

The Shifting Balance of Intellectual Trade in Information Studies

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The authors describe a large-scale, longitudinal citation analysis of intellectual trading between information studies and cognate disciplines. The results of their investigation reveal the extent to which information studies draws on and, in turn, contributes to the ideational substrates of other academic domains. Their data show that the field has become a more successful exporter of ideas as well as less introverted than was previously the case. In the last decade, information studies has begun to contribute significantly to the literatures of such disciplines as computer science and engineering on the one hand and business and management on the other, while also drawing more heavily on those same literatures.

Introduction

Citation analysis is a powerful means of mapping the flow of ideas between specialty groups, disciplines, and nation states (e.g., Liu & Wang, 2005; Peritz & Bar-Ilan, 2002; Urata, 1990). The matrices and maps produced by bibliometricians and others can be used to demonstrate the relative impact and perceived utility of research, all the way from a single article on topic X to the entire published output of a nation state in a discipline, in both domestic (intradisciplinary) and foreign (extradisciplinary) markets. Here we describe a large-scale citation analysis of intellectual trading between information studies and other disciplines. The results of our study reveal the extent to which information studies draws on and, in turn, contributes to the ideational bases of other academic domains. For an overview of the theory and application of citation analysis, the reader is referred to Garfield (1979).

An Economic Metaphor

In their study, "The Export of Ideas from Information Science," Cronin and Pearson (1990, p. 381) analyzed

citations to the publications of a number of grandees within the field and found that the impact of these scholars' work outside their home discipline was rather modest; they spoke of an "apparently weak export performance" (p. 386). Researchers in other disciplines have since employed the same economic metaphor. Lockett and McWilliams (2005, p. 139) used citation analysis to determine "whether management exports knowledge to a broader academic community." They found evidence of "a substantial trade deficit" (p. 148). Goldstone and Leydesdorff's (2006, p. 988) article, "The Import and Export of *Cognitive Science*," established that the interdisciplinary journal in question had "a strong export of ideas to other fields." Arhonditsis, Adams-VanHarn, Nielsen, Stow, and Reckhow (2006, p. 6553) used citation analysis to estimate the broad impact of work in the field of mechanistic aquatic biogeochemical modeling. They found that some research in oceanic modeling had the "ability to produce exportable knowledge" (p. 6553). Stegmann and Grohmann (2001, p. 493) analyzed publication and citation data for dermatology and found that "each journal exhibits a characteristic profile with respect to . . . its knowledge export." Grover, Ayyagari, Gokhale, Lim, and Coffey (2006, p. 290) note that information systems "has always been viewed as an importer of ideas," although they found that the knowledge base of the field was being drawn on more extensively than before by its "traditional reference disciplines" (p. 293).

Crudely stated, a discipline that is a net exporter of ideas to others can be said to have a healthy balance of trade; a discipline that is a heavy importer of ideas can be characterized as having a weak balance of trade. A strong discipline may be one that has a positive trade balance, but that need not necessarily be the case. Conversely, a discipline with a poor export record is not thereby a failing field. Nevertheless, it is not unreasonable to posit that a discipline that is being ignored (i.e., receives few, if any, citations from other disciplines) may be suffering from "intellectual inbreeding" (Bedeian, 2005, p. 154), may be stagnating, or may lack a strong "cumulative tradition" (Keen, 1980, p. 9). By the same token, a discipline may be so technically sophisticated

Received July 3, 2007; revised September 8, 2007; accepted September 8, 2007

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and theoretically fecund that it is neither a significant importer nor exporter of ideas: It is happily self-contained.

Over the years, social scientific disciplines such as psychology and sociology have successfully exported theories and methods to epistemic near neighbors (e.g., management, political science). Other disciplines are more self-reliant; economics, for example, “is oriented toward itself” (Bedeian, 2005, p. 154). Harnad (2007) talks metaphorically of disciplines being endogamous or exogamous based on their citation characteristics; economics is clearly endogamous, highly self-citing in other words. As Ferraro, Pfeffer, and Sutton (2005, pp. 10–11) note: “Economics enjoys status and, indeed, dominance . . . Economics literature is cited more frequently in other social sciences literature.” Management, by way of contrast, is “an integrating discipline” (Bedeian, 2005, p. 154), much less self-contained than economics. Such characterizations call to mind Mote’s (1962) distinction between high-scatter and low-scatter domains. In the case of the former, scholars typically have to search widely across fields and disciplines to source relevant materials (see also, Bates, 1996, and Talja, 2005, on topic dispersion).

It is not illogical to suggest that a healthy discipline will produce, consciously or otherwise, intellectual goods for consumption in both domestic and foreign (export) markets. This would seem to be the view of Menand (2005, p. 14), who has argued that humanities departments should “colonize . . . hunt down the disciplines whose subject matter they covet and bring them into their own realm.” As Cronin and Pearson (1990, p. 382) put it: “The more attractive the goods (new insights, paradigms, models, techniques, patents, interpretations) on offer, the wider the potential market.” And yet, as Bowker (2005, p. 123) observes, “scientists are not trained to share information across disciplinary divides,” a view borne out by Kärki’s (1996, p. 333) cocitation analysis of research into scholarly communication in both sociology of science and information science: “Members of a community do not attend to the work of non-members and insights originating in a discipline may be lost to those outside its circles.” Her findings apply more widely, as Swanson has demonstrated in his continuing analysis of logically linked, but noninteracting literature corpora (e.g., Swanson, 1986).

Inherent disciplinary differences and also differences in institutional regimes and material practices clearly have a bearing on knowledge import and export ratios. To take an extreme case, there is little likelihood of intellectual trading between information studies (information science, librarianship, information management, archival studies, etc.) and nuclear physics, given the manifestly high degree of disciplinary separation (in terms of paradigms, content, methods, and contexts). However, there are good *prima facie* reasons to assume that some research in information studies should be of interest to scholars in, for instance, education or communication studies. These disciplines have a measure of topical overlap (e.g., knowledge management, information transfer, formal and informal modes of communication) and one might thus expect there to be some multilateral exchange of concepts and methods (e.g., Borgman & Rice,

1992; Rice, Borgman, & Reeves, 1988). Likewise, one might expect there to be “interdisciplinary citation traffic” (Tang, 2004, p. 58) between computer science and information studies, particularly in the field of information retrieval. However, experience suggests that common subject interests do not always or necessarily translate into the expected density of interdisciplinary citation.

Miyamoto, Midorikawa, and Nakayama (1990, p. 80) found that library and information science took “89% of its journal citations from itself” and opined that it might “lapse into irrelevancy.” In their analysis of the subfield of human information behavior (HIB)—an area, it would appear, of growing significance within information studies—McKechnie, Goodall, Lajoie-Paquette, and Julien (2005) found that HIB research was consumed primarily by other human information behavior researchers: 85% of all citations to the literature came from insiders. They concluded that human information behavior was “yet to have theoretical and methodological impact on other disciplines.” A cocitation analysis by Ellis, Allen, and Wilson (1999) found little evidence of intellectual interaction between the ostensibly cognate domains of information science and information systems. White (2004) reexamined the connection between the two subfields of information science and linguistics (citation analysis and discourse analysis, respectively) and found that although the strength of interdisciplinary ties between the two domains remains fairly weak, citationists have been making greater use of research in linguistics of late.

