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STUDYING KNOWLEDGE MANAGEMENT IN INFORMATION SYSTEMS RESEARCH: DISCOURSES AND THEORETICAL ASSUMPTIONS[1]

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Abstract

In information systems, most research on knowledge management assumes that knowledge has positive implications for organizations. However, knowledge is a double-edged sword: while too little might result in expensive mistakes, too much might result in unwanted accountability. The purpose of this paper is to highlight the lack of attention paid to the unintended consequences of managing organizational knowledge and thereby to broaden the scope of IS-based knowledge management research. To this end, this paper analyzes the IS literature on knowledge management. Using a framework developed by Deetz (1996), research articles published between 1990 and 2000 in six IS journals are classified into one of four scientific discourses. These discourses are the normative, the interpretive, the critical, and the dialogic. For each of these discourses, we identify the research focus, the metaphors of knowledge, the theoretical foundations, and the implications apparent in the articles representing it. The metaphors of knowledge that emerge from this analysis are knowledge as object, asset, mind, commodity, and discipline. Furthermore, we present a paper that is exemplary of each discourse. Our objective with this analysis is to raise IS researchers' awareness of the potential and the implications of the different discourses in the study of knowledge and knowledge management.

Keywords: Epistemology, knowledge, knowledge management

ISRL Categories: IB02, AL01, AJ

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Introduction

Despite the difficulties associated with defining and identifying knowledge, knowledge has become a primary resource in organizations. Organizations are implementing knowledge management practices and technologies on the promise of increasing their effectiveness, efficiency, and competitiveness. These promises are based on an assumption that knowledge is good and that there are at worst negligible negative consequences of knowledge management. Scrupulous consideration might suggest, however, that knowledge is a double-edged sword: while too little leads to inefficiencies, too much results in rigidities that tend to be counterproductive in a dynamically changing world (March 1991); while too little might result in chaotic social relations, too much implies the silencing of diverse perspectives (Bowker and Star 1999); and while too little might result in expensive mistakes (e.g., faulty new product), too much might result in unwanted accountability (e.g., the class action law suits filed against the tobacco industry in the U.S. because it hid knowledge about the negative health effects of smoking).

We argue that in order to understand the ways that information systems can support the management of knowledge in organizations, consideration must be given to not only the intended, positive consequences of knowledge and its management, but also the negative, unintended ones. This requires that researchers have an awareness of the diversity of possible theoretical assumptions about knowledge and its management, and the extent to which the field of knowledge management research represents—or fails to represent—this potential theoretical diversity. In this paper, our objective is to raise IS researchers' awareness of the different discourses of knowledge and knowledge management. Much like Orlikowski and Baroudi (1991) and Mingers (2001), our intent is to guard against intellectual monism. By excluding epistemological and theoretical discourses from knowledge management research, there is a danger of unduly restricting inquiry into issues that knowledge management researchers could and, most probably should, be addressing.

In order to frame the theoretical perspectives and assumptions that are available for knowledge management research, we adopt Deetz's (1996) framework, which allows us to carve the theoretical landscape into four scientific discourses: the normative, the interpretive, the critical and the dialogic. After identifying and interpreting the situated, working definitions of knowledge within each discourse, we develop metaphors of knowledge associated with the discourses. We consider metaphors particularly helpful in shaping and communicating the meaning of abstract, poorly understood phenomena (Klagge 1997) such as knowledge. Lakoff and Johnson (1980, p. 5) suggest that it is a "seeing as," a mode of cognition in which "understanding and experiencing [of] one kind of thing [is done] in terms of another." We therefore anticipate that the metaphors of knowledge will provide a rich, yet concise, conceptual tool that will enable knowledge management researchers and practitioners to capture their underlying assumptions about knowledge.

This paper is organized as follows: we begin by presenting the theoretical framework according to which we categorize and analyze the knowledge management research published in the field of information systems. This is followed by a description of the methodology that we relied upon to select and analyze the knowledge management literature in IS. We elaborate on each of the discourses of knowledge management by first describing the research themes, knowledge metaphors, theoretical foundations, and implications represented in each discourse, and then discussing a piece of research that is exemplary of the discourse. We highlight the implications of omitting any one of the discourses from the portfolio of knowledge management research in IS and conclude with recommendations for IS-based knowledge management research.

Theoretical Underpinning: Deetz's Framework

In order to both identify and evaluate the situated definitions of knowledge and its management in IS

research on knowledge management, we rely on Deetz's (1996) taxonomy of discourses in organizational science. This framework is a contemporary adaptation of Burrell and Morgan's (1979) paradigms of social and organizational inquiry. Developed for the context of scientific inquiry, this framework appears well suited for making sense of knowledge management research as well as of knowledge management itself.

Social scientists have long been concerned with the differences in ontological and epistemological assumptions that account for different perspectives, conflicting theories, and contradictory findings in social and organizational research. Burrell and Morgan's classification of social and organizational science into four paradigms, i.e., positivism, interpretivism, radical structuralism, and radical humanism, is a primary example. Criticisms of the framework (e.g., Tinker 1986; Tsoukas 1994) have led to the development of alternative frameworks that remedy some of the weaknesses of Burrell and Morgan's taxonomy.

Deetz, for instance, argues that the subjective-objective dualism results in an oversimplified classification of research into irreconcilable opposites such as qualitative versus quantitative research, hypothesis testing versus hypothesis developing, and a practical versus a theoretical focus. Ultimately, these conceptual opposites result in attributions of good versus bad research (also Wicks and Freeman 1998). Deetz (p. 195) contends that the subject-object dualism is harmful to science in that it reifies and strengthens false dichotomies by denying the intersubjective, "socially shared, historically produced" nature of phenomena. Deetz concludes that subjectivity and objectivity are used primarily as rhetorical moves to justify research programs.

Adopting Deetz' critique of the subject-object divide and his proposal to replace the static concept of paradigms used by Burrell and Morgan with the more language-based, dynamic notion of discourses, we apply his framework to our research. Each discourse represents an orientation to organizations, a way of constituting people and events in them, and a way of reporting on them. In this respect they bear much resemblance with Burrell and Morgan's paradigms, but the discursive underpinnings of Deetz' framework imply that discourses (1) are plagued by internal strife and conflict, (2) have poorly demarcated edges in that participants in one discourse borrow concepts and metaphors from other discourses in order to "dodge criticism by co-optation" (Deetz 1996, p. 199), and (3) are not sealed off from each other as participants from one discourse are influenced by the insights generated in other discourses. This implies that the boundaries between discourses are more fluid than those between paradigms.

A diagrammatic representation of this model is presented in Figure 1, where the X axis represents the "origin of concepts and problems" dimension and the Y axis represents the "relation to dominant social discourse" dimension. In our ensuing discussion of this model we will commence with an overview of the two main dimensions: the origin of concepts and problems, and the relation to the dominant social discourse. We will then describe the four discourses.

The Origin of Concepts and Problems: Local/Emergent Versus Elite/A Priori

Focusing on the constitutive process in research, the key question addressed by this dimension is "where and how do research concepts arise?" Deetz contends that, as ideal types, research concepts and problems are either developed with organizational members participating in research or applied to them. Whereas the former represents the local/emergent orientation, the latter represents the elite/*a priori* orientation. The local/emergent orientation develops insights from a deep understanding of the specifics of organizational situations. While prior theories may be used as sensitizing devices in such research, their logic and vocabulary are frequently intermingled with the vernacular and concepts developed in interaction with research participants from the field. In contrast, the elite/*a priori* orientation privileges the language and expertise of the research community by defining the problem space in terms of

