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Information systems as a reference discipline

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Introduction

In our 2002 article we suggested that it might be time for the field of information systems to be considered as a reference discipline for others (Baskerville and Myers 2002). For the previous two decades the conventional wisdom among information systems (IS) researchers had been that IS is an applied discipline drawing upon other, more fundamental, reference disciplines. These reference disciplines were seen as having foundational value for IS. Before our 2002 article the only arguments concerning this topic had been about which disciplines should be regarded as reference disciplines. No one had actually questioned this conventional wisdom, that perhaps it was time for IS itself to be considered as a reference discipline for others. In our 2002 article we did not claim that IS had in fact achieved the status of a reference discipline; rather, we suggested that it was time to at least consider this question. We said that our paper was designed to be provocative and rhetorical in order to stimulate discussion about the nature and status of our field.

Our aim in writing the article was certainly achieved. The 2002 article sparked much discussion and debate in the IS research literature, with one special issue of the *Journal of the Association for Information Systems* devoted to this issue. Our article has now received more than 500 citations, with scholars coming down on both sides of the argument.

The purpose of this chapter, therefore, is to discuss our original argument for IS to be considered as a reference discipline, review the various contributions that have been made to the debate since then and suggest a way forward for future research.

The outline of this chapter is as follows. The next section briefly summarizes our original argument as to why IS should be considered as a reference discipline, as per our 2002 article. The following section reviews the various contributions that have been made to the debate by IS scholars since then. The final section suggests some possible future directions for further work on this important topic.

**IS as a reference discipline?**

In this first section we briefly summarize our original argument as to why IS should be considered as a reference discipline.
The idea that the field of information systems is an applied discipline drawing upon other, more fundamental, reference disciplines, was first suggested by Peter Keen at the first International Conference on Information Systems (ICIS) in 1980. Because these reference disciplines were more mature, Keen argued that IS researchers could borrow and learn from the theories, methods and exemplars of good research in these reference disciplines (Keen 1980). Following on from Keen’s original ICIS paper, IS scholars spent much time and effort debating which disciplines should be counted as reference disciplines. For example, as well as the usual suspects of engineering, computer science, mathematics, management science and behavioral decision theory, IS scholars suggested that many other related disciplines should be added to the list. These additional disciplines included accounting, management, architecture and anthropology. But until our 2002 article no one had really considered the idea that other fields might borrow and learn from the theories, methods and exemplars of good research in IS. The flow of knowledge and information was assumed to be entirely one way.

The conventional wisdom regarded IS as having many reference disciplines but not its own research tradition, and that it had few, if any, referring disciplines. We suggested that this view of the nature of our field might be outdated for four reasons (Baskerville and Myers 2002).

First, the field of information systems has developed its own research tradition. By 2002 the field had at least one major journal (MIS Quarterly) that was established more than 25 years ago, the field’s major international conference (ICIS) was more than 20 years old and most major universities had IS departments. As well as having its own international society (the Association for Information Systems), the field has a distinct subject matter, a distinct research perspective and a well-developed communication system that includes respected journals (Baskerville and Myers 2002).

Second, we argued that IS has much to offer researchers in many other disciplines. This contribution is especially important because information technology and systems had already become ubiquitous in the developed world by 2002. We provided two examples of IS research articles that had been well cited by researchers from other disciplines, one by Markus, the other by Davenport and Short. Markus’s classic article on resistance to IS implementation (Markus 1983) had been cited over 200 times over the previous decade (Lee et al. 2000) in such diverse disciplines as Communication (Lewis 2000), Education (Telem 1997), Human Resources (Fincham 1994), Manufacturing (Guimaraes et al. 1995), Medical Informatics (Kaplan 1997), Organizational Behavior (Singh and Ginzberg 1996), Organizational Change Management (Kaarst-Brown 1999), Sociology (Rachel and Woolgar 1995) and Urban Planning (Budic and Godsalk 1994). Davenport and Short’s (1990) original article on business process reengineering had been cited more than 250 times by 2002 in fields such as Behavioral Science (Paul et al. 1999), Systems Science (Gross and Traunmuller 1996), Government (Caudle 1996), Manufacturing and Engineering (Harris 1996; Li 1996) and Medical Informatics (Buetow and Roland 1999). As an aside, Markus’s 1983 article has been cited more than 2,600 times, and Davenport and Short’s 1990 article more than 4,300 times.

