

The Changing Face of Information Systems Research: A Longitudinal Study of Author Influence

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Abstract

This paper examines the impact of key authors on Information Systems research from 1986 to 2005 and analyzes changes in influence and research interests over this period. The author set was based on publication counts in top Information Systems journals, supplemented on a reputational basis with authors recognized for their contribution to the field. Citation analysis was used to identify the most influential authors and to examine changes in influence across four five-year time periods. The results show that certain key authors have exerted strong influence throughout the twenty-year period, but that a new set of authors has begun to emerge in the last five years. In addition we note that, in spite of apparent similarities between the Information Science and Information Systems fields, the gulf between these two disciplines continues to be substantial, offering researchers on both sides of the divide a significant opportunity for greater integration of research results across the disciplines.

Keywords: Information Systems research, citation analysis.

Introduction

An important contribution that Information Science can make to an emerging discipline is the charting of its development over time through the use of bibliometric techniques such as citation analysis. In this study we turn our attention to what some consider to be Information Science's

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younger sister discipline, Information Systems. While the disciplines of Information Science and Information Systems might appear to have much in common, since they both have a focus on the intersection of information, technology, processes, and people, previous research has highlighted the very limited amount of overlap between the two disciplines (Ellis, Allen, & Wilson, 1999; Sawyer & Huang, 2007; Sugimoto,

Pratt, & Hauser, 2008). The present study focuses on gaining a deeper understanding of the development of the Information Systems discipline over the twenty year period from 1986 to 2005 by examining the impact of key Information Systems authors and analyzing changes in their influence and research interests over this period.

The research reported here is part of a historical and descriptive study whose primary purpose is to examine the changing intellectual structure of the Information Systems field in the twenty years since Culnan's seminal studies (1986, 1987). In these studies, Culnan provided a snapshot of the intellectual structure of the Management Information Systems (MIS) field over the periods 1972 to 1982 and 1980 to 1985. Her studies were based on a set of authors that she had identified on a reputational basis as the most influential in the Management Information Systems field at that time. In the subsequent twenty years, scholars have continued to debate the nature and structure of the Information Systems discipline (Benbasat & Zmud, 2003; Lyytinen & King, 2004; Orlikowski & Iacono, 2001), and now that the field has grown over a longer period, we are able to examine changes in author influence over time. The aims are twofold: first, to highlight those seminal researchers whose contributions have significantly helped to frame the development and direction of the Information Systems field over the past twenty years; and, second, to identify key emerging researchers who are likely to have considerable impact in coming years, and whose research directions might be indicative of future areas of growth and consolidation, and potential cross-discipline collaboration. (We note that, in recent years, the term 'information systems' (IS) has become more commonly used than 'management information systems' (MIS), and thus, following Davis' (1999) convention and more recent trends, we use 'information systems' unless referring to a early paper, such as Culnan's, which reported specifically on management information systems.)

We base our study on the hypothesis that the extent of citations during a given period to an author's body of work is indicative of the impact and influence of that author over that period of time. We note that a single article may be cited for many reasons, including the possibility that the article is a poor example of research in the field. Thus, reliance on citations to a *single work* as an indication for influence may lead to an unjustified conclusion about the positive impact of the work and its author (Aksnes, 2006). However, by examining citations to an author's *entire oeuvre* over a period, we minimize the risk of drawing false conclusions from a single article that has been highly cited for negative reasons. Indeed, citation frequencies are well correlated with other measures of an author's influence or impact (Aksnes, 2006).

The present study reports the first stage of the research, and our aim here was to identify the core Information Systems knowledge producers across the twenty year period from 1986 to 2005 and to examine changes in author influence during that period. Further, by examining the research areas of those researchers who were highly cited in each of four five-year time blocks (1986 to 1990, 1991 to 1995, 1996 to 2000, 2001 to 2005), we sought to identify key areas that might reflect new and emerging foci of research. In the next section, we discuss in detail the selection of the author set, and retrieval of citations and author data. We then present results and discussion, and finally discuss limitations and conclude with plans for future study.

Method

The study used citation analysis of a set of key authors in the Information Systems field. Citation analysis has a long tradition of application as a measure of author influence in a discipline (Adkins & Budd, 2006; Grover, Ayyagari, Gokhale, Lim, & Coffey, 2006). A basic assumption is that the influence of an author can be measured by the number of citations to the author in published articles in the field. Citations to authors' publications were retrieved from the Web of Science *Social Sciences Citation Index*. Hence the study is limited by the range of journals indexed by SSCI, and by its indexing methods. In particular, all researchers who share authorship of a

journal article indexed by SSCI will be retrieved in a citation search, no matter what their position on the authorship list. However, only the first author of jointly authored books is indexed by SSCI, and hence the influence of researchers who have been a second or subsequent author on an influential book will be underestimated.

The study was conducted in two stages. In the first stage we identified the set of authors to be used for the analysis, while the second stage involved retrieving citation records and author data for the analysis of influence and changes in influence.

Selection of the Author Set

The choice of key authors was a critical decision for the study. Information systems is a broad and multidisciplinary field, and thus it was important to ensure that the set of authors covered the breadth of the field over the span of years being investigated and included those who have been recognized as the key or seminal authors in the Information Systems discipline. Previous studies have typically based their author selection on: publication counts (Chua, Cao, Cousins, & Straub, 2002) or reputation, including reputation-based surveys of experts in the field (Bayer, Smart, & McLaughlin, 1990; Culnan, 1987; Culnan, O'Reilly, & Chatman, 1990); lists of award winners (Bayer et al., 1990); and scholars named in review books or articles over-viewing the development of the field (Ellis et al., 1999).

We used both reputation and publication count to identify highly influential researchers in the Information Systems field. We started with Culnan's 1987 reputational list of authors and supplemented this list from two sources. First, to ensure the inclusion of key foundational authors, whose influential works were published in books or management-based journals before Information Systems-specific journals were established, we added those researchers who have been recognized by the Association of Information Systems (AIS) for their outstanding contributions to the field. The AIS has conferred thirteen LEO awards for "lifetime exceptional achievement in information systems" and 36 AIS Fellow awards, which recognize "individuals who have made outstanding contributions to the Information Systems discipline in terms of research, teaching, and service". The Leo award winners and AIS Fellows not already on Culnan's list were added. Second, in order to expand UK/European representation, we included ten Information Systems authors identified on a reputational basis in a UK-based comparative study of Information Science and Information Systems research (Ellis et al., 1999).