The findings of these various studies lend some credence to Cronin and Pearson’s (1990, p. 386) speculation that information science is a weak export performer. As Grover et al. (2006, p. 272) note with regard to information systems, such matters “demand a level of introspection that goes beyond speculation or pontification.” The same surely holds for information studies. The purpose of this study, then, is to provide a robust test of Cronin and Pearson’s claim using scaled-up data sets covering the somewhat broader literature of information studies.

Methods

Citation analyses of knowledge exchange involving information studies (IS) and other disciplines have tended to (a) cover a fairly limited time period (e.g., Peritz & Bar-Ilan, 2002—articles published in *Scientometrics* in 1990 and 2000; Tang, 2004—IS articles published in 1975, 1980, 1985, 1990, 1995, and 2000), (b) concentrate on a specific subfield of IS (e.g., Ellis et al., 1999—user studies and information retrieval; Kärki, 1996—scholarly communication; McKechnie et al., 2005—human information behavior; Tang, 2004—information retrieval; White, 2004—citation analysis), or (c) examine a small number of works (e.g., Buttlar, 1999—61 library science and information science dissertations; Meyer, 1996—24 library science journals; Tang, 2004—150 IS articles; White, 2004—cocitation counts of six prolific authors). The present study extends considerably both the scale and scope of such investigations.

We conducted a large-scale, longitudinal citation analysis of exports from, and imports to, the literature of IS based on an inclusive population of journals and conference proceedings in the field. We gathered data covering a 30-year period (1977–2006) that we analyzed both cumulatively and by period (1977–1986, 1987–1996, and 1997–2006) to explore import/export trends longitudinally.

To identify exports from IS, we retrieved all items in all three ISI (Thomson Scientific, formerly Thomson ISI [Institute for Scientific Information], Philadelphia, PA) databases that had cited any of the 275 IS journals and conference proceedings (periodicals, hereafter) that constituted our population (see Table 1).¹ We initially analyzed 577 unique periodical titles for possible inclusion; these were compiled from Nisonger and Davis (2005), *Ulrich's Periodicals Directory* (limited to refereed and/or academic/scholarly periodicals with the subject "Library and Information Sciences"), Wilson's *Library Literature and Information Science* directory of indexed periodicals, and *WorldCat* (examining the top 500 periodicals that were assigned the subject headings of archives, information science, libraries, or library science).

We eliminated 302 titles because they were either not cited or were cited fewer than 30 times over the course of 30 years (1977–2006) or because they were titles that belonged to other/multiple disciplines. Examples of the latter include communication journals (e.g., *Journal of Health Communication*), management/information systems journals (e.g., *Information Systems Journal*, *Information Systems Research*, *Journal of Information Technology*, *Journal of Management Information Systems*, *MIS Quarterly*), and multidisciplinary humanities journals (e.g., *British Library Journal*, *The Library: Transactions of the Bibliographic Society*, *Papers of the Bibliographical Society of America*, *Studies in Bibliography*). We also excluded titles that had been in existence for fewer than 6 years (e.g., *International Journal of Information Ethics* [2004], *Journal of Information Literacy* [2006], *Journal of Map & Geography Libraries* [2004], and *Journal of Electronic Resources in Medical Libraries* [2004]); these were typically not cited or were cited very few times. Finally, we eliminated a few titles that might at one time have been classified as IS, but had changed focus significantly over the years (e.g., *Journal of Chemical Information and Modeling*, which was formerly known as the *Journal of Chemical Information and Computer Sciences*, and before that as the *Journal of Chemical Documentation*). We acknowledge that others might wish to either relax or constrain the criteria for inclusion.

Once we created our set of 275 IS periodicals, we used the ISI databases (through DIALOG) to identify all the items that had cited these periodicals.² To do this for each of the periodicals, we first had to identify all possible abbreviated

¹The three ISI citation databases are the Arts & Humanities Citation Index (A&HCI), Science Citation Index (SCI), and Social Sciences Citation Index (SSCI).

²The coverage period of the databases through DIALOG is 1980 to present for A&HCI, 1974 to present for SCI, and 1972 to present for SSCI.

title name strings in the cited references field in the ISI databases. For example, we found and used (among others) the following combinations/permutations in our searches to identify documents that had cited the journal *Library Quarterly*: LIB Q OR LIB Q JAN OR LIB Q JUL OR LIB Q OCT OR LIB QUART OR LIBR Q OR LIBR QUART? OR LIBRARY Q OR LIBRARY Q APR OR LIBRARY Q JAN OR LIBRARY Q JUL OR LIBRARY Q OCT OR LIBRARY QUART?

The 275 information studies periodicals were cited by a total of 67,693 items, of which 63,741 (94%) were published between 1977 and 2006.³ We then restricted our focus to articles, conference papers, and review articles. By eliminating citations from other document types (e.g., book reviews, editorials, letters, and meeting abstracts), the number of citations we processed was reduced by 15% (9,560) to 54,181—distributed across approximately 4,000 periodicals.⁴

To identify imports to IS, we analyzed the references in all 48,441 articles and review articles found in the 80 IS periodicals that were covered in the ISI databases between 1977 and 2006 (see Table 2). With only a few exceptions (e.g., *The American Archivist*, *Behavioral & Social Sciences Librarian*, *IFLA Journal*, *Journal of Government Information*, and *Journal of Information Ethics*), the majority of these periodicals has been covered continuously in the databases throughout the entire survey period (1977–2006) and/or for as long as they were in publication (e.g., *Drexel Library Quarterly* and *Wilson Library Bulletin* ceased publication in 1986 and 1995, respectively). In short, we found that the 48,441 articles and review articles cited tens of thousands of unique sources for a total of 566,000.

Because these sources were cited and entered into the ISI databases using abbreviated formats, we had to manually identify all the variant abbreviations used for a source and change these to the full and most recent name of the source (e.g., AM DOCUMENTATION, IN PRESS JASIS, J AM SOC INFORMATION, J ASIS, J DOCUMENTARY REPROD, and JASIST to *Journal of the American Society for Information Science and Technology*).⁵ In some instances, the same source was cited and entered into the ISI databases in more than 50 different ways (e.g., *Proceedings of the American Society for Information Science and Technology*). Because it was impractical to standardize the names of all cited sources, we limited ourselves to those 7,000 unique sources that had each been cited at least 5 times in the 48,441 articles that we examined. As in the case of identifying

³All percentages reported here have been rounded to the nearest whole number.

⁴The actual number of periodicals in which citations to the IS literature were found was 5,490. Using *Ulrich's Periodicals Directory*, we found that 33% of the top 300 citing periodicals had changed names once or more since their creation, hence the rough estimate of 4,000.

⁵As can be seen from this example, we collapsed the older names of a journal (*American Documentation*, *Journal of Documentary Reproduction*, and *Journal of the American Society for Information Science*) under their most recent name (*Journal of the American Society for Information Science and Technology*).

TABLE 1. Information studies periodicals used to identify exports.

