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## Assessing Leading Institutions, Faculty, and Articles in Premier Information Systems Research Journals

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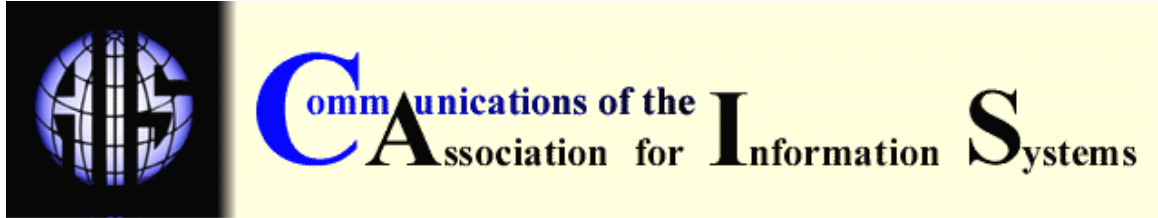
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## ASSESSING LEADING INSTITUTIONS, FACULTY, AND ARTICLES IN PREMIER INFORMATION SYSTEMS RESEARCH JOURNALS

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### ABSTRACT

This study provides a current assessment of the impact of various Information Systems (IS) articles, and the productivity of IS researchers and institutions. Using a data set of Information Systems articles that spans 15 years, we conducted a scientometric study of the field. The articles are drawn from three premier IS journals. We use citation analysis to demonstrate the impact of articles on institutions and individuals in the IS field. In addition, we identify IS topics with the highest impact. The results indicate that leading productive institutions have changed over time, and problematically, institutions outside of North America are poorly represented. We compare our results with earlier productivity findings created using alternative metrics.

Keywords: research productivity, citation analysis, scientometrics, bibliometrics, information systems

### I. INTRODUCTION

The purpose of this scientometric study, or empirical study of science [Chua et al. 2003; Lowry et al. 2004], is to provide citation analysis of premier information systems (IS) research journals to determine the institutions, individuals, articles, and themes that have had the greatest impact on citation analysis research. Before proceeding, we explain this study's unique contributions to the body of similar, previously conducted studies.

The proliferation of rankings of universities and business schools by magazines such as *U.S. News and World Report*, *Financial Times*, and *BusinessWeek* attests to the wide-reaching academic and nonacademic interest in assessing institution quality. Developing objective measures of institutional quality gives students, faculty, and other key decision-making stakeholders metrics with which to make informed career and educational choices [Grover et al. 1992]. However, one of the key limitations of these surveys (aside from the usual biases inherent in surveys) is that they tend to focus on non-research measures of quality, such as alumni giving, undergraduate SAT averages, general school reputation, and so forth [Grover et al. 1992]. Not to

mention, the overall purpose of popular-press rankings is typically tied to helping students select graduate schools, not to assessing research quality and impact.

Some may argue that non-research measures of institutional quality can be used as a surrogate to assess the quality of academic research. In reality, related research has shown little relationship between the popular-press ratings of top business schools and top business research schools [Trieschmann et al. 2000]. This disparity can occur when institutions that focus too much on increasing their ratings in the popular press decide to shift their resources away from quality research and educational performance toward MBA programs (e.g., building elaborate MBA student lounges, hiring more MBA recruiting staff, hiring more MBA PR staff) [Trieschmann et al. 2000]. Just as top ranked MBA programs do not necessarily produce the most influential business research, the top ranked IS programs from popular-press rankings are not necessarily leaders in IS research.

Institutional *research* rankings (as opposed to the *general* rankings in the popular press) are useful in several ways: they help indicate which programs have the best research faculty and resources, which programs are actively building the community within academia and practice, and which professors are creating the latest theory and practices to teach in their classes [Athey and Plotnicki 2000]. Research productivity, as assessed by such institutional research rankings, has been found to positively influence teaching effectiveness [Bell et al. 1993; Chua et al. 2003] and academic prestige [Armstrong and Sperry 1994; Chua et al. 2003]. Furthermore, institutional research rankings help schools benchmark their overall research performance relative to that of their peers [Athey and Plotnicki 2000]. Such information can help institutions set reasonable goals for research improvement and can assist potential faculty and graduate students in choosing institutions that best fit their abilities and goals. Such data also has the potential to help funding agencies and journal editors. The data can even be used to help justify resource allocations within universities [Kalaitzidakis et al. 2003].

In benchmarking research performance of IS institutions, three approaches are typically used [Chua et al. 2003]: (1) institutional surveys of research productivity; (2) article counting of research productivity; and (3) citation analysis of research impact.

The first approach to research performance assessment is the use of *institutional surveys*. These surveys suffer from a number of problems, including self-selection bias, non-response bias, differences in perceived quality of journals, differences in how co-authored articles are counted, and reporting error [Athey and Plotnicki 2000]. For these reasons, institutional surveys are not used in this study.

The *article count* method is a second approach to research performance assessment. To provide an article count of research production, a researcher chooses a subset of journals and counts the number of times a given author has published in each journal [Chua et al. 2003]. Accordingly, the primary construct of interest in these studies is researcher production, which is “the quantity of a researcher’s output in research journals” [Chua et al. 2003, p. 146]. These studies have been widely published in citation analysis, and include research performed by [Athey and Plotnicki 2000; Bradbard and Niebuhr 1987; Grover et al. 1992; Huang and Hsu 2005; Im et al. 1998; Jackson and Nath 1989; Lending and Wetherbe 1992; Remus 1991; Shim and English 1987; Shim et al. 1991; Trower 1995; Vogel and Wetherbe 1984]. These articles have contributed greatly to understanding which institutions (and sometimes individuals) are producing the most research articles. One stated limitation of these article count studies is that they have stark outcome differences based on the “journal baskets” that are used, the timeframe that is examined, and how authorship credit is given [Chua et al. 2003], but this is a general limitation of virtually all citation studies. A more important limitation of such studies is that research production is not equivalent to research impact. In other words, some articles appearing in top journals contribute significantly to the development of the field while other articles are virtually ignored. The article counting methodology treats all articles as if quality and impact could be assessed by measures of research quantity.

The third method for assessment of research performance in IS institutions is *citation analysis*, which we use in our research. Citation analysis is performed by examining how many times a given published article has been cited by other articles; thus, it provides a critical perspective in which journal influence can be objectively analyzed [Cote et al. 1991; Garfield 1979]. In particular, citation analysis “reflect(s) the usefulness of research to other scientists doing related work” [Garfield 1983, p. 9]. One of the advantages of citation analysis is that it objectively compares the research impact of institutions and individuals against each other [Kalaitzidakis et al. 2003]. Accordingly, citation analysis provides insight into the impact and quality of a research article, and is thus the established procedure for assessing scientific knowledge exchange throughout academia [Cote et al. 1991; Garfield, 1979]. Examples of its use in other fields include computer science [Geist et al. 1996], software engineering [Glass and Chen 2002], artificial intelligence [Cheng et al., 1996], innovation management [Cheng et al., 1999], economics [Kalaitzidakis et al. 2003], humanities [Garfield 1979], the hard sciences [Garfield 1979], and virtually every business field [Trieschmann et al. 2000].

Despite the importance and prevalence of citation analysis in most fields, only a few of these studies have used citation analysis to examine institutional productivity, individual research productivity, or the impact of particular articles [e.g., Culnan 1986; Culnan 1987; Hamilton and Ives 1982; Van Over and Nelson 1986; Walstrom and Leonard 2000]. Although these studies are important contributions to the field, most are so dated that they lack current relevance.

Given the importance of institutional research rankings and the utility of citation analysis for assessing these rankings, we use citation analysis for this study. Our phenomenon of interest is *research impact*, which is the degree to which a research article is cited by other articles. We also extend our view of impact beyond the institution to include impact of individual researchers, specific articles, and research themes. Accordingly, we ask the following research questions:

- Which institutions have the most research impact for premier IS journal research? Has this changed over time? Are there differences for specific premier journals?
- Which individual researchers have the most research impact for premier IS journal research?
- Which IS articles appearing in premier IS journals have the most research impact?
- What are the most common themes that have been published in premier IS journals?

## II. PREVIOUS STUDIES

As previously indicated, most studies that benchmark institutional research performance use one of three approaches [Chua et al. 2003]: (1) institutional surveys of research productivity; (2) article counting of research productivity; or (3) citation analysis of research impact. In our review, we found no IS-specific studies that rely on institutional surveys of research productivity. One related study used institutional surveys of research productivity to assess research productivity standards for newly tenured faculty members [Dennis et al. 2006]. However, tenure benchmarking is outside the scope of this paper. Thus, the articles we review following use one of the two latter methods of research performance assessment: raw research productivity (measured by counting articles published in particular journals) or citation analysis. The vast majority of research performance studies in IS have examined research performance from the viewpoint of raw productivity. Table 1 summarizes these studies.

Although most of the articles in Table 1 use article counting as their method of research-quality assessment, precedent exists for the use of citation analysis in IS. A very dated study looked at research impact from a citations perspective [Van Over and Nelson 1986]. Later, Holsapple et al. [1994; 1993] conducted citation analysis of IS research, but only with the goal of examining the structure of the field and providing journal rankings. Hamilton and Ives [1982] primarily examined the intellectual structure of IS, but as part of their study they determined the top 15 commonly referenced articles. Culnan [1986] built on the Hamilton and Ives study and produced a list of 47 top individual researchers and seven top cited articles. Culnan [1987] later produced a similar

study that had the same purpose but examined the intellectual structure of the field from 1980 to 1985.

Table 1. IS Articles Assessing Research Performance

Reference	Method	Years covered	Measures	Target journals
[Hamilton & Ives, 1982]	Citation analysis	1970-1979	Impact: 15 articles	Non-IS: MS, Decision Sciences, CACM, ACM Computing Surveys, ACM Transactions on Database Systems, IBM Systems Journal, HBR, SMR, AMJ, AMR, Accounting Review, Journal of Accountancy  IS: MISQ, Data Base, I&M
[Culnan, 1986]	Citation analysis	1972-1982	Impact: 47 individuals; 7 articles	Non-IS: MS, CACM, AMJ, AMR, ASQ  IS: MISQ, ICIS (conference)
[Jackson & Nath, 1989]	Article count	1975-1987	Impact: # of articles published that are IS articles; 37 individuals	Non-IS: CACM, SMR, HBR, MS, Decision Sciences, AMJ, AMR  IS: I&M, MISQ, JMIS,
[Vogel & Wetherbe, 1984]	Article count	1977-1983	Productivity: 20 institutions; no individuals	Non-IS: MS, CACM, Decision Sciences, ACM Transactions on database Systems, SMR, AMJ, ACM Computing Surveys, Accounting Review, Datamation, HBR, Journal of Data Education; Systems, Objectives, and Solutions  IS: MISQ, I&M, Data Base
[Bradbard & Niebuhr, 1987]	Article count	1979-1985	Productivity: 10 institutions; no individuals	Non-IS: CACM, Journal of Management  IS: MISQ, I&M
[Culnan, 1987]	Citation analysis	1980-1985	Impact: 42 individuals; 13 articles	Non-IS: MS, Interfaces, Decision Sciences, CACM, ACM Computing Surveys, HBR, SMR, Accounting Review  IS: MISQ, ICIS (conference)
[Shim & English, 1987]	Article count	1980-1986	Productivity: 20 institutions; no individuals	Non-IS: MS, CACM, Decision Sciences, Harvard Business Review  IS: MISQ
[Shim et al., 1991]	Article count	1980-1988	Productivity: no institutions; 60 individuals	Non-IS: MS, CACM, HBR, ACM Computing Surveys, Decision Sciences, SMR  IS: MISQ, I&M
[Grover et al., 1992]	Article count	1982-1991	Productivity: 50 institutions; no individuals	Non-IS: MS, CACM, Decision Sciences  IS: MISQ, JMIS
[Lending & Wetherbe, 1992]	Article count	1984-1990	Productivity: 20 institutions; no individuals	Non-IS: AMJ, Accounting Review, ACM Computing Surveys, ACM Transactions on Database Systems, CACM, Decision Sciences, HBR, MS, SMR  IS: Data Base, I&M, ISR, MISQ
[Walstrom & Leonard, 2000]	Citation analysis	1986-1995	Impact: 47 articles	Non-IS: MS, CACM, Decision Sciences, DSS, Organization Science  IS: MISQ, ISR, JMIS, I&M
[Remus, 1991]	Article count	1987-1991	Productivity: 39 institutions; 10 individuals	Non-IS: MS, HBR, CACM  IS: MISQ
[Trower, 1995]	Article count	1990-1994	Productivity: 30 institutions; 30 individuals	Non-IS: n/a  IS: MISQ, IS

Reference	Method	Years covered	Measures	Target journals
[Im et al., 1998]	Article count	1991-1996	Productivity: 52 institutions; 28 individuals	Non-IS: CACM, Decision Sciences, MS IS: ISR, JMIS, MISQ
[Athey & Plotnicki, 2000]	Article count	1992-1996	Productivity: 24 institutions; 26 individuals	Non-IS: CACM, Decision Sciences, HBR, IEEEETSE, MS, SMR IS: I&M, ISR, JMIS, MISQ
[Huang & Hsu, 2005]	Article count	1999-2003	Productivity: 31 institutions; 30 individuals	Non-IS: CACM, Decision Sciences, MS, HBR, IEEEETSE, SMR, DSS IS: ISR, JMIS, MISQ, I&M, JAIS

AMJ = Academy of Management Journal; AMR = Academy of Management Review; ASQ = Administrative Sciences Quarterly; CACM = Communications of the ACM; DSS = Decision Support Systems; HBR = Harvard Business Review; IEEEETSE = IEEE Transactions on Software Engineering; I&M = Information & Management; ISR = Information Systems Research; JAIS = Journal of the Association for Information Systems; JMIS = Journal of Management Information Systems; MISQ = MIS Quarterly; MS = Management Science; SMR = Sloan Management Review

Cheon et al. [1992] later built on and replicated the Culnan studies from 1980 to 1989, which included an expanded set of journals. However, Cheon et al. focused only on the primary point of the Culnan studies, which was to map the intellectual structure of the IS field. Accordingly, they did not produce impact data on top institutions, individuals, or articles. Meanwhile, several important articles have recently examined the impact of top research articles in IS—again building on [Culnan 1986; Culnan 1987]. Walstrom and Leonard [2000] examined four top IS journals and five top non-IS journals from 1986 to 1995 to find “citations classics,” which they defined from a substantial base of interdisciplinary literature as any article that is cited four times a year or more.