The reputational approach ensured that we had identified contributors who have demonstrated sustained influence in the field, but was not as effective in identifying those researchers whose influence is more recent or still emerging. To capture researchers of more recent influence, we used publication counts to identify authors whose papers have been recognized by editors and reviewers of the leading Information Systems journals as making a substantial contribution to the Information Systems domain. Focusing on journals that specialize in Information Systems research, we selected the three leading journals in the field, *MIS Quarterly* (MISQ), *Information Systems Research* (ISR) and *Journal of Management Information Systems* (JMIS) (Saunders, n.d.). We examined MISQ from 1984 through 2005 and all articles in ISR and JMIS from their inceptions in 1990 and 1984, respectively, and used an arbitrary cut-off point of at least eight publications (excluding editorials) to select the 62 most highly published researchers in these top three Information Systems journals. In addition, since these three journals (MISQ, ISR and JMIS) represent the North American academy but may under-represent UK and European contributors, we also examined two highly ranked UK/European journals, *Information Systems Journal* (ISJ) and *European Journal of Information Systems* (EJIS) from their inceptions in 1991. A further nine authors, who each had at least four publications across these two journals, were added. The final author list comprised 117 authors as shown in Table 1 in the Appendix.

Retrieval of Citations and Author Data

Citation records for each author were retrieved from the *ISI Web of Science* database. We restricted the citation search to the years 1986-2005 and to the *Social Science* database in order to reduce the number of problems arising from authors with the same name writing in different fields. Where we were aware that an author had published with one or two initials (e.g. Orlikowski W and Orlikowski WJ) or that an author's name was frequently misspelled in citations (e.g. Hirschheim is often cited as Hirscheim) we searched using both alternatives. We limited the citing references to articles in English, thus eliminating references in working papers, theses and other works of limited accessibility to other writers in the field. Finally, we restricted the resulting sets of citing references to a broad set of information systems subject categories both to identify the most influential authors specifically in the Information Systems field and to further reduce the likelihood of contamination from authors with the same name working in other social science fields. Five authors (Ritu Agarwal, Alok Gupta, Michael Jackson, John Ward, and Ron Weber) required intensive manual analysis to distinguish their citations from those to other authors of the same name and initially working in the Information Systems field. We retrieved a total of 30059 citations referencing authors in the author set, comprising 7798 unique articles, since many of these citations referenced more than one of the authors from the set.

We prepared brief biographies of each author, drawing from information posted by these authors on their web-sites, where available, including details of their current research interests. We used a content analysis procedure to classify the great variety of reported research interests into categories using Swanson and Ramiller's (1993) classification scheme as a framework. Research topics that did not seem to fit any of these categories were initially assigned to an 'Other' category, which was subsequently re-analyzed to identify emerging themes that may not have been prominent when Swanson and Ramiller developed their scheme.

Results

The Most Influential Authors

Table 1 displays the rank, total raw citation counts, and relative citation frequencies for the 117 authors for the twenty-year period and for each five-year sub-period (1986-1990, 1991-1995, 1996-2000, 2001-2005), with the author set arranged in descending order of total number of Information Systems-related citations across the twenty year period. Fifteen of the thirty most highly cited authors across the whole twenty year period were also in the set identified by Culnan (1987). Not surprisingly, our author selection process favors authors who have been publishing for the longest time, since they have had the greatest opportunity of being cited. While the staying power of some of our leading authors suggests a certain stability of influence on the Information Systems field over time, it is also encouraging to note the introduction of a new generation of Information Systems researchers, as shown in Table 2, which reports the top ten authors for each sub-period. Indeed, while nine of the top ten authors in the first two periods (1986-90 and 1991-95) are Culnan authors (shown in bold), the last two periods show the increasing influence of more recent researchers, with the Culnan authors reducing to six in the 1996-2000 period, and only three Culnan authors remaining in the 2001-2005 period.

Five authors, all from Culnan's original set (Benbasat, Huber, Ives, Keen, and Zmud) appear in the top ten of three of the four periods and, not surprisingly, feature prominently in the overall top ten. Clearly these authors have had a long and sustained influence on the field. In contrast, in the most recent period, 2001 to 2005, five of the top ten authors (Grover, Orlikowski, Todd, Straub, and Igarria) had less than ten citations in the earliest period, highlighting their relative youth as publishers in the field. Sadly, two of the newer highly cited authors (DeSanctis, who is tenth

Table 2: Top ten authors by five year period (Culnan authors in bold)

Period	Top Ten authors for period	Original discipline	Citations for period	
1986-90	Keen PGW	Psychology	131	4.48%
	Ackoff RL	Philosophy	116	3.97%
	Lucas HCJ	MIS	113	3.87%
	Ives B	MIS	96	3.28%
	Rockart JF	MIS	96	3.28%
	Sprague RH	Quantitative Business Analysis	90	3.08%
	Dickson GW	Business Administration	86	2.94%
	Huber GP	Industrial Engineering	83	2.84%
	Churchman CW	Philosophy	76	2.60%
	Olson MH	MIS	74	2.53%
1991-95	Keen PGW	Psychology	211	3.34%
	Ives B	MIS	206	3.27%
	Rockart JF	MIS	194	3.07%
	Huber GP	Industrial Engineering	161	2.55%
	DeSanctis G	MIS	156	2.47%
	Zmud RW	Business Administration	148	2.35%
	Dickson GW	Business Administration	140	2.22%
	Benbasat I	MIS	136	2.16%
	Robey D	Administrative Science	135	2.14%
	Ackoff RL	Philosophy	120	1.90%
1996-00	Benbasat I	MIS	242	2.51%
	Ives B	MIS	236	2.45%
	Zmud RW	Business Administration	235	2.44%
	Orlikowski WJ	MIS	227	2.35%
	Markus ML	Organizational Behavior	215	2.23%
	Huber GP	Industrial Engineering	212	2.20%
	Keen PGW	Psychology	200	2.07%
	Jarvenpaa SL	Management	198	2.05%
	Venkatraman N	Management	189	1.96%
	DeSanctis G	MIS	175	1.81%
2001-05	Jarvenpaa SL	Management	319	2.88%
	Grover V	MIS	310	2.79%
	Benbasat I	MIS	301	2.71%
	Orlikowski WJ	MIS	293	2.64%
	Zmud RW	Business Administration	283	2.55%
	Markus ML	Organizational Behavior	236	2.13%
	Todd PA	MIS	229	2.06%
	Straub DW	MIS	227	2.05%
	Venkatraman N	Management	223	2.01%
	Igbaria M	Computers & Information Systems	201	1.81%