<i>Acquisitions Librarian</i>	<i>FID Review*</i>
<i>Advances in Classification Research</i>	<i>First Monday</i>
<i>Advances in Librarianship</i>	<i>Florida Libraries</i>
<i>Advances in Library Administration and Organization</i>	<i>FLQ*</i>
<i>Advances in Library and Information Science</i>	<i>Georgia Library Quarterly*</i>
<i>Advances in Library Automation and Networking</i>	<i>Government Information Quarterly*</i>
<i>Advances in Library Resource Sharing</i>	<i>Harvard Library Bulletin*</i>
<i>Advances in Serials Management</i>	<i>Health Information and Libraries Journal*</i>
<i>African Journal of Library, Archives and Information Science</i>	<i>Herald of Library Science</i>
<i>Alabama Librarian</i>	<i>HLA Journal*</i>
<i>American Archivist</i>	<i>Horn Book Magazine</i>
<i>American Libraries*</i>	<i>IASLIC Bulletin</i>
<i>Anales de Documentacion*</i>	<i>IATUL Proceeding*</i>
<i>Annals of Library and Information Studies*</i>	<i>Idaho Librarian</i>
<i>Annual Review of Information Science and Technology</i>	<i>IFLA Journal*</i>
<i>Archival Issues*</i>	<i>Illinois Libraries</i>
<i>Archival Science*</i>	<i>Indexer</i>
<i>Archivaria*</i>	<i>Indian Librarian</i>
<i>Archives (British Records Association)</i>	<i>Indiana Libraries*</i>
<i>Archives and Manuscripts</i>	<i>Inform: The Magazine of Information*</i>
<i>Archives et Bibliothèques de Belgique*</i>	<i>Information - Wissenschaft und Praxis*</i>
<i>Arkansas Libraries</i>	<i>Information Development</i>
<i>ARSC Journal*</i>	<i>Information Outlook*</i>
<i>Art Documentation*</i>	<i>Information Processing & Management*</i>
<i>Art Libraries Journal*</i>	<i>Information Reports*</i>
<i>Aslib Proceedings</i>	<i>Information Research</i>
<i>Australasian Public Libraries and Information Services</i>	<i>Information Services & Use*</i>
<i>Australian Academic & Research Libraries*</i>	<i>Information Society</i>
<i>Australian Library Journal</i>	<i>Information Studies</i>
<i>Behavioral & Social Sciences Librarian</i>	<i>Information Technology and Libraries*</i>
<i>Bibliotekarz</i>	<i>Information Technology-Research Development</i>
<i>Bibliotekovedenie*</i>	<i>Information Today</i>
<i>Bibliothek- & Archiefgids*</i>	<i>InfoTrend*</i>
<i>Bibliothek Forschung und Praxis</i>	<i>Inspel</i>
<i>Bibliothek und Wissenschaft</i>	<i>Interlending & Document Supply*</i>
<i>Bogens Verden tidsskrift for kultur og litteratur</i>	<i>International Cataloguing and Bibliographic Control*</i>
<i>Bok og Bibliotek*</i>	<i>International Information & Library Review*</i>
<i>Bowker Annual*</i>	<i>International Journal of Information Management*</i>
<i>BuB Forum für Bibliothek und Information*</i>	<i>International Journal of Legal Information*</i>
<i>Bulletin des Bibliothèques de France</i>	<i>Internet and Higher Education*</i>
<i>Bulletin of the American Society for Information Science and Technology*</i>	<i>Internet Reference Services Quarterly</i>
<i>California Librarian</i>	<i>Internet Research*</i>
<i>Canadian Journal of Information</i>	<i>Iowa Library Quarterly</i>
<i>Canadian Library Journal</i>	<i>JISSI</i>
<i>Cataloging & Classification Quarterly</i>	<i>Journal of Academic Librarianship</i>
<i>Catalogue & Index</i>	<i>Journal of Business & Finance Librarianship</i>
<i>Catholic Library World</i>	<i>Journal of Documentation</i>
<i>Choice</i>	<i>Journal of East Asian Libraries</i>
<i>Ciencia da Informacao</i>	<i>Journal of Education for Library and Information Science*</i>
<i>Ciencias de la Informacion*</i>	<i>Journal of Educational Media and Library Sciences*</i>
<i>Collection Building</i>	<i>Journal of Electronic Publishing</i>
<i>Collection Management*</i>	<i>Journal of Global Information Management</i>
<i>College & Research Libraries</i>	<i>Journal of Government Information</i>
<i>College & Research Libraries News</i>	<i>Journal of Hospital Librarianship</i>
<i>College & Undergraduate Libraries</i>	<i>Journal of Information Ethics</i>
<i>Colorado Libraries</i>	<i>Journal of Information Science*</i>
<i>Computers in Libraries*</i>	<i>Journal of Information, Communication and Library Science</i>
<i>Current Studies in Librarianship</i>	<i>Journal of Interlibrary Loan, Document Supply & Electronic Reserves*</i>
<i>Cybermetrics</i>	<i>Journal of Internet Cataloging</i>
<i>Der Bibliothekar Zeitschrift für das Bibliothekswesen</i>	<i>Journal of Librarianship and Information Science*</i>
<i>DF Revy</i>	<i>Journal of Library Administration</i>
<i>D-Lib Magazine</i>	<i>Journal of Library and Information Science</i>
<i>Document Delivery World*</i>	<i>Journal of Library Services for Distance Education</i>
<i>Documentaliste - Sciences de l'Information*</i>	<i>Journal of Research Communication Studies</i>
<i>Documentation et Bibliothèques*</i>	<i>Journal of Scholarly Publishing*</i>
<i>Drexel Library Quarterly</i>	<i>Journal of the American Society for Information Science*</i>
<i>DitP</i>	<i>Journal of the Medical Library Association*</i>
<i>Econtent*</i>	<i>Journal of the Society of Archivists</i>
<i>Education for Information</i>	<i>Journal of Youth Services in Libraries*</i>
<i>Education Libraries</i>	<i>Judaica Librarianship*</i>
<i>Education Libraries Journal*</i>	<i>Kentucky Libraries*</i>
<i>Electronic Library</i>	<i>Knjiznica</i>

(Continued)

TABLE 1. (Continued)