Given the research cited previously, a clear precedent exists for using citation analysis to assess institutional research quality. In the current study, we enhance this body of research by using citation analysis to determine the institutions, individuals, articles, and themes that have had the greatest impact on citation analysis research.

### III. METHODOLOGY

Our study specifically examines research performance in premier IS journals from 1990 through 2004 from a citations impact perspective. Our study focuses on top institutions, top researchers, and top articles in order to provide useful benchmarks for institutions and researchers. We specifically focus on premier journals; thus, we call our specific construct of interest the *premier-research impact*.

#### TARGET PREMIER IS JOURNALS

We chose *MIS Quarterly* (MISQ), *Information Systems Research* (ISR), and the IS articles from *Management Science* (MS) as representative of premier IS research because we wanted to focus on citations from journals that are universally and historically considered the leaders in publishing IS research internationally. These three journals have been consistently ranked as the most influential general IS journals in the field by the last eight IS journal-ranking studies, from 1994 to 2005 [Gillenson and Stutz 1991; Hardgrave and Walstrom 1997; Holsapple et al., 1993; Lowry et al., 2004; Mylonopolous and Theoharakis 2001; Peffers and Ya, 2003; Rainer Jr. and Miller 2005; Whitman et al. 1999]. In all of these studies, only two IS journals, MISQ and ISR, are consistently ranked in the top two positions. *Journal of Management Information Systems* (JMIS), *European Journal of Information Systems* (EJIS), *Journal of the AIS* (JAIS), and *Information & Management* (I&M) are never ranked in the top two journal positions and are not consistently ranked in these seven studies, although they are clearly high-quality journals that have higher rankings than most and are considered A journals at an increasing number of institutions. JAIS in particular has



dramatically increased in quality over time [Lowry et al. 2004]. We consider IS articles published in MS because it was generally considered the second-highest rated journal before ISR was published, it is still highly esteemed, it is the highest rated management journal that has a dedicated IS section, and it has a deep citations history. MISQ was first published in 1977; MS was first published in 1954; ISR was first published in 1990.

## CITATIONS

Through the Web of Science,<sup>1</sup> we traced citations data from the Science Citations Index Expanded, the Social Sciences Citation Index (SSCI), and the Art and Humanities Citations Index, for papers published in MISQ, ISR, and MS (for IS articles only) from 1990 to 2004. These databases index the references cited in papers from target journals. Collectively, the three databases of the Web of Science draw their data from 8,600 high-quality scholarly journals. We compiled citations data for a total of 883 articles published in MISQ, ISR, and MS that are included in the data set for this study. By the year 2004, the articles in the dataset had accumulated 14,967 citations.

## CREDIT FOR AUTHORSHIP

Two approaches have traditionally been used in giving credit for authorship in multiple-authored works [Im et al. 1998]: a normal count, where authors get full credit for any work in which they participate, and a diminished count, where authors receive diminished credit based on the number of authors. (For a list of other, less-common approaches, see [Chua et al. 2003]). Four approaches for giving diminished credit include: (1) an *arithmetic mean* (also known as an *adjusted-count* [Chua et al. 2003]), where each author's contribution is computed by the value of 1 divided by the number of contributors [Im et al. 1998]; (2) a *weighted citations count*, where the weight of an article is greater for fewer authors, less for more authors [Chua et al., 2003] (3) a *geometric mean*, where the value depends upon the position of the name in the list of contributors [Im et al. 1998] (e.g., first authors receive more credit than second authors, and so forth); and (4) a *straight count*, where only the first author is given credit [Chua et al. 2003; Jackson and Nath 1989]. Another approach, which does not take authorship into account, adjusts the impact of an article by its length [Chua et al. 2003].

We recognize, as supported in [Chua et al. 2003], that because different approaches to giving authorship credit yield different results, more than one approach should be considered. However, we did not use the article-length adjustment approach, as seen in [Im et al., 1998; Trieschmann et al. 2000], because it raises many concerns in providing credit for multiple authorship. Our focus is on authors, not on length. We also do not use the straight-count approach because multiple-author works are increasingly the norm in IS, not the exception—especially in top journals [Peffer and Ya 2003]. Accordingly, we computed *arithmetic* means (unweighted citation counts), *weighted* citations counts, and *geometric* means (weighted by number and order of authors).

## CREDIT FOR UNIVERSITY

We provide an institutional assessment of IS productivity. When giving credit to a university for a given article, we used the university that each author was at when he or she published the article. We grouped and added together authors' citation credits (using the three methods described previously) by the institutions of the author.

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<sup>1</sup> Web of Science is a product of the Thomson Corporation, which provides access to three citations index databases. See their link at <http://portal01.isiknowledge.com/> (subscription required).

## IV. RESULTS

### INSTITUTIONAL IMPACT

Appendix 1 summarizes the top 100 institutions for publishing in a combination of ISR, MISQ, and the IS section of MS. Appendix 2 summarizes the top 100 institutions for publishing in each of these three journals separately. Appendix 3 summarizes the top 100 institutions for publishing in a combination of ISR, MISQ, and the IS section of MS over three time periods: 1990-94, 1995-99, and 2000-2004.

### ARTICLE IMPACT

Appendix 4 summarizes the top 100 most cited articles published in a combination of ISR, MISQ, and the IS section of MS.

### AUTHOR IMPACT

Appendix 5 provides author-impact ratings based on our three approaches: arithmetic means, weighted means, and geometric means. This appendix summarizes the top 100 most cited authors from articles published in a combination of ISR, MISQ, and the IS section of MS. Appendix 6 summarizes the top 100 most cited articles by the time periods of 1990-1994, 1995-1999, and 2000-2004.

### KEYWORDS OVER TIME

Appendix 7 lists the most common keywords that were used in the published articles that appeared in the three journals that are considered separately.

## V. DISCUSSION

The purpose of this scientometric study was to conduct citation analysis of premier IS research journals to determine the institutions, individuals, and articles that have the greatest impact on IS research. We also examined the most common topics that appeared in these journals.

### DISCUSSION OF FINDINGS

**Top Institutions for Research Impact:** The results of the top institutions for all time periods and all premier journals (Appendix 1) were not too surprising, as most of the “usual suspects” are found in the top 25. As noted in our study methodology, we use three methods of counting the citations. Small variations in the ranking order are noted across the three methods.

These rankings reflect stark differences from the 2005 US News rankings of IS graduate programs: First, British Columbia, Western Ontario, and Queens are not eligible for the *U.S. News* rankings because these rankings are U.S.-centric. A couple of institutions that are on the *U.S. News* rankings but are noticeably absent from the top 25 of our research impact rankings include Pennsylvania, Purdue, Arizona State, and Northwestern.

The lack of any institution outside North America in the top 25 was troubling from a global perspective. However, five non-North American institutions appear in the top 50 when using at least one of the ranking methods (arithmetic, weighted, geometric): Ecole Hautes Etudes Commerciales (#31, 32, 29), National University Singapore (#41,55,39), INSEAD (#47,45,57), Melbourne (#38,20,37), Manchester (# 39, 37 44). This calls into question how “international” MISQ, ISR, and MS truly are, and whether they adequately represent all the major forms of research produced by IS academics worldwide. A counter argument may be that if MISQ, ISR, and MS truly are the best IS journals in the world that many international institutions simply do not publish enough in these journals.



An examination of Appendix 2 (which compares the institutions that publish in each of the three premier journals) revealed other interesting patterns. Virtually no institution had consistent impact across all three journals. For example, MIT is 2<sup>nd</sup> for ISR, 33<sup>rd</sup> for MISQ, and 2<sup>nd</sup> for MS. Georgia State is 3<sup>rd</sup> for ISR, 2<sup>nd</sup> for MISQ, but 38th for MS. Such differences may indicate an inherent bias in the type of research each journal is willing to publish and from whom each journal is more willing to accept submissions. This phenomenon could also be attributed to the reasoning that research at certain institutions may naturally be geared toward research topics sought after by a specific journal. It is also interesting to note that more non-North American representation occurs when breaking down top institutions by journal (though these results are still highly imbalanced in favor of North American institutions). For example, Manchester is ranked 15<sup>th</sup> for ISR, INSEAD is 31st for MISQ, and Ecole Hautes Etudes Commerciales is 9<sup>th</sup> for MS. As previously explained, these rankings use the weighted citations counting method.

To further break down this data, we provided citations for all journals for three time periods: 1990-94, 1995-99, and 2000-2004 (Appendix 3). This data shows clear trends in emerging and declining IS research institutions over time. For example, Florida International University starts at 8<sup>th</sup> (1990-1994), drops to 42<sup>nd</sup> (1995-1999), and then drops out of the top 100 in 2000-2004. In contrast, Indiana University starts at 56th (1990-1994), rises to 13th (1995-1999), and then rises to seventh (2000-2004). Also worth noting is the ranking of University of Maryland at 4<sup>th</sup> position (1995 – 2004), and its top ranking in 1999-2004. During 2000-2004, we note the exceptional performance of University of Maryland as reflected by the citation of papers published by its faculty (Appendix 3). To explain this performance, we took articles that account for the top 10 percent of the total citations and ranked the institutions involved in publishing them. 25 percent of these highly cited articles were published by affiliates of the University of Maryland (See Table 2). While these trends may reflect the growth of IS productivity in the institutions, a more plausible reason for the changes could be the movement of productive faculty between the universities.

Table 2. Institutions Involved in Publishing Papers (in MISQ,ISR, and MS(IS) 2000-2004) That Account for the top 10% of Total Citations

University/Institution	Papers Published	% of Paper Published
Maryland	5	25%
So. California	2	10%
MIT	2	10%
Emory	2	10%
USAF	1	5%
N Carolina	1	5%
Georgia	1	5%
Arkansas	1	5%
Texas Christian	1	5%
Rutgers State	1	5%
NYU	1	5%
National Science Foundation	1	5%
INSEAD	1	5%
Total	20	100%

**Most Cited Articles:** In terms of the most cited articles published between 1990 and 2004 (Appendix 4), the data suggests several interesting results. The vast majority of top articles appear in MISQ and ISR, indicating a general shift away from the earlier dominance of MS. Most of the articles are theory based but some focus more on instrument development (e.g., "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation") or discussion of issues (e.g., "Key issues in information systems management: 1994-95 SIM Delphi results"). Also, several are extensions related to TAM, which disproves the notion that a study has to represent completely original theory for maximum impact (e.g., "Perceived Usefulness, Ease of Use, and Usage of Information Technology - A Replication"; "Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior"; "Understanding Information Technology Usage - A Test of Competing Models"; "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies."

**Top Researchers:** As described earlier, we also provide analysis (in Appendix 5) of the top researchers for premier-journal research impact, analyzed by unweighted means, weighted means, and geometric means. The top 10 unweighted authors are shown in table 3.

Similar redistributions occur when moving to geometric means. The top 10 researchers under this approach are Orlikowski, Benbasat, Venkatesh, Brynjolfsson, Delone, Todd, Bakos, Compeau, Alavi, and Straub. These results support the assertion by Chua et al. [2003] that research rankings are heavily biased by how authorship is credited and that multiple approaches should be considered. These differences are particularly problematic the farther down in the rankings a researcher is ranked. The top researchers, however, are more consistent and clear.

Although we provide geometric means, we believe they may be less valid than the other two approaches. Although it is true that most (but not all) articles in IS list authors according to contribution [Peffer and Ya, 2003], it may still be impractical to guess the level of contribution of each author on each article. Further, in older IS articles authors were often listed alphabetically. Moreover, members of the AIS follow strict rules of authorship that require that only those who have made substantial contributions to a publication be listed as authors [Davison et al. 2003]. Thus, we assume that very rarely do authors in premier IS journal articles provide secondary contributions.