overall, fifth in the 1991 to 1995 period, and tenth in the 1996 to 2000 period, and Igarria, who is tenth in the latest period) are recently deceased, and while their works continue to be influential, the field is deprived of any new contributions from these highly valued authors.

An examination of the lower ranked authors in Table 1 reveals that 22 have no publications available to cite in the first five year period. The impact of these researchers on the Information Systems field may well be seen more substantially in future years. Some of the other low-cited authors are surprising, however, and highlight other limitations of using citation analysis as a tool for examining influence in a field. For example, Langefors has been recognized with a Leo Award for his contributions to Information Systems research and practice, particularly in Scandinavia, and his low citation rate here is an example of two biases set by our research design. First, our focus on English language articles disadvantages researchers whose influence has been primarily in non-English speaking countries. Second, the citation analysis approach under-recognizes those whose contribution has been primarily through books rather than articles, and more in teaching and service areas than in research. Similarly, Neumann, an AIS Fellow, has been recognized for his impact on Information Systems teaching, practice, and research in Israel, but is under-recognized by our citation count approach. Another limitation is that second or subsequent authors of books do not get citation credits under the SSCI citation indexing system, and this is reflected in Carlson's low count. Carlson was a second author with Sprague on a key book, "Building Effective Decision Support Systems", and it is worth noting that 166 of the 311 citations recorded for Carlson's co-author, Sprague, are citations to their co-authored book. Finally, Jackson has been highly cited in the Web of Science database, reflecting his influence in more technical computer science areas, and our deliberate exclusion of citations in those technical areas, in order to keep our focus as tightly as possible on the Information Systems field, gives him a lower rating in this study.

Changes in Influence

In addition to examining those authors who were highly cited in each period, we also analyzed changes in citation percentages to reveal changes in influence of key authors over the twenty year time frame. Figure 1 shows the changes in citation percentages from one period to the next for the top ten most highly cited authors across the twenty year period (annotated with 'Top 10' in Figure 1) and for the authors showing the highest levels of increase and decline in citation percentages between the first and last periods of study. Note that this figure is intended to highlight the key *changes* in influence rather than overall *level* of influence, and hence authors whose citation rate over the twenty year period has been high but steady appear on the figure in the middle with very small bars.

Most of the overall top ten authors appear in the center of Figure 1, indicating a steady and continuing influence across the periods. However, Orlikowski and Jarvenpaa are noticeable both for their overall impact and for their dramatic positive increases in influence. On the other hand, authors who have high overall ranking but also high negative change in citation rate – in particular Ives and Keen – may have peaked in terms of their direct influence on the field, although they are likely to still be indirectly influential, with citers moving over time to citing authors who in turn cited the originals. Indeed, it is interesting to note that Ives and Jarvenpaa have co-authored a number of papers, and it is possible that newer researchers are now turning to Jarvenpaa rather than Ives when citing prior work. Authors also of particular interest in Figure 1 are the three who have not yet appeared in one of the top ten lists – Agarwal, Willcocks, and Leidner – since their rapid increase in citation rate suggests that these are authors who are likely to have considerable impact on the Information Systems field in the next decade.

