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- A new point of view in the IS reference dicipline
  discussion

by

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Scholarly Hallucinations and Screwed Expectations!

- A New Point of View in the IS Reference Discipline Discussion

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Abstract

Information Systems scholars continuously debate about the nature of the IS discipline. Recently a series of articles have discussed whether the IS field has reached the status of a reference discipline. We address this issue by examining the application of the theory of sensemaking in IS research. Our findings show that the prospects for IS as a reference discipline are not promising. Based on these findings we suggest that IS scholars hallucinate when they a) assume that to become a 'real' academic discipline, IS has to become a reference discipline, and b) believe that IS will become a reference discipline in time. Hence, we describe the IS reference discipline discussion as a misconception, which should be abandoned in the pursuit of a stronger IS discipline.

Keywords: Academic legitimacy, information systems research, reference disciplines, theory application, theory of sensemaking

SCHOLARLY HALLUCINATIONS AND SCREWED EXPECTATIONS!

A NEW POINT OF VIEW IN THE IS REFERENCE DISCIPLINE DISCUSSION

Over the past almost thirty years, scholars of information systems have debated the status of the IS discipline as a scientific field. Many leading IS scholars have contributed to the debate and while they do not necessarily agree upon the current status of the IS discipline, the dominant perception is that it has matured significantly during the last decade (see, e.g., Baskerville and Myers 2002). The debate is divided into a number of sub-debates ranging from problems of legitimacy and recognition from other research fields, experienced by the IS field (Lyytinen and King 2004), to the lack of a clear definition of the IS field (Avgerou et al. 1999), to the problems related to the absence of a theoretical core of the IS field (Benbasat and Weber 1996; Benbasat and Zmud 2003). Since 2002 a debate about the status of the IS discipline as a reference discipline has evolved[1]. Some IS scholars (Vessey et al. 2002) argue that IS has already become a reference discipline whereas others claim that IS is now ready to become a reference discipline (Baskerville and Myers 2002). More critical voices find that IS still needs to cover some ground before it can proclaim itself a reference discipline, or as Wade et al. (2006) put it "in order for a field to be considered a reference discipline, it must first be referenced by other disciplines" (ibid, p. 248).

Debating the relevance of the reference discipline discussion itself, Wade et al. (2006) ask rhetorically "As a field should we care?" (ibid, p. 260), in order to address the view that whether or not IS becomes a reference discipline may be of limited importance. Wade et al. (2006) answer the question by stating that most members of the IS field agree that external influence on other fields is important to sustain the legitimacy of the IS field in academia. In the words of DeSanctis (2003, p. 369) the very survival of the IS discipline may depend on it, and Robey (2003) concurs, stating that most members of the field would agree that it behooves the field to increase its external influence.

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[1] A previous reference discipline discussion explored how other disciplines served as reference disciplines for IS, see, e.g., Keen (1980).

Even if the majority of the contribution to the reference discipline discussion believe that IS must strive to become a reference discipline, there is a lack of agreement about appropriate means to be applied to reach this goal. Suggestions for improving the field's influence on other disciplines are several and varied, see for example Lee (2001; 1999; 2000) about cross-discipline publication, Benbasat and Zmud (2003) on attending other disciplines' conferences, Galliers (2003) on accepting and embracing pluralism, and Hirschheim and Klein (2003) on developing a discipline-wide body of knowledge. Nevertheless, while we acknowledge the importance of these suggestions for improvement and their potential usefulness for increasing the external influence of the discipline, we suggest that one dimension is missing from the discussion, namely how IS scholars apply theories borrowed from other research fields.

In a recent paper, Truex et al. (2006) discuss the adaptation of theory in IS research, and they highlight that poorly informed adaptation of theory may generate three mistakes; a) repetition of mistakes made and debated within the original disciplines' discourse, b) misinterpretation of underlying assumptions about the nature of reality and how knowledge is acquired which are implicit in the theory and the methodological implications of those assumptions, and c) waste of time and effort by not adding value to the cumulative tradition in the IS field (ibid, p. 798). Truex et al. (2006, p. 798) suggest that it is "the manner in which theories are borrowed" by IS scholars more than the borrowing itself that creates problems for and weakens the IS discipline. Using this point of view as our stepping-stone we speculate if the manner in which theories are borrowed by IS scholars has consequences for whether IS research gets cited by scholars from other disciplines. Our assumption being that the manner of borrowing may have negative consequences for the ability of IS scholars to give back to other research fields. We do not say that this is necessarily the case, but we find it worth investigating, because we assume that in order to reference IS research, scholars from other disciplines must experience that the IS discipline offers something valuable to them. In summary, like Truex et al. (2006) we express "concern over the negative impact that uninformed borrowing of external theories has on our field" (ibid, p. 799), albeit in a different way.

For the purpose of addressing our speculation, we review how the theory of sensemaking has been adapted in IS research and what the outcome has been. As organization studies has a long tradition for serving as a reference discipline for IS (Benbasat and Zmud 2003;

DeSanctis 2003), we have chosen a theory from this research field. Hence, our objective is to uncover a potential dependent variable for becoming a reference discipline.