Table 3. Ranking of Top 10 Authors by Citations of Articles Published In Target Premier Journals

Rank	Total Citations		Weighted by No. Authors		Weighted by No. and Order of Authors	
	Author's Name	Cites	Author's Name	Cites	Author's Name	Cites
1	Benbasat, I	976	Benbasat, I	454.50	Orlikowski, WJ	619.00
2	Todd, P	695	Orlikowski, WJ	444.00	Benbasat, I	529.67
3	Orlikowski, WJ	640	Venkatesh, V	330.00	Venkatesh, V	517.00
4	Brynjolfsson, E	551	Bakos, J	317.17	Brynjolfsson, E	495.00
5	Zmud, R	538	Todd, P	306.33	Delone, WH	481.00
6	Venkatesh, V	531	Brynjolfsson, E	288.25	Todd, P	401.33
7	Mclean, ER	510	Straub, D	255.67	Bakos, J	352.00
8	Higgins, CA	502	Robey, D	248.00	Compeau, D	336.00
9	Straub, D	493	Mclean, ER	246.30	Alavi, M	321.50
10	Delone, WH	481	Mathieson, K	241.00	Straub, D	318.50

**Top Topics:** Finally, we examine the most common keywords used in each particular journal over time (Appendix 7). Clear differences in the journals emerge. ISR has been much more likely to publish e-commerce-related articles than has MISQ. Both MISQ and ISR have been much more likely to publish group support systems (GSS) articles than has MS. MISQ has been much more likely to publish on knowledge management and management of IS than have ISR and MS. This analysis lends insight into which topics each journal has a higher propensity to publish; this may also help explain the difference in institutional focus among the top journals.

## LIMITATIONS AND FUTURE RESEARCH

Citation analysis has several limitations, as mentioned in [Lowry et al. 2004]. The biggest limitation is that citation analysis is naturally biased toward time and number of articles. Hence, MISQ naturally has more citations when compared to ISR and MS because it has been in existence the longest and has published the most articles. Institutional rankings are similarly biased toward institutions that have had IS departments or groups the longest and that have larger faculties. Also, some journals are published more frequently than others. There are also differences in number of pages, average number of articles, and editorial policies on how many citations are allowed. However, these tend to be true with any kind of ranking: there are inherent advantages to size and history.

It is important to reemphasize that our research used MISQ, ISR, and MS as surrogates for premier IS research. We recognize that MISQ, ISR, and MS do not represent all IS topics or reference disciplines, and are only a small sample of the potential impact of all IS research. Furthermore, niche areas and sub-communities, in particular, can be underrepresented by citation analysis. Time clearly has a critical effect not just because older articles are more frequently cited but because of variations in acceptance rates and journal practices over time [Chua et al. 2003]. For example, an article can be excellent yet have little citation impact because it deals with an area in which few people are working [Lowry et al. 2004]. As time passes, researchers will want to continue to assess other premier IS research outlets to ensure that the results of this study are generalizable to the IS field.

Our analysis also suggests fairly poor international representation in these three journals, providing a strong North American bias to these results. Future research can further expand the scope of journals considered to perhaps gain a wider perspective.

It is important to remember that many other high-quality journals exist that include a mix of IS and non-IS research; thus, several highly productive authors and institutions may have been underrepresented using our focused criteria. Many authors focus on journals other than MISQ, ISR, and MS because their expertise better fits other top journals. Even though these other journals are typically never rated in the top two in IS journal studies, see [Lowry et al. 2004], this does not mean that the research contained in them is of lower quality. JMIS, JAIS, EIJIS, I&M, and DSS are increasingly important and highly ranked journals that rival MISQ and ISR. For example, empirical arguments have been put forth to show that EJIS and I&M have citations impact similar to ISR and MISQ [Katerattanakul and Han, 2003], although such impact is not manifest in ISI impact factor rankings.<sup>2</sup> Examples of other high-quality interdisciplinary journals

<sup>2</sup> Citation analysis has become immensely popular, to the point where Thomson Corporation has created the ISI Web of Science that generates yearly citation impact factor reports (and provides other services) for thousands of journals. Institute for Scientific Information (ISI) Impact Factors for a given year for a journal are calculated by averaging the number of times articles from the journal published in the past two years (from the target year) have been cited in the target year. An impact factor of 2.0 means that, on average, all of the articles published one or two years ago from the target year in the target journal have been cited an average of two times. Over time, academics (especially in traditional sciences) have increasingly embraced impact factor ratings as a journal-quality ratings surrogate, with the idea that higher-quality journals are going to be cited more because they contribute more to science.

that publish IS research include [Athey and Plotnicki, 2000]: *Communications of the ACM*, *Decision Sciences*, *Harvard Business Review*, *IEEE Transactions on Software Engineering*, and *Sloan Management Review*, to name a few. One way to deal with these limitations in future research may be to build on an approach taken from economics that weights journals according to their citations impact factors (e.g., ISI impact factors rankings) over three years [Kalaitzidakis et al. 2003], thus accommodating a larger number of journals. A variation of this approach could also use weightings.

Citation analyses have several other limitations [Lowry et al. 2004], including variations in journals' self-citation policies. To examine whether self-citation would change the results in this study, we eliminated all self-citations from the MISQ, ISR, and MS articles and found nearly identical results throughout.

A more potentially insidious limitation—which we did not observe in our top 25 article list but which still has potential impact on citation analyses—is that articles may be negatively cited as poor examples of research or flawed paradigms. A classic example of such an atheoretical article is Ackoff's classic article [1967] on "Management Misinformation Systems," which was written intentionally to stir debate. A recent example, and maybe one of the greatest offenders, was the highly questionable and atheoretical article by Nicholas G. Carr claiming "IT Doesn't Matter" [2003]. However, some critics would say that such negatively cited articles, even if created on flawed and atheoretical foundations, are important contributions to the literature because they stir up debate and research conversation [Cote et al. 1991]. Thankfully, negative citations (when an article is used as a poor example of a finding) account for less than 10 percent of all citations [Moravcsik and Muragesan 1975], and appear to have a lower percentage in our top articles list.

## VI. CONCLUSION

We have used citation analysis of premier research journals to determine the institutions, researchers, articles, and topics that have had the greatest impact on IS research over time. We make a case for the importance of IS research rankings, and use the citation analysis method to obtain these rankings.

We also found that non-North American institutions may not be adequately represented in top IS research journals. When broken down by journal, the institutions that had the largest impact varied from journal to journal, and non-U.S. institutions displayed more prominence in this rankings approach when compared to the other approaches. We also noted the decline of several institutions and the rise of others over time.

Regarding the articles that had the highest impact, we observed that, contrary to popular belief, articles do not need to be theoretical in order to have a high impact. "First movers" in a high-impact area often have a high impact, as do articles that stir up debate and discussion. We found that the measured impact of authors often varies widely depending on which measurement is used but that many authors retain top 10 positions regardless of which measurement is used. Finally, our data suggest that each of the journals seems to be biased toward different topics.

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**APPENDIX 1. RANKING OF INSTITUTIONS BY NUMBER OF CITATIONS OF ARTICLES PUBLISHED IN TARGET PREMIER JOURNALS (1990 – 2004) BY AUTHORS AFFILIATED WITH THE INSTITUTIONS**

Rank	Institution Name	Cumm. Citation	Institution Name	Arith. Weighted Citations	Institution Name	Geo. Weighted Citations
1	MIT	984	MIT	486.25	MIT	861.42
2	Georgia State	837	British Columbia	384.50	Carnegie Mellon	558.00
3	British Columbia	792	Georgia State	372.23	British Columbia	553.83
4	Minnesota	743	Carnegie Mellon	333.02	Maryland	525.33
5	Carnegie Mellon	636	Maryland	332.33	Georgia State	505.30
6	Maryland	606	Minnesota	321.08	Minnesota	496.83
7	Texas	527	Texas	250.27	Florida State	465.25
8	Florida State	513	UC Irvine	222.33	Texas	461.07
9	Georgia	462	Florida State	218.42	Western Ontario	417.67
10	Arizona	461	Florida Int	200.17	Georgia	405.02
11	Western Ontario	444	UCLA	199.00	American	386.00
12	Florida Int	419	Oakland	197.17	UC Irvine	348.00
13	American	386	American	189.67	Calgary	314.33
14	UC Irvine	367	Western Ontario	185.58	Arizona	312.83
15	Queens	334	Georgia	173.40	Colorado	302.00
16	Calgary	318	Calgary	147.17	Florida Int	270.83
17	Colorado	303	Queens	131.17	Queens	257.33
18	Indiana	288	Arizona	128.93	UCLA	237.50
19	Pittsburgh	272	Colorado	126.92	Pittsburgh	234.92
20	S Carolina	256	Melbourne	126.17	Indiana	219.25

Rank	Institution Name	Cumm. Citation	Institution Name	Arith. Weighted Citations	Institution Name	Geo. Weighted Citations
21	UCLA	253	Pittsburgh	121.45	Oakland	214.67
22	Harvard	241	S Carolina	109.33	Harvard	213.50
23	So Calif	238	So Calif	103.37	S Carolina	210.83
24	NYU	225	Indiana	103.00	Virginia	203.58
25	Oakland	224	Harvard	97.00	McGill	196.00
26	N Carolina	217	NYU	96.92	NYU	192.42
27	Virginia	213	Houston	94.08	So Calif	191.12
28	Houston	207	McGill	88.83	Houston	174.75
29	McGill	200	Emory	88.67	Ecole Hautes Etudes Commerciales	169.00
30	Stanford	185	Stanford	88.33	N Carolina	157.38
31	Ecole Hautes Etudes Commerciales	175	Illinois	80.00	Boston	156.00
32	Illinois	174	Ecole Hautes Etudes Commerciales	79.00	Stanford	152.50
33	SMU	164	N Carolina	78.60	Illinois	149.50
34	Boston	158	SMU	78.50	Purdue	149.00
35	Arkansas	153	Northeastern	75.00	Memphis State	143.00
36	Purdue	151	Boston	75.00	SMU	142.17
37	Memphis State	148	Manchester	73.50	Melbourne	136.33
38	Melbourne	145	Virginia	71.58	Emory	129.33
39	Manchester	143	Arkansas	67.08	Natl Singapore	126.50
40	Emory	141	Purdue	66.33	Northeastern	118.00
41	Natl Singapore	136	Penn	57.50	Tennessee Technol	111.00

Rank	Institution Name	Cumm. Citation	Institution Name	Arith. Weighted Citations	Institution Name	Geo. Weighted Citations
42	Tennessee Technol	123	Memphis State	57.00	Drexel	109.83
43	Drexel	121	Drexel	54.67	SUNY Binghamton	101.00
44	Northeastern	118	Texas Christian	54.50	Manchester	99.50
45	SUNY Binghamton	113	INSEAD	53.67	Auburn	98.00
46	Michigan	110	SUNY Binghamton	53.50	Claremont Grad Sch	97.00
47	INSEAD	109	Syracuse	48.50	Michigan	95.50
48	Texas Christian	109	Oklahoma	47.50	Penn	94.17
49	Penn	105	Michigan	47.33	Vermont	93.00
50	Claremont Grad Sch	105	Tennessee Technol	46.50	Cimnet Syst Inc	89.00
51	N Florida	104	Vermont	46.50	Arkansas	87.42
52	Memphis	102	Claremont Grad Sch	42.00	Syracuse	84.00
53	Auburn	102	Auckland	41.00	Ohio State	82.33
54	Oklahoma	100	N Florida	37.33	San Diego State	72.00
55	Syracuse	99	Natl Singapore	37.23	Fairleigh Dickinson	69.00
56	San Diego State	96	Waterloo	35.00	Boston Coll	67.75
57	Wisconsin	93	Fairleigh Dickinson	34.50	INSEAD	62.50
58	Vermont	93	Memphis	34.00	Tel Aviv	60.50
59	Cimnet Syst Inc	89	S Florida	33.92	S Florida	60.33
60	Ohio State	83	Rochester	31.17	Rutgers State	58.40
61	Auckland	82	Auburn	31.08	Bentley Coll	58.17
62	Rutgers State	82	Case Western Reserve	30.33	Texas Christian	58.00
63	Boston Coll	81	Cimnet Syst Inc	29.67	Inst Estudios Super Empresa	56.00

Rank	Institution Name	Cumm. Citation	Institution Name	Arith. Weighted Citations	Institution Name	Geo. Weighted Citations
64	Bentley Coll	72	Boston Coll	29.25	Rochester	54.00
65	Fairleigh Dickinson	69	Wisconsin	28.67	Loughborough Technol	54.00
66	Rochester	66	CUNNY Bernard M Baruch	28.33	AT&T Corp	53.00
67	S Florida	64	Inst Estudios Super Empresa	28.00	Inst Res Learning	53.00
68	Tel Aviv	62	Ohio State	27.75	N Florida	50.67
69	Brunel	60	Loughborough Technol	27.00	Oklahoma	50.50
70	Delft Technol	59	Inst Res Learning	26.50	Washington	50.00
71	Ernst & Young	59	USAF	26.33	Missouri	47.00
72	CUNY Bernard M Baruch I	59	Louisville	26.00	Case Western Reserve	46.67
73	Canterbury	59	Rensselaer Polytech Inst	24.00	Rensselaer Polytech Inst	46.50
74	Inst Estudios Super Empresa	56	San Diego State	24.00	CUNY Bernard M Baruch Coll	44.67
75	Loughborough Technol	54	Missouri	24.00	Louisville	44.50
76	Helix Grp Inc	54	Baylor	23.67	Ernst & Young	44.25
77	AT&T Corp	53	Rutgers State	23.60	Eastern Kentucky	44.00
78	Inst Res Learning	53	Washington	22.67	IBM Corp	44.00
79	Vanderbilt	53	Bentley Coll	22.08	Baylor	43.83
80	USAF	53	Eastern Kentucky	22.00	Vanderbilt	43.50
81	Case Western Reserve	52	Queensland	20.50	Energy Management Associates Inc.	43.00
82	Baylor	52	Connecticut	20.33	Connecticut	42.67
83	Louisville	52	Vanderbilt	20.17	Nanyang Technol	42.33
84	Washington	50	Great Plains Reg Med Ctr	20.00	Wisconsin	42.33