<i>Knowledge Organization*</i>	<i>Pakistan Library & Information Science Journal*</i>
<i>Knowledge Quest*</i>	<i>Personnel, Training and Education*</i>
<i>Konyvtari Figyelo*</i>	<i>PNLA Quarterly</i>
<i>LASIE</i>	<i>portal: Libraries and the Academy</i>
<i>Law Library Journal</i>	<i>Private Library</i>
<i>Learned Publishing*</i>	<i>Probleme de Informare si Documentare*</i>
<i>Legal Information Management*</i>	<i>Proceedings of the ACM/IEEE Joint Conference on Digital Libraries*</i>
<i>Legal Reference Services Quarterly</i>	<i>Proceedings of the American Society for Information Science*</i>
<i>LIBER Quarterly*</i>	<i>Profesional de la Informacion*</i>
<i>Libraries & the Cultural Record*</i>	<i>Program-Automated Library and Information Systems*</i>
<i>Library & Archival Security*</i>	<i>Progressive Librarian</i>
<i>Library & Information Science Research*</i>	<i>ProLibris*</i>
<i>Library + Information Update</i>	<i>Public - Access Computer Systems Review</i>
<i>Library Administration and Management*</i>	<i>Public Libraries*</i>
<i>Library and Information Research*</i>	<i>Public Library Journal</i>
<i>Library and Information Science</i>	<i>Public Library Quarterly</i>
<i>Library Association Record</i>	<i>Public Services Quarterly*</i>
<i>Library Collections Acquisitions & Technical Services*</i>	<i>Publishers Weekly</i>
<i>Library Computing*</i>	<i>Publishing Research Quarterly*</i>
<i>Library Hi Tech</i>	<i>Quarterly Bulletin of the International Association of Agricultural Information Specialists*</i>
<i>Library Hi Tech News</i>	<i>RBM: A Journal of Rare Books, Manuscripts and Cultural Heritage*</i>
<i>Library History</i>	<i>Reference & User Services Quarterly*</i>
<i>Library Hotline</i>	<i>Reference Librarian</i>
<i>Library Issues</i>	<i>Reference Services Review</i>
<i>Library Journal</i>	<i>Research Evaluation</i>
<i>Library Management*</i>	<i>Research in Librarianship</i>
<i>Library Mosaics</i>	<i>Research Strategies</i>
<i>Library of Congress Information Bulletin*</i>	<i>Resource Sharing & Information Networks*</i>
<i>Library Philosophy and Practice</i>	<i>Restaurator-International Journal for the Preservation of Library and Archival Material</i>
<i>Library Quarterly</i>	<i>Revista Espanola de Documentacion Cientifica*</i>
<i>Library Resources & Technical Services*</i>	<i>Rural Libraries</i>
<i>Library Review</i>	<i>Scandinavian Public Library Quarterly*</i>
<i>Library Technology Reports</i>	<i>School Librarian*</i>
<i>Library Trends</i>	<i>School Libraries in Canada*</i>
<i>Libres Library and Information Science Research Electronic Journal</i>	<i>School Libraries Worldwide</i>
<i>Libri</i>	<i>School Library Journal*</i>
<i>Link-Up</i>	<i>School Library Media Research*</i>
<i>Louisiana Libraries*</i>	<i>Science & Technology Libraries</i>
<i>Lucknow Librarian</i>	<i>Scientometrics</i>
<i>Malaysian Journal of Library and Information Science</i>	<i>Searcher</i>
<i>Medical Reference Services Quarterly</i>	<i>Serials Librarian</i>
<i>Mezhdunarodnyi Forum po Informatsii*</i>	<i>Serials Review</i>
<i>Michigan Librarian*</i>	<i>Shelflife*</i>
<i>Microform and Imaging Review*</i>	<i>South African Journal of Library and Information Science*</i>
<i>Minnesota Libraries</i>	<i>SRELS Journal of Information Management*</i>
<i>Mississippi Libraries*</i>	<i>Studies in Library Management</i>
<i>Missouri Library World*</i>	<i>Teacher Librarian*</i>
<i>Mousaion</i>	<i>Technical Services Quarterly</i>
<i>Multimedia World*</i>	<i>Technicalities</i>
<i>Music Reference Services Quarterly</i>	<i>Tennessee Libraries*</i>
<i>Nebraska Library Association Quarterly*</i>	<i>Texas Library Journal</i>
<i>New Jersey Libraries</i>	<i>Unabashed Librarian</i>
<i>New Library World*</i>	<i>UNESCO Journal of Information Science*</i>
<i>New Review of Academic Librarianship*</i>	<i>Urban Library Journal*</i>
<i>New Review of Children's Literature and Librarianship*</i>	<i>Utah Libraries</i>
<i>New Zealand Libraries</i>	<i>Vine: The Journal of Information and Knowledge Management Systems</i>
<i>Newsletter on Intellectual Freedom</i>	<i>Virginia Libraries*</i>
<i>Nigerian Libraries</i>	<i>Vjesnik Bibliotekara Hrvatske</i>
<i>Nordisk Tidskrift für Bok- och Bibliotekshistoria*</i>	<i>Voice of Youth Advocates</i>
<i>North Carolina Libraries</i>	<i>Wilson Library Bulletin*</i>
<i>Notes</i>	<i>Wisconsin Library Bulletin</i>
<i>OCLC Systems and Services*</i>	<i>World Libraries*</i>
<i>Ohio Libraries*</i>	<i>World Library and Information Congress</i>
<i>Online</i>	<i>Zeitschrift für bibliothekswesen und Bibliographie*</i>
<i>Online Information Review*</i>	<i>Zentralblatt für Bibliothekswesen</i>
<i>Open vaktijdschrift voor bibliothecarissen, literatuuronderzoekers en documentalisten*</i>	

Note. * indicates journals that have changed names once or more since their creation.

TABLE 2. Information studies periodicals used to identify imports.

Rank	Source name	Number of articles, conference papers, and review articles in ISI database			
		1977–1986	1987–1996	1997–2006	Total
1	<i>Library Journal</i>	911	991	1,281	3,183
2	<i>Journal of the American Society for Information Science and Technology</i> (formerly until 2000: <i>Journal of the American Society for Information Science</i> ; 1970: <i>American Documentation</i> ; and 1942: <i>Journal of Documentary Reproduction</i>)	424	590	1105	2,119
3	<i>Scientometrics</i>	248	650	963	1,861
4	<i>Proceedings of the American Society for Information Science and Technology Annual Meeting</i> (formerly until 2001: <i>Proceedings of the Annual Meeting of the American Society for Information Science</i> ; 1973: <i>Proceedings of the American Society for Information Science</i> ; 1967: <i>Proceedings of the American Documentation Institute</i>)	747	353	444 Coverage dropped 2004	1,544
5	<i>Online</i>	352	709	463	1,524
6	<i>EContent</i> (formerly until 1999: <i>Database</i>)	246	640	547	1,433
7	<i>Information Processing & Management</i> (formerly until 1974: <i>Information Storage and Retrieval</i>)	355	509	550	1,414
8	<i>Journal of Academic Librarianship</i>	328	411	522	1,261
9	<i>Aslib Proceedings</i>	512	380	364	1,256
10	<i>Journal of the Medical Library Association</i> (formerly until 2002: <i>Bulletin of the Medical Library Association</i>)	311	421	493	1,225
11	<i>Library Trends</i>	401	407	408	1,216
12	<i>Government Information Quarterly</i> (formerly until 1994: <i>Government Publications Review</i>)	401	434	247	1,082
13	<i>Journal of Information Science</i> (formerly until 1978: <i>Information Scientist</i>)	292	353	423	1,068
14	<i>College & Research Libraries</i>	366	374	325	1,065
15	<i>Wilson Library Bulletin</i>	415	605	Ceased publication 1995	1,020
16	<i>Serials Librarian</i>	333	573	113	1,019
17	<i>Reference & User Services Quarterly</i> (formerly until 1997: <i>RQ</i>)	368	339	295	1,002
18	<i>Library Collections, Acquisitions, and Technical Services</i> (formerly until 1999: <i>Library Acquisitions: Practice and Theory</i>)	259	411	319	989
19	<i>Law Library Journal</i>	298	324	238	860
20	<i>Online Information Review</i> (formerly until 1999: <i>Online & CD-ROM Review</i> ; 1992: <i>On-line Review</i>)	215	256	360	831
21	<i>Electronic Library</i>	57	315	415	787
22	<i>Journal of Scholarly Publishing</i> (formerly until January 1994: <i>Scholarly Publishing</i>)	313	261	180	754
23	<i>Library Resources & Technical Services</i>	302	253	196	751
24	<i>Information Technology and Libraries</i> (formerly until 1982: <i>Journal of Library Automation</i>)	207	286	250	743
25	<i>Libri</i>	232	247	251	730
26	<i>Zentralblatt für Bibliothekswesen</i>	511	201 Merged in 1990 with <i>Zeitschrift für Bibliothekswesen und Bibliographie</i>		712
27	<i>International Information and Library Review</i> (formerly until 1991: <i>International Library Review</i>)	347	297	57	701
28	<i>Information Outlook</i> (formerly until 1997: <i>Special Libraries</i>)	389	295	Coverage dropped 1996	684
29	<i>International Journal of Information Management</i> (formerly until 1985: <i>Social Science Information Studies</i>)	85 Coverage started with vol. 2 (1982)	246	324	655