The theory of sensemaking has been adapted by IS scholars to analyze IS in organizations, foremost in studies of how users appropriate, frame, construct meaning and make sense of information systems (Markus and Robey 2004). In order to investigate the application of the theory of sensemaking in IS research we conduct a review of IS research published in four North American and two European IS journals. The study is divided into four phases; a) identification of articles that mention the theory of sensemaking (sample A), b) identification of articles in sample A, which apply the theory of sensemaking as part of their analytical framework (sample B), c) examination of the application of the theory of sensemaking in the articles included in sample B using Gregor's (2006) taxonomy of theory types in information systems research and Baskerville and Myers' (2002) five bodies of knowledge categories. And finally d) review of the examined articles impact outside the IS discipline.

The paper is structured as follows. First, we present the ongoing debate about IS as a reference discipline and describe the theory of sensemaking to outline its theoretical foundation and its use in organization studies. Subsequently, in section three, we present the methodology of the study. In section four, we analyze how the theory of sensemaking is applied in IS research. Finally, based on our findings in the analysis, we discuss the IS discipline's adaptation of the theory of sensemaking as an example of theory adaptation in IS research, and make some predictions regarding the IS discipline's prospects for becoming a reference discipline.

The Disciplinary Debate and the Reference Discipline Discussion in Information Systems Research[2]

The ongoing debate among IS scholars about the disciplinary status of the IS field feeds on a perception of the IS field as having failed to establish legitimacy, and therefore, as being threatened on its existence, or at least being in a state of crisis (Hirschheim and Klein 2003; Lucas 1999; Markus 1999). In such a situation, the improvement of the IS discipline's

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[2] It is worth mentioning that most research fields have debates about the field's raison d'être, its demarcation and inclusion or exclusion of topics and research objects, levels of analysis, etc. Hence, the IS discipline is not an exception. A quick visit to organization studies reveals that a similar debate is both ongoing and lively in this research field, see, e.g., Augier et al. (2005) and March (2004; 2007).

legitimacy becomes a means to its survival, even if debates about how this can and should be done prevails.

One debate focuses on *diversity versus unity*. The diversity of the field in its research problems, its methods and its theories has been the subject of an intense debate (Robey 1996; Swanson and Ramiller 1993; Vessey et al. 2002). Some IS scholars perceive diversity as a threat to the IS field and call for a more focused direction and for consensus about a set of core research problems (Benbasat and Weber 1996; Checkland and Holwell 1998; Davis 2000). Some see a need for establishing a theoretical core in order to become legitimate[3] (Benbasat and Weber 1996; Benbasat and Zmud 2003) or suggest the creation of a shared body of knowledge (Hirschheim and Klein 2003). Others argue that diversity is a necessity and a quality of the IS field that enables it to grow and develop (Banville and Landry 1989; Galliers 2003; Robey 1996; Swanson and Ramiller 1993). Proponents of diversity stress the need for the field to continuously adapt to changing interests in academia, business and society in general. Opponents, in contrast, consider diversity as a dilution and a breakdown of the field, which potentially causes the field to be engulfed by other more established disciplines. Instead, they call for a more cohesive, accepted conceptual framework or paradigm for IS research (Baskerville and Myers 2002).

Another debate focuses on whether IS by nature is an *applied* or a *theoretical* discipline. In the perception of Baskerville and Myers (2002) one of the lasting outcomes of the first International Conference of Information Systems in 1980 was the understanding that IS was an applied discipline that borrowed and learned from the theories, methods and exemplars of good research in other disciplines (ibid, p. 2). However, they also point to a recent change from an applied to a more theoretical focus. The applied nature is also stressed by Hirschheim and Klein (2003) who maintain that "without a thriving practitioner community, there is little need for an academic one" (ibid, p. 242), and they identify five stakeholders relations; three of which are external 1) IS researcher – executive, 2) IS practitioner – IS researcher and 3) executive – IS practitioner, and two which are internal 4) IS researcher – IS researcher and 5) IS researcher – other disciplinary researcher. Hence, a key concern in this discussion is who constitutes the audience for the IS field. Galliers (2003**)** take on an even boarder perspective and talks about society as the target group.

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[3] A proposition which Lyytinen and King (2004) recently concluded "is logically invalid and does not recognize ample evidence to the contrary from the history of other disciplines" (p. 220).

A third debate focuses on whether IS has established *a research tradition or not*. Contributing to this debate Baskerville and Myers (2002) argue that the conventional conception of IS as being near the end of an intellectual food chain is outdated, instead they maintain that the field now has a research tradition of its own: "the field has a distinct subject matter, a distinct research perspective, and a well-developed communication system that includes respected journals" (ibid, p. 3). DeSanctis (2003) argues that the IS discipline can sustain itself as a research community by focusing on the study of a certain set of empirical phenomena. She argues that "the measure of a discipline lies less in its outputs or artifacts than in the interactions of its scholars" (ibid, p. 361). In pursuing this argument she applies a community of practice perspective (Wenger 1998) to focus on internal matters rather than on external legitimacy.

Although many different strands characterize the debate, they all address the question of how the IS discipline can become more legitimate and justify its existence in the eyes of stakeholders such as IS practitioners, IS executives and scholars belonging to other academic disciplines. Emanating from the disciplinary debate, the IS reference discipline discussion, which we describe in more details in the following section, has as its main concern, academic legitimacy and recognition from other disciplines.