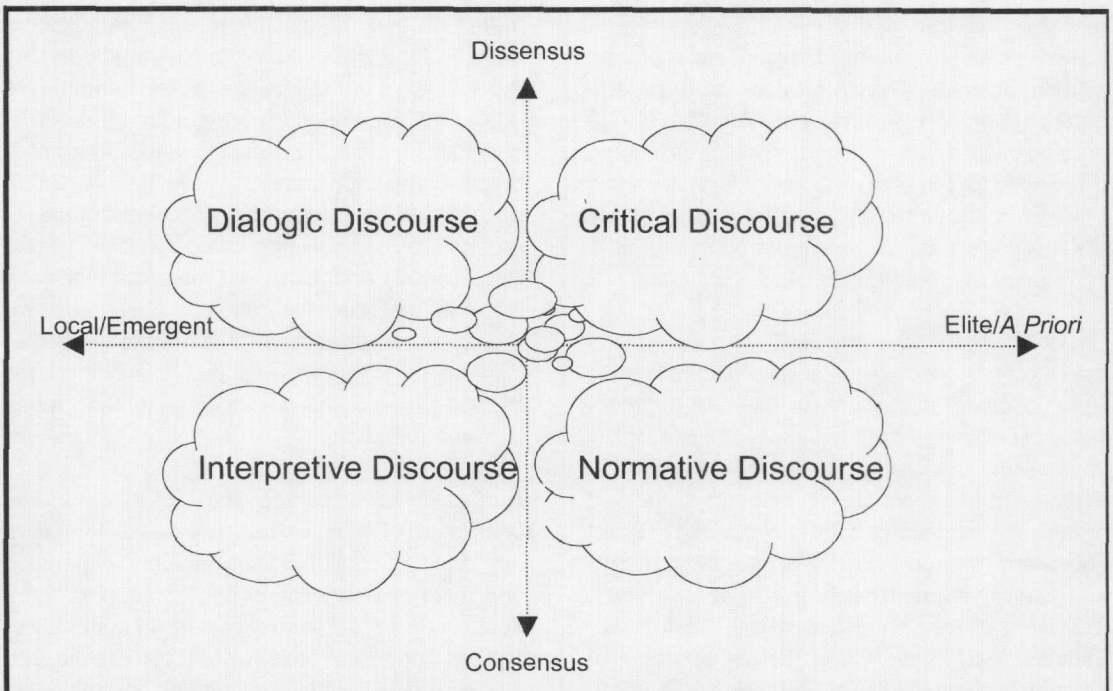

Figure 1. Deetz's Four Discourses of Organizational Inquiry

existing theoretical concepts and by applying the logic and language of such theories to the organizational situation of interest.

The distinction between the local/emergent and the elite/*a priori* orientations has implications for the generalizability of the research findings: local/emergent research is more likely to be particularistic regarding both time and place, whereas elite/*a priori* research claims freedom from both temporal and local limitations on knowledge production.

The Relation to the Dominant Social Discourse Dissensus Versus Consensus

Deetz indicates that research orientations can be either in line with the dominant social order, i.e., the dominant ways of structuring knowledge, social relations, and identities, or they can be at odds with it. While the former represents a consensus orientation, which reproduces the dominant structures, the latter represents an orientation of dissensus, which disrupts these dominant structures. A consensus orientation characterizes a research program that both seeks order and regards the production of order and equilibrium as a normal and even necessary state of natural and social systems. In contrast, the dissensus orientation characterizes a research program that considers struggle, conflict, and tension as a natural state. Thus consensus research assumes that organizational phenomena such as knowledge, culture, and identity are coherent and more or less unified, whereas dissensus research assumes that these phenomena are multiple, conflicting, and fragmented. Next, we briefly describe the four discourses.

The Normative Discourse

According to Deetz, the normative discourse reflects modernity with its assumptions of progressive enlightenment as well as increasing rationalization, management, and control (also Harvey 1989). Researchers participating in the normative discourse are concerned with codifi-

cation, the normalization of experience, and the search for law-like relationships. The objects or artifacts that result from normative research are described as facts that are assumed to be reflective of nature. This implies that the research findings are both generalizable and cumulative. The search for enlightenment and the striving for progress assume that there is a place of omniscience that science can achieve. Seeking to establish general laws and causal relationships through hypothesis testing, researchers participating in the normative discourse typically rely upon nomothetic methods.

Interpretive Discourse

The interpretive discourse emphasizes the social rather than the economic view of organizational activities (Deetz 1996, p. 201). It also embraces premodern and traditional themes in that it is concerned with aspects of organizational life that have not yet been systematized and brought under the control of rationalized logics. People in organizations are viewed as active sense-makers, engaged participants, and creators of organizational life. Ethnographic and hermeneutic research methods that are grounded in the social practices of organizational participants are indicative of interpretive research.

Research that is part of the interpretive discourse aims to create a coherent, consensual, and unified representation of what the organizational reality is "actually" like, despite its complexities and contradictions. Adhering to the consensus view of society, this discourse acknowledges the multi-vocal, fragmented, and conflicted nature of society, yet also focuses on the integrative values that allow organizations and communities to function in harmony.

Critical Discourse[2]

The critical discourse is marked by a view of organizations as sites of political struggle and fields of continuous conflict. The objective of critical research is to unmask and critique the forms of domination and distorted communication by showing how they are produced and reproduced (Ngwenyama and Lee 1997). Cultural criticism and ideology critique are methods used by critical researchers. Highlighting how certain kinds of interest, social practices, and institutional structures conspire to create power differences and how they silence and obscure other voices and alternative perspectives, the critical discourse aims to create the conditions in which the conflicts between different groups can be surfaced, discussed openly, and resolved fairly. This implies that the reformation of social order is the objective of researchers participating in the critical discourse.

Dialogic Discourse

According to Deetz, the dialogic discourse could also have been labeled the postmodern discourse in that it focuses not only on the constructed nature of reality and the role of language in this construction process, but also on the fragmented and multi-vocal nature of this never-ending construction process. The image of social life held by this discourse is one of disjointed narratives and perspectives that fail to add up to a coherent reality. Thus a single reality remains elusive. Indeed, the dialogic discourse seeks to unpack taken-for-granted social realities in order to uncover their complexities, their lack of shared meanings, and their hidden enclaves of resistance.

Even though the dialogic discourse is similar to the critical discourse in its concern over asymmetry and domination, it differs from it in that it considers power and domination as situational and not owned by anyone or anything. Instead, the dialogic discourse traces power and domination to claims of expertise using deconstructionist and genealogic methods.

In summary, Deetz's classification of discourses can serve as a useful framework in assessing the goals, methods, and hopes of research. When applied to IS research, the framework can help assess which discourses are explicitly or implicitly

[2]Many subsume research conducted in both the dialogic and critical traditions under the "critical" label (e.g., Jönsson and Macintosh 1997; Ngwenyama and Lee 1997; Orlikowski and Baroudi 1991). The critical discourse that we describe here thus overlaps only partly the critical research as it is defined elsewhere.

Table 1. Summary of the Four Discourses

Issue	Normative Discourse	Interpretive Discourse	Critical Discourse	Dialogic Discourse
Basic Goal	Law-like relations among objects	Display unified culture	Unmask domination	Reclaim conflict
Method	Nomothetic science	Hermeneutics, Ethnography	Cultural criticism, ideology critique	Deconstruction, genealogy
Research Hope	Progressive emancipation	Recovery of integrative values	Reformation of social order	Claim a space for lost voices

chosen in a given stream of inquiry. By understanding the discourses, and the assumptions underlying the discourses, one is better positioned to understand and interpret IS research on knowledge management, and to identify potential questions for future research. Table 1 presents a summary of the four discourses that we have just discussed. This table is abbreviated from Deetz (1996, p. 199).

Having outlined the theoretical scaffolding that guides our classification of knowledge management research in IS, we now turn our attention to the method we relied upon for selecting and coding knowledge management articles.

Method

Knowledge management is the generation, representation, storage, transfer, transformation, application, embedding, and protecting of organizational knowledge (adapted from Hedlund 1994; similarly, Alavi and Leidner 2001: Pentland 1995). Concepts such as organizational learning (e.g., March 1991), organizational memory (e.g., Anand et al. 1998; Walsh and Ungson 1991), information sharing (e.g., Constant et al. 1994) and collaborative work (e.g., Schrage 1990) are closely related to knowledge management. Bearing this in mind, we selected the following keywords as the basis for our searches of the IS literature: knowledge, knowledge management, organizational learning, learning organization(s) and memory.

We selected six IS journals that publish academic rather than practitioner research because we would expect academics to devote more time than practitioners to contemplating the epistemological and theoretical assumptions of knowledge and what it means to manage it. Specifically aiming to review academic research that represents a diversity of epistemological assumptions, we chose the following six journals: *Accounting, Management and Information Technologies* (AMIT), *European Journal of Information Systems* (EJIS), *Information Systems Research* (ISR), *Journal of Management Information Systems* (JMIS), *Journal of Strategic Information Systems* (JSIS), and *MIS Quarterly* (MISQ).

Using the ABI Inform database, the titles and abstracts of papers published in these six journals between 1990 and 2000, inclusively, were queried for the occurrence of our list of five keywords. Of the six journals there were two, namely *AMIT* and *JSIS*, that were not searchable through ABI Inform. To identify the relevant papers in these journals, we relied on Science Direct, a library service for Elsevier journals for manuscripts published between 1994 and 2000, and a manual scan of the abstracts of papers published between 1991 (when both journals started) and 1993.