(Continued)

TABLE 2. (Continued)

Rank	Source name	Number of articles, conference papers, and review articles in ISI database			
		1977–1986	1987–1996	1997–2006	Total
30	<i>Journal of Documentation</i>	146	144	281	571
31	<i>Zeitschrift für Bibliothekswesen und Bibliographie</i>	171	163	231	565
32	<i>Canadian Library Journal</i>	386	178	Ceased publication 1992	564
33	<i>Program: Electronic Library and Information Systems</i> (formerly until 1997: <i>Program: Automated Library and Information Systems</i> ; 1979: <i>Program: News of Computers in Libraries</i>)	136	193	226	555
34	<i>Library Computing</i> (formerly until 1998: <i>Library Software Review</i> ; 1984: <i>Software Review</i>)	210	275	68	553
35	<i>Journal of Education for Library and Information Science</i> (formerly until 1984: <i>Journal of Education for Librarianship</i>)	196	275	72	543
36	<i>Library & Information Science Research</i> (formerly until 1983: <i>Library Research</i>)	143	172	203	518
37	<i>Interlending & Document Supply</i> (formerly until 1983: <i>Interlending Review</i> ; 1978: <i>BLL Review</i> ; January 1973: <i>NLL Review</i>)	81	185	246	512
38	<i>The American Archivist</i>	219	287	Coverage dropped 1995	506
39	<i>Journal of Librarianship and Information Science</i> (formerly until 1991: <i>Journal of Librarianship</i>)	170	155	169	494
40	<i>Bulletin of the American Society for Information Science</i>	109 Coverage began with vol. 13 (1983)	350	31 Coverage dropped 1997	490
41	<i>IFLA Journal</i>	221	263	Coverage dropped 1995	484
42	<i>FID Review</i> (formed by the merger of <i>International Forum of Information and Documentation</i> (1975–1999) and <i>FID Bulletin</i> (1960–1999), which was formerly until 1997: <i>FID News Bulletin</i>)	258	193	30 Coverage dropped 1999	481
43	<i>Library Quarterly</i>	184	133	158	475
44	<i>Internet Research</i> (formerly until 1993: <i>Electronic Networking</i>)	Coverage began with vol. 3 (1993)	97	369	466
45	<i>Libraries & the Cultural Record</i> (formerly until 2006: <i>Libraries & Culture</i> ; 1987: <i>Journal of Library History</i> ; 1973: <i>Journal of Library History, Philosophy, and Comparative Librarianship</i> ; 1972: <i>Journal of Library History</i>)	195	124	139	458
46	<i>Knowledge Organization</i> (formerly until 1992: <i>International Classification</i>)	125	182	118	425
47	<i>Learned Publishing</i>	Coverage began with vol. 7 (1994)	66	336	402
48	<i>Journal of the Society of Archivists</i>	58	172	169	399
49	<i>Harvard Library Bulletin</i>	124	169	66	359
50	<i>Notes: The Quarterly Journal of the Music Library Association</i>	82	96	164	342
51	<i>Canadian Journal of Information and Library Science</i> (formerly until 1993: <i>Canadian Journal of Information Science</i>)	119	130	84	333
52	<i>Publishing Research Quarterly</i> (formerly until 1991: <i>Book Research Quarterly</i>)	Coverage began with vol. 10 (1994)	81	188 Coverage dropped 2004	269
53	<i>Annual Review of Information Science and Technology</i>	96	86	96	278
54	<i>Journal of Micrographics</i> (changed names in 1983 to <i>Journal of Information and Image Management</i> and in 1986 to <i>Inform</i>)	259	Coverage dropped 1981		259

(Continued)

TABLE 2. (Continued)

Rank	Source name	Number of articles, conference papers, and review articles in ISI database				
		1977–1986	1987–1996	1997–2006	Total	
55	<i>Information Society: An International Journal</i>	Coverage began with vol. 13 (1997)		257	257	
56	<i>Drexel Library Quarterly</i>	256	Ceased publication 1986		256	
57	<i>Library and Information Science</i>	127	83	44	254	
58	<i>Journal of Government Information</i>	Coverage began with vol. 21 (1994)		86	163	249
59	<i>Information-Wissenschaft und Praxis</i> (formerly until 1997: <i>Nachrichten für Dokumentation</i>)	Coverage began with vol. 48 (1998) and dropped with vol. 54 (2003)		247	247	
60	<i>Library Hi Tech</i>	Coverage began with vol. 13 (1995)		110	135	245
61	<i>Restaurator: International Journal for the Preservation of Library and Archival Material</i>	Coverage began with vol. 14 (1993)		64	179	243
62	<i>Education for Information</i>	56	162	10	228	
63	<i>Unesco Journal of Information Science, Librarianship and Archives Administration</i> (formerly until 1978: <i>Unesco Bulletin for Libraries</i>)	208	Ceased publication 1983		208	
64	<i>Behavioral & Social Sciences Librarian</i>	100	63	38	201	
65	<i>portal: Libraries and the Academy</i>	Coverage began with vol. 2 (2002)		165	165	
66	<i>Information Research: An International Electronic Journal</i>	Coverage began with vol. 8 (2003)		149	149	
67	<i>Research Evaluation</i>	Coverage began with vol. 9 (2000)		139	139	
68	<i>Journal of Information Ethics</i>	Coverage began with vol. 4 (1995)		32	102 (coverage dropped 2004)	134
69	<i>Library Science with a Slant to Documentation</i> (changed names in 1988 to <i>Library Science with a Slant to Documentation and Information Studies</i> and in 2000 to <i>SRELS Journal of Information Management</i>)	102	Coverage dropped 1981		102	
70	<i>Journal of Research Communication Studies</i> (merged in 1982 with <i>Scientometrics</i>)	99	Merged in 1982 with <i>Scientometrics</i>		99	
71	<i>Health Information and Libraries Journal</i>	Coverage began with vol. 22 (2005)		98	98	
72	<i>Archives</i> (British Records Association)	80	11	Coverage dropped 1988		91
73	<i>Science & Technology Libraries</i>	Coverage began with vol. 16 (1997)		63	63	
74	<i>Profesional de la Informacion, El</i> (formerly until 1998: <i>Information World en Espanol</i>)	Coverage began with vol. 15 (2006)		52	52	
75	<i>Serials Review</i>	Coverage began with vol. 31 (2005)		46	46	
76	<i>Microcomputers for Information Management</i> (changed names in 1996 to <i>Internet and Higher Education</i>)	45	Only first two volumes were covered (1984–1985)		45	
77	<i>Journal of Global Information Management</i>	Coverage began with vol. 13 (July-Sep 2005)		29	29	
78	<i>Information Technology: Research, Development, Applications</i> (formerly until 1983: <i>Information Technology, Research and Development</i>)	26	Coverage began with issue 1 of vol. 2 (January 1983); Ceased publication 1984; Incorporated with <i>Information Processing & Management</i> (1984)		26	