The Reference Discipline Discussion in Information Systems

The reference discipline discussion in IS has two main foci. From around 1980 and until 2002, the discussion focused on the academic disciplines that served as reference disciplines for IS. Papers with this focus include Keen (1980), Hamilton and Ives (1982), Culnan and Swanson (1986), Culnan (1987), and Lee (1991). In 2002 the reference discipline discussion in IS made an important turn as two papers (Baskerville and Myers 2002; Vessey et al., 2002) initiated a debate about IS as a reference discipline on its own merits. From 2002 the center of the reference discipline discussion moved to the question of the IS field's external influence and how referencing to IS research by other academic disciplines could be measured and strengthened. Vessey et al. (2002) suggested that IS had already become a reference discipline whereas Baskerville and Myers (2002) argued that IS was ready to serve as a reference discipline for other academic disciplines, as it had developed its own research tradition and perspective, and thus, had become of interest and value to researchers in other disciplines. Later Wade et al. (2006) challenged these two positions by showing that IS had yet to attain the status of a reference discipline. According to their definition of a reference

discipline, someone has to reference a discipline for it to be a reference discipline. Hence, the disagreement about the current status of the IS discipline as a reference discipline may be traced back to the fact that the concept of a reference discipline is equivocal[4].

Another dimension of the debate has focused on possible solutions and suggestions for improvement or corrective action, aimed at making IS a reference discipline that other disciplines see the value of and want to include in their research (Hirschheim and Klein 2003). The suggestions include:

- Publishing IS research in journals from other academic fields or focus on co-publication with scholars from other research fields (Baskerville and Myers 2002).

- Pursuing a constant strive for quality (Lucas 1999): "There is a simple strategy that can help advance our field, and that is *to constantly strive for quality in all that we do*."

- Increasing the quantity of articles in leading IS journals (Wade et al. 2006).

- Making sure that IS research is readily accessible to researchers in other fields (Baskerville and Myers 2002).

- Publication of joint special issues with journals from other academic disciplines (Lee 1999).

- Attendance of other areas' conferences and to encourage researchers from other fields to attend IS conferences (Benbasat and Zmud 2003).

- Promotion of systems thinking (Wade et al. 2006).

The suggestions for improvement are relevant, and we do not question their potential. Yet, we find that the suggestions spring from the assumption that scholars belonging to other academic disciplines are able to identify IS research, which they find it worthwhile to reference. In the present paper we question this 'taken-for-granted' assumption by taking Wade et al.'s (2006, p. 248) statement "for a field to be considered a reference discipline, it must first be referenced by other disciplines" a step further and suggest that *for someone to reference a discipline there must be something of interest to reference*. We make this

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[4] A fourth paper (Katerattanakul et al., 2006) claims that IS has become a reference discipline. However, the results are problematic, because the paper solely categorizes Communications of the ACM as an IS journal, and thereby it concludes that IS is a major reference discipline for computer science.

suggestion the point of departure for our endeavor, and elaborate on it in the following section.

The Paper's Approach to the IS Reference Discipline Discussion

In the previous sections we indicated that claims have been made about the IS discipline's potential as a reference discipline. However, we find that none or at least very few of the contributors to the discussion have touched upon what we find to be an important question in the IS reference discipline debate[5], namely: When do scholars from other academic disciplines find IS research interesting? Instead, IS scholars who are engaged in the IS reference discipline discussion commonly focus on another question, namely: What does the IS discipline have to offer to other academic disciplines? A question which is typically answered by explaining "that information technology and systems have become ubiquitous in the industrial world" (Baskerville and Myers 2002, p. 6) and therefore scholars belonging to other academic disciplines "have realized that their phenomena of interest are now mediated by information technology" (ibid, p. 6). Or by describing examples of IS research that have been widely cited by scholars belonging to other academic disciplines, and thereby, showing that IS research has been picked up by other disciplines.

We believe that in order to deal with the central question: *When do scholars from other academic disciplines find IS research interesting?* We need to take a look at IS research, which is acknowledged to have had an influence outside the IS discipline. As examples[6] of such IS research, Baskerville and Myers (2002) mention M. Lynne Markus' research on intra-organizational power and resistance to IS implementation (Markus 1981; Markus 1983; Markus and Pfeffer 1983) and Truex et al. (2006) mention Mark Keil's research on de-escalation of commitment to failing courses of action in IT-projects (Keil 1995; Keil et al. 2000a; Keil and Robey 1999; Keil et al. 2000b; Montealegre and Keil 2000).

A closer look at these two examples of IS research reveals that they both borrow a theory from another academic discipline, in these two cases organizations studies, apply it to an empirical phenomenon of interest to the IS discipline, and produce research results which

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[5] Only Baskerville and Myers (2002) come close when they ask: "How does IS research have any interest and value for researchers in other fields?" (ibid, p. 5), but in their answer they do not go any further than to mention examples of IS research that have been cited by scholars from other academic disciplines.

[6] Orlikowski's (1992, 2000) and Orlikowski et al's.(1995) research on technology structuring could be a third example of such research had it not been published in organization studies journals.

contribute to the advancement of the theories borrowed. In the case of M. Lynne Markus' research, the theory applied is politics in organizations (Pfeffer 1981), and the research results are insights into interaction between intra-organizational power and the implementation of new technologies. In the case of Mark Keil's research the theory applied is escalating commitment to failing courses of actions (Brockner 1992; Ross and Staw 1986; Ross and Staw 1993), and the research result is an extension to the theory in terms of insights into how de-escalation of commitment to failing courses of action can happen. Hence, both these examples of IS research provide a theoretical contribution of value to scholars from other academic disciplines.