An initial perusal of the abstracts indicated that not all of the papers retrieved by the keyword searches were related to organizational knowledge management as defined earlier, i.e., the generation, organization/storage, transfer, and application of organizational knowledge. For instance, a number of abstracts were retrieved

because of statements like "we don't have enough *knowledge* on this subject." There were also a number of manuscripts that dealt with IS curriculum development and the kinds of knowledge that IS professionals need. These articles were excluded from our sample, as they did not address concerns of organizational knowledge as much as IS educational concerns. Moreover, articles focusing on learning outside of an organizational context, such as classroom learning, were excluded from analysis.

The 94 articles that qualified for inclusion in our study are listed in Appendix A. Working independently, we then classified each article according to Deetz's (1996) primary classification criteria: the elite/local dimension and the consensus/ dissensus dimension. Papers that were not research papers, such as editorials (Galliers 1998, opinion/ issue essays (Mumford 1998; Watson 1994), or descriptive studies and reviews (Amaravadi et al. 1992; Jones 1995; Maletz 1990; Mann et al. 1991; Mykytyn et al. 1990; Robey et al. 2000; Sarker and Lee 1999; Tuomi 1999/2000) were not coded because absent a theoretical lens and/or an interpretation of empirical data, it was infeasible to try to ascertain the authors' theoretical view of knowledge. Our final sample thus comprised 78 articles. Cohen's kappa (Cohen 1960) was computed to measure the inter-rater reliability. Cohen's kappa, measured at .959 with a standard deviation of .04, indicates the degree of agreement that is achieved after the agreement due to chance is taken into account. The z-score of 11.1 shows significant agreement beyond chance ($p < .0001$).

Even though the categorization scheme proposed by Deetz appears straightforward and simple enough (i.e., it consists of only two dimensions), we encountered a number of difficulties in coding the articles. First, articles that used multiple methods, particularly inductive and deductive methods (e.g., Jonas and Laios 1993; Mao and Benbasat 2000), were difficult to code as it was unclear whether the paper was elite/*a priori* or emergent. Second, classifying articles whose stated approach was different from our reading of the article presented a dilemma. For example, some papers claim to deal with power (e.g., Huysman 2000) or claim to use an emergent approach (e.g., Fowler 2000), but these claims were unsupported by the text. Third, the genre of academic journal publication favors the presentation of theory and literature prior to data and analysis. This complicates the communication of interpretive research, in which the research insights are derived from data rather than theory. In some cases, interpretive research is written much like a normative paper (e.g., Scott 2000), and normative research appears to be based more on an emergent than an elite orientation (e.g., McLure Wasko and Faraj 2000). Thus, it is more likely that papers are falsely coded as normative rather than falsely coded in one of the other discourses. Fourth, papers that rely on data not specifically collected for the research presented in the paper (e.g., Brown 1998; Gill 1995; Käkölä 1995) also require some analysis of language, writing style, and theory in order to decide whether the paper was done with an emergent or elite orientation.

Notwithstanding these difficulties, we classified each paper into one of the four discourses rather than locating them in either more than one discourse or between two discourses. Indeed, Deetz's notion of discourse allows for disagreements within discourses and for the transfer of theories, methods, and concepts across discourses. We found that the papers representing anomalies helped us to define the core meanings of a discourse. Throughout our discussion of the discourses, we highlight the poorly demarcated boundaries between them.

After coding all of the articles in our final sample, it became apparent that there was no paper representing the critical discourse. Scanning through abstracts from the journals we had chosen for this analysis, we set out to identify an article that was related to our definition of knowledge management and that was critical. The first paper we found that met these criteria was the Elkjaer et al. (1991) paper, "The Commodification of Expertise: The Case of Systems Development Consulting." We chose this paper as our exemplar for the critical discourse.

Table 2. Classification of Knowledge Management Research in IS

Dialogic Discourse Bowker (1997) Orlikowski (1991)	***Critical Discourse*** Elkjaer, Flensburg, Mouritsen, and Willmott (1991)
Interpretive Discourse Brown (1998) El Sawy and Bowles (1997) George, Iacono, and Kling (1995) Henfridsson and Söderholm (2000) Huysman (2000) Käkölä (1995) Lanzara (1999) Pentland (1995) Reeves-Ellington and Anderson (1997) Robey and Sahay(1996) Robey, Wishart, and Rodriguez-Diaz (1995) Sahay and Robey (1996) Schultze (2000) Schultze and Boland (2000a, 2000b) Scott (2000) Star and Ruhleder (1996) Stenmark (2000-2001) Turoff, Hiltz, Bahgal, and Rana (1993) Virkkunen and Kuutti (2000)	***Normative Discourse*** Agarwal , Kudys, and Tanniru (1997) Argarwal, Tanniru, and Dacruz (1992) Andreu and Ciborra (1996) Baets, Brunenberg, and van Wezel (1998) Balachandran, Buzydlowski, Dworman, Kimbrough, Vachula, and Shafer (1999) Baker (1995) Basu and Hevner (1992) Bieber and Kimbrough (1992) Boyton, Zmud, and Jacobs (1994) Byrd, Cossik, and Zmud (1992) Choudhury and Sampler (1997) Dhaliwal and Benbasat (1996) Edwards, Duan, and Robins (2000) Fowler (2000) Gill (1995) Goodman and Darr (1998) Gray (2000) Gregor and Benbasat (1999) Hightower and Sayeed (1996) Hine and Goul (1998) Holsapple and Joshi (2000) Jarvenpaa and Staples (2000) Jonas and Laios (1993) Kiang, Chi, and Tam (1993) Kirsch and Cummings (1996) Lamberti and Wallace (1990) Lee and O'Keefe (1996) Madon (1999) Mao and Benbasat (2000) McLure Wasko and Faraj (2000) Merali (2000) Meyer and Curley (1991) Mitev (1996) Nambisan, Agarwal, and Tanniru (1999) Nelson and Cooprider (1996) Newell, Swan, and Robertson (1998) Nissen (1998, 2000) Ouksel, Mihavics, and Chalos (1997) Raghunathan, Krishnan, and May (1993) Rai (1995) Shaft and Vessey (1995, 1998) Simon, Grover, Teng,and Whitcomb (1996) Srinivas and Shekar (1997) Stäbler and Erwaldt (1998) Stein (1992) Stein and Zwass (1995) Storey and Goldstein (1993) Sviokla (1990) Trice and Davis (1993) Unland, Kirn, Wanka, O'Hare,and Abbas (1995) Wijnhoven (1999) Zhao, Kumar and Stohr (2000-2001) Zhu, Prietula and Hsu (1997)

Analysis

Our categorization of the knowledge management articles we considered is presented in Table 2.

In order to highlight the differences between the discourses in the context of knowledge management research, we begin our analysis by summarizing within each discourse four main areas: the focus of the research, the metaphors of knowledge based on the operationalizations of knowledge, the theoretical underpinnings of the research, and the implications for IS that can be drawn from the research.

Normative Discourse

Research Focus

The normative discourse has research focusing on the use of technology to enable discovery in databases (Balachandran et al. 1990), to develop efficient organizational memory systems (Wijnhoven 1999), and to monitor e-mail usage so that only individuals who should be interested in an e-mail announcement (such as one sent to a list) will receive it (Zhao et al. 2000-2001). There are papers that examine explanations in knowledge-based systems (Dhaliwal and Benbasat 1996; Gregor and Benbasat 1999), as well as papers that deal with knowledge representation (Lee and O'Keefe 1996; Jonas and Laios 1993; Nissen 2000). Thus, generally speaking, the normative discourse has as one focus the discovery of technology solutions (rules, explanations, memory systems) to knowledge problems (transferring knowledge from experts to novices; remembering). With regard to knowledge creation and transfer issues in particular, there is normative research looking at IT innovation among users (Nambisan et al. 1999) and the learning about innovation among IT employees (Agarwal et al. 1997).

While there is a great divergence of knowledge management related topics covered in the normative discourse, one unifying theme is that much of the research frames the research question in the context of problem solving and decision-making tasks (e.g., Dhaliwal and Benbasat 1996; Zhu et al. 1997; Gray 2000). Research representing the normative discourse thus creates a problem space that can be decomposed in a logical, top-down fashion (Raghunathan et al. 1993; Shaft and Vessey 1995) and represented in terms of cognitive maps (Srinivas and Shekar 1997). This problem solving focus is particularly apparent in the research on expert systems.