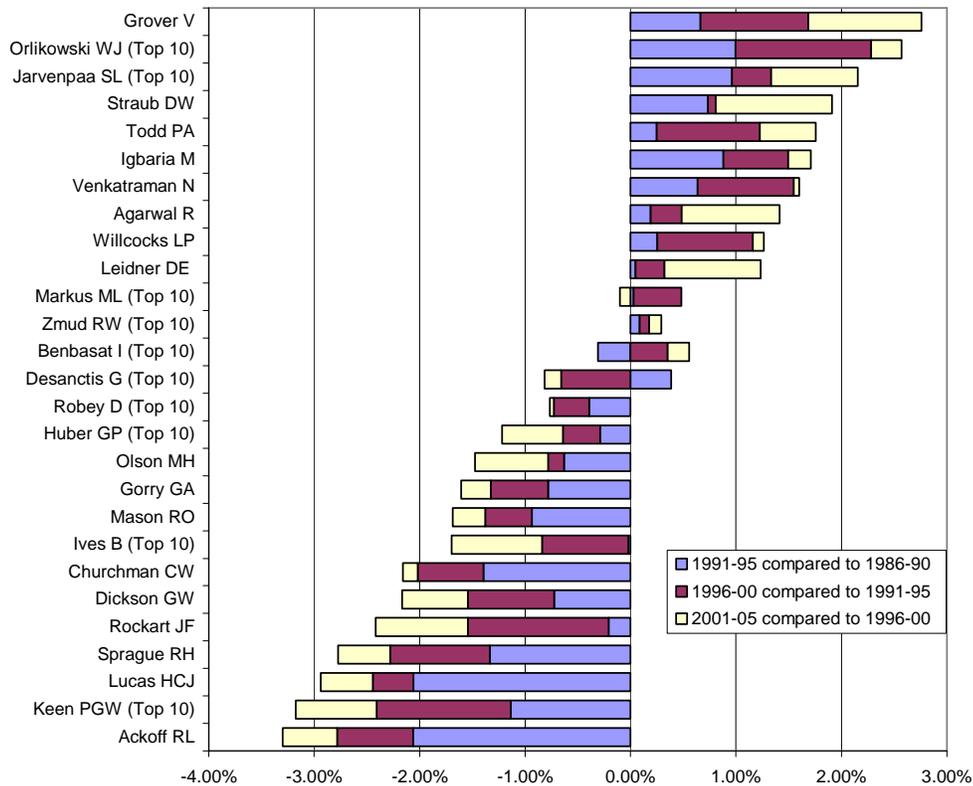


Figure 1: Changes in influence for authors of overall impact and greatest change

Demographics of the Author Set

One of our initial aims in developing the author set was to extend our view beyond the more typical North American focus and ensure that we included influential researchers from around the globe. In contrast with Culnan's 1987 study, where 38 (95%) of the 42 authors were affiliated with US or Canadian institutions, our 117 author list does have a wider constituency. While 91 (78%) of the 117 authors are North American based, 18 (15%) of the researchers are affiliated with UK or other European countries, and the remaining eight (7%) are drawn from Australia, Hong Kong, and Israel. It is also encouraging to note a doubling in percentage terms in the number of female authors, from only 3 (7%) of Culnan's 42 authors to 16 (14%) of our 117 author set.

We also examined the original discipline of these researchers, as evidenced by their PhD topic area. Of those researchers who are PhD or DBA qualified (7 did not have a PhD or DBA), almost half (46%) have a degree in an Information Systems or Management Information Systems-related area. Another 22% were trained in Business or Management areas, 10% in Computer Science, and 7% in Decision Science. The range of topics in the remaining 15% is considerable, including Architecture, Engineering, English, Mathematics, Philosophy, Psychology, and Sociology.

Looking at the original disciplines of the top ten researchers in each period, shown in Table 2, we noted that even in the earliest period, 1986-90, four of the top ten authors have Management Information Systems qualifications, while two have a management background and the remaining four come from other disciplines. The number of Management Information Systems qualified top ten authors remains at four until the most recent period, 2001-05, when it increases to six. Authors with management or business-related backgrounds increase to three in 1991-95 and then level off at four in the last two time periods. By 2001-05, authors from disciplines other than

Management Information Systems or management are no longer featuring in the top ten most cited authors, suggesting that the Information Systems field is beginning to mature to some extent, in that researchers are increasingly referencing Information Systems authors, rather than drawing from writers from outside disciplines. However, the steady presence of management-related authors in the top ten most cited lists suggests that a strong link exists between management and Information Systems research interests.

Table 3: Research topics for top ten authors for each time period, and for high citation increase authors.

Research topic (based on Swanson & Ramiller 1993 scheme)	No. of top ten authors coded with research topic				Highest citation increase
	1986-90	1991-95	1996-00	2001-05	
Computer-supported Cooperative Work	1	2	1	1	2
Information & Interface	1	1	2	2	1
Decision Support/Knowledge-based Systems	4	3	1	1	1
Systems Projects	2	2	1	0	1
Evaluation & Control	1	0	0	3	4
Users	2	3	2	2	2
Economics & Strategy	1	1	2	4	4
Introduction & Impact	3	4	4	6	5
IS Research	2	1	0	1	2
Other topics ^a	3	2	3	5	7

^a [E-commerce, knowledge management, international issues, distributed teams/on-line communities]

Research Areas

We categorized the research areas self-reported by authors on their personal websites, using the top level of Swanson and Ramiller's (1993) classification scheme. Table 3 shows the number of top ten authors in each time period coded to each research area. The final column of Table 3 shows the research areas for the ten authors showing greatest percentage increase in citations (i.e., Grover, Orlikowski, Jarevenpaa, Straub, Igbaria, Todd, Agarwal, Venkatraman, Willcocks, and Leidner, as shown in the top of Figure 1). Since the areas reported by researchers most likely reflect their current interests, rather than the interests they may have focused on twenty years ago, the figures shown for the earlier time periods should be interpreted cautiously. However, it is worth noting that researchers reporting a current focus on Decision Support and Knowledge-based Systems featured highly in the first ten years (1986 to 1995), but declined in the later time periods. In contrast, highly cited researchers in the last ten years from 1996 to 2005 reported an increasing focus on Economics and Strategy, and Evaluation and Control. The area of Introduction and Impact featured highly in all four periods, but was most prominent in the latest period, from 2001 to 2005. These three areas (Economics and Strategy, Evaluation and Control, and Introduction and Impact) also featured most highly among those researchers showing rapid increase in citation rates. There was a steady increase across the twenty year period in the number of re-

searchers reporting other topics that were not well catered for in the Swanson and Ramiller framework, such as e-commerce, knowledge management, international issues, and distributed teams/on-line communities (shown as ‘other topics’ in Table 3). These topics also featured prominently in the research interests listed by seven of the authors showing greatest percentage increase in citations (namely, Grover, Jarvenpaa, Straub, Igbaria, Agarwal, Willcocks and Leidner), and may suggest key areas of research focus for the coming decade.

Table 4: Top twenty journals containing citing references

Journal Title	No. of citing references
Information & Management	561
MIS Quarterly	420
European Journal Of Operational Research	286
Omega-International Journal Of Management Science	272
International Journal Of Information Management	270
Management Science	246
Journal Of The Operational Research Society	240
Journal Of Computer Information Systems	236
Decision Support Systems	224
Journal Of Information Technology	211
Information Systems Research	201
Behaviour & Information Technology	189
Journal Of Management Information Systems	174
European Journal Of Information Systems	159
Information Systems Journal	154
International Journal Of Technology Management	148
International Journal Of Human-Computer Studies	142
Communications Of The ACM	141
Interfaces	124
Journal Of Strategic Information Systems	121

Journals

The range of journals containing the citing references was extensive: the 7783 unique titles in our set of citing references were published in 281 different journals. However, as Table 4 shows, the top twenty journals accounted for well over half of the citing references. This table also reveals a limitation of reliance on Web of Science databases for citation analysis: Web of Science does not yet fully index all years of some of the relevant journals. In particular, the Journal of Management Information Systems is only indexed from 1996 onwards, and hence is under-represented both here, and in the authors’ citation counts.