Based on these observations we suggest that IS research papers are very likely to contribute to the IS discipline's status as a reference discipline if they either advance theories of interest to other academic disciplines or if they produce insights into empirical phenomena, which are of interest to other academic disciplines. From these two suggestions it follows that how theory is borrowed and applied in IS research has implications for its potential for getting referenced by scholars from other academic disciplines. Using this observation as our point of departure, we review how a theory is borrowed from another academic discipline and applied in IS research.

The Theory of Sensemaking

The theory of sensemaking (Weick 1995) has been chosen as the object of our review of the borrowing and application of theory by the IS discipline. In IS research it is quite common for IS scholars to state that agents make sense of information or technology. Hence, we have taken the liberty to assume that the theory of sensemaking is widely applied IS research and have chosen it as the object of our analysis.

The theory of sensemaking originates from the field of organization studies, where it first appeared in Karl Weick's 1969 book The Social Psychology of Organizing, almost at the same time as the IS discipline was formed. Since then it has continuously been developed by Karl Weick and his collaborators, e.g., Daft and Weick (1984), and by other scholars of organizations, such as Fiol and O'Conner (2003). Thus the theory of sensemaking is still a vital theoretical approach in the field of organization studies.

The theory of sensemaking focuses on the relationship between cognition and action (Weick, 1995). It contains the cognitive and social mechanisms for dealing with ambiguity and uncertainty in organizations. Summarized by Corea (2006, p. 136), the understanding it forms

is "retrospective, enactive of sensible actions based on focused cues, and marked by plausibility rather than accuracy. Its tactical utility is limited to the unique context it frames, in which it can nevertheless engender useful learning."

In his book Sensemaking in Organizations from 1995, Karl E. Weick constructed a theoretical framework of sensemaking based on earlier writings about the topic (see e.g. March and Olsen 1976; Starbuck and Milliken 1988; Thomas et al. 1993). The book has been highly influential and Karl Weick is now perceived as 'the father of sensemaking'. The theoretical base of sensemaking cuts across and is applicable to several disciplines including psychology, organizational behavior, education, sociology, management, and information systems.

Sensemaking is both an individual and a social activity, and the two are not easily separated, as the cognitive process happens within the individual, but the individual always reflects his or her 'self' in other individuals (as well as what he or she believes others perceive about him- or herself). Sensemaking is also the creation of reality as well as comprehension of reality, and it is therefore strongly linked to constructivism. Although sensemaking is a cognitive process, it is also closely linked to action, which precedes the construction of meaning and makes sensemaking a retrospective activity. The core concepts employed in the analysis of sensemaking are; a frame, a cue, and a connection, which together create meaning: "Meaning = cue + relation + frame" Weick (1995, p. 110). It is an ongoing process of meaning construction and meaning is understood as a product of the sensemaking process. In Weick's description sensemaking is about enlargement of small cues and a search for contexts within which small details fit together and make sense (Weick 1995, p. 133). Although sensemaking is a continuous process, it can intensify when an organization experiences a high level of ambiguity or uncertainty. Ambiguity is the situation where the assumptions necessary for rational decision making are not met (Weick 1995, p. 92). The problem here is not that information is insufficient, but that more information may not resolve misunderstandings. Ambiguity may also be referred to as confusion. Uncertainty, on the other hand, governs when there is a lack of knowledge, and it might thus be resolved by gaining additional information.

In organization studies the theory of sensemaking has been used to understand the construction of meaning of organizational phenomena or processes. It has been applied in a number of studies including studies of technology in complex organizations (Weick 1990a), studies of social processes of sensemaking (Maitlis 2005), studies of the cause and course of

crises and disasters (Weick 1993; Weick 1990b), studies of high reliability organizations (Weick and Roberts 1993; Weick et al. 1999), and more recently mindful behavior in organizations (Levinthal and Rerup 2006; Weick and Sutcliffe 2006). Hence, it is not difficult to imagine the potential of applying the theory of sensemaking in IS research.

In the next section, we present a methodology for sampling and categorization of IS research, which apply the theory of sensemaking. The purpose is to identify IS research that we believe has the potential for producing contributions of interest to scholars from other academic disciplines.

Research Methodology

Over the years IS scholars have used different approaches to measure or asses referencing between IS and other disciplines. Citation analysis has been used to study to what extent other disciplines reference articles published in IS journals (Baskerville and Myers 2002; Wade et al. 2006). Classification studies have been used to study topics which are referenced by other disciplines (Vessey et al, 2002) and finally some in-depth studies of other disciplines' use of a specific IS theory have also contributed to IS reference discipline research (Truex et al, 2006). In this paper, we have chosen to study the use and application of a theory from the field of organization studies in IS research. We want to explore how the theory has been used and if the patterns of use can explain the slowness for IS to become a reference discipline. For this purpose we conduct a review of IS research applying and adapting the theory of sensemaking. This section presents the criteria used to create a sample of articles for review and it introduces the classification scheme methods used to examine the articles.

Defining the Scope of the Review

Our review includes articles published in six IS journals: MIS Quarterly (MISQ), Information Systems Research (ISR), Journal of the Association of Information Systems (JAIS), Information Systems Journal (ISJ), Information & Organization[7] (I&O) and European Journal of Information Systems (EJIS). We used three criteria to select the journals for inclusion in the review: a) the inclusion of three top ranked, North American journals, in our review these are; MISQ, ISR and JAIS, b) two top ranked European journals which in our study are

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[7] Until 2001 this journal was published as Accounting, Management and Information Technologies.

represented by ISJ and EJIS and c) journals which we would consider particularly prone to publish research that involves the theory of sensemaking. I&O represents this category. As our focus is on referencing in academic journals, we have not included practitioner-oriented journals such as Communications of the ACM and Sloan Management Review in our sample.