Third, given the rapid and unrelenting digitization of business and society as a whole, we suggested that researchers from many other fields would soon start to recognize the importance of IS research.

Hence we suggested that IS has an opportunity to become established as a reference discipline for other research fields because almost every other human discipline was now a potential consumer of IS research discoveries.

Fourth, we suggested that IS could be seen as one part among many knowledge creation networks throughout the world. Seen in this way, IS would cease to be regarded as a referring
discipline with many reference disciplines, but one of many reference disciplines exchanging ideas in an intellectual discourse with other disciplines. IS would be seen as one “reference discipline” or “contributing discipline” among others (Baskerville and Myers 2002).

In order for the field to take its place as one reference discipline among others, we suggested that there were at least two arenas for concentrated improvement. The first arena was a change in our own mind-set as to the audience for IS research. As well as our existing constituency, we suggested that we needed to address a much broader audience in our work – this audience to include scholars in any field that would be affected by the use and application of information technology and systems. The second arena involved making sure that our research is easily accessible to researchers in other fields. We suggested that our research articles needed to be visible, readily available, and understandable to others.

We concluded our 2002 piece by suggesting that there was an opportunity for IS scholars to take a more visible and active leadership role within a larger community of scholars. Taking a position of leadership would mean transforming our research agendas and clearly explaining the broad value of our research discoveries. It would also mean working toward the situation where scholars from many other fields look to our top journals for leadership and guidance. Our research articles would need to be of sufficient quality, substance and depth that scholars in other fields would find IS research increasingly useful (Baskerville and Myers 2002).

To summarize, the main purpose of our 2002 paper was to stimulate discussion about the nature and status of our field. Our 2002 article suggested that it was time to question the conventional wisdom that IS was simply a consumer of knowledge from other fields, and consider instead whether it was also a contributor. We argued that the IS field had come of age, although whether IS had in fact become a reference discipline at that time was still an open question. We thought that 2002 was certainly an appropriate time to consider the question of whether IS had emerged as a reference discipline in its own right, although we acknowledged that there was still much work to be done.

The subsequent reference discipline discourse

It might be said that our 2002 paper represented a milestone in the disciplinary debate. It offered one path away from the inwardly focused information systems “identity crisis” (Benbasat and Zmud 2003), instead focusing outwardly on the intellectual utility of information systems research. If not a milestone, it certainly became something of a lightning rod. It precipitated a discourse about the usefulness of the scholarly knowledge proceeding from the field. This discourse includes work of an empirical nature, with conclusions based on citation analyses of the research literature, to work of a more theoretical nature.

We suggest that the subsequent discourse can be grouped into three types of argument: (1) information systems is an intellectual black hole; (2) information systems is a rising star; and (3) information systems scholars should move on to consider a different set of questions.

Information systems is an intellectual black hole

The first type of argument in the subsequent discourse is that the discipline of information systems only absorbs knowledge from other fields. We can characterize this first type of argument as the black hole proposition. IS scholars taking this line of argument say that knowledge flows into the discipline, but relatively little, if any, flows out of the discipline. This view reiterates the idea that the field of information systems is not a reference discipline, or at least not yet.
A leading work taking this perspective is Wade, Biehl and Kim’s article titled “Information Systems Is Not a Reference Discipline (And What We Can Do About It)” (2006b). Using a citation analysis of 22 journals (1990–2001) anchored to the *Financial Times* list of research journals, they found it “difficult to conclude that the IS field is a reference discipline” (p. 256). Further, based on a social network analysis, they offer evidence that IS is not even a contributing discipline. A time series analysis that the authors conducted produced no indications that any spread of IS knowledge is developing. They say that their findings cast doubt on Baskerville and Myers’ conclusion that IS is ready to attain the status of a reference discipline. [The findings] also draw into question the extent to which the IS field has become a contributing discipline for other management fields.

(p. 260)

In “Relationships Among the Academic Business Disciplines: A Multi-Method Citation Analysis,” Biehl et al. (2006) delivered a more general analysis of the *Financial Times* list of management journals (1985–2001) using social network analysis. In their study of the relationships among the research publications in the management disciplines, they found indications that information systems was highly interdisciplinary in that it seemed to draw its reference base from broadly across other management disciplines. However, the other disciplines, even those that were most cited within information systems, were not citing IS research from information systems journals.