Subject Categories

The Web of Science database includes subject categories for every article, and the 7784 unique citing articles were categorized with fifty seven different subject categories, with many articles carrying two or more codes. These categories covered a very wide range of areas, including che-

mistry, linguistics, law, history, agriculture, mathematics, transportation, and geography. However, the great majority of categories fell into familiar territory as shown in Table 5, which lists the subject categories accounting for at least 1% of the category usage. Not surprisingly, Computer Science-Information Systems and Information Science & Library Science categories were the most common with 19% of the codes each, followed by Management (17%), Computer Science-Other (15%) and Operations Research & Management Science (12%). Perhaps more surprising is the strength of contribution to Medicine (1%) primarily through contributions to medical informatics.

Table 5: Top subject categories

Subject category	No. of articles	%
Computer Science – Information Systems	3176	19
Information Science & Library Science	3107	19
Management	2878	17
Computer Science – Other	2527	15
Operations Research & Management Science	2043	12
Engineering	1017	6
Ergonomics	790	5
Psychology	355	2
Medicine	143	1
Telecommunications	100	1
Education & Educational Research	91	1
Twenty-five other categories	394	2

Conclusion

In summary, we have investigated the landscape of the Information Systems field across a twenty year period from 1986 to 2005, in terms of its most influential, and newly emerging, authors. Our study identifies key authors, including Benbasat, Huber, Ives, Keen and Zmud, who have had a sustained influence over the field for more than twenty years. More recently, a number of newer contributors, including Grover, Orlikowski, Jarvenpaa, Todd, and Straub, have become highly cited, and three emerging authors – Agarwal, Leidner, and Willcocks - are receiving rapidly increasing attention through citations. The research interests of these authors may point to new directions for the Information Systems field in the future, with an emerging focus on topics such as economics and strategy, e-commerce, knowledge management, international issues, and on-line communities.

There are a number of limitations to the use of citations to an author’s body of work as a measure of influence. In particular, citing authors may cite a researcher’s work for many reasons, including negative and spurious citations. A citation to a researcher’s brief report in a practitioner journal is treated on the same level as a citation to a major research article in a leading journal in the field. Newer researchers will be under-represented since citations always lag behind publications; just by being in the field a long time, older researchers are more likely to have received more citations. In spite of these drawbacks, we argue that the present analysis of citation frequencies has provided a useful and interesting picture of author influence and impact in the Information Systems field.

An examination of the original disciplines of the top ten cited authors in each time period suggests the field is slowly moving towards greater reliance on its own scholars. However, similar to Ellis, Allen and Wilson's (1999) findings, we note that there is no overlap between the leading authors that we have identified in the Information Systems field and the author set identified in White and McCain's (1998) seminal study on the Information Science discipline. In spite of the apparent similarities between the fields – both are focused on the interactions of people, processes, and technology with information – the gulf between the two disciplines is substantial. This gap offers researchers on both sides of the divide a significant opportunity for greater integration of research results across the disciplines.

The gulf between the two disciplines may in part be due to their differing origins, with Information Science emerging from the field of librarianship, while Information Systems is a relatively recent offshoot from the management field. Indeed, the strong prominence in this study of authors with business and management backgrounds reflects the continuing influence of the management field and may highlight a blurring of the boundaries between Information Systems and Management Studies. Indeed, the emerging topics mentioned above could be equally at home in management journals. While the evidence here for such blurred boundaries is limited and speculative, it does provide some input for the ongoing debate on the core identity of the Information Systems field. Clearly, more work is needed to clarify the changes in the discipline over time, and subsequent stages of this research are planned, using a co-citation analysis approach to delve deeper into the key research areas that are evolving in the Information Systems field.

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The Changing Face of Information Systems Research

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Appendix

Table 1: Author list, reason for inclusion, overall rank, and raw and relative citation frequencies.
 [Culnan authors in bold; n/a indicates no publications to cite in this period]

Authors	Reason for Inclusion	Total citations 86-05			1986-90 citations			1991-95 citations			1996-00 citations			2000-05 citations		
		Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%
Benbasat I	MISQ, ISR, JMIS publications (39)	1	751	2.5%	13	72	2.5%	8	136	2.2%	1	242	2.5%	3	301	2.7%
Zmud RW	MISQ, ISR, JMIS publications (29)	2	732	2.4%	16	66	2.3%	6	148	2.3%	3	235	2.4%	5	283	2.6%
Ives B	MISQ, ISR, JMIS publications (34)	3	714	2.4%	4	96	3.3%	2	206	3.3%	2	236	2.4%	14	176	1.6%
Keen PGW	Culnan 87 study	4	687	2.3%	1	131	4.5%	1	211	3.3%	7	200	2.1%	21	145	1.3%
Jarvenpaa SL	MISQ, ISR, JMIS publications (18)	5	644	2.1%	45	21	0.7%	20	106	1.7%	8	198	2.1%	1	319	2.9%
Huber GP	Culnan 87 study	6	636	2.1%	8	83	2.8%	4	161	2.6%	6	212	2.2%	13	180	1.6%
Markus ML	MISQ, ISR, JMIS publications (11)	7	614	2.0%	22	51	1.7%	17	112	1.8%	5	215	2.2%	6	236	2.1%
Orlikowski WJ	MISQ, ISR, JMIS publications (9)	8	589	2.0%	85	2	0.1%	38	67	1.1%	4	227	2.4%	4	293	2.6%
Robey D	MISQ, ISR, JMIS publications (15)	9	579	1.9%	10	74	2.5%	9	135	2.1%	11	174	1.8%	11	196	1.8%
DeSanctis G	MISQ, ISR, JMIS publications (9)	10	576	1.9%	18	61	2.1%	5	156	2.5%	10	175	1.8%	12	184	1.7%
Rockart JF	Leo Award	11	554	1.8%	4	96	3.3%	3	194	3.1%	13	168	1.7%	50	96	0.9%
Grover V	MISQ, ISR, JMIS publications (24)	12	521	1.7%	88	1	0.0%	59	44	0.7%	14	166	1.7%	2	310	2.8%
Venkatraman N	Ellis et al. 99 study	13	490	1.6%	61	12	0.4%	39	66	1.0%	9	189	2.0%	9	223	2.0%
Olson MH	Culnan 87 study	14	480	1.6%	10	74	2.5%	10	120	1.9%	12	169	1.8%	12	117	1.1%
King WR	MISQ, ISR, JMIS publications (12)	15	472	1.6%	14	69	2.4%	21	103	1.6%	20	145	1.5%	17	155	1.4%
Lucas HCJ	AIS Fellow	16	467	1.6%	3	113	3.9%	15	114	1.8%	15	137	1.4%	46	103	0.9%
Dickson GW	Culnan 87 study	17	447	1.5%	7	86	2.9%	7	140	2.2%	22	135	1.4%	56	86	0.8%
Kling R	Leo Award	18	441	1.5%	27	43	1.5%	34	72	1.1%	18	152	1.6%	15	174	1.6%
Nunamaker JF	MISQ, ISR, JMIS publications (36)	19	435	1.5%	49	18	0.6%	10	120	1.9%	16	160	1.7%	25	137	1.2%
McFarlan FW	Culnan 87 study	20	431	1.4%	12	73	2.5%	14	117	1.9%	24	129	1.3%	40	112	1.0%
Wetherbe JC	MISQ, ISR, JMIS publications (8)	21	428	1.4%	26	45	1.5%	10	120	1.9%	15	165	1.7%	48	98	0.9%
Ackoff RL	Culnan 87 study	22	424	1.4%	2	116	4.0%	10	120	1.9%	28	114	1.2%	64	74	0.7%
Todd PA	MISQ, ISR, JMIS publications (11)	23	421	1.4%	67	9	0.3%	66	35	0.6%	19	148	1.5%	7	229	2.1%
Igbaria M	MISQ, ISR, JMIS publications (14)	24	420	1.4%	83	3	0.1%	43	62	1.0%	17	154	1.6%	10	201	1.8%
Checkland P	Ellis et al. 99 study	25	395	1.3%	20	54	1.8%	16	113	1.8%	28	114	1.2%	39	114	1.0%
Straub DW	MISQ, ISR, JMIS publications (18)	26	377	1.3%	76	4	0.1%	48	55	0.9%	46	91	0.9%	8	227	2.0%
Baroudi JJ	MISQ, ISR, JMIS publications (9)	27	374	1.2%	34	33	1.1%	23	97	1.5%	23	134	1.4%	42	110	1.0%
Lederer AL	MISQ, ISR, JMIS publications (10)	28	365	1.2%	63	11	0.4%	28	85	1.3%	28	114	1.2%	17	155	1.4%
Davis GB	MISQ, ISR, JMIS publications (11)	29	362	1.2%	14	69	2.4%	22	100	1.6%	36	101	1.0%	51	92	0.8%