Searching the Journals

In order to identify all articles that applied the theory of sensemaking, we searched the journals using three search words: sensemaking, enactment and Weick. 'Sensemaking' was chosen as the key concept of our review. We chose to include the second concept of enactment because it describes a central process in sensemaking. The reason for including 'enactment' in the search was to assure that we did not overlook papers, which dealt with the processes of making sense without directly using the word 'sensemaking'. Finally, and of obvious reasons, we included 'Weick' as search word. We did not include other concepts common in the theory of sensemaking, such as heedful interrelation and mindfulness, because although they are important concepts and relate to sensemaking, they are not as widely recognized and used in the literature as sensemaking and enactment.

For the purpose of identifying the articles, we used a number of databases with scholarly journals; J-Stor, for MISQ (1977-2001), Business Source Complete, for ISJ (1998-2006), ISR (1990-2006), and MISQ (1977-2006), Science Direct, for Information & Organization (1991-2006) Palgrave Journals, for EJIS (1997-2006), jais.aisnet.org for JAIS (2000-2006). Hence, for EJIS and ISJ the search samples do not include volume 1-5 and volume 1-7, respectively.

In each database we performed full text search, using each of the three search words individually, and we downloaded pdf-files of all the identified articles.

Both authors conducted all searches in order to make sure that we did not miss any articles that matched our search words. Following each search, we compared our findings and resolved any inconsistencies in our samples of articles.

Sorting the Results

Our search in the databases produced a sample of 222 articles, which matched one or more of our search words. These 222 articles constitute our Sample A. Acknowledging that most likely not all articles in Sample A applied the theory of sensemaking, we went through all the articles in the sample in order to identify, which should be read more closely and analyzed. In

this process we selected articles for closer reading and analyses if they used sensemaking as a central construct in their analytical framework a) in theoretical discussion, b) in creation of a theoretical framework or c) in construction of theoretical concepts. Hence, we excluded articles, which solely mentioned, for example, sensemaking in the introduction, but did not involve the construct further in the body of the article. We also excluded papers which used nominally identical concepts to those used in the theory of sensemaking, but which did not refer to the theory. Both researchers sorted the papers in Sample A according to the criteria above and we compared our findings and resolved differences and disagreements. The result from the sorting was a reduced Sample B of 35 articles, which we took to the next step of examination.

Examining the Selected Articles

For the purpose of examining the application of the theory of sensemaking in the Sample B articles, we adopted Gregor's (2006) five interrelated *types of theory*: a) theory for analyzing, b) theory for explaining, c) theory for predicting, d) theory for explaining and predicting, and e) theory for design and action. Subsequently, for the purpose of examining the application domain in each of the articles, we adopted the five categories of bodies of knowledge developed by Baskerville and Myers (2002) based on Davis (2000). These are a) IS management processes, b) IS development processes, c) IS development concepts, d) representations in IS, and e) application systems.

The articles from the sample were then read carefully and discussed with the aim of examining each article's application domain. In this process we adopted a qualitative approach to focus on the details of the application of the theory in the selected articles.

In the next section, we present the findings from our review and subsequently discuss the articles' impact outside the IS discipline.

The Application of the Theory of Sensemaking in IS Research

From our initial Sample A (222 articles), we selected our Sample B (35 articles) for a closer examination as described in the methodology. Each of these 35 articles (sample B) was examined according to theory application and application domain. During the examination, another 18 articles were excluded from the sample as they showed not to be relevant for our purpose. The major reason for excluding these articles was that their main theoretical focus

was not the theory of sensemaking, for example, Daft et al. (1987) mainly applies media richness theory, and Jones (1995) focuses on organizational learning theories. Thus, these articles should have been excluded from Sample B. This left us with 17 articles (Sample B2) from five different journals as shown in table 1.

Table 1: Sample sizes and distribution of articles on journals							
	MISQ	ISR	I&O	JAIS	EJIS	ISJ	Total
Sample A	80	26	69	9	36	2	222
Sample B	14	5	11	3	2	0	35
Sample B2	7	2	6	1	1	0	17

Based on Gregor's (2006) taxonomy of theories in IS, we first examined our sample. Seven of the articles in Sample B2 applied the theory of sensemaking to analyze the phenomena of interest in the article, and seven other articles applied it for explaining, whereas three applied it for design and action. In our reading, none of the articles applied the theory of sensemaking for predicting. The results are shown in table 2.

Table 2: Distribution of articles in Sample B on Gregor's (2006) types of theory in IS	
Type of theory	Authors
Theory for analyzing	Davidson (2002)
	Lim & Benbasat (2000)
	Majchrzak er al. (2005)
	Ramiller (2001)
	Swanson & Ramiller (2004
	Tan & Hunter (2002)
	Vaast & Walsham (2005)
Theory for explaining	Boland & Greenberg (1992)
	Bondarouk (2006)
	Butler & Gray (2006)
	Ciborra (1999)
	Hirschheim & Newman (1991)
	Jasperson et al. (2005)
	Kirsch & Beath (1996)
Theory for predicting	None
Theory for explaining and predicting	None

Theory for design and action	Ciborra & Lanzara (1994)
	Gosain (2004)
	Kydd (1989)

The articles that applied the theory of sensemaking for analysis focused on describing relationships between constructs and the boundaries within which relations and observation were held. Articles applying theory of sensemaking for explanation focused on how, why and when things happened with the aim of providing a greater understanding of the phenomena of interest. Finally articles applying theory of sensemaking for design and action provided recipes for prescriptive action. A brief description of the application of the theory of sensemaking in each article is provided in table 3.