Polites and Watson (2009), in “Using Social Network Analysis to Analyze Relationships Among IS Journals,” used social network analysis of the core journals in information systems in relation to journals in allied disciplines (2003–2005). They say that their findings support the conclusions of Wade et al. (2006) based on 1990–2001 data from 31 top business journals and others that IS has not yet achieved status as a full-fledged reference discipline, in that it is not being extensively cited by other disciplines.

(pp. 608–609)

Larsen and Levine, in “Searching for Management Information Systems: Coherence and Change in the Discipline” (2005) use a co-word analysis of the literature to identify 62 different centers of coherence in the information systems discipline. They find only weak evidence of theory building. With so much diversity, they believe that any kind of cumulative tradition continues to elude the field of information systems. They conclude:

No end appears to be in sight for the now familiar and longstanding discussions on the status of MIS. This debate touches upon the identity and value of MIS as a field within the university and in relation to industry practice.

(p. 377)

We can see, therefore, that the first discourse disagrees with any proposition that IS has achieved the status of a reference discipline; rather, the evidence for the building of a coherent, cumulative tradition of IS research is weak, and any knowledge that flows into IS tends to disappear into a black hole, that is, once it enters our field it stays there, never to see the light of day anywhere else.
Information systems is a rising star

The second argument in this discourse takes an opposing line of argument to the first. This discourse takes the view that the discipline of information systems is indeed diffusing knowledge into other fields. We call this line of argument the *rising star proposition*. It takes the general view that knowledge is not only being drawn into the discipline, but is increasingly flowing out of the discipline. IS scholars taking this view argue that the field of information systems is well on the way to becoming a reference discipline, if it is not one already.

A leading work taking this perspective is Grover et al.’s (2006b) “A Citation Analysis of the Evolution and State of Information Systems Within a Constellation of Reference Disciplines.” In their citation analysis of 16 management journals during the period 1990–2003, they find:

In general, these results support the contention that IS is becoming an exporter of ideas. . . . Our analysis suggests that our traditional reference disciplines are increasingly drawing . . . from IS; in a sense the tables have turned. It is also evident that fields like engineering . . . and ergonomics . . . are also benefactors of our knowledge base. Therefore, despite the diversity of the field, there seems to be an intellectual engine emerging that can contribute to more “mature” disciplines.

(pp. 292–294)

Katerattanakul, Han and Rea, in “Is Information Systems a Reference Discipline?” (2006), conducted a citation analysis of the 4,668 journals indexed in the Social Science Citation Index and the Science Citation Index. They analyzed the citations to the 1,120 articles in the top six information systems journals.

Results from this study provide strong evidence that the information systems discipline has become a reference discipline for others. That is, IS research published in IS journals is frequently cited by other disciplines, even those fields that previously served as reference disciplines for IS (such as computer science, management, and organization science).

(p. 117)

In “Defining the Intellectual Structure of Information Systems and Related College of Business Disciplines: A Bibliometric Analysis,” Pratt et al. (2012) seek to identify the reciprocal impact of scholarly contributions between information systems and five other business disciplines. Basing their co-citation analysis on a selection of 115 journals (25 in each discipline, including overlaps), and using the Thomson Reuters Web of Knowledge, they analyzed 148,009 papers. They conclude that

there is an increased export of IS literature to other COB disciplines with the sharpest increases to Marketing and Entrepreneurship. The increased export of IS knowledge to other COB disciplines demonstrates the growing influence of IS on other disciplines and further supports the argument that IS is becoming a reference discipline.

(p. 301)

We can see, therefore, that the second argument in this discourse agrees with the proposition that IS has achieved the status of a reference discipline, or at least is well on the way to becoming one. Knowledge is increasingly flowing out of IS into other fields.
Why the contradictions in the citation evidence?

The somewhat equally weighted yet diametrically opposing citation evidence for each argument is intriguing. Surprisingly, two of these contradictory articles, namely, Wade et al. (2006b) and Grover et al. (2006b), appeared in the very same issue of the *Journal of the Association for Information Systems* dedicated to the subject. Scientometric studies such as those described earlier are sometimes superficial, but not in this case. Both these papers are extremely rigorous and thorough, characterized by one of the special issue editors as raising “the level of the discourse to the highest level” (Straub 2006, p. 243). In fact, all six of the studies mentioned are very well executed.