Rank	Institution Name	Cumm. Citation	Institution Name	Arith. Weighted Citations	Institution Name	Geo. Weighted Citations
85	Baltimore	49	Brunel	20.00	Auckland	42.00
86	Rensselaer Polytech Inst	48	Simon Fraser	19.33	Yonsei	41.67
87	CSC Consulting & Syst Integrat	48	Hankook Foreign Studies	19.33	Washington State	40.00
88	IBM Corp	48	Warwick	18.00	Brunel	40.00
89	Missouri	48	Helix Grp Inc	18.00	Queensland	37.50
90	Queensland	46	Dayton	18.00	Bell Atlantic Corp	36.75
91	Connecticut	45	Oxford	18.00	Helix Grp Inc	36.00
92	Suffolk	44	Cent Florida	18.00	Helsinki Sch Econ & Business Adm	34.33
93	Eastern Kentucky	44	Nanyang Technol	17.67	Memphis	34.00
94	Nanyang Technol	43	Kent State	17.50	Suffolk	33.67
95	Yonsei	43	Hong Kong	17.00	N Texas	32.00
96	Hankook Foreign Studies	43	Suffolk	16.83	Massachusetts	32.00
97	Energy Management Associates Inc.	43	Washington State	16.67	CSC Consulting & Syst Integrat	32.00
98	Bell Atlantic Corp	42	Yonsei	16.50	London Business Sch	31.67
99	Washington State	42	Tel Aviv	16.25	Bull Hn Informat Syst	31.00
100	SUNY Buffalo	40	CSC Consulting & Syst Integr	16.00	Duquesne	30.83



**APPENDIX 2. JOURNAL SPECIFIC RANKING OF INSTITUTIONS BY CITATIONS OF ARTICLES PUBLISHED IN TARGET JOURNALS (1990 – 2004, Citation Count Weighted by Number of Authors)**

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Institution Name	Citations	Institution Name	Citations	Institution Name	Citations
1	British Columbia	282.67	Minnesota	130.42	Carnegie Mellon	240.33
2	MIT	274.50	Georgia State	130.17	MIT	177.42
3	Georgia State	237.67	Maryland	124.50	UC Irvine	171.08
4	Oakland	192.50	Western Ontario	124.17	UCLA	116.50
5	American	183.00	Georgia	119.75	Florida State	90.00
6	Maryland	144.33	British Columbia	101.83	Minnesota	75.67
7	Florida Int	130.00	Queens	86.67	Maryland	63.50
8	Texas	127.43	S Carolina	85.67	Pittsburgh	54.00
9	Calgary	123.17	Emory	82.17	Ecole Hautes Etudes Commerciales	54.00
10	Melbourne	116.00	Colorado	75.17	Stanford	52.50
11	Minnesota	115.00	Texas	75.00	NYU	50.25
12	Arizona	90.33	McGill	74.50	Arkansas	48.50
13	UCLA	75.00	Virginia	71.58	Texas	47.83
14	Carnegie Mellon	71.02	Florida Int	68.17	Purdue	46.33
15	Manchester	69.50	Florida State	64.75	So Calif	43.00
16	Florida State	63.67	Harvard	60.17	Boston	40.00
17	Western Ontario	61.42	Illinois	59.83	Rochester	25.17
18	Colorado	51.75	Memphis State	57.00	Georgia	22.65
19	Pittsburgh	48.92	Indiana	56.58	Penn	17.00
20	Northeastern	48.00	So Methodist	51.50	Houston	16.50

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Institution Name	Citations	Institution Name	Citations	Institution Name	Citations
21	Queens	44.50	N Carolina	51.27	Indiana	15.50
22	UC Irvine	37.50	Drexel	51.17	Hankook Foreign Studies	15.00
23	Fairleigh Dickinson	34.50	SUNY Binghamton	47.50	Michigan	13.50
24	Houston	34.42	Vermont	46.50	Georgia Inst Technol	11.00
25	Michigan	33.50	Houston	43.17	Case Western Reserve	10.00
26	Georgia	31.00	Texas Christian	42.00	Washington	9.00
27	Indiana	30.92	Auckland	41.00	Helsinki Sch Econ & Business Adm	8.33
28	Boston	29.50	Oklahoma	39.67	Harvard	8.00
29	Harvard	28.83	Claremont Grad Sch	39.50	SMU	8.00
30	Stanford	27.50	N Florida	37.33	Chicago	7.67
31	Syracuse	27.50	INSEAD	36.50	Vanderbilt	7.50
32	Inst Res Learning	26.50	So Calif	36.03	Arizona	7.50
33	CUNY Bernard M Baruch Coll	26.00	MIT	34.33	Politecn Milan	5.00
34	Penn	25.50	Memphis	34.00	Illinois	5.00
35	N Carolina	25.00	Waterloo	32.00	Notre Dame	4.50
36	Wisconsin	24.50	Arizona	31.10	Delaware	4.50
37	So Calif	24.33	Auburn	31.08	Western Carolina	4.40
38	San Diego State	24.00	Tennessee Technol	30.00	Georgia State	4.40
39	S Carolina	23.67	Cimnet Syst Inc	29.67	Natl Singapore	4.40
40	Baylor	20.17	NYU	28.00	IBM Corp	4.00
41	Purdue	20.00	Inst Estudios Super Empresa	28.00	Queensland	3.50

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Institution Name	Citations	Institution Name	Citations	Institution Name	Citations
42	So Methodist	19.00	Northeastern	27.00	Connecticut	3.50
43	NYU	18.67	Loughborough Technol	27.00	INSEAD	3.17
44	Warwick	18.00	Ohio State	26.33	SUNY Albany	2.75
45	Rutgers State	18.00	USAF	26.33	Drake	2.67
46	Kent State	17.50	Calgary	24.00	Kentucky	2.67
47	Queensland	17.00	Rensselaer Polytech Inst	22.50	Illinois State	2.67
48	Hong Kong	17.00	Eastern Kentucky	22.00	Inst Tecnol Autonomo Mexico	2.50
49	Dayton	16.67	Carnegie Mellon	21.67	N Carolina	2.33
50	Tennessee Technol	16.50	Syracuse	21.00	Florida Int	2.00
51	Yonsei	15.17	S Florida	21.00	Frankfurt	2.00
52	Illinois	15.17	Natl Singapore	20.67	Coll William & Mary	2.00
53	Washington State	14.67	Great Plains Reg Med Ctr	20.00	Lawrence Berkeley Lab	2.00
54	Natl Sci Fdn	14.50	Brunel	20.00	Hong Kong Polytech	1.67
55	Williams Power Co	14.50	Pittsburgh	18.53	CNRS	1.50
56	McGill	14.33	Louisville	18.50	Pros Revenue Management	1.50
57	INSEAD	14.00	Boston Coll	18.25	Nevada	1.50
58	Washington	13.67	Oxford	18.00	ENAC	1.50
59	Arkansas	13.17	Helix Grp Inc	18.00	Ulsan	1.33
60	North Carolina A&T	13.00	Missouri	18.00	Concours Grp	1.33
61	S Florida	12.92	Suffolk	16.83	Dankook	1.33
62	Texas Christian	12.50	CSC Consulting & Syst Integrat	16.00	San Francisco State	1.33
63	Denver	12.50	London Business Sch	15.83	Yonsei	1.33

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Institution Name	Citations	Institution Name	Citations	Institution Name	Citations
64	Natl Singapore	12.17	Ecole Hautes Etudes Commerciales	15.50	Korea Adv Inst Sci & Technol	1.33
65	Vanderbilt	11.67	Case Western Reserve	15.50	Toledo	1.00
66	San Francisco State	11.50	Penn	15.00	Natl Cent	1.00
67	Salford	11.50	Delft Technol	14.75	Clemson	1.00
68	Boston Coll	11.00	Tel Aviv	14.75	Nanyang Technol	0.67
69	Massachusetts	10.67	Canterbury	14.75	Oklahoma State	0.50
70	Carleton	10.67	Ernst & Young	14.75	Chutney Technol Inc	0.50
71	Connecticut	9.83	Virginia Commonwealth	14.00	McKinsey & Co Inc	0.33
72	Ecole Hautes Etudes Commerciales	9.50	UC Irvine	13.75	Singapore Management	0.33
73	Michigan State	8.67	Bentley Coll	13.67	Ohio State	0.25
74	SUNY Buffalo	8.60	AT&T Corp	13.25	Texas A&M	0.25
75	Bentley Coll	8.42	Nanyang Technol	13.00		
76	Cent Florida	8.00	St Cloud State	12.33		
77	Oklahoma	7.83	IBM Corp	12.00		
78	Simon Fraser	7.83	Cambridge	12.00		
79	Energy Management Associates Inc.	7.67	Simon Fraser	11.50		
80	Babson Coll	7.67	N Texas	10.67		
81	Baltimore	7.50	Bell Atlantic Corp	10.50		
82	Louisville	7.50	Bull Hn Informat Syst	10.33		
83	Nevada	7.50	Melbourne	10.17		
84	Notre Dame	7.17	Salisbury State	10.00		

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Institution Name	Citations	Institution Name	Citations	Institution Name	Citations
85	Bowling Green State	6.67	Temple	10.00		
86	Cincinnati	6.67	Millsaps Coll	10.00		
87	Erasmus	6.50	Cent Florida	10.00		
88	Emory	6.50	George Washington	9.67		
89	Aalborg	6.33	USN	9.67		
90	Missouri	6.00	Alberta	9.00		
91	SUNY Binghamton	6.00	Texas A&M	9.00		
92	Fed Rio Grande Sul	6.00	Bar Ilan	9.00		
93	Rochester	6.00	Duquesne	8.83		
94	Oulu	6.00	Comp Sci & Informat Syst	8.67		
95	So Illinois	6.00	Gartner Grp Pacific	8.67		
96	Calif State Long Beach	5.83	AT Kearney	8.67		
97	Jyvaskyla	5.33	Stanford	8.33		
98	Nokia Telecommun	5.33	British Petr Plc	8.33		
99	Fed Reserve Bank New York	5.33	Erasmus	8.00		
100	Hong Kong Sci & Technol	5.00	Copeland & Co	7.67		

**APPENDIX 3. INSTITUTIONAL RANKING BY CITATIONS OF ARTICLES PUBLISHED OVER THREE TIME PERIODS  
(Citation Weighted by Number of Authors)**

Rank	Institution Name	1990-94	Institution Name	1995-99	Institution Name	1999-2004
1	MIT	323.17	UCIrvine	159.33	Maryland	218.08
2	British Columbia	289.50	Western Ontario	142.00	Emory	82.00
3	Carnegie Mellon	236.67	Minnesota	130.67	MIT	81.00
4	Georgia State	199.00	Maryland	114.25	Georgia State	67.67
5	Oakland	192.50	Georgia State	105.57	Arkansas	52.75
6	American	189.67	Texas	93.93	Georgia	50.83
7	UCLA	186.00	MIT	82.08	Indiana	37.50
8	Florida Int	178.67	Carnegie Mellon	71.77	INSEAD	33.50
9	Minnesota	166.50	S Carolina	66.83	British Columbia	29.33
10	Florida State	143.00	British Columbia	65.67	Texas	27.67
11	Texas	128.67	Georgia	62.65	USAF	26.33
12	Calgary	118.50	Florida State	61.42	CUNY Bernard M Baruch Coll	26.00
13	Melbourne	116.00	Indiana	51.00	So Calif	25.62
14	Arizona	100.60	Vermont	46.50	Texas Christian	25.50
15	Queens	93.17	So Calif	44.25	Carnegie Mellon	24.58
16	Colorado	87.67	SUNY Binghamton	42.00	Minnesota	23.92
17	Pittsburgh	79.20	Drexel	39.50	Stanford	20.17
18	Harvard	74.50	NYU	38.50	Warwick	18.00
19	Manchester	69.50	N Carolina	36.25	S Florida	16.42
20	Boston	67.00	Auckland	36.00	NYU	15.50
21	Purdue	64.33	Waterloo	35.00	UC Irvine	15.50