Knowledge Metaphor

Just as there is a diverse set of research topics represented in the normative discourse, there is much diversity in the operationalization of knowledge. Knowledge is operationalized as rules (Jonas and Laios 1993; Kiang et al. 1993), chunks (Nissen 1998), explanations (Gregor and Benbasat 1999) and problem-solution sets (Goodman and Darr 1998). These operationalizations are closely associated with problem-solving tasks in research on knowledge-based systems. The metaphor that emerges from these operationalizations is knowledge as an object that can exist outside an individual, that can be stored and manipulated in the absence of a human knower, and that can be transferred to others (humans or machines). Associated with this object metaphor is the view of knowledge as memory (Stein and Zwass 1995; Wijnhoven 1999), information (Hightower and Sayeed 1996) and as stock (Choudhury and Sampler 1997; Ouksel et al. 1997).

Another way in which knowledge is operationalized is as expertise (Stein 1992), competence (Andreu and Ciborra 1996), familiarity (Shaft and Vessey 1995), and job experience measured in terms of tenure (Kirsch and Cummings 1996). These perspectives associate knowledge with the individual knower and are therefore distinct from the presentation of knowledge as an object. Based on their usage in the research, the metaphor that binds these operationalizations to each other is that of asset. These papers view knowledge as a key driver of organizational performance, effectiveness, and efficiency.

It is also noteworthy that the papers in the normative discourse classify knowledge into different types, thereby setting up categories conducive to the construction of contingency theories. Taxonomies of knowledge include episodic and semantic memory (Stein and Zwass 1995), declarative (know-what), procedural (know-how), and conceptual (know-why) knowledge (Agarwal et al. 1997), and terminological, domain, and problem-solving knowledge (Dhaliwal and Benbasat 1996).

Theoretical Foundation

The theories underlying normative research into knowledge management are varied and include innovation diffusion theory (Rai 1995), theory of absorptive capacity (Agarwal et al. 1997; Boyton et al. 1994), and theories of managerial cognition (Dhaliwal and Benbasat 1996; Hine and Goul 1998; Merali 2000). Some research develops theory about the knowledge and time specificity of information, and uses this to help explain information acquisition and environmental scanning behaviors in organizations (Choudhury and Sampler 1997).

Quite a few papers in the normative discourse use theories of knowledge to examine long-standing research issues in IS, such as the problem of database design and expert system design. For instance, Storey and Goldstein (1993) see database design as a knowledge transfer problem. Similarly, Jonas and Laios (1993) and Lee and O'Keefe (1996) consider expert system design as a knowledge transfer problem. Nelson and Cooprider (1996) see the lack of shared knowledge between IS and line managers as a contributor to poor IS group performance, and Boynton et al. (1994) view communication problems between developers and users as a result of lack of common knowledge. Likewise, Nissen (1998) views reengineering as a knowledge problem, Rai (1995) considers CASE adoption to be hindered by knowledge barriers and tests hypotheses as to the influence of information source on knowledge barriers to CASE adoption. Nambisan et al. (1999) examine IT innovation through the perspective of knowledge creation. Hence, there is ample evidence that traditional notions within IS research are being reinterpreted in light of our understanding of knowledge, its creation, and its transfer.

Implications for IS Research

In terms of implications for IS, some of the research in the normative discourse extracts specific design recommendations. For example, Gregor and Benbasat (1999) conclude that attention needs to be paid to the inclusion of explanations in any system designed to transfer knowledge. This conclusion would appear to extend well beyond expert systems. Hine and Goul (1998) also draw conclusions about system design, proposing an initial set of operational requirements for an organizational learning system. Goodman and Darr (1998) make design recommendations for systems that enhance organizational learning. They suggest attention be paid to detailed problem and solution categories so that the matching of problems and resolutions becomes easier and quicker. As with the research focus, the normative discourse emphasizes technology solutions—in this case design features—that promise to improve the impact of information systems on organizational knowledge management.

Exemplar of the Normative Discourse

Jarvenpaa and Staples (2000) studied the use of collaborative electronic media for information sharing. Specifically, they looked at factors that influence individuals to share knowledge via electronic means. Both the object and the asset metaphor of knowledge are apparent in this paper. Jarvenpaa and Staple's study assumes both that individuals can share their knowledge and that such sharing is beneficial to the organization. The research question is: What leads individuals to share and what prompts them to share via an impersonal medium?

The authors suggest that "one party has to be willing to give something or get something from another party." They further elaborate on several factors that they assert can predict information sharing behavior. For example, they proposed that open and organic information cultures, as opposed to closed and mechanistic information cultures, lead to greater sharing. They propose that individuals who believe that what they know belongs to them, rather than to the organizations that they serve, will be more likely to share. Based on prior research, they develop theoretical antecedents of information sharing and move toward uncovering the various contingencies that influence sharing. Their research objective is to "extend the understanding of the organizational context factors in general and organization culture in particular."

In an empirical analysis of over 1,000 survey responses, Jarvenpaa and Staples found that, contrary to their prediction, open and organic information cultures were not associated with the use of collaborative electronic media for information sharing whereas closed and mechanistic information cultures were. They also found that people who believed the information belonged to the organization were less likely to use collaborative media for sharing than were people who believed the information was their personal asset.

The role of technology in the normative discourse is to aid in the storage and transfer of knowledge so that knowledge is available for retrieval by others across time and space. Jarvenpaa and Staples focused exclusively on the role of electronic communication media in knowledge transfer, but one can also envision knowledge bases, repositories, and search engines as examples of the normative discourse's technological solutions for managing an organization's stock of knowledge.

In summary, the normative discourse is characterized by a construction of knowledge as an object and/or asset and its management as a matter of providing systems to facilitate the storing and transferring of knowledge. The results of normative research contribute to the creation of an analytical infrastructure for contingency theory that allows researchers to ask questions about the conditions under which a certain kind of knowledge management solution or technology is more appropriate than another, and what the implications of each solution would be. Such a theoretical scaffolding creates a path toward progressive enlightenment, which is the purpose of knowledge in the normative discourse.

Interpretive Discourse

Research Focus

Whereas a fair amount of the research in the normative discourse treated knowledge as an independent variable and sought to understand its role in organizational processes and performance, knowledge is generally subsumed in organizational practices in the interpretive discourse. Thus, generally speaking, the interpretive discourse does not study knowledge directly but rather examines the role of knowledge in organizational transformation (e.g., Robey and Sahay 1996) and the role of technologies in supporting knowledge work (e.g., George et al. 1995; Star and Ruhleder 1996). Nevertheless, some of the research in this discourse asks questions specifically directed at knowledge processes, e.g., how individuals most effectively retrieve knowledge (Stenmark 2000-2001).

In contrast to the normative discourse's focus on a problem solving setting, the research in the interpretive discourse focuses on situated work and organizational practices (e.g., Brown 1998) in the context of organizational learning (Henfridsson and Söderholm 2000; Pentland 1995). Moreover, the interpretive discourse explores the work practices that constitute knowledge work (Schultze 2000; Schultze and Boland 2000b). Even in research on IT implementations, the focus is on organizational practices that both enable and

inhibit the implementation of technology, rather than on the technology itself (e.g., El Sawy and Bowles 1997; Schultze and Boland 2000a).

Knowledge Metaphor

Three interrelated operationalizations of knowledge are apparent in the interpretive discourse. The first is knowledge as situated practice (Brown 1998; Star and Ruhleder 1996). The second is knowledge as culture (Huysman 2000; Reeves-Ellington and Anderson 1997) and culturally and historically specific tools and concepts (Virkkunnnen and Kuutti 2000). The third operationalization is knowledge as symbolic capital (Schultze and Boland 2000a, 2000b), i.e., the basis for making claims about the value adding role that an individual or a professional grouping plays in the organization.

What is common among these operationalizations is that knowledge is socially constructed and shared among the participants in a practice or organizational culture (Pentland 1995) even as individuals have their own interpretations of organizational situations and events. Sahay and Robey (1996) capture this in their operationalization of knowledge as "social interpretation," for instance. Thus, in contrast to the normative discourse's notion of knowledge as ever-true and generalizable rules, the interpretive discourse highlights the dynamic and situated nature of knowledge.

Identifying an evocative metaphor to capture these different operationalizations of knowledge is difficult, especially since the metaphor is supposed to simplify a complex phenomenon. However, the metaphor of organizational mind (Weick and Roberts 1993) summarizes at least two of the interpretive operationalizations of knowledge, namely knowledge as practice and knowledge as culture. This metaphor of organizational mind should **not** be confused with the organization as brain (Morgan 1986). Instead, the mind metaphor needs to be understood in the context of organizations as systems of distributed cognition (Boland et al. 1994), in which individual participants operate with incomplete information and knowledge, and without shared meaning. In such dynamic organizations, the challenge is to coordinate actions among multiple and potentially conflicting views expressed by individuals who are interested in developing and maintaining their autonomy as well as their unique, personal identities. According to Weick and Roberts, coordination is achieved through heedful or mindful interrelating among individuals. The metaphor of mind thus derives from the verb "to mind."