One possible explanation for the apparently contradictory results lies in the selection of journals included in the studies. For example, is *Decision Sciences* an information systems journal or a management science journal (cf. the arguments of Wade et al. (2006a) on this point)? Over time, journals change editorial policies, for example, *Communications of the ACM* changed in its scope (cf. the arguments of Grover et al. (2006a) on this point). Another possible explanation is the varying assumptions about whether all papers published in information systems journals ought to be considered information systems papers (Wade et al. 2006a). Yet another is whether citations can provide an appropriate measure to indicate a reference discipline anyway. These are a matter of degree and the degree is a matter of opinion (Grover et al. 2006a). Finally, the analytical tools used in each paper might affect the results. Social network analysis seems to support the black hole proposition, and other forms of co-citation analysis seem to support the rising star proposition (Polites and Watson 2009).

The subsequent discourse to our 2002 article thus includes well-designed and well-executed citation-based scientometric studies that support both the black hole proposition and the rising star proposition. This outcome leads us to concur with Grover et al. (2006b) that it may well be a faulty conceptualization of the two propositions that supposes them as being in opposition to each other. Perhaps a reframing of the two propositions might yield some useful insights.

Reframing the two propositions

The two opposing arguments discussed earlier have attracted alternative ways of reframing the two propositions. As for the black hole proposition, Gill and Bhattacherjee (2009) reframed this proposition in their article titled “Whom Are We Informing? Issues and Recommendations for MIS Research From an Informing Sciences Perspective.” They argued that the various clients of the information systems academic discipline include students, practitioners and other academics (outside of information systems). They positioned their work as focusing on the degree to which information systems is informing practice; or more particularly, informing important problems facing practice. They argue that all business disciplines in general (and not just IS) do a poor job of informing practice. In Europe, they note how the information systems discipline is better aligned with practice than in North America.

As for the rising star proposition, our subsequent paper titled “Fashion Waves in Information Systems Research and Practice” (Baskerville and Myers 2009) reframed this proposition as related to the use of IS research by IS practice, not the use of IS research by other academic disciplines. We considered whether the fashion-following tendencies known to inhabit management practice (Abrahamson 1991; Abrahamson 1996) were also a feature of the IS field; namely, whether information systems practice mirrored those fashions found in information systems research. Using bibliographic analysis, we found indications that both IS research and practice are closely aligned. We showed how the discipline’s research tracked, and occasionally
led, practice. Our findings suggested that there were opportunities for information systems not only to contribute knowledge to other academic disciplines, but to contribute in the formulation of new trends and fashions in practice.

We can see, therefore, that the subsequent reframing of the discourse has only continued the apparent disagreement over the state of the IS field (Myers et al. 2011). Some authors have continued to argue in favor of the black hole proposition, saying that IS research is irrelevant to practice, whereas others such as ourselves have continued to argue in favor of a slightly modified version of the rising star proposition, saying that IS research is not only relevant but closely aligned to IS practice.

IS scholars should move on to consider a different set of questions

While reframing the two original arguments has helped to broaden the discourse to include the degree to which information systems research has contributed to practice, a third type of argument in the subsequent discourse to our 2002 article is that IS scholars should move on to consider a different set of questions. That is, grounding their work in the foregoing reference discipline debate, these researchers have sought to frame the discourse in a different way.

Kjaergaard and Vendelø (2015) suggest that any proposition that information systems is a reference discipline will more likely depend on the nature of the theory adaptation taking place in particular research projects. In “The Role of Theory Adaptation in the Making of a Reference Discipline,” they examine the particular case of sense-making theory, its adaptation in information systems research and the subsequent impact of such research. Using a set of 323 articles from nine leading information systems journals ranging from 1997 until 2006, they identified 19 articles that adapt and use sense-making theory as a central construct in a theoretical framework. They conducted a citation analysis of these articles using the Web of Knowledge and Web of Science and compared the referencing of these articles to the results of the Wade et al. (2006b) study mentioned earlier. They conclude that this set of sense-making articles “are remarkably more successful in attracting citations from outside the IS discipline, and therefore conclude that theory adaptation matters for external referencing” (p. 144). Hence these scholars have moved the discourse forward from simply discussing whether knowledge flows in or out of the field of information systems. Instead, they consider how it flows, looking at the bi-directional flow of knowledge both into IS and subsequently out of IS.