Rank	Institution Name	1990-94	Institution Name	1995-99	Institution Name	1999-2004
22	Houston	63.17	Fairleigh Dickinson	34.50	Houston	15.08
23	Ecole Hautes Etudes Commerciales	62.50	Memphis State	34.00	Michigan	14.58
24	Georgia	59.92	Memphis	34.00	Natl Sci Fdn	14.50
25	Virginia	59.67	McGill	33.50	SMU	14.50
26	McGill	51.00	Oklahoma	33.00	Oklahoma	14.50
27	Stanford	49.67	Pittsburgh	33.00	Florida State	14.00
28	SMU	49.50	Queens	30.50	N Carolina	13.68
29	Illinois	49.00	Colorado	30.25	Vanderbilt	12.67
30	Northeastern	48.00	Cimnet Syst Inc	29.67	Drexel	12.17
31	UC Irvine	47.50	N Florida	29.33	Harvard	12.00
32	NYU	42.92	Penn	28.00	Virginia	11.92
33	Western Ontario	41.00	Inst Res Learning	26.50	Penn	11.83
34	S Carolina	39.00	Ohio State	26.33	Notre Dame	11.67
35	So Calif	33.50	Syracuse	26.00	Connecticut	11.33
36	Auburn	31.08	Illinois	26.00	Northeastern	11.00
37	Texas Christian	29.00	Tennessee Technol	25.50	Washington	10.83
38	N Carolina	28.67	Rochester	23.50	Michigan State	10.67
39	Michigan	28.50	Claremont Grad Sch	21.83	Rensselaer Polytech Inst	10.00
40	Inst Estudios Super Empresa	28.00	Calgary	21.33	Case Western Reserve	9.83
41	Loughborough Technol	27.00	Arizona	21.25	Cent Florida	9.50
42	Louisville	26.00	Florida Int	21.00	Simon Fraser	9.33
43	San Diego State	24.00	Brunel	20.00	Pittsburgh	9.25

Rank	Institution Name	1990-94	Institution Name	1995-99	Institution Name	1999-2004
44	Memphis State	23.00	Great Plains Reg Med Ctr	20.00	Bar Ilan	9.00
45	Wisconsin	22.17	Hankook Foreign Studies	19.33	Colorado	9.00
46	Eastern Kentucky	22.00	Stanford	18.50	So Illinois	8.67
47	Tennessee Technol	21.00	Missouri	18.00	City Hong Kong	8.00
48	Natl Singapore	18.67	Oxford	18.00	Syracuse	8.00
49	Helix Grp Inc	18.00	Bentley Coll	17.50	Queens	7.50
50	Rutgers State	18.00	Hong Kong	17.00	Nevada	7.50
51	Claremont Grad Sch	17.67	Tel Aviv	16.25	Calgary	7.33
52	Penn	17.67	CSC Consulting & Syst Integrat	16.00	Arizona	7.08
53	Kent State	17.50	Northeastern	16.00	Calif State Long Beach	6.83
54	Baylor	15.50	Dayton	16.00	Missouri	6.00
55	Denver	14.75	London Business Sch	15.83	Queensland	6.00
56	Indiana	14.50	Houston	15.83	Cincinnati	5.67
57	Syracuse	14.50	Georgia Inst Technol	15.00	Rutgers State	5.60
58	Energy Management Associates Inc.	14.33	Delft Technol	14.75	UCLA	5.50
59	Rensselaer Polytech Inst	14.00	Ernst & Young	14.75	Fed Reserve Bank New York	5.33
60	AT&T Corp	13.25	Canterbury	14.75	Boston Coll	5.00
61	Boston Coll	13.25	Washington State	14.67	Cornell	5.00
62	North Carolina A&T	13.00	Erasmus	14.50	Politecn Milan	5.00
63	St Cloud State	12.33	So Methodist	14.50	Auckland	5.00
64	SUNY Binghamton	11.50	Queensland	14.50	Illinois	5.00
65	INSEAD	11.00	Williams Power Co	14.50	Vienna Econ & Business Adm	4.67

Rank	Institution Name	1990-94	Institution Name	1995-99	Institution Name	1999-2004
66	Carleton	10.67	Arkansas	14.33	Bentley Coll	4.58
67	Bull Hn Informat Syst	10.33	Natl Singapore	14.07	Natl Singapore	4.50
68	Suffolk	10.33	Virginia Commonwealth	14.00	Wisconsin	4.50
69	Temple	10.00	SUNY Buffalo	13.10	McGill	4.33
70	George Washington	9.67	Ecole Hautes Etudes Commerciales	12.50	Nanyang Technol	4.17
71	Baltimore	9.67	Alberta	12.50	Clemson	4.00
72	Case Western Reserve	8.50	Cambridge	12.50	Ecole Hautes Etudes Commerciales	4.00
73	N Florida	8.00	Case Western Reserve	12.00	Louisiana State	4.00
74	Grp Cge Inc	7.67	IBM Corp	12.00	Yonsei	4.00
75	Quebec	7.67	Aalborg	11.83	Boeing Corp	3.75
76	Beijing Aeronaut & Astronaut	7.50	San Francisco State	11.50	Baylor	3.50
77	Simon Fraser	7.50	Salford	11.50	Penn State	3.50
78	S Florida	7.50	Boston Coll	11.00	S Carolina	3.50
79	Washington	7.50	Massachusetts	10.67	Kansas	3.33
80	Vanderbilt	7.50	N Texas	10.67	Old Dominion	3.00
81	Yonsei	7.50	Bell Atlantic Corp	10.50	Temple	3.00
82	Allied Consultants Int.	7.00	Harvard	10.50	Cambridge	3.00
83	Cisi Grp	7.00	Nanyang Technol	10.50	Kentucky	3.00
84	Weiss Associates Inc	6.67	Melbourne	10.17	Raytheon Syst Co	2.75
85	New York State Off Gen Serv	6.00	Millsaps Coll	10.00	Rochester	2.67

Rank	Institution Name	1990-94	Institution Name	1995-99	Institution Name	1999-2004
86	Mellon Bank	5.75	Salisbury State	10.00	Mckendree Coll	2.67
87	Profit Management Grp	5.75	S Florida	10.00	Texas Tech	2.67
88	Sultan Qaboos	5.50	USN	9.67	Western Ontario	2.58
89	Informission	5.00	Jyvaskyla	9.33	Australian Grad Sch Management	2.50
90	Rochester	5.00	INSEAD	9.17	Claremont Grad Sch	2.50
91	Bowling Green State	4.67	Western Carolina	9.07	Fac Notre Dame Paix	2.50
92	Bryant Coll	4.67	Texas A&M	9.00	Inst Tecnol Autonomo Mexico	2.50
93	Virginia Polytech Inst & State	4.33	Connecticut	9.00	S Pacific	2.50
94	IBM Corp	4.00	AT Kearney	8.67	Helsinki Sch Econ & Business Adm	2.33
95	Middle Tennessee State	4.00	Comp Sci & Informat Syst	8.67	Twente	2.33
96	Drexel	3.00	Gartner Grp Pacific	8.67	Bell Labs	2.00
97	Nanyang Technol	3.00	Cent Florida	8.50	Bowling Green State	2.00
98	Micro Planning Int	2.25	Delaware	8.50	Duke	2.00
99	Duquesne	2.17	British Petr Plc	8.33	George Mason	2.00
100	Nanyang Tech Inst	2.17	Helsinki Sch Econ & Business Adm	8.33	St Francis Xavier	2.00

**APPENDIX 4. RANKING OF THE MOST CITED ARTICLES PUBLISHED IN TARGET JOURNALS (1990 – 2004)**

Rank	Au	Ti	Journal	Year	Vol	No	BP	EP	Citations
1	Delone, William H., Mclean, Ephraim R..	Information Systems Success: The Quest for the Dependent Variable.	ISR	1992	3	1	60	95	432
2	Moore, Gary C., Benbasat, Izak.	Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation.	ISR	1991	2	3	192	222	278
3	Orlikowski W. J.; Robey, D.	Information Technology and the Structuring of Organizations.	ISR	1991	2	2	142	172	256
4	Adams, DA; Nelson, RR; Todd, PA	Perceived Usefulness, Ease of Use, and Usage of Information Technology - A Replication	MISQ	1992	16	2	227	247	209
5	Mathieson, Kieren.	Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior.	ISR	1991	2	3	173	191	209
6	Taylor, S; Todd, PA	Understanding Information Technology Usage - A Test of Competing Models	ISR	1995	6	2	144	176	205
7	Cooper, RB; Zmud, RW	Information Technology Implementation Research - A Technological Diffusion Approach	MS	1990	36	2	123	139	190
8	Venkatesh, V; Davis, FD	A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies	MS	2000	46	2	186	204	151
9	Compeau, DR; Higgins, CA	Computer Self-Efficacy - Development of a Measure and Initial Test	MISQ	1995	19	2	189	211	148
10	Bakos, JY	Reducing Buyer Search Costs: Implications for Electronic Marketplaces	MS	1997	43	12	1676	1692	144
11	Brynjolfsson, E; Hitt, L	Paradox Lost? Firm-Level Evidence on the Returns to Information Systems Spending	MS	1996	42	4	541	558	138
12	Melone, NP	A Theoretical Assessment of the User-Satisfaction Construct In Information-Systems Research	MS	1990	36	1	76	91	133
13	Orlikowski, WJ	Case Tools as Organizational-Change - Investigating Incremental and Radical Changes in Systems-Development	MISQ	1993	17	3	309	340	132
14	Brynjolfsson, E; Smith, Md	Frictionless Commerce? A Comparison of Internet and Conventional Retailers	MS	2000	46	4	563	585	130
15	Weill, Peter.	The Relationship between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector.	ISR	1992	3	4	307	333	126
16	Bakos, JY	A Strategic Analysis of Electronic Marketplaces	MISQ	1991	15	3	295	310	123

17	Hartwick, J; Barki, H	Explaining the Role of User Participation in Information-System Use	MS	1994	40	4	440	465	123
18	Thompson, RL; Higgins, Ca; Howell, JM	Personal Computing - Toward a Conceptual-Model of Utilization	MISQ	1991	15	1	125	143	120
19	Goodhue, DL; Thompson, RL	Task-Technology Fit and Individual-Performance	MISQ	1995	19	2	213	236	118
20	Iacovou, CL; Benbasat, I; Dexter, AS	Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology	MISQ	1995	19	4	465	485	117
21	Niederman, F; Brancheau, JC; Wetherbe, JC	Information-Systems Management Issues for the 1990s	MISQ	1991	15	4	475	495	117
22	Brancheau, JC; Janz, BD; Wetherbe, JC	Key Issues in Information Systems Management: 1994-95 SIM Delphi Results	MISQ	1996	20	2	225	242	111
23	Alavi, M; Leidner, DE	Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues	MISQ	2001	25	1	107	136	110
24	Webster, J; Martocchio, JJ	Microcomputer Playfulness - Development of a Measure with Workplace Implications	MISQ	1992	16	2	201	226	109
25	Orlikowski, WJ	Improving Organizational Transformation Over Time: A Situated Change Perspective	ISR	1996	7	1	63	92	107
26	Mukhopadhyay, T; Kekre, S; Kalathur, S	Business Value of Information Technology - A Study of Electronic Data Interchange	MISQ	1995	19	2	137	156	105
27	Mata, Fj; Fuerst, WL; Barney, JB	Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis	MISQ	1995	19	4	487	505	103
28	Gefen, D; Straub, DW	Gender Differences in the Perception and Use of E-Mail: An Extension to the Technology Acceptance Model	MISQ	1997	21	4	389	400	102
29	George, Joey F., Easton, George K., Nunamaker Jr., J.F., Northcraft, Gregory B..	A Study of Collaborative Group Work with and without Computer-Based Support.	ISR	1990	1	4	394	415	97
30	Klein, HK; Myers, MD	A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems	MISQ	1999	23	1	67	93	96
31	Swanson, EB	Information-Systems Innovation among Organizations	MS	1994	40	9	1069	1092	96
32	Barua, A; Kriebel, CH; Mukhopadhyay, T	Information Technologies and Business Value - An Analytic and Empirical-Investigation	ISR	1995	6	1	3	23	91
33	Compeau, DR; Higgins, CA	Application of Social Cognitive Theory to Training for Computer Skills	ISR	1995	6	2	118	143	90