Although it is based on Bourdieu's (1977) theory of practice, the operationalization of knowledge as symbolic capital extends the view of knowledge as practice into the dissensus discourses in that it highlights knowledge claims as a source for drawing distinctions among value adding and non-value adding roles in organizations. This is associated with power differences between professional groupings and organizational functions (also, George et al. 1995). The symbolic capital operationalization of knowledge is thus an indication of Deetz's (1996) point that discourses have poorly demarcated edges and that they are not sealed off from each other as participants from one discourse are influenced by the insights generated in another.

Theoretical Foundation

The knowledge management research in the interpretive discourse regards knowledge (e.g., Pentland 1995), technology (e.g., Käkölä 1995) and organizational practices (e.g., Robey and Sahay 1996) as socially constructed. Sahay and Robey highlight the implications of this social construction, namely that conceptual knowledge about a system is heavily intertwined with the social environment and that this environment influences not only the spread of knowledge but also the adoption—and adaptation—of information technology. Because the assimilation process can be viewed as one of organizational learning, knowledge transfer and IT adoption, Sahay and Robey suggest that organizational learning should be a theoretical perspective adopted for research on organizational transformation through

information technology. Pentland (1995) and Scott (2000) generate models of how IT can facilitate organizational learning. For instance, Scott identifies IT's use to monitor, to model, and to communicate as influencing interorganizational trust, collaboration, and learning. Robey and Sahay use organizational learning to understand the relationship between IT, in this case geographic information systems, and organizational change.

Other theoretical approaches include Bateson's (1972) levels of learning theory, upon which Star and Ruhleder (1996) rely to help explain why an infrastructure intended to facilitate collaboration and knowledge sharing among researchers failed. Furthermore, George et al. (1995) and Brown (1998) rely on Lave and Wenger's (1991) communities of practice and legitimate peripheral learning as theoretical constructs. Schultze and Boland (2000a, 2000b) apply Bourdieu's theory of practice and Virkkunen and Kuutti (2000) rely on activity theory. Lanzara (1999) relies on the theoretical concept of *bricolage*.

Implications for IS Research

Whereas the research in the normative discourse focuses on ways of designing IT to support learning, the interpretive discourse focuses on the interpretive flexibility of IT (e.g., Käkölä 1995; Lanzara 1999), and on the social processes by which IT may facilitate (e.g., Robey et al. 1995; Scott 2000) or inhibit (Henfriddson and Söderholm 2000; Pentland 1995) organizational learning. Interpretive research indicates concern that information systems will reinforce pre-existing procedures rather than occasion the learning of new ones. In other words, participants in the interpretive discourse highlight the unintended consequences of information technology. For example, Pentland discussed the potential of information technology to restrict the range of inquiry and experience. Similarly, Henfridsson and Söderholm found that the information technology they studied seemed to reinforce and augment pre-existing routines rather than leading to the learning of new ones; and Schultze and Boland's (2000a) analysis focused on how technologies can be at odds with knowledge workers' existing work practices, and that this apparent contradiction is not visible even to the very workers who are doing the job.

In summary, the research in the interpretive discourse does not provide specific IT development guidelines; however, it highlights that technology needs to be viewed from an emergent perspective (Markus and Robey 1988). Thus, this discourse reminds us that as a socially constructed artifact, technology has unintended consequences.

Exemplar of the Interpretive Discourse

Using a grounded-theory approach, Stenmark's (2000-2001) initial aim was to examine how agent-based retrieval technology could be used in an innovative way. In implementing and studying the use of this agent-based retrieval prototype, he observed unexpected behavior: "the best results were achieved when the users cut and pasted a large chunk of text from a relevant document" into a search agent and "asked the agent to find more similar documents." In contrast, users who were forced to define keywords for a search achieved less favorable results. Built on explicit knowledge and espoused theory of work, agents relying on job profiles linked individuals with others having supposedly similar interests; however, users found the results of the agent "strange" in "the negative sense of the word." Yet users matched to others via an agent that built on similarities in documents that both users found useful—in other words, matching people based on tacit knowledge—regarded the match as interesting and useful.

Stenmark's study illustrates a very different metaphor of knowledge from the normative metaphor of knowledge as an object. Stenmark rejects "the positivistic view of knowledge as an objectified and monistic absolute truth" and instead adopts "a pluralistic epistemology, acknowledging that there are many forms or types of human knowledge." This metaphor implies that

knowledge cannot be managed like an object, i.e., separate from human action. Rather, knowledge is organizational mind, a web of distributed yet interrelated activities. This view of knowledge is reflected in Stenmark's findings that users preferred to provide examples by pointing to relevant web documents as opposed to citing abstract keywords to describe their interests. This is because the act of recognizing an interesting document utilizes tacit knowledge whereas the task of selecting descriptive keywords requires a non-trivial translation to explicit knowledge. The tacit knowledge or theory in use is regarded by users as more trustworthy than the knowledge made explicit or the espoused theory based job description.

In the interpretive discourse, knowledge is continuously shaping and being shaped by the social practices of individuals. Knowledge is both an outcome of action as well as an input to action. In Stenmark's paper, knowledge serves as an input to the retrieval agent and an output of the agent's activities.

Given this inseparability of knowledge from the knower, how might technology be applied to knowledge management? Technological solutions to managing knowledge might include the use of knowledge directories, maps, and pointers that assist in the identification of experts in the knowledge community, as was one of the goals of the prototype Stenmark studied. However, Stenmark goes further to suggest that web documents and information retrieval technologies can act as a facilitator in the knowledge management process by leveraging tacit knowledge in an intra-organizational web. Indeed, he states that just because knowledge is implicit in behavior, it does not imply that it is outside the realm of IT support. He concludes that instead of trying to identify, capture, and make tacit knowledge explicit—as the normative discourse espouses— IT should be designed to use tacit knowledge to help users locate and communicate with knowledgeable people in their area of interest.

In summary, the interpretive discourse concerns itself particularly with coordinating collective action in systems of distributed knowledge. It views knowledge as mind, a notion that does not separate knowledge from action, but views it instead as a dynamic affordance for heedful interrelating. In light of this image of organizations, knowledge plays an important role in the recovery of integrative values that support communities of practice.

Critical Discourse

In the critical discourse we found only one example, the paper by Elkjaer et al. (1991). As this is the only paper representing the critical discourse, we will highlight each of the themes—research focus, knowledge metaphor, theoretical foundations, and the implications for IS—within our discussion of the research exemplar below.

Exemplar of the Critical Discourse

The *research focus* of the paper by Elkjaer et al. is on power relations in organizations. In particular, the authors wish to stimulate reflection on the social process through which systems developers' authoritative power and expertise is constituted and maintained. In this endeavor, they rely on two *a priori* assumptions: (1) that systems developers are acting as agents with their own interests and motivations, instead of merely being a disinterested party to the application of a development tool-set or methodology, and (2) that prevailing organizational structures are power relations that are incapable of supporting and sustaining open dialog and agreement between users and systems developers. These theoretical assumptions motivate this research and its objective to reclaim conflict and destroy false order by advocating that systems developers not only take a more critical stance "towards the nature of institutionalization" (p. 154), but also explore "how information systems may be used to change and develop the institutional conditions which currently

frustrate and impede communication and cooperation in organizations" (p. 154). In that sense, the paper's objective is in line with the agenda of the critical discourse to unmask domination (Deetz 1996).

In their endeavor to open Pandora's box (p. 151), Elkjaer et al. critique the systems development philosophy and methodology described in the 1988 annual report of BSO, a large Dutch technology consulting firm. At the heart of BSO's methodology is an ideology of consensus among users. However, the authors note that the power relations inherent in organizational structures generally restrict the open dialogue that is required for such consensus building. This argument is based on a critical view of institutionalized organizational structures and a *theoretical foundation* based on labor process theory and the work of Foucault (1979).

> Institutionalization of particular organizational and social practices is generally an outcome of on-going struggle between different groups who have unequal access to valued material and symbolic resources rather than the result of an unmediated meeting of minds. Opportunities to engage in, and secure control over, processes of institutionalization are asymmetrically distributed in organizations and society (p. 149).