Table 3: Summaries of theory use in the articles in Sample B2	
Authors	Use of theory
Boland & Greenberg (1992)	The theory is used to analyze if information systems analysts interpret the same situation differently and operate on it differently. The study explores their language use to reveal how the schema used in the analysis shaped the formulation of problems and the choice of action.
Bondarouk (2006)	The theory is used to build a framework in order to conceptualize the role of user interaction in IT implementation processes. The framework is then used to explain group learning in three case studies.
Butler & Gray (2006)	The theory is used to explain the efforts to achieve individual and organizational reliability in complex and surprising environments by drawing from the theoretical concept of mindfulness.
Ciborra (1999)	The theory is used to explain improvisation as an alternative approach to cope with time in business and to increase the chance of making sense of complex situations.
Ciborra & Lanzara (1994)	The theory is used to propose an interpretive vocabulary for helping systems' designers and organizational actors to deal with ambiguous and interactive setting. A framework for "designing-in-action" is developed.
Davidson (2002)	The theory is used to build a socio-cognitive process model which is used to analyze how participants in requirement determination processes make sense of contextual information and what implication this has for possible requirements.

Gosain (2004)	The theory is used for developing a theoretical model of enterprise information systems as objects of institutionalizing forces. The model is used to explain the how enterprise information systems constrain organizational activities and the cognitive frames of organizational members.
Hirschheim & Newman (1991)	The theory is used to explain why IS development is not a normative process reflecting conventional economic rationality. Symbolism is presented as important in the development of IS to describe and explain the behavior of developers and users in ISD processes.
Jasperson et al. (2005)	The theory is used to build a conceptual model of post-adoptive behavior which explains the relation between cognition and action in post-adoptive IT behavior focusing on technology management.
Kirsch & Beath (1996)	The theory is used to examine how user participation is enacted in practice and to explain why those enactments result in particular project outcomes. Three patterns of user participation are presented.
Kydd (1989)	The theory is used to analyze why failure to address uncertainty and equivocality during development and implementation of new management information systems may lead to failing projects. Management tools to reduce uncertainty and avoid equivocality are presented and evaluated.
Lim and Benbasat (2000)	The theory is used to construct hypotheses about and to analyze how to capture and present information using a variety of representation formats so that members of an organization can make better sense out of the information available.
Majchrzak et al. (2005)	The theory is used to analyze how IT can support an individual's communication of context in order to develop collaboration know-how to work effectively with other members of a team.
Ramiller (2001)	The theory is used to analyze five images of information systems practitioners' use of language and how they promote rationality in identifying emerging opportunities for organizational innovation through information technology.
Swanson & Ramiller (2004)	The theory is used to analyze organizational innovation with information technology through the use of the concepts of mindfulness and mindlessness.
Tan & Hunter (2002)	The theory is used to explain a cognitive mapping technique. This technique is discussed in relation to IS, considering its strengths and weaknesses and its underlying theory.

Vaast & Walsham (2005)	The theory is used to analyze what makes agents transform how they work with IT and how these transformations may be shared among members of the same work group. The study presents a conceptual framework to relate actions and representations to practice change.

We examined the application domain for the theory in the articles and categorized them according to Baskerville & Myers' (2002) categories of bodies of knowledge within IS. Results are presented in table 4.

Table 4: Application Domains for the Articles in Sample B2	
Type of theory	Authors
Information systems management processes	Butler & Gray (2006) Ciborra (1999) Majchrzak et al. (2005) Ramiller (2001) Tan & Hunter (2002)
Information systems development processes	Bondarouk (2006) Ciborra & Lanzara (1994) Davidson (2002) Hirschheim & Newman (1991) Jasperson et al. (2005) Kirsch & Beath (1996) Kydd (1989) Swanson & Ramiller (2004) Vaast & Walsham (2005)
Information systems development concepts	Boland & Greenberg (1992)
Representations in information systems	Lim & Benbasat (2000)
Application systems	Gosain (2004)

The application domain exercise showed that when the theory of sensemaking is central to the theoretical framework of the article, it is primarily to explain or analyze IS development processes or secondarily to explain and analyze IS management processes.

Based on our examination of the articles in Sample B2, we concluded that all of them had potential as contributors to research performed in other disciplines than IS. In order to

examine their external impact we therefore decided to do a citation analysis for each article[8]. For this purpose we used the ISI web of knowledge, including Arts & Humanities Citation Index (A&HCI), Social Sciences Citation Index (SSCI), as well as Science Citation Index (SCI) in the queries. We present the results of the citation analysis in table 5.

Table 5 to be inserted here

The total number of references to the 17 journals is 149 of which 42 are external, and thus, at a first glance the results look quite promising for IS as a reference discipline. Yet, when cleaning the references from outside IS for self citations and citations from IS scholars publishing outside the discipline, then the number drops to 29, and thereby, 19,5 % of the references come from outside IS.