(Continued)

TABLE 2. (Continued)

Rank	Source name	Number of articles, conference papers, and review articles in ISI database			
		1977–1986	1987–1996	1997–2006	Total
79	<i>Searcher: The Magazine for Database Professionals</i>	Selectively covered from vol. 6 (1998) to present		15	15
80	<i>Information Research and Resource Reports</i>	10	Only reports 3–5 were covered (1984)		10
Total ^a		15,022	16,911	16,508	48,441

Note. ISI = Thomson ISI (Institute for Scientific Information), now Thomson Scientific (Philadelphia, PA).

^aThe number of titles covered was 62 during 1977–1986, 61 during 1987–1996, and 65 during 1997–2006.

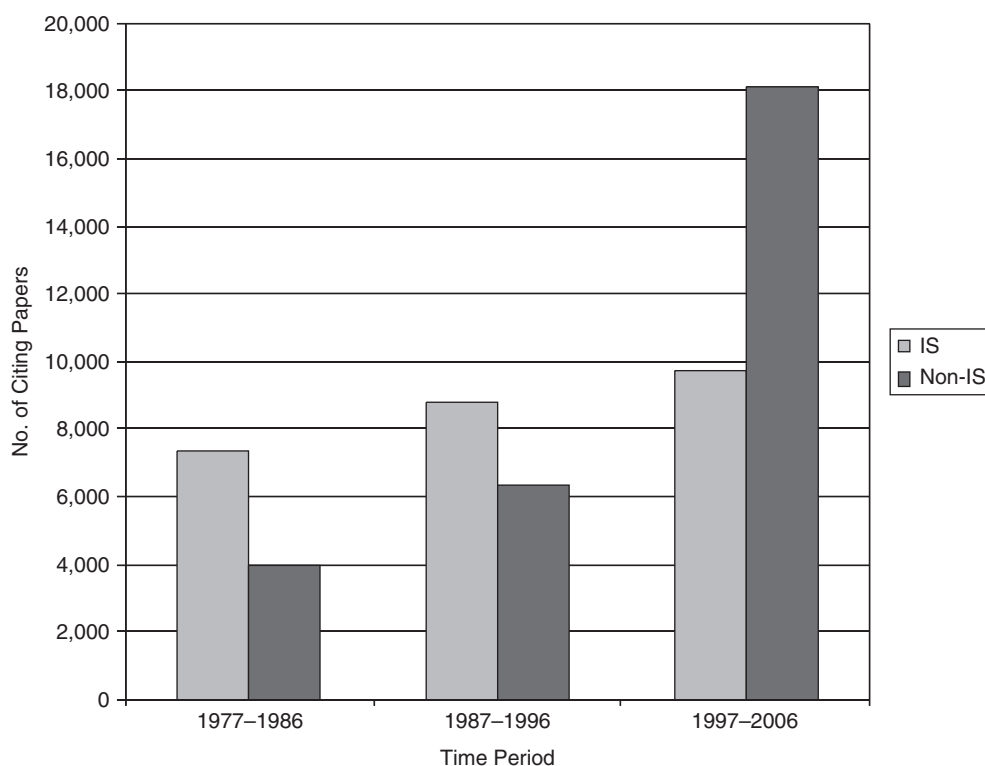


FIG. 1. Articles citing the information studies literature.

abbreviations for the 275 IS periodicals used for examining exports, the process of standardizing the names of sources cited by IS periodicals took several hundred hours.

Once we stabilized the names of the 7,000 unique cited sources, we used ISI’s journal subject classification scheme, citation analysis (see below), and our domain knowledge to assign each source the discipline to which it belonged. If the cited source was a journal that was assigned only one subject category by ISI, it was classified accordingly (e.g., *Library Quarterly* was classified under “Information Science & Library Science” exclusively and was, therefore, treated as an

IS journal).⁶ If the cited source was a journal that was assigned more than one subject category by ISI, we classified it based on the subject background of the journals that had

⁶We made a few exceptions to this rule. When we disagreed with ISI’s subject classification of a journal, we used our domain knowledge and citation analysis to decide on the most accurate subject classification for that journal. For example, *Journal of the American Medical Informatics Association* is classified by ISI under “Information Science & Library Science” exclusively. Both our knowledge of the journal and citation analysis indicates that the journal actually belongs to, and is most frequently cited by, informatics journals. So, we classified this journal as informatics rather than as IS.

TABLE 3. Exports from information studies (based on an examination of 54,181 articles that have cited 275 Information Studies periodicals between 1977 and 2006).

Period	Information studies			Non-information studies			Total no. of citing articles
	No. of citing articles	% of total	Increase over previous decade	No. of citing articles	% of total	Increase over previous decade	
1977–1986	7,311	65%		3,982	35%		11,293
1987–1996	8,800	58%	20%	6,302	42%	58%	15,102
1997–2006	9,707	35%	10%	18,079	65%	187%	27,786
1977–2006	25,818	47.7%		28,363	52.3%		54,181

cited it most frequently. For example, *MIS Quarterly* was classified as both “Information Science & Library Science” and “Management.” An analysis of the titles that have cited *MIS Quarterly* revealed that it has been cited mostly by business and management/information systems journals, followed by computer science. In this case, the journal would be classified as a business and management journal. We applied the same approach for a variety of sources not listed in the ISI databases, such as books. For example, *Introduction to Modern Information Retrieval* by Salton and McGill (1983) was cited between 1983 and 2006 mostly by computer science journals and was, therefore, assigned to computer science. Because it was effectively impossible to assign subject categories to all of the 7,000 cited sources, we limited ourselves to the 200 most cited. These 200 sources accounted for 139,459 or 25% of the 566,000 cited references found in the 48,441 IS articles examined here.⁷

Results and Discussion

Exports

Of the 54,181 papers that cited the 275 IS periodicals included in the study, 28,363 (52%) came from outside the field. Exports from IS to other fields have increased significantly over time. As shown in Figure 1, and in greater detail in Table 3, the number of non-IS papers citing the IS literature has risen from 3,982 for the period 1977–1986 to 18,079 for the period 1997–2006, an increase of 354%. By way of contrast, the level of intrafield citations (IS citing IS) increased by a mere 33% during the same time period.