Furthermore, organizational control mechanisms are

> historically forged through the systematic exclusion and subordination of the proprieties of employees to the impersonal discipline of management and the capitalist market (p. 153).

Elkjaer et al. fault the consulting firm for remaining silent on issues related to such organizational power structures in the presentation of their own expertise. This expertise was manifest in BSO's systems development philosophy and methodology, which espoused agreement and consensus building through dialogue. The authors do not take BSO's silence on issues of organizational power structures as a form of ignorance or naïveté; instead they see it as a consequence of the commodification of knowledge and as a form of self-censorship contrived by BSO's own need to position itself within relations of power. In other words, in order to put itself into a position of relative competitive advantage and to speak with some measure of authority, BSO needs to commodify its expertise.

However, as knowledge becomes a commodity and "enters a realm of political economy in which any claim to universal utility is subverted by its perceived value to parties (e.g., users and developers) who do not, in practice, routinely assume or accept a shared sense of their respective interests" (p. 152), the systems developers who claim ownership over this knowledge need to render it valuable by making it acceptable to their customers. Hence, the consultants' claims of objective and neutral expertise need to be tempered by their self-interested concerns about securing and advancing their position in a competitive market place.

In the paper by Elkjaer et al., the *metaphor of knowledge* is commodity: something that poses as a neutral object or resource. However, this image of knowledge is criticized on the grounds that knowledge is not neutral but carefully crafted within the context of specific market or organizational relations. Furthermore, the authors of this paper maintain that it is the decommodification of knowledge (p. 153) that offers hope of achieving more equitable institutional structures, namely those that are more amenable to open dialogue and more equitable power relations. It is only through the unpacking of the contextual economic and power relations, in which the knowledge commodity is produced and used, that knowledge in the form of organizational consensus can come to the fore.

The *implication for IS research* that we can draw from this paper is that systems development methodologies and the IS professionals who apply them, are not neutral. IS developers and the methodologies that they advocate need to be

understood in the context of the larger socio-political context. Neither outside technology consultants, such as BSO, nor their methodologies, can claim to be objective.

The authors thus conclude that BSO's apparent commitment to agreement and consensus building in organizations is not genuine; if it were, they would seek ways of using technology to facilitate institutional conditions that foster collaboration and communication in organizations and that attempt to overcome

> the institutional barriers in the form or relations of autonomy and dependence [that] form a context through which only some forms of agreements and dialogue are "acceptable" (p. 150).

In sum, the work by Elkjaer et al. has highlighted that the critical discourse concerns itself with the power relations and inequities that are inherent in organizational and societal structures. At a minimum, critical researchers seek to highlight these power inequities and demonstrate their influence on economic action; at a maximum, critical researchers seek to affect social change through action research.

Dialogic Discourse

One of the two articles representing the dialogic discourse explores the intertwined nature of organizational learning and intentional organizational forgetting (Bowker 1997); the other, the reciprocally invoked dynamic between organizational controls and information technology (Orlikowski 1991). Relying upon grounded methods, these papers are indicative of the dialogic discourse in that they develop insights on managing knowledge in an emergent way. Furthermore, both papers address the contradictory nature of managing knowledge. Bowker examines this in the context of the creation of classification schemes, while Orlikowski focuses on the embedding of an organization's system development methodology in a CASE tool. Both articles are cognizant of the implications that knowledge management initiatives have on power relations in organizations. Because of the paucity of the research representing this discourse, we will highlight each of the four knowledge management research themes in the discussion of our exemplar.

Exemplar of the Dialogic Discourse

Bowker's *research focus* is the dynamically intertwined and conflicting nature of organizational memory and organizational forgetting, as well as the implications of memory and forgetting on identity, visibility, and power. Bowker highlights the dynamic tension between the selective erasure and clearance of the nursing profession's past knowledge and the construction of a new classification scheme of nursing work that is intended to render the profession more scientific and its work more visible. The motivation behind greater visibility is to ensure that nursing work becomes part of the formal record in the hospital system's informational infrastructure. In other words, the nursing profession does not want its contribution to be either ignored or forgotten.

In his deconstruction of documents related to the Nursing Interventions Classification (NIC) project, Bowker emphasizes the complexity of balancing the positive and negative implications of creating a classification scheme for the nursing profession. He argues that this classification scheme serves as an infrastructure or theory of nursing knowledge, and that it enables nursing work to become a legitimate part of the patient record. Furthermore, this classification scheme will make nursing knowledge more accessible to scientific inquiry. At the same time, this new classification scheme serves a disciplining function that threatens to turn a care-giving profession into an information-processing one. While this conceptualization of the research appears rather Foucauldian, Bowker relies on literature from the sociology of science (e.g., Latour 1987) as a *theoretical foundation*.

Using the NIC project as an illustrative example, Bowker highlights the contradictory nature of organizational learning and knowledge creation: in order to create a classification scheme that legitimizes and makes visible nursing work, existing knowledge structures have to be selectively erased or rendered inaccessible by erecting a barrier that prevents knowledge from the past to seep through to the present. This is because past knowledge and identities have to be sworn off in order to embrace the new profession with all its promises of scientific status, visibility, and the respect that they command. Thus, in motivating the need for a new nomenclature and knowledge infrastructure, the creators of the NIC simultaneously acknowledge and deny the existence of prior nursing knowledge:

> The NIC team in general are claiming both that nursing is already a science and that it is one which has not yet been formulated: they need to maintain the former in order to justify the profession against current attacks and the latter in order to justify their classification system, which when in place will protect it from future attacks (p. 122).

Thus knowledge, particularly existing knowledge, is a liability. Such a view stands in stark contrast to the normative discourse's notion of knowledge as an asset. In addition to increasing the visibility of the nursing profession, the new NIC classification scheme acts as a disciplining device. Nurses are no longer supposed to "do everything possible" (p. 121) to help a patient; instead, they are supposed to set priorities and make decisions with the same rationality as the other professions that operate within the contemporary data-centric, information-intensive environment. And by striving for increased visibility through the creation of a classification scheme that allows for easy representation and capture of nursing work in electronic patient records, the NIC project also creates the conditions for an information panopticon (p. 124). Thus one of the challenges of the NIC project is to make nursing work visible enough without making it too visible. This is achieved through continued partial erasure of nursing knowledge (p. 126).

Bowker's paper is exemplary of the dialogic discourse in that it highlights the value of strategic and selective forgetting and the creation of knowledge as the construction of new disciplinary power relationships. The dialogic discourse focuses on the disciplinary practices that operate to create order, knowledge, and power effects. The *metaphor of knowledge* is discipline, with discipline having a dual meaning as (1) a branch of knowledge and (2) a system of correction and control (Foucault 1979). This inextricable intermingling of knowledge and power give rise to the construct of power/knowledge and highlights that before something can be controlled, managed, or governed, it must first be known. Knowledge thus plays a fundamental role in rendering phenomena visible, thinkable, calculable, and amenable to intervention. In other words, knowledge makes things manageable.

The *implications for IS research* that can be drawn from Bowker's article include the role that technology plays in making invisible work visible, and the stakes that are involved in achieving this feat. This research also raises questions about the feasibility of organizational forgetting in the face of increasing technology use. It would seem that strategies of clearance and erasure are difficult to execute in an environment of visible and traceable information. Hence strategies that initially promise visibility may lead to unerasable information traces that ensnare rather than progressively enlighten.

In summary, the dialogic discourse's view of knowledge as discipline, i.e., a system of knowing and correcting, appears somewhat negative and hopeless. The creation and management of knowledge is not a means of achieving progress toward a goal such as sustained competitive advantage. Instead it results in a never-ending cycle of self-reflection and self-discipline. From Bowker, we learn that the way to escape from the disciplinary power that knowledge exerts over a knower or a profession is through selective and strategic forgetting.

Discussion and Implications

Our primary objective with this paper was to take stock of IS-based knowledge management research by identifying the theoretical perspectives of knowledge and its management that are possible and assessing the extent to which these diverse perspectives—as captured in discourses—are represented in knowledge management research that has been published in IS journals in the last 10 years. Our analysis highlights that more than half of the published knowledge management research (i.e., 55 articles) represents the normative discourse. Twenty of the articles represented the interpretive discourse, two represented the dialogic discourse, and only one article was found that embraced the theoretical assumptions of the critical discourse.

