decision Sciences	145	408	6	43
ACM T. on Information Systems	60	260	2	8
IEEE T. on Software Engineering	289	1327	10	59
ACM T. on Database Systems	49	156	0	12
Decision Support Systems	271	416	0	101
Organization Science	147	1120	26	7
Harvard Business Review	267	1037	22	80
Academy of Management J.	260	2926	76	22
Sloan Management Review	416	508	9	291
ACM Computing Surveys	235	402	0	110
IEEE T. Knowledge & Data Engineering	289	724	6	62
Information & Management	199	444	0	48
Academy of Management Review	86	1347	36	4
Administrative Science Quarterly	87	1655	41	2
EJIS	90	254	1	30
Human-Computer Interaction	63	189	1	12
International J. Human-Computer Studies	283	894	6	81
J. of Strategic Information Systems	68	106	0	36
Organ. Behav. & Human Decis. Processes	319	1660	31	7
Information Systems	112	241	0	37
Operations Research	300	1252	14	29
Information Systems Management	236	90	0	178
J. of Computer Information Systems	239	68	0	192
Expert Systems with Applications	327	405	1	168
Interfaces	201	359	4	62
J. of Systems and Software	350	317	0	195
Knowledge-Based Systems	169	214	1	83
INFOR	73	90	0	26
Behaviour & Information Technology	127	217	2	37
Information Systems J.	64	118	0	21
IEEE Computer	622	1288	3	216
IBM Systems J.	148	444	3	39
J. of the ACM	139	786	9	23
Computer J.	258	273	0	140

A: Number of target articles published in the journal during 1995-1998
B: Number of citations made to the target articles
C: Number of the target articles that had been cited at least 20 times during 1995-2000
D: Number of the target articles that had never been cited during 1995-2000

Appendix C. Citation-Based Indices of Journal Quality

Journal	A	B	C	D	E
MISQ	7.69	0.06	0.08	1.96	1.58
ISR	6.25	0.09	0.10	1.63	1.05
CACM	4.39	0.24	0.04	1.19	1.26
Management Science	3.88	0.13	0.07	1.09	0.85
Decision Sciences	2.79	0.30	0.04	0.75	0.48
ACM T. on Information Systems	4.21	0.13	0.03	1.14	0.90
IEEE T. on Software Engineering	4.50	0.21	0.03	1.25	1.19
ACM T. on Database Systems	3.36	0.24	0.00	0.98	0.88
Decision Support Systems	1.50	0.38	0.00	0.43	0.42
Organization Science	7.78	0.05	0.18	2.22	1.52
Harvard Business Review	3.96	0.29	0.09	1.08	0.93
Academy of Management J.	10.67	0.09	0.28	2.88	2.11
Sloan Management Review	1.25	0.70	0.02	0.35	0.25
ACM Computing Surveys	2.59	0.31	0.00	0.92	0.65
IEEE T. Knowledge & Data Engineering	2.47	0.22	0.02	0.72	0.50
Information & Management	2.16	0.24	0.00	0.60	0.48
Academy of Management Review	16.49	0.05	0.45	4.64	3.35
Administrative Science Quarterly	19.91	0.02	0.48	5.13	3.77
EJIS	2.97	0.32	0.01	0.75	0.71
Human-Computer Interaction	3.34	0.14	0.02	0.90	1.01
International J. Human-Computer Studies	3.17	0.28	0.02	0.87	0.86
J. of Strategic Information Systems	1.45	0.54	0.00	0.34	0.38
Organ. Behav. & Human Decis. Processes	4.78	0.02	0.08	1.34	1.13
Information Systems	2.07	0.34	0.00	0.53	0.49
Operations Research	3.98	0.10	0.04	1.13	0.87
Information Systems Management	0.39	0.75	0.00	0.10	0.13
J. of Computer Information Systems	0.28	0.80	0.00	0.08	0.11
Expert Systems with Applications	1.18	0.52	0.00	0.32	0.37
Interfaces	1.79	0.31	0.02	0.51	0.35
J. of Systems and Software	0.91	0.56	0.00	0.25	0.25
Knowledge-Based Systems	1.39	0.49	0.01	0.35	0.35
INFOR	1.23	0.36	0.00	0.31	0.33
Behaviour & Information Technology	1.73	0.29	0.02	0.47	0.32
Information Systems J.	1.84	0.33	0.00	0.51	0.53
IEEE Computer	2.02	0.35	0.00	0.56	0.56
IBM Systems J.	2.96	0.26	0.02	0.83	0.92
J. of the ACM	5.77	0.17	0.06	1.73	1.54
Computer J.	1.02	0.56	0.00	0.29	0.23
Mean	*3.95*	*0.30*	*0.06*	*1.08*	*0.88*
SD	*4.07*	*0.20*	*0.11*	*1.09*	*0.79*
Number of journals	*38*	*38*	*38*	*38*	*38*

A: *Citations per article*
B: *Un-cited ratio*
C: *20+ Citations*
D: *Annual mean citation rate per article*
E: *Current article impact*