34	Brancheau, James C., Wetherbe, James C..	The Adoption of Spreadsheet Software: Testing Innovation Diffusion Theory in the Context of End-User Computing.	ISR	1990	1	2	115	143	87
35	Earl, MJ	Experiences in Strategic Information-Systems Planning	MISQ	1993	17	1	1	24	84
36	Stein, EW; Zwass, V	Actualizing Organizational Memory with Information-Systems	ISR	1995	6	2	85	117	84
37	Venkatesh, V	Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model	ISR	2000	11	4	342	365	84
38	Venkatesh, V; Morris, MG	Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behavior	MISQ	2000	24	1	115	139	83
39	Sethi, V; King, WR	Development of Measures to Assess the Extent to Which an Information Technology Application Provides Competitive Advantage	MS	1994	40	12	1601	1627	82
40	Alavi, M	Computer-Mediated Collaborative Learning - An Empirical-Evaluation	MISQ	1994	18	2	159	174	81
41	Lee, AS	Electronic Mail as a Medium for Rich Communication - An Empirical-Investigation Using Hermeneutic Interpretation	MISQ	1994	18	2	143	157	81
42	Pitt, LF; Watson, RT; Kavan, CB	Service Quality - A Measure of Information-Systems Effectiveness	MISQ	1995	19	2	173	187	80
43	Loh, Lawrence, Venkatraman, N..	Diffusion of Information Technology Outsourcing: Influence Sources and the Kodak Effect.	ISR	1992	3	4	334	358	79
44	Barki, H; Hartwick, J	Measuring User Participation, User Involvement, and User Attitude	MISQ	1994	18	1	59	82	77
45	Igbaria, M; Zinatelli, N; Cragg, P; Cavaye, Alm	Personal Computing Acceptance Factors in Small Firms: A Structural Equation Model	MISQ	1997	21	3	279	305	77
46	Clemons, EK; Row, MC	Sustaining IT Advantage - The Role of Structural Differences	MISQ	1991	15	3	275	292	76
47	Davenport, TH; Stoddard, DB	Reengineering - Business Change of Mythic Proportions	MISQ	1994	18	2	121	127	75
48	Reich, Blaize Horner, Benbasat, Izak.	An Empirical Investigation of Factors Influencing the Success of Customer-Oriented Strategic Systems.	ISR	1990	1	3	325	347	73
49	Todd, P.A. And I. Benbasat	An Experimental Investigation of the Impact of Computer Based Decision Aids on Decision Making Strategies.	ISR	1991	2	2	87	115	71
50	Taylor, S; Todd, P	Assessing IT Usage: The Role of Prior Experience	MISQ	1995	19	4	561	570	70
51	Brynjolfsson, E; Malone, TW; Gurbaxani, V; Kambil, A	Does Information Technology Lead to Smaller Firms	MS	1994	40	12	1628	1644	69



52	Jessup, LM; Connolly, T; Galegher, J	The Effects of Anonymity on GDSS Group-Process with an Idea-Generating Task	MISQ	1990	14	3	313	321	69
53	Compeau, D; Higgins, CA; Huff, S	Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study	MISQ	1999	23	2	145	158	67
54	Conner, KR; Rumelt, RP	Software Piracy - An Analysis of Protection Strategies	MS	1991	37	2	125	139	67
55	Karahanna, E; Straub, DW; Chervany, NL	Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs	MISQ	1999	23	2	183	213	67
56	Ngwenyama, OK; Lee, AS	Communication Richness In Electronic Mail: Critical Social Theory and the Contextuality of Meaning	MISQ	1997	21	2	145	167	66
57	Poole, MS; Holmes, M; Desanctis, G	Conflict-Management In A Computer-Supported Meeting Environment	MS	1991	37	8	926	953	66
58	Star, SL; Ruhleder, K	Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces	ISR	1996	7	1	111	134	65
59	Bharadwaj, AS	A Resource-Based Perspective On Information Technology Capability and Firm Performance: An Empirical Investigation	MISQ	2000	24	1	169	196	64
60	Chidambaram, L	Relational Development In Computer-Supported Groups	MISQ	1996	20	2	143	165	64
61	Seddon, PB	A Respecification and Extension of the Delone and Mclean Model of IS Success	ISR	1997	8	3	240	253	63
62	Alavi, M; Joachimsthaler, EA	Revisiting DSS Implementation Research - A Metaanalysis of The Literature and Suggestions for Researchers	MISQ	1992	16	1	95	116	62
63	Beath, CM	Supporting the Information Technology Champion	MISQ	1991	15	3	355	372	62
64	Boynton, AC; Zmud, RW; Jacobs, GC	The Influence of It Management Practice on IT Use in Large Organizations	MISQ	1994	18	3	299	318	62
65	Cragg, PB; King, M	Small-Firm Computing - Motivators and Inhibitors	MISQ	1993	17	1	47	60	62
66	Silver, Mark S..	Decision Support Systems: Directed and Nondirected Change.	ISR	1990	1	1	47	70	62
67	Straub, DW	The Effect of Culture on IT Diffusion - E-Mail and Fax In Japan and The United-States	ISR	1994	5	1	23	47	62
68	Goodhue, DL	Understanding User Evaluations of Information Systems	MS	1995	41	12	1827	1844	61
69	Jarvenpaa, SL; Ives, B	Executive Involvement and Participation in the Management of Information Technology	MISQ	1991	15	2	205	227	61
70	Mckeen, JD; Guimaraes, T; Wetherbe, JC	The Relationship between User Participation and User Satisfaction - An Investigation of 4 Contingency Factors	MISQ	1994	18	4	427	451	61
71	Newman, M; Robey, D	A Social-Process Model of User-Analyst Relationships	MISQ	1992	16	2	249	266	61

72	Agarwal, R; Karahanna, E	Time Flies When You're Having Fun: Cognitive Absorption and Beliefs About Information Technology Usage	MISQ	2000	24	4	665	694	60
73	Dos Santos, Brian L., Peffers, Ken, Mauer, David C..	The Impact of Information Technology Invest Announcements on The Market Value of the Firm.	ISR	1993	4	1	1	23	60
74	Kettinger, Wj; Grover, V; Guha, S; Segars, AH	Strategic Information-Systems Revisited - A Study In Sustainability and Performance	MISQ	1994	18	1	31	58	59
75	Leidner, DE; Jarvenpaa, SL	The Use of Information Technology to Enhance Management School Education - A Theoretical View	MISQ	1995	19	3	265	291	59
76	Nunamaker, JF; Dennis, AR; Valacich, JS; Vogel, DR	Information Technology For Negotiating Groups - Generating Options for Mutual Gain	MS	1991	37	10	1325	1346	58
77	Lee, DMS; Trauth, EM; Farwell, D	Critical Skills And Knowledge Requirements of IS Professionals - A Joint Academic-Industry Investigation	MISQ	1995	19	3	313	340	57
78	Venkatraman, N., Zaheer, Akbar.	Electronic Integration and Strategic Advantage: A Quasi-Experimental Study in the Insurance Industry.	ISR	1990	1	4	377	393	57
79	Bakos, Y; Brynjolfsson, E	Bundling Information Goods: Pricing, Profits, and Efficiency	MS	1999	45	12	1613	1630	55
80	Henderson, JC; Lee, S	Managing I/S Design Teams - A Control Theories Perspective	MS	1992	38	6	757	777	55
81	Hitt, LM; Brynjolfsson, E	Productivity, Business Profitability, and Consumer Surplus: Three Different Measures of Information Technology Value	MISQ	1996	20	2	121	142	55
82	Newman, Michael, Noble, Faith.	User Involvement as an Interaction Process: A Case Study	ISR	1990	1	1	89	114	55
83	Bostrom, RP; Olfman, L; Sein, Mk	The Importance of Learning Style in End-User Training	MISQ	1990	14	1	101	119	54
84	Keil, M	Pulling The Plug: Software Project Management and the Problem of Project Escalation	MISQ	1995	19	4	421	447	54
85	Davis, SA; Bostrom, RP	Training End Users - An Experimental Investigation of the Roles of the Computer-Interface and Training Methods	MISQ	1993	17	1	61	85	53
86	Segars, AH; Grover, V	Strategic Information Systems Planning Success: An Investigation of the Construct and Its Measurement	MISQ	1998	22	2	139	163	53
87	Walsham, G	The Emergence of Interpretivism in IS Research	ISR	1995	6	4	376	394	52
88	Zack, Michael H..	Interactivity and Communication Mode Choice in Ongoing Management Groups.	ISR	1993	4	3	207	239	51
89	Zigurs, I; Buckland, BK	A Theory of Task/Technology Fit and Group Support Systems Effectiveness	MISQ	1998	22	3	313	334	51
90	Venkatesh, V	Creation of Favorable User Perceptions: Exploring the Role of	MISQ	1999	23	2	239	260	50

		Intrinsic Motivation							
91	Ives, B; Jarvenpaa, SL	Applications of Global Information Technology - Key Issues For Management	MISQ	1991	15	1	33	49	49
92	Kumar, K; Vandissel, HG	Sustainable Collaboration: Managing Conflict and Cooperation in Interorganizational Systems	MISQ	1996	20	3	279	300	49
93	Srinivasan, K; Kekre, S; Mukhopadhyay, T	Impact of Electronic Data Interchange Technology on JIT Shipments	MS	1994	40	10	1291	1304	49
94	Watson, HJ; Rainer, RK; Koh, CE	Executive Information-Systems - A Framework for Development and a Survey of Current Practices	MISQ	1991	15	1	13	30	49
95	Banker, RD; Datar, SM; Kemerer, CF	A Model to Evaluate Variables Impacting the Productivity of Software Maintenance Projects	MS	1991	37	1	1	18	48
96	Chidambaram, L; Jones, B	Impact of Communication Medium and Computer Support on Group Perceptions and Performance - A Comparison of Face-to-Face and Dispersed Meetings	MISQ	1993	17	4	465	491	48
97	Fichman, RG; Kemerer, CF	The Assimilation of Software Process Innovations: An Organizational Learning Perspective	MS	1997	43	10	1345	1363	48
98	Todd, P; Benbasat, I	The Use of Information in Decision-Making - An Experimental Investigation of the Impact of Computer-Based Decision Aids	MISQ	1992	16	3	373	393	48
99	Keeney, RL	The Value of Internet Commerce to the Customer	MS	1999	45	4	533	542	47
100	Nelson, RR	Educational-Needs as Perceived by IS and End-User Personnel - A Survey of Knowledge and Skill Requirements	MISQ	1991	15	4	503	521	47

**APPENDIX 5. RANKING OF MOST CITED AUTHORS OF ARTICLES PUBLISHED (1990 – 2004) IN TARGET JOURNALS  
(Using Three Methodologies of Citations Count)**

Rank	Author's Name	Total Citations	Author's Name	Cites Weighted by No. Authors	Author's Name	Cites Weighted by No. and Order of Authors
1	Benbasat, I	976	Benbasat, I	454.50	Orlikowski, WJ	619.00
2	Todd, P	695	Orlikowski, WJ	444.00	Benbasat, I	529.67
3	Orlikowski, WJ	640	Venkatesh, V	330.00	Venkatesh, V	517.00
4	Brynjolfsson, E	551	Bakos, J	317.17	Brynjolfsson, E	495.00
5	Zmud, R	538	Todd, P	306.33	Delone, WH	481.00
6	Venkatesh, V	531	Brynjolfsson, E	288.25	Todd, P	401.33
7	Mclean, ER	510	Straub, D	255.67	Bakos, J	352.00
8	Higgins, CA	502	Robey, D	248.00	Compeau, D	336.00
9	Straub, D	493	Mclean, ER	246.30	Alavi, M	321.50
10	Delone, WH	481	Mathieson, K	241.00	Straub, D	318.50
11	Robey, D	458	Delone, WH	240.50	Moore, GC	312.00
12	Mukhopadhyay, T	416	Zmud, R	239.75	Taylor, S	302.00
13	Wetherbe, JC	416	Higgins, CA	213.67	Robey, D	286.00
14	Bakos, J	352	Alavi, M	197.83	Goodhue, DL	278.50
15	Compeau, D	340	Wetherbe, JC	171.17	Zmud, R	278.50
16	Jarvenpaa, SL	334	Jarvenpaa, SL	157.67	Brancheau, JC	267.50
17	Alavi, M	328	Goodhue, DL	156.08	Mukhopadhyay, T	267.17
18	Brancheau, JC	328	Moore, GC	156.00	Higgins, CA	250.17
19	Moore, GC	312	Compeau, D	155.83	Mclean, ER	246.30
20	Taylor, S	302	Weill, P	153.50	Mathieson, K	241.00
21	Barki, H	295	Taylor, S	151.00	Jarvenpaa, SL	228.17

Rank	Author's Name	Total Citations	Author's Name	Cites Weighted by No. Authors	Author's Name	Cites Weighted by No. and Order of Authors
22	Goodhue, DL	290	Hitt, L	145.00	Dennis, AR	224.33
23	Dennis, AR	267	Lee, AS	141.50	Adams, DA	214.00
24	Hitt, L	266	Barki, H	137.00	Barki, H	212.50
25	Nelson, RR	263	Mukhopadhyay, T	135.73	Cooper, RB	206.00
26	Thompson, RL	252	Melone, NP	135.00	Agarwal, R	205.50
27	Hartwick, J	248	Brancheau, JC	124.50	Hartwick, J	190.50
28	Sambamurthy, V	248	Hartwick, J	124.00	Thompson, RL	188.50
29	Davis, FD	242	Nelson, RR	120.33	Sambamurthy, V	178.17
30	Mathieson, K	241	Dennis, AR	118.08	Gefen, D	176.50
31	Grover, V	233	Swanson, EB	113.00	Hitt, L	176.00
32	Leidner, DE	224	Leidner, DE	112.00	Wetherbe, JC	171.17
33	Agarwal, R	221	Cooper, RB	109.00	Barua, A	170.50
34	Adams, DA	214	Davis, FD	106.50	Newman, M	170.00
35	Kekre, S	213	Sambamurthy, V	105.17	Banker, RD	168.50
36	Nunamaker, J	208	Thompson, RL	105.17	Weill, P	165.50
37	Cooper, RB	206	Agarwal, R	99.67	Igbaria, M	159.50
38	Ives, B	203	Chidambaram, L	95.00	Nelson, RR	156.00
39	Watson, R	203	Ives, B	94.75	Reich, BH	153.00
40	Gefen, D	195	Newman, M	94.50	Niederman, F	149.00
41	Karahanna, E	193	Earl, MJ	94.33	Lee, AS	147.00
42	Newman, M	189	Venkatraman, N	91.50	Leidner, DE	142.00
43	Lee, AS	185	Beath, CM	87.50	Kettinger, WJ	140.00
44	Venkatraman, N	183	Grover, V	86.08	Webster, J	137.00