Authors	Reason for Inclusion	Total citations 86-05			1986-90 citations			1991-95 citations			1996-00 citations			2000-05 citations		
		Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%
Kraemer KL	MISQ, ISR, JMIS publications (12)	30	352	1.2%	34	33	1.1%	29	83	1.3%	42	97	1.0%	24	139	1.3%
Dennis AR	MISQ, ISR, JMIS publications (23)	31	346	1.2%	64	10	0.3%	37	70	1.1%	24	129	1.3%	25	137	1.2%
Hiltz SR	MISQ, ISR, JMIS publications (8)	32	345	1.2%	24	50	1.7%	24	90	1.4%	32	113	1.2%	51	92	0.8%
Alavi M	MISQ, ISR, JMIS publications (8)	33	340	1.1%	37	30	1.0%	46	59	0.9%	38	100	1.0%	19	151	1.4%
Konsynski BR	Culnan 87 study	34	331	1.1%	34	33	1.1%	19	109	1.7%	41	98	1.0%	53	91	0.8%
Clemons EK	MISQ, ISR, JMIS publications (31)	35	324	1.1%	64	10	0.3%	33	73	1.2%	40	99	1.0%	22	142	1.3%
Hirschheim R	Ellis et al. 99 study	36	319	1.1%	70	6	0.2%	40	65	1.0%	27	121	1.3%	35	127	1.1%
Sprague RH	MISQ, ISR, JMIS publications (9)	37	311	1.0%	6	90	3.1%	18	110	1.7%	58	77	0.8%	91	34	0.3%
Vessey I	AIS Fellow	38	307	1.0%	41	24	0.8%	34	72	1.1%	28	114	1.2%	49	97	0.9%
Swanson EB	Culnan 87 study	39	302	1.0%	29	41	1.4%	27	86	1.4%	48	88	0.9%	55	87	0.8%
Watson RT	MISQ, ISR, JMIS publications (13)	40	299	1.0%	64	10	0.3%	61	41	0.6%	38	100	1.0%	20	148	1.3%
Vogel DR	MISQ, ISR, JMIS publications (11)	41	290	1.0%	54	15	0.5%	25	88	1.4%	35	105	1.1%	60	82	0.7%
Mumford E	Leo Award	42	287	1.0%	27	43	1.5%	44	61	1.0%	34	108	1.1%	63	75	0.7%
Valacich JS	MISQ, ISR, JMIS publications (8)	43	280	0.9%	85	2	0.1%	57	45	0.7%	26	128	1.3%	44	105	0.9%
Ginzberg MJ	AIS Fellow	44	279	0.9%	22	51	1.7%	30	78	1.2%	55	79	0.8%	66	71	0.6%
Whinston AB	MISQ, ISR, JMIS publications (17)	45	269	0.9%	56	13	0.4%	69	32	0.5%	48	88	0.9%	28	136	1.2%
King JL	MISQ, ISR, JMIS publications (25)	46	268	0.9%	31	35	1.2%	25	88	1.4%	54	80	0.8%	71	65	0.6%
Willcocks LP	ISI/EJIS publications (9)	46	268	0.9%	-	n/a	-	85	16	0.3%	33	112	1.2%	23	140	1.3%
Mason RO	Leo Award	48	267	0.9%	17	63	2.2%	31	77	1.2%	60	75	0.8%	79	52	0.5%
Higgins CA	MISQ, ISR, JMIS publications (9)	49	265	0.9%	76	4	0.1%	62	38	0.6%	48	88	0.9%	29	135	1.2%
Barki H	MISQ, ISR, JMIS publications (11)	50	257	0.9%	76	4	0.1%	59	44	0.7%	53	81	0.8%	33	128	1.2%
Churchman CW	Leo Award	50	257	0.9%	9	76	2.6%	32	76	1.2%	67	56	0.6%	82	49	0.4%
Goodhue DL	MISQ, ISR, JMIS publications (8)	52	249	0.8%	88	1	0.0%	71	31	0.5%	51	83	0.9%	31	134	1.2%
Walsham G	ISI/EJIS publications (5)	53	248	0.8%	73	5	0.2%	76	26	0.4%	44	95	1.0%	37	122	1.1%
Nolan RL	Culnan 87 study	54	246	0.8%	19	57	1.9%	36	71	1.1%	60	75	0.8%	85	43	0.4%
Tam KY	MISQ, ISR, JMIS publications (13)	55	242	0.8%	88	1	0.0%	74	27	0.4%	51	83	0.9%	32	131	1.2%
Bostrom RP	MISQ, ISR, JMIS publications (9)	56	240	0.8%	56	13	0.4%	45	60	1.0%	46	91	0.9%	62	76	0.7%
Guimaraes T	MISQ, ISR, JMIS publications (9)	57	236	0.8%	42	23	0.8%	54	46	0.7%	42	97	1.0%	67	70	0.6%
Lyytinen K	AIS Fellow	58	231	0.8%	70	6	0.2%	63	37	0.6%	59	76	0.8%	40	112	1.0%
Eindor P	AIS Fellow	59	223	0.7%	31	35	1.2%	47	56	0.9%	57	78	0.8%	78	54	0.5%
Galliers RD	Ellis et al. 99 study	60	220	0.7%	88	1	0.0%	66	35	0.6%	36	101	1.0%	59	83	0.7%
Mukhopadhyay T	MISQ, ISR, JMIS publications (14)	61	217	0.7%	-	n/a	-	93	10	0.2%	55	79	0.8%	33	128	1.2%
Agarwal R	MISQ, ISR, JMIS publications (15)	62	216	0.7%	-	n/a	-	89	12	0.2%	73	47	0.5%	16	157	1.4%