These results show that the portfolio of knowledge management research in the IS literature is biased toward the consensus discourses and the normative discourse in particular. This implies that the negative implications of knowledge, namely its disciplining and dominating effects, are left largely unexamined. Although research in the interpretive discourse highlights the negative consequences of information technologies on organizational learning, the discourse does not question the value of knowledge itself. The danger of an area of research that ignores a set of epistemological assumptions is that it may become unduly myopic and closed to new ideas. Furthermore, if organizational members' experiences with knowledge management are more influenced by power, politics, and contradiction than IS researchers are able to recognize, then the research will lose its ability to explain organizations' experiences with knowledge management. The metaphors associated with each discourse should help researchers and practitioners capture their underlying assumptions about knowledge and its management.

This paper has highlighted that each of the discourses lends itself to a particular aspect of knowledge management research. For instance, the normative discourse appears well suited to studying technology solutions to knowledge management problems. The interpretive discourse, in contrast, is more adept at understanding the implementation and the organizational implications of knowledge management initiatives and technologies. With the paucity of papers in both the critical and the dialogic discourses, it is difficult to identify themes in the dissensus discourses. Nevertheless, based on Deetz's framework and the exemplars presented in this paper, we can identify some research topics that may be fruitfully approached from either a critical or a dialogic perspective. The critical discourse is promising with respect to highlighting the social inequities underlying such organizational stratifications as the distinction between service and knowledge work (Drucker 1993). The dialogic discourse lends itself well to the examination of the contradictions in managing knowledge.

Because of the different assumptions of knowledge in each discourse, the questions surrounding a research issue will vary across discourses. We encourage researchers to consider alternative research questions within a given knowledge management research stream. Take as an example the impact of knowledge management systems on individual power. A normative researcher might hypothesize that knowledge management systems allow for faster, more effective problem solving, thereby essentially increasing individual power. The normative researcher could build a model based upon existing theory, such as organizational learning or absorptive capacity, and test this in an organizational context. An interpretive researcher interested in the same issue might suggest that *a priori* relationships are not appropriate, and therefore seek to discover how individuals use knowledge management systems in ways that increase their power. The interpretive researcher could very well employ the same theories as the normative researcher, with a hope of explaining the phenomenon through the theory and possibly expanding the theory rather than testing it. The critical researcher might pursue a project to uncover ways that individuals can prevent their

own loss of power (and possible deskilling) with the introduction of knowledge management systems. As a theoretical base, such research might draw upon a variety of social perspectives, including that of Marx. A dialogic researcher, drawing from Foucault (1979) as a theoretical base, might hypothesize the opposite of the normative researcher, namely that such systems normalize behavior and actually hinder, rather than promote, effective responses, thus disempowering, rather than empowering, the individual.

In summary, we encourage researchers to consider their implicit assumptions about knowledge, its meaning and its worth. We further wish to challenge researchers to consider broadening their range of inquiry and to consider perspectives other than the ones with which they are most comfortable. In particular, we hope that this article promotes a line of inquiry into the contradictory and double-edged nature of knowledge.

Limitations

Like any research, ours has its shortcoming. Foremost among them is the somewhat ambiguous definition of knowledge management. Even though knowledge management became a buzzword in the 1990s, this does not mean that similar initiatives did not exist prior to the popularization of this concept. The way that we have sought to overcome this problem of nomenclature in constructing our keywords, with which knowledge management papers were identified, was by including "organizational learning" and "memory" in our operationalization of knowledge management.

Conclusions

In order to promote a stream of knowledge management research that is neither biased nor constrained by theoretical assumptions and methodological choices, this paper attempts to raise awareness of the various discourses of knowledge management. We have reviewed the IS literature on knowledge management in order to understand how knowledge is currently treated and to understand what topics and themes are raised by IS researchers undertaking studies of knowledge management. In so doing, we have noted tendencies to adopt an optimistic view of the role of knowledge in organizations and the role of information systems in enabling knowledge management. The voices of the dissenters are few; however, they are provocative. We therefore encourage IS researchers to wrestle with the difficult issues of power and conflict that knowledge management might incite. The metaphors used to explain the views of knowledge represented in the four discourses can help guide the development of definitions and interpretations of knowledge.

Finally, our research suggests that few IS researchers doing knowledge management research are adopting the critical and dialogic discourses in their research programs, or that few journals are publishing these discourses. The exemplars presented as representative of these discourses provide a shining testament to the interesting conclusions that can be derived from adopting the dissensus perspective. Given the influence that epistemological assumptions have on a researcher's interpretation of data, we encourage more IS researchers to consider reinterpreting their existing work or engaging in new research built around the critical and dialogic discourses. In this way, IS-based research on knowledge management will develop a stronger theoretical base that includes both favorable and unfavorable consequences of knowledge and its management.

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About the Authors

Ulrike Schultze is an assistant professor in Information Technology and Operations Management at Southern Methodist University. Her research focuses on the impact of information technology on work practices and she has been particularly interested in knowledge work, i.e., the social processes of creating and using information in organizations. Ulrike has written on hard and soft information genres, information overload, knowledge management, and knowledge workers' informing practices. Her more recent projects are in the area of electronic business and social embeddeness. Her research has been published in *MIS Quarterly*, *The Journal of Organizational Computing and Electronic Commerce*, *The Journal of Strategic Information Systems* and *Information & Organizations*. Ulrike currently serves on the editorial boards of *MIS Quarterly*, *Information & Organization*, and *The Journal of Information Technology*.

Dorothy E. Leidner is a professor of Information Systems and Director of the Center for Knowledge Management at Baylor University. Prior to rejoining the Baylor faculty, she was associate professor at INSEAD and at Texas Christian University. She has also been a visiting professor at the Instituto Tecnologico y des Estudios Superiores de Monterrey, Mexico, at the Institut d'Administration des Entreprises at the Université de Caen, France, and at Southern Methodist University. Dorothy received her Ph.D. in Information Systems from the University of Texas at Austin. Dorothy's research has been published in a variety of journals, such as *MIS Quarterly*, *Information Systems Research*, *Journal of Management Information Systems*, *Decision Sciences*, *Decision Support Systems*, and *Organization Science*. She has received best paper awards in 1993 from the Hawaii International Conference on System Sciences, in 1995 from *MIS Quarterly*, and in 1999 from the Academy of Management. She is currently serving as co-editor of the journal *Data Base for Advances in Information Systems*.

Appendix A

Knowledge Management Articles Included in Our Sample

Note: Journals are listed in alphabetical order; articles are listed in chronological order.

Journal	Author(s)	Title
AMIT (24)	Orlikowski (1991)	Integrated Information Environment or Matrix of Control? The Contradictory Implications of Information Technology
	Elkjaer, Flensburg, Mouritsen and Willmott (1991)	The Commodification of Expertise: The Case of Systems Development Consulting
	Jönsson (1992)	Accounting for Improvement: Action Research on Local Management Support
	George, Iacono and Kling (1995)	Learning in Context: Extensively Computerized Work Groups as Communities of Practice
	Unland, Kirn, Wanka, O'Hare and Abbas (1995)	AEGIS: Agent Oriented Organizations
	Käkölä (1995)	Increasing the Interpretive Flexibility of Information Systems through Embedded Application Systems
	Gill (1995)	High-Tech Hidebound: Case Studies of Information Technologies that inhibited Organizational Learning
	Robey, Wishart and Rodriguez-Diaz (1995)	Merging the Metaphors for Organizational Improvement: Business Process Reengineering as a Component of Organizational Learning
	Jones (1995)	Organizational Learning: Collective Mind or Cognitivist Metaphor?
	Pentland (1995)	Information Systems and Organizational Learning: The Social Epistemology of Organizational Knowledge
	Kirsch and Cummings (1996)	Contextual Influences on Self-Control of IS Professionals Engaged in Systems Development
	Sahay and Robey (1996)	Organizational Context, Social Interpretation, and the Implementation and Consequences of GIS
	Reeves-Ellington and Anderson (1997)	The Ethnology of Information: Cultural Learning Through Cooperative Action Research in a Multinational Firm
	Srinivas and Shekar (1997)	Applications of Uncertainty-Based Mental Models in Organizational Learning: A Case Study in the Indian Automobile Industry
	Bowker (1997)	Lest We Remember: Organizational Forgetting and the Production of Knowledge
	Ouksel, Mihavics and Chalos (1997)	Accounting Information Systems and Organizational Learning: A Simulation