Rank	Author's Name	Total Citations	Author's Name	Cites Weighted by No. Authors	Author's Name	Cites Weighted by No. and Order of Authors
45	Weill, P	182	Watson, R	85.97	Melone, NP	135.00
46	Dexter, AS	181	Gefen, D	84.17	Karahanna, E	133.50
47	Barua, A	180	Walsham, G	83.50	Grover, V	131.00
48	Banker, RD	174	Bharadwaj, A	82.67	Klein, HK	128.33
49	Gurbaxani, V	174	Silver, MS	81.33	Iacovou, CL	127.00
50	Kemerer, CF	172	Webster, J	80.00	Swanson, EB	123.00
51	Kraemer, KL	170	Myers, M	78.00	Ives, B	121.08
52	Valacich, JS	165	Kemerer, CF	77.83	Venkatraman, N	120.50
53	Igbaria, M	164	Reich, BH	77.00	Chidambaram, L	119.50
54	Segars, AH	162	Karahanna, E	76.00	Watson, R	119.17
55	Klein, HK	159	Klein, HK	75.33	Pitt, LF	116.50
56	Reich, BH	155	Smith, MD	74.25	Kekre, S	111.33
57	Smith, MD	150	Banker, RD	74.00	Mata, FJ	111.00
58	Morris, MG	149	Kekre, S	72.00	Watson, HJ	110.50
59	Niederman, F	149	Keil, M	71.67	Beath, CM	107.00
60	Kettinger, WJ	146	Adams, DA	71.33	Davis, FD	106.50
61	Watson, HJ	146	Seddon, PB	70.00	George, JF	106.50
62	Huff, S	145	Choudhary, V	66.33	Choudhary, V	104.00
63	Myers, M	137	Dexter, AS	64.00	Nunamaker, J	102.85
64	Webster, J	137	Segars, AH	63.58	Trauth, EM	102.00
65	Melone, NP	135	Barua, A	63.33	Henderson, JC	100.00
66	Northcraft, GB	134	King, WR	62.00	Keil, M	99.50
67	Trauth, EM	131	Kraemer, KL	61.50	Segars, AH	99.08

Rank	Author's Name	Total Citations	Author's Name	Cites Weighted by No. Authors	Author's Name	Cites Weighted by No. and Order of Authors
68	Pitt, LF	129	Watson, HJ	61.50	Clemons, EK	99.00
69	Davis, GB	127	Morris, MG	60.00	Earl, MJ	99.00
70	Iacovou, CL	127	Tam, KY	59.83	Walsham, G	95.50
71	Choudhary, V	126	Kauffman, RJ	59.33	Gurbaxani, V	92.50
72	Howell, JM	125	Martocchio, JJ	57.00	Fichman, RG	92.00
73	Kauffman, RJ	125	Zack, MH	54.00	Poole, MS	90.50
74	King, WR	125	Igbaria, M	53.50	Dewan, S	90.00
75	Chidambaram, L	124	Stoddard, DB	52.83	Kraemer, KL	89.00
76	Swanson, EB	123	Valacich, JS	51.42	Pinsonneault, A	89.00
77	Kavan, CB	122	Nunamaker, J	50.35	Sethi, V	89.00
78	Kriebel, CH	122	Fichman, RG	50.00	Stein, EW	89.00
79	Stoddard, DB	121	Henderson, JC	50.00	Davenport, TH	88.00
80	Beath, CM	119	Palmer, JW	50.00	Loh, L	88.00
81	Janz, BD	116	Trauth, EM	50.00	Silver, MS	88.00
82	Martocchio, JJ	114	Gurbaxani, V	49.75	Bharadwaj, A	86.00
83	Poole, MS	114	Niederman, F	49.67	Jessup, LM	83.50
84	Vogel, D	114	Brown, CV	49.50	Boynton, AC	83.00
85	Connolly, T	113	Clemons, EK	49.50	Bostrom, RP	82.50
86	Earl, MJ	113	Keeney, RL	49.00	Hirschheim, R	78.50
87	Kalathur, S	113	Kettinger, WJ	48.58	Mckeen, JD	78.50
88	Kirsch, LJ	113	Huff, S	48.08	Kumar, K	78.00
89	Barney, JB	112	Zaheer, A	47.50	Myers, M	78.00
90	Whinston, A	112	Weber, R	47.25	Kemerer, CF	77.83



Rank	Author's Name	Total Citations	Author's Name	Cites Weighted by No. Authors	Author's Name	Cites Weighted by No. and Order of Authors
91	Fuerst, WL	111	Mendelson, H	47.00	Dos santos, BL	76.50
92	Guimaraes, T	111	Massetti, B	46.50	Conner, KR	75.00
93	Mata, FJ	111	Koufaris, M	46.00	Marakas, GM	75.00
94	Bostrom, RP	109	Poole, MS	45.83	Morris, MG	74.50
95	George, JF	107	Kirsch, LJ	45.75	Smith, MD	74.25
96	Keil, M	107	Bostrom, RP	45.17	Brown, CV	73.00
97	Guha, S	105	Nidumolu, SR	44.75	Kauffman, RJ	72.00
98	Srinivasan, K	103	Sethi, V	44.50	Srinivasan, K	71.00
99	Walsham, G	102	Stein, EW	44.50	Zigurs, I	71.00
100	Wei, KK	102	Zwass, V	44.50	Massetti, B	70.00

**APPENDIX 6. MOST CITED ARTICLES BY THREE TIME PERIODS OF ARTICLE PUBLICATION**

	1990-94		1995-99		2000-2004	
Rank	Article	Citations	Article	Citations	Article	Citations
1	DeLone, William H., McLean, Ephraim R. (1992), "Information Systems Success: The Quest for the Dependent Variable," <i>Information Systems Research</i> (3:1) pp 60-95	481	Taylor, S; Todd, PA (1995), "Understanding Information Technology Usage - A Test of Competing Models," <i>Information Systems Research</i> (6:2) pp 144-176	227	Venkatesh, V; Davis, FD (2000), "A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies," <i>Management Science</i> (46:2) pp 186-204	178
2	Moore, Gary C., Benbasat, Izak. (1991), "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation," <i>Information Systems Research</i> (2:3) pp 192-222	312	Compeau, DR; Higgins, CA (1995), "Computer Self-Efficacy - Development Of A Measure and Initial Test," <i>MIS Quarterly</i> (19:2) pp 189-211	163	Brynjolfsson, E; Smith, MD (2000), "Frictionless commerce? A comparison of Internet and conventional retailers," <i>Management Science</i> (46:4) pp 563-585	147
3	Orlikowski WJ; Robey, D (1991), "Information Technology and the Structuring of Organizations," <i>Information Systems Research</i> (2:2) pp 142-172	277	Bakos, JY (1997), "Reducing buyer search costs: Implications for electronic marketplaces," <i>Management Science</i> (43:12) pp 1676-1692	155	Alavi, M; Leidner, DE (2001), "Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues," <i>MIS Quarterly</i> (25:1) pp 107-136	124
4	Mathieson, Kieren. (1991), "Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior," <i>Information Systems Research</i> (2:3) pp 173-191	241	Brynjolfsson, E; Hitt, L (1996), "Paradox lost? Firm-level evidence on the returns to information systems spending," <i>Management Science</i> (42:4) pp 541-558	154	Venkatesh, V (2000), "Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model," <i>Information Systems Research</i> (11:4) pp 342-365	99
5	Adams, DA; Nelson, RR; Todd, PA (1992), "Perceived Usefulness, Ease of Use, and Usage of Information Technology - A Replication," <i>MIS Quarterly</i> (16:2) Pp 227-247	214	Iacovou, CL; Benbasat, I; Dexter, AS (1995), "Electronic data interchange and small organizations: Adoption and impact of technology," <i>MIS Quarterly</i> (19:4) pp 465-485	127	Venkatesh, V; Morris, MG (2000), "Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior," <i>MIS Quarterly</i> (24:1) pp 115-139	90
6	Cooper, RB; Zmud, RW (1990), "Information Technology Implementation Research - A Technological Diffusion Approach," <i>Management Science</i> (36:2) pp 123-139	194	Goodhue, DL; Thompson, RL (1995), "Task-Technology Fit and Individual-Performance," <i>MIS Quarterly</i> (19:2) pp 213-236	127	Bharadwaj, AS (2000), "A resource-based perspective on information technology capability and firm performance: An empirical investigation," <i>MIS</i>	76

	1990-94		1995-99		2000-2004	
Rank	Article	Citations	Article	Citations	Article	Citations
					Quarterly (24:1) pp 169-196	
7	Weill, Peter. (1992), "The Relationship Between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector," <i>Information Systems Research</i> (3:4) pp 307-333	136	Brancheau, JC; Janz, BD; Wetherbe, JC (1996), "Key issues in information systems management: 1994-95 SIM delphi results," <i>MIS Quarterly</i> (20:2) pp 225-242	116	Agarwal, R; Karahanna, E (2000), "Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage," <i>MIS Quarterly</i> (24:4) pp 665-694	70
8	Orlikowski, WJ (1993), "Case Tools as Organizational-Change - Investigating Incremental and Radical Changes In Systems-Development," <i>MIS Quarterly</i> (17:3) pp 309-340	135	Mukhopadhyay, T; Kekre, S; Kalathur, S (1995), "Business Value of Information Technology - A Study of Electronic Data Interchange," <i>MIS Quarterly</i> (19:2) pp 137-156	113	Venkatesh, V; Morris, MG; Davis, GB; Davis, FD (2003), "User acceptance of information technology: Toward a unified view," <i>MIS Quarterly</i> (27:3) pp 425-478	58
9	Melone, NP (1990), "A Theoretical Assessment of The User-Satisfaction Construct in Information-Systems Research," <i>Management Science</i> (36:1) pp 76-91	135	Orlikowski, WJ (1996), "Improvising organizational transformation over time: A situated change perspective," <i>Information Systems Research</i> (7:1) pp 63-92	113	Orlikowski, WJ; Iacono, CS (2001), "Research commentary: Desperately seeking the "IT" in IT research - A call to theorizing the IT artifact," <i>Information Systems Research</i> (12:2) pp 121-134	52
10	Bakos, JY (1991), "A Strategic Analysis of Electronic Marketplaces," <i>MIS Quarterly</i> (15:3) pp 295-310	128	Mata, FJ; Fuerst, WL; Barney, JB (1995), "Information technology and sustained competitive advantage: A resource-based analysis," <i>MIS Quarterly</i> (19:4) pp 487-505	111	Gefen, D; Karahanna, E; Straub, DW (2003), "Trust and TAM in online shopping: An integrated model," <i>MIS Quarterly</i> (27:1) pp 51-90	49
11	Hartwick, J; Barki, H (1994), "Explaining the Role of User Participation in Information-System Use," <i>Management Science</i> (40:4) pp 440-465	126	Gefen, D; Straub, DW (1997), "Gender differences in the perception and use of E-mail: An extension to the technology acceptance model," <i>MIS Quarterly</i> (21:4) pp 389-400	109	Faraj, S; Sproull, L (2000), "Coordinating expertise in software development teams," <i>Management Science</i> (46:12) pp 1554-1568	47
12	Thompson, RL; Higgins, CA; Howell, JM (1991), "Personal Computing - Toward a Conceptual-Model of Utilization," <i>MIS Quarterly</i> (15:1) pp 125-143	125	Klein, HK; Myers, MD (1999), "A set of principles for conducting and evaluating interpretive field studies in information systems," <i>MIS Quarterly</i> (23:1) pp 67-93	106	Koufaris, M (2002), "Applying the technology acceptance model and flow theory to online consumer behavior," <i>Information Systems Research</i> (13:2) pp 205-223	46
13	Niederman, F; Brancheau, JC; Wetherbe, JC (1991), "Information-Systems Management Issues for the 1990s," <i>MIS Quarterly</i> (15:4) pp 475-495	121	Compeau, DR; Higgins, CA (1995), "Application of Social Cognitive Theory to Training for Computer Skills," <i>Information Systems Research</i> (6:2) pp 118-143	96	Palmer, JW (2002), "Web site usability, design, and performance metrics," <i>Information Systems Research</i> (13:2) pp 151-167	45