Authors	Reason for Inclusion	Total citations 86-05			1986-90 citations			1991-95 citations			1996-00 citations			2000-05 citations		
		Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%
Lee AS	MISQ, ISR, JMIS publications (20)	63	203	0.7%	88	1	0.0%	80	24	0.4%	45	92	1.0%	56	86	0.8%
Watson HJ	MISQ, ISR, JMIS publications (11)	64	196	0.7%	39	28	1.0%	52	49	0.8%	65	63	0.7%	77	56	0.5%
McKenney JL	AIS Fellow	65	194	0.6%	31	35	1.2%	53	48	0.8%	64	66	0.7%	83	45	0.4%
Mingers J	Ellis et al. 99 study	66	190	0.6%	67	9	0.3%	51	50	0.8%	66	57	0.6%	64	74	0.7%
Gorry GA	Culnan 87 study	67	188	0.6%	21	53	1.8%	40	65	1.0%	73	47	0.5%	104	23	0.2%
Chen PPS	Culnan 87 study	68	184	0.6%	25	46	1.6%	42	64	1.0%	80	39	0.4%	89	35	0.3%
Barua A	MISQ, ISR, JMIS publications (9)	69	182	0.6%	-	n/a	-	100	4	0.1%	62	71	0.7%	43	107	1.0%
Sambamurthy V	MISQ, ISR, JMIS publications (15)	70	178	0.6%	-	n/a	-	89	12	0.2%	78	41	0.4%	36	125	1.1%
Leidner DE	MISQ, ISR, JMIS publications (9)	71	171	0.6%	-	n/a	-	104	3	0.0%	96	31	0.3%	25	137	1.2%
Chin WW	MISQ, ISR, JMIS publications (9)	72	170	0.6%	-	n/a	-	108	2	0.0%	91	33	0.3%	29	135	1.2%
Boland RJ	Culnan 87 study	73	168	0.6%	52	16	0.5%	71	31	0.5%	71	51	0.5%	67	70	0.6%
Lacity MC	ISJ/EJIS publications (4)	73	168	0.6%	-	n/a	-	85	16	0.3%	63	67	0.7%	58	85	0.8%
Couger JD	Leo Award	75	166	0.6%	42	23	0.8%	49	54	0.9%	70	54	0.6%	89	35	0.3%
Rivard S	MISQ, ISR, JMIS publications (8)	76	163	0.5%	51	17	0.6%	54	46	0.7%	76	43	0.4%	76	57	0.5%
Kettinger WJ	MISQ, ISR, JMIS publications (10)	77	160	0.5%	88	1	0.0%	104	3	0.0%	69	55	0.6%	47	101	0.9%
Kauffman RJ	MISQ, ISR, JMIS publications (20)	78	153	0.5%	-	n/a	-	88	14	0.2%	85	35	0.4%	45	104	0.9%
Kriebel CH	Culnan 87 study	79	152	0.5%	56	13	0.4%	84	18	0.3%	67	56	0.6%	71	65	0.6%
Anthony RN	Culnan 87 study	80	150	0.5%	29	41	1.4%	54	46	0.7%	85	35	0.4%	97	28	0.3%
Liang TP	AIS Fellow	81	147	0.5%	76	4	0.1%	57	45	0.7%	75	46	0.5%	79	52	0.5%
Chervany NL	Culnan 87 study	82	144	0.5%	48	19	0.6%	85	16	0.3%	104	18	0.2%	53	91	0.8%
Wiseman CM	Ellis et al. 99 study	83	139	0.5%	45	21	0.7%	50	52	0.8%	77	42	0.4%	102	24	0.2%
Saunders CS	MISQ, ISR, JMIS publications (8)	84	134	0.4%	73	5	0.2%	89	12	0.2%	81	37	0.4%	61	80	0.7%
McLean ER	AIS Fellow	85	132	0.4%	40	25	0.9%	68	34	0.5%	96	31	0.3%	87	42	0.4%
Weber R	MISQ, ISR, JMIS publications (17)	86	127	0.4%	56	13	0.4%	83	19	0.3%	87	34	0.4%	75	61	0.5%
Gray P	Leo Award	87	125	0.4%	37	30	1.0%	73	29	0.5%	87	34	0.4%	94	32	0.3%
Alter S	Culnan 87 study	88	121	0.4%	49	18	0.6%	74	27	0.4%	93	32	0.3%	84	44	0.4%
Land FF	Leo Award	89	119	0.4%	54	15	0.5%	77	25	0.4%	71	51	0.5%	98	28	0.3%
Bjornandersen N	AIS Fellow	90	118	0.4%	47	20	0.7%	63	37	0.6%	93	32	0.3%	97	29	0.3%
Zwass V	MISQ, ISR, JMIS publications (33)	91	106	0.4%	88	1	0.0%	105	3	0.0%	91	33	0.3%	69	69	0.6%
Vitale MR	AIS Fellow	92	105	0.4%	76	4	0.1%	69	32	0.5%	82	36	0.4%	92	33	0.3%
Baskerville RL	ISI/EJIS publications (8)	93	103	0.3%	-	n/a	-	99	5	0.1%	87	34	0.4%	74	64	0.6%
Wei KK	MISQ, ISR, JMIS publications (9)	93	103	0.3%	-	n/a	-	109	2	0.0%	82	36	0.4%	71	65	0.6%
Munro MC	Culnan 87 study	95	101	0.3%	42	23	0.8%	65	36	0.6%	102	20	0.2%	105	22	0.2%