Journal	Author(s)	Title
	Brown (1998)	Internet Technology in Support of the Concept of "Communities of Practice": The Case of Xerox
	Baets, Brunenberg, and van Wezel (1998)	Using Neural Network-Based Tools for Building Learning Organizations
	Stäbler and Erwaldt (1998)	Simulation Modeling and Analysis of Complex Learning Processes in Organizations
	Henfridsson and Söderholm (2000)	Barriers to Learning: On Organizational Defenses and Vicious Circles in Technological Adoption
	Robey, Boudreau, and Rose (2000)	Information Technology and Organizational Learning: A Review and Assessment of Research
	Huysman (2000)	Rethinking Organizational Learning: Analyzing the Learning Processes of Information Systems Designer
	Schultze and Boland (2000)	Place, Space and Knowledge Work: A Study of Outsourced Computer Systems Administrators
	Virkkunen and Kuutti (2000)	Understanding Organizational Learning by Focusing on "Activity Systems"
EJIS (6)	Jonas and Laios (1993)	Knowledge Acquisition and Integration Tools Aiming to Support Managerial Planning in Greek SMEs
	Rai (1995)	External Information Source and Channel Effectiveness and the Diffusion of CASE innovations: An Empirical Study
	Lee and O'Keefe (1996)	An Experimental Investigation into the Process of Knowledge-Based Systems Development
	Mitev (1996)	Convergence and Divergence in Information Systems and Knowledge Based Systems Methodologies: A Case for Integrated Strategic Planning
	Agarwal, Krudys, and Tanniru (1997)	Infusing Learning into the Information Systems Organization
	Edwards, Duan, and Robins (2000)	An Analysis of Expert Systems for Business Decision Making at Different Levels and in Different Roles
ISR (11)	Trice and Davis (1993)	Heuristics for Reconciling Independent Knowledge Bases
	Raghunathan, Krishnan, and May (1993)	MODFORM: A Knowledge-Based Tool to Support the Modeling Process
	Stein and Zwass (1995)	Actualizing Organizational Memory with Information Systems
	Shaft and Vessey (1995)	The Relevance of Application Domain Knowledge: The Case of Computer Program Comprehension
	Dhaliwal and Benbasat (1996)	The Use and Effect of KBS Explanations: Theoretical Foundations and a Framework for Empirical Evaluation
	Robey and Sahay (1996)	Transforming Work Through Information Technology: A Comparative Case Study of GIS in County Government
	Hightower and Sayeed (1996)	Effects of Communication Mode and Prediscussion Information Distribution Characteristics on Information Exchange in Groups
	Sinha and May (1996)	Providing Design Assistance: A Case-Based Approach

Journal	Author(s)	Title
	Simon, Grover, Teng, and Whitcomb (1996)	The Relationship of Information Systems Training Methods and Cognitive Ability to End-User Satisfaction, Comprehension, and Skill Transfer: A Longitudinal Field Study
	Star and Ruhleder (1996)	Steps Towards an Ecology of Infrastructure: Design and Access for Large Information Spaces
	Zhu, Prietula, and Hsu (1997)	When Processes Learn: Steps Toward Crafting an Intelligent Organization
JMIS (15)	Stein (1992)	A Method to Identify Candidates for Knowledge Acquisition
	Agrawal, Tanniru and Dacruz (1992)	Knowledge-Based Support for Combining Qualitative and Quantitative Judgments in Resource Allocation Decisions
	Amaravadi, Liu, George, and Nunamaker (1992)	AEI: A Knowledge-Based Approach to Integrated Office Systems
	Basu and Hevner (1992)	The Analysis and Design of Embedded Knowledge-Based Systems using Box Structure Method
	Kiang, Chi, and Tam (1993)	DKAS: A Distributed Knowledge Acquisition System in a DSS
	Hine and Goul (1998)	The Design, Development and Validation of a Knowledge-Based Organizational Learning Support System
	Shaft and Vessey (1998)	The Relevance of Application Domain Knowledge
	Balachandran, Buzydlowski, Dworman, Kimbrough, Vachula, and Shafer (1999)	MOTC: An Interactive Aid for Multidimensional Hypothesis Generation
	Wijnhoven (1999)	Development Scenarios for Organizational Memory Information Systems
	Tuomi (1999)	Data Is More than Knowledge: Implications of the Reversed Knowledge Hierarchy for Knowledge Management and Organizational Memory
	Stenmark (2000)	Leveraging Tacit Organizational Knowledge
	Nissen (2000)	An Experiment to Assess the Performance of a Redesign Knowledge System
	Mao and Benbasat (2000)	The Use of Explanation in Knowledge-Based Systems: Cognitive Perspectives and Process Tracking Analysis
	Zhao, Kumar, and Stohr (2000)	Workflow-Centric Information Distribution Through E-mail
	Scott (2000)	Facilitating Organizational Learning with Information Technology
JSIS (17)	Baker (1995)	The Role of Feedback in Assessing Information Systems Planning Effectiveness
	Moreton (1995)	Transforming the Organization: The Contribution of the Information Systems Function
	Andreu and Ciborra (1996)	Organizational Leaning and Core Capabilities Development: The Role of IT

Journal	Author(s)	Title
	Galliers (1998)	Towards the Integration of E-Business, Knowledge Management and Policy Considerations Within an Information Systems Strategy Framework
	Mumford (1998)	Problems, Knowledge, Solutions: Solving Complex Problems
	Newell, Swan, and Robertson (1998)	A Cross-National Comparison of the Adoption of Business Process Reengineering: Fashion Setting Networks?
	Madon (1999)	International NGOs: Networking, Information Flows and Learning
	Lanzara (1999)	Between Transient Constructs and Persistent Structures: Designing Systems for Action
	Galliers (1999)	Towards the Integration of E-Business, Knowledge Management and Policy Considerations within an Information Systems Strategy Framework
	Sarker and Lee (1999)	IT-enabled Organizational Transformation: A Case Study of BPR Failure in TELECO
	Fowler (2000)	The Role of AI Technology in Support of the Knowledge Management Value Activity Chain
	Jarvenpaa and Staples (2000)	The Use of Collaborative Electronic Media for Information Sharing: An Exploratory Study of Determinant
	McLure Wasko and Faraj (2000)	"It Is What One Does": Why People Participate and Help Others in Electronic Communities of Practice
	Gray (2000)	The Effects of Knowledge Management Systems on Emergent Teams: Towards a Research Model
	Schultze and Boland (2000)	Knowledge Management Technology and the Reproduction of Knowledge Work Practices
	Merali (2000)	Individual and Collective Congruence in the Knowledge Management Process
	Holsapple and Joshi (2000)	An Investigation of Factors that Influence the Management of Knowledge in Organizations
MISQ (21)	Lamberti and Wallace (1990)	Intelligent Interface Design: An Empirical Assessment of Knowledge Presentation in Expert Systems
	Mykytyn, Mykytyn, and Slinkman (1990)	Expert Systems: A Question of Liability
	Sviokla (1990)	An Examination of the Impact of Expert systems on the Firm: The Case of XCON
	Maletz (1990)	KBS Circles: A Technology Transfer Initiative that Leverages Xerox's "Leadership through Quality Program"
	Mann, Rudman, Jencjkes, and McNurlin (1991)	EPRINET: Leveraging Knowledge in the Electric Utility Industry
	Meyer and Curley (1991)	An Applied Framework for Classifying the Complexity of Knowledge-Based Systems
	Bieber and Kimbrough (1992)	On Generalizing the Concept of Hypertext

Journal	Author(s)	Title
	Byrd, Cossick, and Zmud (1992)	A Synthesis of Research on Requirements Analysis and Knowledge Acquisition Techniques
	Turoff, Hiltz, Bahgal, and Rana (1993)	Distributed Group Support Systems
	Storey and Goldstein (1993)	Knowledge-Based Approaches to Database Design
	Boyton, Zmud, and Jacobs (1994)	The Influence of IT Management Practice on IT use in Large Organizations
	Watson (1994)	Creating and Sustaining a Community of Scholars
	Alavi, Wheeler, and Valacich (1995)	Using IT to Reengineer Business Education: An Exploration of Collaborative Learning
	Nelson and Cooprider (1996)	The Contribution of Shared Knowledge to IS Group Performance
	Choudhury and Sampler (1997)	Information Specificity and Environmental Scanning: An Economic Perspective
	El Sawy and Bowles (1997)	Redesigning the Customer Support Process for the Electronic Economy: Insights from Storage Dimensions
	Goodman and Darr (1998)	Computer-Aided Systems and Communities: Mechanisms for Organizational Learning in Distributed Environments
	Nissen (1998)	Redesigning Reengineering Through Measurement-Driven Inference
	Gregor and Benbasat (1999)	Explanations form Intelligent Systems: Theoretical Foundations and Implications for Practice
	Nambisan, Agarwal, and Tanniru (1999)	Organizational Mechanisms for Enhancing User Innovation in Information Technology
	Schultze (2000)	A Confessional Account of an Ethnography about Knowledge Work