Bernroider et al. (2013) used citation and co-citation analysis across the AIS basket or eight journals together with 825 journals in 22 business and management fields (1995–2011). They identified general management as the original main reference discipline for information systems, but say its influence has declined over time, giving way to a more diverse set of reference disciplines (notably marketing, business strategy and social science). Their analysis focused on the information systems discipline’s increased advocacy for its jurisdiction over certain problem areas (Abbott 2001). They found evidence that this advocacy initially rose, then fell, then rose again over the history of the field. They regard the multi-disciplinarity of information systems and its fluid boundaries as essential for the field’s continued formation, saying “the multi-disciplinary and hybrid nature of the developing IS discipline remains visible over time as it equally shares its discourses with inputs from non-IS disciplines, and as a discipline has established different levels of jurisdiction over time” (p. 85). Hence this article also moves the debate forward by establishing which areas of knowledge are in effect “owned” by IS.

Córdoba et al. (2012) examine the field of information systems from the perspective of the sociology of science. Using Abbott’s (2001) theories of disciplinary emergence, they propose three concepts as being relevant: differentiation (jurisdiction over problem areas), competition
(externally with other disciplines and internally, e.g., over research methods) and absorption (winning rights to a jurisdiction). Using evidence from citation analysis (see Bernroider et al. 2013), their insights “indicate that IS has gone through stages of differentiation, competition and is currently in a stage of absorption, in what appears to be a consolidation of positivist and behaviourally oriented research oriented to study and manage IS acceptance and use” (p. 492). Like the previous article, this work focuses on what areas of knowledge are unique to IS.

We can see, then, that the third discourse moves on from the original debate about whether information systems is a reference discipline or not. Instead, these scholars adopt a more dynamic perspective and consider which areas of knowledge are continuously owned by IS and which areas exhibit ownership that flows dynamically between disciplines over time.

**Summarizing the discourse**

Has the field of information systems now achieved the status of a reference discipline? Was our original argument right or wrong? We have seen that the evidence, whether it is citation, co-citation or social network analyses, is mixed and somewhat equivocal. The answer depends on the assumptions that are made about which journals to include in the studies and the analytical methods that are employed. More recent work has suggested alternative ways to reframe the argument. These more nuanced ways of analyzing the flow of knowledge within and between disciplines now lead us to suggest a way forward for future research.

**Future directions**

As we have just mentioned, the most recent work related to the IS as a reference discipline debate actually moves on from considering whether knowledge flows in one direction or the other. Rather, recent work builds on the idea that knowledge flows in many directions, whether from one academic discipline to another, or from academia to practice (and vice versa). Seen in this way, the field of IS can be seen as one part among many intertwining knowledge creation networks throughout the world. The field of information systems is simply one academic discipline among others exchanging knowledge in a free flow of ideas. Information Systems is simply one of many “contributing disciplines” to an ever-changing discourse related to information technology (Baskerville and Myers 2002). Hence, we suggest that one future direction of IS research could be to document and analyse this multidirectional flow of knowledge over time. We regard Kjaergaard and Vendelø’s (2015) article as an exemplar of this kind of future work.

Another future direction for further work builds on a suggestion that we made in our 2002 article. We suggested that there was an opportunity for IS scholars to take a more visible and active leadership role within a larger community of scholars. We said that we as IS scholars should work toward the situation where scholars from many other fields would look to our top journals for leadership and guidance (Baskerville and Myers 2002). So an appropriate question to ask, approximately 15 years since our original article, is this: has IS taken up a position of leadership not only within academia, but also with IS practitioners and society as a whole with respect to the discourse related to development, use, application and impact of IT? While we would argue that our research is being cited and used in these various arenas, we think that there is still a long way to go before we are seen as thought leaders. The idea of having grand challenges for the IS discipline is one step in the right direction (Baskerville et al. 2006; Limayem et al. 2011), but much more work remains to be done. Hence this remains a work in progress.
Information systems as reference discipline

References