Authors	Reason for Inclusion	Total citations 86-05			1986-90 citations			1991-95 citations			1996-00 citations			2000-05 citations		
		Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%	Rank	No.	%
Cavaye ALM	ISI/EJIS publications (4)	96	99	0.3%	-	n/a	-	113	0	0.0%	93	32	0.3%	70	67	0.6%
Ciborra C	Ellis et al. 99 study	97	93	0.3%	73	5	0.2%	95	9	0.1%	82	36	0.4%	85	43	0.4%
Ward J	Ellis et al. 99 study	98	88	0.3%	-	n/a	-	97	8	0.1%	99	30	0.3%	81	50	0.5%
Jenkins AM	Culnan 87 study	99	86	0.3%	61	12	0.4%	77	25	0.4%	87	34	0.4%	109	15	0.1%
Galletta DF	AIS Fellow	100	85	0.3%	85	2	0.1%	77	25	0.4%	79	40	0.4%	106	18	0.2%
Smithson S	ISI/EJIS publications (6)	101	72	0.2%	-	n/a	-	101	4	0.1%	96	31	0.3%	88	37	0.3%
O'Keefe RM	ISI/EJIS publications (4)	102	68	0.2%	85	2	0.1%	85	15	0.2%	101	21	0.2%	96	30	0.3%
Jackson MA	Ellis et al. 99 study	103	66	0.2%	52	16	0.5%	81	21	0.3%	103	19	0.2%	113	10	0.1%
Neumann S	AIS Fellow	104	63	0.2%	70	6	0.2%	90	12	0.2%	99	30	0.3%	109	15	0.1%
Karimi J	MISQ, ISR, JMIS publications (8)	105	62	0.2%	83	3	0.1%	82	20	0.3%	107	13	0.1%	101	26	0.2%
Mathiassen L	ISI/EJIS publications (4)	106	59	0.2%	76	4	0.1%	99	5	0.1%	103	19	0.2%	95	31	0.3%
Briggs RO	MISQ, ISR, JMIS publications (17)	107	45	0.2%	-	n/a	-	105	3	0.0%	109	9	0.1%	92	33	0.3%
Kozar KA	MISQ, ISR, JMIS publications (8)	108	39	0.1%	76	4	0.1%	98	6	0.1%	106	16	0.2%	111	13	0.1%
Avergou C	AIS Fellow	109	37	0.1%	-	n/a	-	101	4	0.1%	110	8	0.1%	102	25	0.2%
Gupta A	MISQ, ISR, JMIS publications (8)	110	34	0.1%	-	n/a	-	113	0	0.0%	111	6	0.1%	98	28	0.3%
Carlson ED	Culnan 87 study	111	28	0.1%	56	13	0.4%	95	9	0.1%	116	5	0.1%	117	1	0.0%
Mookerjee VS	MISQ, ISR, JMIS publications (8)	112	25	0.1%	-	n/a	-	109	2	0.0%	113	6	0.1%	107	17	0.2%
Weber BW	MISQ, ISR, JMIS publications (14)	113	24	0.1%	-	n/a	-	112	1	0.0%	112	7	0.1%	108	16	0.1%
Langefors B	Leo Award	114	20	0.1%	69	8	0.3%	101	4	0.1%	113	6	0.1%	116	2	0.0%
De Vreede GJ	MISQ, ISR, JMIS publications (9)	115	18	0.1%	-	n/a	-	113	0	0.0%	110	8	0.1%	113	10	0.1%
Stowell F	ISI/EJIS publications (5)	116	17	0.1%	-	n/a	-	113	0	0.0%	108	10	0.1%	115	7	0.1%
Choudhary V	MISQ, ISR, JMIS publications (8)	117	14	0.1%	-	n/a	-	113	0	0.0%	117	2	0.0%	112	12	0.1%
TOTAL CITATIONS		30059			2927			6323			9680			11129		

Biographies



Hazel Taylor is an Assistant Professor at the Information School, University of Washington, Seattle. She holds a Ph.D. from Queensland University of Technology, Brisbane, Australia. Prior to joining the Information School, Dr. Taylor taught at the University of Waikato in New Zealand, and at the Hong Kong University of Science and Technology. Her teaching and research focuses on IT project management and risk management, with an emphasis on tacit knowledge and decision making in these areas. A secondary teaching and research focus is in the area of research methods.



Stuart Dillon is a Senior Lecturer in the Department of Management Systems at the University of Waikato, New Zealand. He has a PhD in Decision Problem Structuring, a Masters degree in Management Systems and a BSc in Information Systems, all from the University of Waikato. His research interests include decision problem structuring, critical incident decision making and E-local government.



Melinda Van Wingen is a history specialist at the Everett Public Library in Everett, Washington. She holds an MLIS from the University of Washington's Information School and an MA in History from the University of Maryland. She received a BA in History and French from Scripps College.