We believe that the striking increase in foreign citations to the literature of IS can be explained in large measure by two developments: the growth of research domains influenced materially by advances in information technology and Internet applications (e.g., computer science, business and management, health/medical sciences, and engineering), and the expansion of ISI’s coverage of domains relative to information studies. As can be seen from Table 4, the most frequently author-assigned keywords to documents citing IS periodicals in 1997–2006 are

related to the Internet, information retrieval, knowledge management, electronic commerce, information technology, the Web, digital libraries, and similar topics. Table 5 shows that ISI’s coverage of 19 of the 50 most frequent importers from information studies began in the 1990s. Consider the case of *Lecture Notes in Computer Science*, the heaviest importer from IS, which has seen a significant increase in the number of its indexed items in ISI, rising from fewer than 600 records per year in the 1980s to over 11,000 per year for the period 2000 to 2006. Similar trends were found in the case of *Lecture Notes in Artificial Intelligence*, the second most frequent importer from IS.

Literature, history, law, and the arts and humanities have not dropped in the rankings because the scholarly literature of information studies is no longer of interest to scholars in these disciplines. Rather, it is because scholars from other disciplines (e.g., computer science, business and management,

TABLE 4. Frequency distribution of keywords assigned by ISI to articles importing from information studies.

Rank	Count	Keywords
1	709	INTERNET
2	545	INFORMATION RETRIEVAL
3	191	KNOWLEDGE MANAGEMENT
4	185	ELECTRONIC COMMERCE
5	154	LIBRARIES
6	151	INFORMATION TECHNOLOGY
7	149	WORLD WIDE WEB
8	141	DIGITAL LIBRARIES
9	135	EVALUATION
10	132	INFORMATION SYSTEMS
11	104	INNOVATION
12	101	DATA MINING
13	93	INFORMATION MANAGEMENT
14	93	USER STUDIES
15	90	BIBLIOMETRICS
16	89	RESEARCH
17	87	DATABASES
18	87	WORLD WIDE WEB
19	86	INFORMATION
20	80	E-COMMERCE
21	80	SEARCH ENGINES
22	78	ACADEMIC LIBRARIES
23	78	INTERLENDING
24	76	ELECTRONIC PUBLISHING
25	75	CITATION ANALYSIS

Note. ISI = Thomson ISI (Institute for Scientific Information), now Thomson Scientific (Philadelphia, PA).

⁷The top 100 cited journals accounted for 115,102 (20%) of the 566,000 cited references found in the 48,441 IS articles we examined. The top 300 cited journals accounted for 153,000 (27%).

TABLE 5. Top 50 importers from information studies (1977–2006).

Overall rank	Rank among importers	Citation count	Citing source name	Year added to ISI (vol.)
1	1	1850	<i>Lecture Notes in Computer Science</i> ^a	1981
24	2	425	<i>Lecture Notes in Artificial Intelligence</i>	1991
34	3	317	<i>Nauchno-Tekhnicheskaya Informatsiya Seriya 1 and 2</i>	1967 (11)
48	4	214	<i>Information & Management</i> (formerly until 1977: <i>Management Datamatics</i> ; 1975: <i>Management Informatics</i>)	1974 (3)
49	5	203	<i>Journal of the American Medical Informatics Association</i>	1994 (1)
50T	6T	202	<i>Journal of Chemical Information and Modeling</i> (formerly until 2005: <i>Journal of Chemical Information and Computer Sciences</i> ; until 1975: <i>Journal of Chemical Documentation</i>)	1961 (1)
50T	6T	202	<i>Research Policy</i>	1974 (3)
53	8	196	<i>International Journal of Human-Computer Studies</i> (formerly until 1993: <i>International Journal of Man-Machine Studies</i>)	1969 (1)
54	9	185	<i>Communications of the ACM</i>	1958 (1)
60	10	158	<i>Current Contents</i>	1969 (11)
62	11	154	<i>Decision Support Systems</i>	1991 (7)
63	12	151	<i>ACM Transactions on Information Systems</i> (formerly until 1988: <i>ACM Transactions on Office Information Systems</i>)	1983 (1)
69	13	112	<i>IEEE Transactions on Systems Man and Cybernetics</i>	1971 (1)
71	14	102	<i>Journal of Computer Information Systems</i> (formerly until 1985: <i>Journal of Data Education</i>)	1994 (34)
73T	15T	96	<i>European Journal of Information Systems</i>	1995 (4)
73T	15T	96	<i>Information Retrieval</i>	2000 (3)
76	17	92	<i>MIS Quarterly</i>	1984 (8)
79	18	85	<i>Industrial Management & Data Systems</i>	1994 (94)
81	19	83	<i>Behaviour & Information Technology</i>	1985 (4)
82T	20T	82	<i>Computers & Education</i>	1978 (2)
82T	20T	82	<i>Journal of Information Technology</i>	1993 (8)
84	22	81	<i>IEEE Transactions on Knowledge & Data Engineering</i>	1992 (4)
86	23	76	<i>Expert Systems with Applications</i>	1991 (2)
87	24	75	<i>International Journal of Medical Informatics</i>	1997 (44)
88T	25T	72	<i>Academic Medicine</i> (formerly until 1989: <i>Journal of Medical Education</i> ; until 1951: <i>Medical Education</i> ; until 1950: <i>Association of American Medical Colleges</i>)	1977 (11)
88T	25T	72	<i>Methods of Information in Medicine</i>	1964 (3)
88T	27T	72	<i>Children's Literature in Education: An International Quarterly</i>	1975 (16)
92T	27T	67	<i>Journal of Management Information Systems</i>	1999 (16)
92T	27T	67	<i>Computers in Human Behavior</i>	1990 (6)
92T	27T	67	<i>International Journal of Technology Management</i>	1994 (9)
95T	31T	64	<i>Computer Networks</i> (formerly until 1999: <i>Computer Networks and ISDN Systems</i> ; until 1985: <i>Computer Networks</i>)	1978 (2)
95T	31T	64	<i>Computer Journal</i>	1958 (1)
97T	33T	62	<i>Interacting with Computers</i>	1992 (4)
97T	33T	62	<i>British Journal of Educational Technology</i>	1971 (2)
97T	33T	62	<i>Social Studies of Science</i> (formerly until 1975: <i>Science Studies</i>)	1971 (1)
100T	36T	61	<i>Fuzzy Sets and Systems</i>	1980 (3)
100T	36T	61	<i>Technovation</i>	1981 (1)
103	38	60	<i>Journal of Strategic Information Systems</i>	1995 (4)
104	39	58	<i>International Journal of Intelligent Systems</i>	1987 (2)
105T	40T	57	<i>Reading Teacher</i>	1956 (9)
105T	40T	57	<i>Technological Forecasting and Social Change</i>	1969 (1)
105T	40T	57	<i>Information Systems</i>	1978 (3)
105T	40T	57	<i>Information and Software Technology</i>	1987 (29)
109	44	56	<i>Computers and the Humanities</i>	1968 (2)
111	45	55	<i>Information Sciences</i>	1968 (1)
112	46	54	<i>New Media & Society</i>	2001 (3)
113T	47T	51	<i>Social Science Computer Review</i>	1994 (12)
113T	47T	51	<i>IEEE Transactions on Engineering Management</i>	1963 (10)
115T	49T	50	<i>European Journal of Operational Research</i>	1978 (2)
115T	49T	50	<i>Journal of Computer-Mediated Communication</i>	2005 (11)

Note. ISI = Thomson ISI (Institute for Scientific Information), now Thomson Scientific (Philadelphia, PA).