When we compare with the results of the citation analysis presented by Wade et al.'s (2006), then the results look a little different, as they limited their study to management areas, from which the 17 articles in Sample B2 receives 22 citations from outside IS or 17,1%, as then the total number of citations go down to 129. If we limit our citation analysis to the journals included in Wade et al's (2006) analysis then the result looks even worse, as solely 3 (7,7%) of a total of 39 citations come from outside IS. Hence, even if we look at Sample B2, which we maintain include IS articles that are highly likely to be references by scholars belonging to other academic disciplines then the prospect for IS as a reference discipline are not promising.

Implications of Findings

In our examination of the application of the theory of sensemaking in IS, we found the theory to be widely referenced, but rarely applied in IS research. Only few of the articles from Sample A discuss it or use it more in-depth. Consequently, it seems that many IS scholars sense that the theory of sensemaking can contribute to their investigation of IS issues, yet

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[8] We note that; a) the last search for citations took place on May 3. 2007, and b) most likely the citation analysis will do not justice to the 7 articles published in 2004 or later.

many of them do not explicitly explain or clarify its theoretical or methodological implications or explanatory power in research on the relation between organizations, users and information systems.

Our finding that no more than 7,7 % of the articles apply the theory of sensemaking in their theoretical framework (see table 1) indicates that in IS research it has become acceptable to talk about sensemaking without further explanation or references to theory. Hence, to the critical observer it appears that in most IS research the use of the theoretical construct of sensemaking is rather eclectic or, in more critical terms, uninformed by substantive theory. In case that the eclectic use is not isolated to the area we examined in this paper, it might present an image of IS as a research field, which focuses more on exploration of theoretical constructs than on exploitation of these. Research which *explore* new ideas or, as in this study, a theory from another discipline, typically seeks to analyze or/and explain empirical phenomena, as it is the case in the articles we examined in the present paper. In contrast, research focusing on exploitation of theory typically attempts to develop contributions to the theory itself in order to develop it further.

None, or at least very few, of the articles in our sample contributed to the advancement of the theory of sensemaking. Is that bad? Well not necessarily. However, a focus on exploration may have consequences for the development of the IS field and for its prospects to become a reference discipline for other academic disciplines. When IS scholars apply theory from other academic disciplines to provide explanations of phenomena of their own interest rather than to produce new theoretical insights related to the theory applied, then the contribution provided is typically of little interest to the mother discipline of a theory. This could explain why the number of citations of research appearing in IS journals is low compared to other academic disciplines (Truex et al., 2006). Finally, when an academic discipline operates in an explorative mode and constant pick up new theories, there is a risk that it will "produce more junk than jewels" (Augier et al. 2005, p. 93).

Closing Statement

We cannot claim that our examination of the application of the theory of sensemaking in IS provides a representative picture of how IS scholars apply theories and theoretical constructs from other academic disciplines. However, based on our examination, we do believe that the findings allow us to suggest that IS scholars hallucinate when they discuss about the status of IS as a reference discipline.

First, IS scholars hallucinate when they assume that to become a 'real' academic discipline IS has to become a reference discipline. Drawing on the example of organization studies, we maintain that this assumption is invalid. In a recent study of the evolution of the organization studies research community in Anglophone North American from 1945 to 2000, Augier et al. (2005) find that over the years, other processes were far more important for the creation of the field of organization studies than becoming a reference discipline:

a) The field has constructed a history about itself, and "there has been some development of a canon" (ibid, p. 87), which is indicated by the change in age distribution of references in major books in the field. In an early well-known book (March and Simon, 1958), the median age of a reference was 5 years, whereas in a later well-known book (Scott, 1998) the median age of a reference was 18 years.

b) The field of organization studies "has increasingly differentiated itself from other fields" (Augier et al., 2005, p. 87). This is evidenced by an increasing concentration of citations over time. Augier et al. (2005, p. 88) find that "there appears to have been a substantial increase in references to organizations journals and a substantial decrease in references to disciplinary journals". Hence, from the early days when references went to a wide range of disciplines, the field had by 2000 become organized around a fairly distinct set of journals.

Together these two developments contributed to the development of a scholarly identity in the field of organization studies, which by the year of 2000 had made it socially meaningful for scholars to identify with the organization studies field, "to publish in journals of that field, to cite other scholars of that field who published in journals of that field" (ibid, p. 88). From this it follows that scholars working within the field of organization studies share a feeling of belonging to the field, even if it "is a large, heterogeneous field involving numerous enclaves having distinct styles, orientations and beliefs" (March 2007, p. 9). "It is integrated neither by a shared theory, nor by a shared perspective, nor even by a shared tolerance for multiple perspectives" (ibid, pp. 9-10), and yet neither its legitimacy, nor its existence appear to be in danger. Finally, it is worth noting that nobody within the field of organization studies seems to worry about whether the field is a reference discipline for other academic disciplines.

Second, based on our findings we suggest that IS scholars hallucinate when they believe that IS will become a reference discipline. In our examination of the application of the theory of sensemaking in IS research, we did not identify indications of an increase in the number of references to IS research by scholars belonging to other academic disciplines, even if IS

scholars have used this theory for more than 20 years. We have already indicated that one important reason for the absence of external referencing to IS research which apply the theory of sensemaking might be that very few pieces of IS research apply the theory beyond the level of stating that users make sense of information or technology. Yet another and perhaps even more correct explanation could be that the wish or strive by IS to become a reference discipline is in conflict with the parochialism[9] exhibited by other academic disciplines, such as the field of organization studies (March, 2005). Put more simply, the observation that within the field of organization studies an increasing number of references go to journals within the field itself is a development which leaves less space for references to other academic disciplines, including IS. Assuming that the development in the pattern of reference is similar in other academic disciplines, the hallucination that IS will become a reference discipline simply produces screwed expectations among IS scholars about who will reference them.