	1990-94		1995-99		2000-2004	
Rank	Article	Citations	Article	Citations	Article	Citations
14	Webster, J; Martocchio, JJ (1992), "Microcomputer Playfulness - Development of a Measure with Workplace Implications," MIS Quarterly (16:2) pp 201-226	114	Barua, A; Kriebel, CH; Mukhopadhyay, T (1995), "Information Technologies and Business Value - An Analytic and Empirical-Investigation," Information Systems Research (6:1) pp 3-23	95	McKnight, DH; Choudhury, V; Kacmar, C (2002), "Developing and validating trust measures for e-commerce: An integrative typology," Information Systems Research (13:3) pp 334-359	44
15	Segars, AH; Grover, V (1993), "Reexamining Perceived Ease of Use and Usefulness - A Confirmatory Factor-Analysis," MIS Quarterly (17:4) pp 517-525	104	Stein, EW; Zwass, V (1995), "Actualizing Organizational Memory With Information-Systems," Information Systems Research (6:2) pp 85-117	89	Majchrzak, A; Rice, RE; Malhotra, A; King, N; Ba, SL (2000), "Technology adaptation: The case of a computer-supported inter-organizational virtual team," MIS Quarterly (24:4) pp 569-600	41
16	Swanson, EB (1994), "Information-Systems Innovation among Organizations," Management Science (40:9) pp 1069-1092	103	Pitt, LF; Watson, RT; Kavan, CB (1995), "Service Quality - A Measure of Information-Systems Effectiveness," MIS Quarterly (19:2) pp 173-187	83	Ba, SL; Pavlou, PA (2002), "Evidence of the effect of trust building technology in electronic markets: Price premiums and buyer behavior," MIS Quarterly (26:3) pp 243-268	38
17	George, Joey F., Easton, George K., Nunamaker Jr., J.F., Northcraft, Gregory B. (1990), "A Study of Collaborative Group work with and without Computer-Based Support," Information Systems Research (1:4) pp 394-415	99	Igbaria, M; Zinatelli, N; Cragg, P; Cavaye, ALM (1997), "Personal computing acceptance factors in small firms: A structural equation model," MIS Quarterly (21:3) pp 279-305	82	Agarwal, R; Sambamurthy, V; Stair, RM (2000), "Research report: The evolving relationship between general and specific computer self-efficacy - An empirical assessment," Information Systems Research (11:4) pp 418-430	34
18	Brancheau, James C., Wetherbe, James C.. (1990), "The Adoption of Spreadsheet Software: Testing Innovation Diffusion Theory in the Context of End-User Computing," Information Systems Research (1:2) pp 115-143	91	Taylor, S; Todd, P (1995), "Assessing IT usage: The role of prior experience," MIS Quarterly (19:4) pp 561-570	75	Chwelos, P; Benbasat, I; Dexter, AS (2001), "Research report: Empirical test of an EDI adoption model," Information Systems Research (12:3) pp 304-321	32
19	Loh, Lawrence, Venkatraman, N.. (1992), "Diffusion of Information Technology Outsourcing: Influence Sources and the Kodak Effect," Information Systems Research (3:4) pp 334-358	88	Karahanna, E; Straub, DW; Chervany, NL (1999), "Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs," MIS Quarterly (23:2) pp 183-213	74	Reich, BH; Benbasat, I (2000), "Factors that influence the social dimension of alignment between business and information technology objectives," MIS Quarterly (24:1) pp 81-113	31

	1990-94		1995-99		2000-2004	
Rank	Article	Citations	Article	Citations	Article	Citations
20	Sethi, V; King, WR (1994), "Development of Measures to Assess the Extent to Which an Information Technology Application Provides Competitive Advantage," Management Science (40:12) pp 1601-1627	86	Compeau, D; Higgins, CA; Huff, S (1999), "Social cognitive theory and individual reactions to computing technology: A longitudinal study," MIS Quarterly (23:2) pp 145-158	73	Boudreau, MC; Gefen, D; Straub, DW (2001), "Validation in information systems research: A state-of-the-art assessment," MIS Quarterly (25:1) pp 1-16	31
21	Earl, MJ (1993), "Experiences in Strategic Information-Systems Planning," MIS Quarterly (17:1) pp 1-24	85	Seddon, PB (1997), "A respecification and extension of the DeLone and McLean model of IS success," Information Systems Research (8:3) pp 240-253	70	Mingers, J (2001), "Combining IS research methods: Towards a pluralist methodology," Information Systems Research (12:3) pp 240-259	30
22	Clemons, EK; Row, MC (1991), "Sustaining IT Advantage - The Role of Structural Differences," MIS Quarterly (15:3) pp 275-292	84	Ngwenyama, OK; Lee, AS (1997), "Communication richness in electronic mail: Critical social theory and the contextuality of meaning," MIS Quarterly (21:2) pp 145-167	69	Ravichandran, T; Rai, A (2000), "Quality management in systems development: An organizational system perspective," MIS Quarterly (24:3) pp 381-415	30
23	Alavi, M (1994), "Computer-Mediated Collaborative Learning - An Empirical-Evaluation," MIS Quarterly (18:2) pp 159-174	83	Star, SL; Ruhleder, K (1996), "Steps toward an ecology of infrastructure: Design and access for large information spaces," Information Systems Research (7:1) pp 111-134	67	Torkzadeh, G; Dhillon, G (2002), "Measuring factors that influence the success of Internet commerce," Information Systems Research (13:2) pp 187-204	29
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94	Caudle, SL; Gorr, WL; Newcomer, KE (1991), "Key Information-Systems Management Issues for the Public-Sector," <i>MIS Quarterly</i> (15:2) pp 171-188	32	Gopal, RD; Sanders, GL (1998), "International software piracy: Analysis of key issues and impacts," <i>Information Systems Research</i> (9:4) pp 380-397	25	Pinker, EJ; Seidmann, A; Vakrat, Y (2003), "Managing Online auctions: Current business and research issues," <i>Management Science</i> (49:11) pp 1457-1484	11
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	1990-94		1995-99		2000-2004	
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100	Lamberti, DM; Wallace, WA (1990), "Intelligent Interface Design - An Empirical-Assessment of Knowledge Presentation in Expert Systems," MIS Quarterly (14:3) pp 279-311	30	Walsham, G; Sahay, S (1999), "GIS for district-level administration in India: Problems and opportunities," MIS Quarterly (23:1) pp 39-65	24	Ang, S; Slaughter, SA (2001), "Work outcomes and job design for contract versus permanent information systems professionals on software development teams," MIS Quarterly (25:3) pp 321-350	10

**APPENDIX 7. MOST COMMON KEYWORDS BY JOURNAL**

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Keyword	Times Used	Keyword	Times Used	Keyword	Times Used
1	Electronic meeting systems	24	Group support systems	30	Information technology	41
2	Information technology	22	Knowledge management	27	Electronic markets	23
3	Group support systems	19	IS management	26	Internet	20
4	Decision support systems	19	Measurement	24	Software development	18
5	Decision support	16	Information systems management	23	Information systems	15
6	Brainstorming	16	Management of information systems	22	Combinatorial auctions	14
7	E-commerce	16	Information technology	22	Pricing	14
8	Model management	15	Technology acceptance model	22	Auctions	13
9	Innovation	15	Information systems development	22	Software productivity	11
10	Information systems	15	Information systems	20	Electronic commerce	11
11	Information systems development	14	Implementation	19	Software quality	11
12	Structural equation modeling	13	Interorganizational systems	18	Supply chain management	11
13	Electronic commerce	13	Information system implementation	17	Productivity	11
14	Computer-mediated communications	13	Organizational learning	17	Decision support systems	11
15	Groupware	13	Group decision support systems	16	Customer satisfaction	10
16	Technology adoption	12	Case study	16	Experimental economics	10
17	Idea generation	12	IT management	15	Capability maturity model	9
18	Human-computer interaction	11	Service quality	15	Bidding	9
19	Information quality	11	Electronic meeting systems	15	Software maintenance	8
20	User satisfaction	11	Expert systems	14	Quality	8
21	Network externalities	11	Electronic markets	14	Data envelopment analysis	8

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Keyword	Times Used	Keyword	Times Used	Keyword	Times Used
22	Information systems research	11	Longitudinal study	14	Computers	8
23	Group decision support systems	10	IT use	13	Software economics	8
24	Information systems design	10	Software project management	13	Network externalities	7
25	Research methodology	10	Strategy	12	Price discrimination	7
26	Technology acceptance model	10	User expectations	12	Stochastic models	7
27	Fit	10	Trust	12	Knowledge management	7
28	Measurement	10	Management information systems	12	Search costs	7
29	Software development	9	Executive information systems	12	Trust	7
30	Expert systems	9	Resource-based view	11	Downsizing	6
31	Incentives	9	User behavior	11	Productivity paradox	6
32	Information systems strategy	9	Competitive advantage	11	Financial services	6
33	Information technology investment	9	Adoption	11	Incentives	6
34	Scale development	9	Corporate strategy	11	Negotiation	6
35	Interorganizational systems	9	Creativity	10	Software metrics	6
36	Electronic data interchange	8	User acceptance	10	Innovation	6
37	Empirical	8	Systems development	10	Information infrastructure	6
38	Causal models	8	Innovation	10	Information goods	6
39	Computer self-efficacy	8	Partnership	10	Information technology investment	6
40	Efficiency	8	Qualitative research	10	Search	6
41	Event study	8	Decision support	10	Control	6
42	Laboratory study	8	Servqual	10	Software process improvement	5
43	Market value	8	Decision support systems	10	Computer-mediated communications	5

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Keyword	Times Used	Keyword	Times Used	Keyword	Times Used
44	End-user computing	8	IS strategic planning	10	E-commerce	5
45	Ontology	7	User satisfaction	10	Knowledge transfer	5
46	Decision making	7	IS research methodologies	10	Flexibility	5
47	Organizational design	7	Electronic data interchange	9	Coordination	5
48	Mental models	7	Action research	9	Organizational design	5
49	Internet	7	System design	9	Collusion	5
50	Technology appropriation	7	Chief information officer	9	National culture	5
51	Information technology adoption	7	Reliability	9	Individualism	5
52	Innovation diffusion	7	End-user computing	9	Outsourcing	5
53	Organizational learning	7	System analysis	9	Consumer behavior	5
54	Self-efficacy	7	Undergraduate curriculum	9	Online haggling	5
55	E-mail	7	Data integration	9	Dynamic consumer search	5
56	Business value	7	Faculty resources	9	Communication medium	5
57	E-business	7	Electronic commerce	9	Task type	5
58	Information sharing	7	Education	9	Management of computing and information systems	5
59	Inductive expert systems	7	IS personnel	9	Majority influence	5
60	Adaptive structuration theory	7	Small businesses	9	Collectivism	5
61	Model management systems	6	Causal models	8	Offshore contracting	4
62	Reliability	6	Application of information technology	8	Online auction design	4
63	Group decision making	6	Computer-mediated communications	8	IS project management	4
64	Complementarity	6	Information attributes	8	Inventory management	4
65	Computer training	6	Interorganizational information systems	8	Competition	4

Rank	Information Systems Research		MIS Quarterly		Management Science	
	Keyword	Times Used	Keyword	Times Used	Keyword	Times Used
66	IT outsourcing	6	User involvement	8	IS-client relationships	4
67	Strategic alignment	6	Field study	8	Electronic integration	4
68	Satisfaction	6	Virtual teams	8	Procurement	4
69	Impact of information technology	6	Task complexity	8	Customization	4
70	Social presence	6	IS implementation	8	Hold-up problem	4
71	System quality	6	Organizational strategies	8	Critical path	4
72	Structure	6	Collaborative work systems	8	MIP	4
73	Case studies	6	Business process redesign	8	Cost of quality	4
74	Database design	6	Career management	8	Mechanism design	4
75	Nomological network	6	Problem solving	8	Price dispersion	4
76	Longitudinal study	6	Competitive use of IS	7	Random restart	4
77	Resource-based view	6	Partial least squares	7	Contract choice	4
78	Online services	6	Shared knowledge	7	Restructuring	4
79	Team processes	6	Technology adoption	7	Longitudinal study	4
80	Individual differences	6	Self-efficacy	7	Optimization models	4
81	Information systems success	6	Ethics	7	Dynamically chosen heuristic	4
82	Feedback	6	Evaluation	7	Data quality	4
83	Electronic markets	6	Groupware	7	Computer industry	4
84	Information structure	6	Structural equation modeling	7	Decision support	4
85	Behavior modeling	6	Executive support systems	7	Online markets	4
86	Institutions	6	Resource-based theory	7	Management science	4
87	Unbundling	6	Information systems usage	7	Time-based competition	4
88	Ethics	6	Power	7	Survey	4



Rank	Information Systems Research		MIS Quarterly		Management Science	
	Keyword	Times Used	Keyword	Times Used	Keyword	Times Used
89	Instrument development	6	Chief information officers	7	Front-end investments	4
90	Construct validity	6	Issues in organizing IS	7	Game theory	4
91	Trust	6	IS research agenda	7	GDSS	4
92	Cognitive inertia	6	IS staffing issues	7	Branching heuristics	4
93	Telecommuting	6	Attitudes	7	Information product	4
94	Creativity	6	CBCS	7	Generating options	4
95	Confirmatory factor analysis	6	IS service quality	7	Team performance	4
96	Structured modeling	6	Interpretivist perspective	7	Bounding across components	4
97	Attitudes	6	User participation	7	Electronic meeting systems	4
98	Validity	6	IS project management	7	Supply chain procurement	4
99	Execution quality	6	Theory of reasoned action	7	Group decision support	4
100	Paradigms	5	Business value of IT	7	Branch and bound	4

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