^aA significant portion of citations in the *Lecture Notes in Computer Science* series are from conference papers dealing with digital libraries and human-computer interaction.

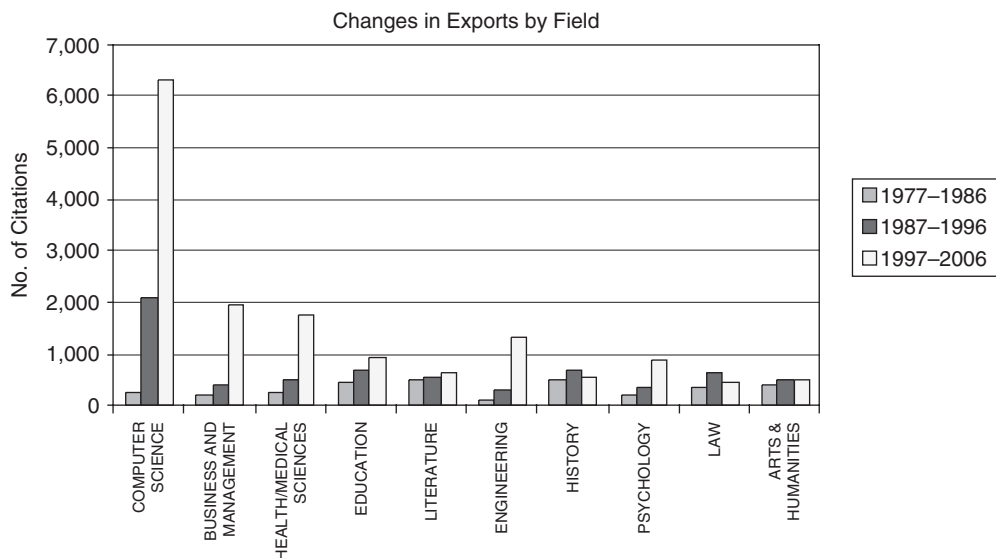


FIG. 2. Top 10 importers from information studies by subject category and time period.

TABLE 6. Top 10 importers from information studies by subject category and period.

	1977-1986		1987-1996		1997-2006		1977-2007	
	Count	Rank	Count	Rank	Count	Rank	Count	Rank
Computer science	252	6	2,079	1	6,286	1	8,617	1
Business and management	204	8	371	8	1,927	2	2,502	2
Health/medical sciences	237	7	477	6	1,745	3	2,459	3
Education	417	3	655	2	928	5	2,000	4
Literature	489	1	515	5	639	7	1,643	5
Engineering	64	10	296	10	1,280	4	1,640	6
History	477	2	654	3	498	8	1,629	7
Psychology	195	9	343	9	846	6	1,384	8
Law	343	5	594	4	426	10	1,363	9
Arts & humanities	392	4	458	7	449	9	1,299	10

health and medical sciences, engineering, and psychology) are now importing ideas and techniques more heavily than previously from IS (see Figure 2 and, for more detail, Table 6).

Our results show that the ranking of importers from IS is statistically significantly different for all pairs of time periods (i.e., 1977-1986 and 1987-1996, 1977-1986 and 1997-2006, and 1987-1996 and 1997-2006)—with Spearman rank order correlation coefficients of 0.672, -0.503, and -0.018, respectively.

Imports

As mentioned earlier, the 48,441 IS articles examined here have cited tens of thousands of unique sources: 566,000 in

total. For practical reasons, we limited our analysis to the top 200 cited sources. Table 7 shows a breakdown of the subject classification of these 200 sources. Over the past 30 years, there has been a significant increase in the number of highly cited business and management, computer science and engineering, health/medical sciences, and communication studies titles at the expense of information studies, sociology, statistics, and education titles. The number of IS titles among the top 200 most frequently cited periodicals dropped from 124 (62%, for the period 1977-1986) to 105 (52%, for 1997-2006). As with exports from IS, the striking increase in imports to IS from computer science and engineering, business and management, and health/medical sciences can be explained in large measure by advances in information technology generally and the Internet (and Web) specifically.

TABLE 7. Subject classification of the top 200 periodicals cited in the information studies literature.

Subject category	Number of titles				No. and % of change from 1977–1986 to 1997–2006
	1977–2006	1977–1986	1987–1996	1997–2006	
Information studies	114	124	120	105	–19 (–15%)
Computer science and engineering	29	27	30	35	+8 (+30%)
Business and management	20	8	15	24	+16 (+200%)
Sciences, multidisciplinary	6	7	6	8	+1 (+14%)
Social sciences, interdisciplinary	6	8	4	8	(0%)
Health/medical sciences	5	3	5	6	+3 (+100%)
Communication studies	4	2	3	4	+2 (+100%)
Psychology/cognitive science	4	4	5	5	+1 (+25%)
Sociology	3	5	3	2	–3 (–60%)
Education	2	3	5	1	–2 (–67%)
Humanities, interdisciplinary	2	2	2	2	(0%)
Economics	1	1	1	2	+1 (100%)
Informatics	1	0	0	1	NA
Law	1	1	1	0	–1 (–100%)
Statistics	1	3	2	0	–3 (–100%)
Telecommunication	1	1		1	(0%)
Physics	0	1	1	0	–1 (–100%)
Total	200	200	203 ^a	204 ^a	

^aThese are greater than 200 because of a tie in the number of citations at rank 200.

Conclusion

Our data present a rather different picture from that drawn by Cronin and Pearson (1990). In fairness, their study looked at the export performance of only a handful of grantees in information science: a comparatively small sample, moreover one drawn from a subdomain of information studies. Additionally, Cronin and Pearson were writing prior to the widespread adoption of the Internet and the Web. The pace and scale of developments in internetworking since then have brought about a kind of simultaneous intellectual fission and fusion within academia; that is to say, elements of IS have spun off into neighboring fields, while IS itself enthusiastically absorbs elements of domains with overlapping or complementary interests in information technology and systems. Information studies may be competing for space with other established and emergent fields, but the ecology of information-related disciplines (to mix metaphors) has expanded, creating opportunities for growth along with well-documented jurisdictional and turf challenges (e.g., Cronin, 2002).

Our data permit two summary assertions: (a) IS has become a much more successful exporter of ideas than in the recent past, a point graphically illustrated in Figure 1; and (b) IS is less introverted than before, drawing more heavily on the literature of such disciplines as computer science and engineering on the one hand and business and management on the other, as Table 7 demonstrates. At the same time, fewer sociology and education titles are featured in the top 200 most frequently cited periodicals. These developments are mirrored in recent hiring trends within information studies programs; a growing number of the fulltime faculty have disciplinary backgrounds/terminal degrees in domains other than IS, a

clear case, if you will, of requisite variety. In conclusion, and to return to the economic metaphor that was our point of departure, IS has in the past decade become a more successful exporter and also a more welcoming importer of intellectual goods trading with an expanding array of partners.

Acknowledgment

We are grateful to Debora Shaw and three anonymous referees for their comments.

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