Based on the two hallucinations described above, we firmly believe that the IS reference discipline discussion is a misconception, which have to be abandoned in the form where it focuses on external referencing to IS. We strongly believe that the discussion is unproductive to the future development of the IS discipline. We perceive the two hallucinations as parts of the anxiety discourse described by Lyytinen and King (2004). A discourse which in an often unproductive way positions the IS discipline as the underdog among academic disciplines. The conception of IS as being near the end of an intellectual food chain, expressed by Baskerville and Myers (2002) is an example of this.

If we abandon the IS reference discipline discussion then what about the two examples of IS research, M. Lynne Markus and Mark Keil's research, that have become widely referenced outside the IS discipline. How can we explain them? We believe that they should count as examples of external referencing by chance, in the sense that either the specific research evolved by chance, or the referencing outside IS evolved by chance. In the case of Mark Keil's research we have his own account of how he came across the theory of escalating commitment to a failing course of action. "I wasn't familiar with the escalation literature until one day in January 1992 when I was browsing the shelves of the periodicals at Georgia State's library. I distinctly remember picking up an issue of the Academy of Management Review (AMR) and scanning the table of contents and seeing Joel Brockner's 1992 article

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[9] Talking about parochialism it is worth mentioning that it can be dangerous to the discipline exhibiting it, as it may become isolated and thereby dry out because a parochial discipline is only rarely exposed to new ideas.

entitled: 'Escalation of Commitment to a Failing Course of Action: Towards Theoretical Progress'. At that very moment, it was like a light bulb went off in my head, because I immediately saw a linkage between escalation theory and the phenomenon I had observed in my dissertation research" (Truex et al., 2006, p. 805).

As for M. Lynne Markus' research we know little about how the external referencing developed. A possible 'by chance explanation' is that in the early 1980s politics and power in organizations was a hot topic in the field of organization studies, and thus, scholars in that field looked around for such research and picked it up when they came across it. In this situation it was probably not bad for the external citing of her research that she collaborated with Jeffrey Pfeffer. For other IS scholars, such as Wanda Orlikowski, the explanation for the extensive referencing from scholars belonging to other academic disciplines appears to be that these IS scholars are either highly visible in or even belong to these other academic disciplines.

Conclusion

Having abandoned the IS reference discipline discussion we would like to emphasize that we question neither the existence of the IS discipline, nor the existence of a research tradition in IS, but we would like to see the field and its legitimacy strengthened, and we would like scholars external to IS to admire the research produced in the field. We believe that this can happen if IS scholars pursue scholarly work of high quality, and thus, we concur with Lucas (1999) in his call for constant strive for quality in all that we do. With point of departure in our examination of the application of the theory of sensemaking in IS research, we furthermore support Truex et al.'s (2006, p. 797) four recommendations for theory adaptation: 1) consider the fit between selected theory and phenomenon of interest, 2) consider the theory's historical context, 3) consider how the theory impacts the choice of research method, and 4) consider the contribution of theorizing to cumulative theory. These recommendations can serve as excellent guidelines for the research performed by IS scholars in the future and in line with Truex et al. (2006) we believe it is important for IS scholars to dig deeper into the theories they want to apply, which means that they must read and consider the original sources before they write their own versions.

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#	Articles by Authors	Citations in IS	Citations in Organization Studies	Citations in Accounting	Citations in Engineering	Citations in HCI	Citations in Computer Science	Citations in Comm. Studies	Citations in other disciplines

Table 5: Citations to Sample B2 articles in SSCI, SCI and A&HCI

#	Articles by Authors	Citations in IS	Citations in Organization Studies	Citations in Accounting	Citations in Engineering	Citations in HCI	Citations in Computer Science	Citations in Comm. Studies	Citations in other disciplines
1	Boland & Greenberg (1992)	2	1	1	None	None	None	None	1
2	Bondarouk (2006)	None	None	None	None	None	None	None	None
3	Butler & Gray (2006)	None	None	None	None	None	None	None	None
4	Ciborra (1999)	10	4	1	1	None	None	None	None
5	Ciborra & Lanzara (1994)	17	3	None	1	None	None	None	3
7	Davidson (2002)	None	None	None	None	None	None	None	None
8	Gosain (2004)	4	None	None	None	None	None	None	None
9	Hirschheim & Newman (1991)	30	1	1	1	1	3	2	3
10	Jasperson et al. (2005)	None	None	None	None	None	None	None	None
11	Kirsch & Beath (1996)	8	None	None	None	1	None	None	None
12	Kydd (1989)	14	1	None	None	None	None	None	1
13	Lim & Benbasat (2000)	15	None	None	2	None	None	None	4
14	Majchrzak et al. (2005)	None	None	None	None	None	None	None	1
15	Ramiller (2001)	1	None	None	None	None	None	None	None
16	Swanson & Ramiller (2004)	4	2	None	1	None	None	None	None
17	Tan & Hunter (2002)	None	None	None	None	None	None	None	None
18	Vaast & Walsham (2005)	2	None	None	1	None	None	None	None
	Total	107	12	3	7	2	3	2	13