Association for Information Systems
AIS Electronic Library (AISeL)

December 2004

Paradoxes in Knowledge Management: A Dialectical Perspective

Bongsug Chae
Kansas State University

James Bloodgood
Kansas State University

Follow this and additional works at: http://aisel.aisnet.org/amcis2004

Paradoxes in Knowledge Management:
A Dialectical Perspective

Bongsug Chae
Department of Management
Kansas State University
bchae@ksu.edu

James M. Bloodgood
Department of Management
Kansas State University
jbloodgood@ksu.edu

ABSTRACT

This paper introduces a dialectical perspective of knowledge management that counters various assumptions in many of the writings on knowledge management. Considering learning, organizing and belonging while reviewing the literature, three categories of paradoxes (Lewis 2000) within the literature on knowledge management are identified. These paradoxes are mainly due to the predominant, unitary view of knowledge management including such concepts as learning, organizing and belonging. The paper proposes a dialectical view (Clegg, Cunha and Cunha 2002) of knowledge management to counter these paradoxes. This alternative view motivates researchers to look at knowledge management phenomena *dialectically* and provide practitioners with a means of addressing the increasingly paradoxical world they confront.

Keywords

Knowledge Management, Paradox, Dialectics, Information Technology, Learning, Organizing, Belonging

INTRODUCTION

Knowledge management (KM) is one of the most popular, important topics in academic research and management practice today (Alavi and Leidner 2001; Eisenhardt and Santos 2002; Grover and Davenport 2001; Ruggles 1998). The topic has drawn interest not only from information systems and organizational theory but also from anthropology, cognitive science, epistemology and other disciplines. Whether it is hype or hope (Blair 2002), this growing interest in knowledge management from diverse disciplines demonstrates the significance of this new field of study in academics and industry very well.

However, there seems to be a need to organize and structure our thinking concerning those key concepts – learning, organizing and belonging – in KM. This paper can be seen as a contribution to structuring the jungle by analyzing critically the way KM literature approaches relevant subjects and proposing an alternative way of analyzing KM and its key concepts. We propose paradox (Cameron and Quinn 1988; Clegg et al. 2002; Lewis 2000; Van de Ven and Poole 1988) as a new metaphor to deepen our understanding of KM by organizing and structuring KM research and practice.

We first identify three categories of paradoxes (Lewis 2000) in KM contexts: paradoxes of learning, organizing and belonging. Next, we review the literature (Van de Ven and Poole 1988) to deal with such paradoxes. Then we propose a dialectical view (Clegg et al. 2002) of KM to counter these paradoxes. Finally, we conclude the paper by discussing the implications of this study for KM research and practice.

IDENTIFYING PARADOXES: THESIS AND ANTITHESIS

Paradox's precise definition and attributes are not yet common components of organizational analysis. However, paradox in the literature involves contradictory, mutually exclusive elements that present and operate equally at the same time (Cameron and Quinn 1988). Paradox is the simultaneous presence of two mutually exclusive assumptions or statements; taken singly, each is incontestably true, but taken together they are inconsistent (Van de Ven and Poole 1988).

Three Categories of Paradoxes:

1. Paradoxes of Learning: Exploitation vs. Exploration; Single loop vs. Double loop; Situated or Accidental vs. Purposeful

One of the key concepts in the studies of KM is learning. Related to this, there are several other concepts such as individual learning, organizational learning and learning organization (Argyris and Schon 1996; Cook and Yanow 1993; Huber 1991;

Levitt and March 1988; Senge 1990). Several special issues (e.g., Organization Science 1991, (2)1; Information and Organizations 1995; Organizational Studies 1996) are devoted for the concept of learning.

There are a number of key sources of learning paradoxes. First, a key source is the tension between old and new—a struggle between the comfort of the past and the uncertainty of the future (Lewis 2000). This tension is also known as exploitation and exploration (March 1991) or incremental and radical learning. Researchers emphasize the importance of old routines and past experiences – organizational memory (Nelson and Winter 1982; Walsh 1991). Huber (1991) argues that organizations must appreciate their past experiences, both successes and failures, and learn from them. Levitt and March (1988), among others, view organizational learning as routine-based and history-dependent. Garvin (1993) states that learning organizations should be skilled at learning from their own experiences and the best practices of others, and propagating knowledge quickly and efficiently throughout the organization. Stein (1995) states that organizational memory is essential to organizational learning, while learning is a necessary condition for memory. Authors in information systems assert that so called organizational memory information systems can be built to support organizational memory (Ackerman and Malone 1990; Conklin 1993; Linger and Burstein 1998; Stein and Zwass 1995; Wang 1999).

However, others are cautious about what Levitt and March (1988) and Miller (1993) referred to as "competency traps" and "simplicity" respectively. A competency trap occurs when organizations blindly adhere to old routines and formulas without regard for changing conditions. This leads to simplicity, an overwhelming preoccupation with a single goal, strategic activity or worldview that increasingly precludes consideration of any others. In dynamic and uncertain environments, what organizations need is a continuous "doubting" or "disbelieving" of their current realities (Weick 1979).

Another key source of learning paradox is the tension between purposeful and situated—a struggle between the need of deliberation for learning and the situated, accidental aspect of learning in real work setting. This is related to the question 'When do organizations learn?' (Huysman 2000). Researchers believe that organizations require learning styles variously described as double-loop (Argyris and Schon 1978, 1996), generative (Senge 1990), higher-level (Fiol and Lyles 1985), or strategic (Mason 1993). Double-loop learning occurs when underlying assumptions, norms, and objectives are open to debate and change (Argyris and Schon, 1978). Mason (1993, p. 843) defines strategic learning as "the process by which an organization makes sense of its environment in ways that broaden the range of objectives it can pursue or the range of resources and actions available to it for processing these objectives." Generative learning requires new ways of looking at the world (Senge, 1990). In general, researchers emphasize purposeful, active and cognitive learning for radical change. Authors in information systems assert that computer-based systems can be built to support this kind of radical learning (Hine and Goul 1998; Ramesh 1994). As an example, Hine and Goul (1998) propose a prototype system called Organizational Learning Support System (OLSS) that supports the processes of developing and exchanging organizational members' underlying opinions, assumptions and interpretations of the environment.

Other researchers see the importance of more accidental and situated nature of learning in real workplaces. For example, Lave and Wenger (1991) explained learning through the concept of Legitimate Peripheral Participation (LPP). This concept explains learning and knowledge sharing so that newcomers to the community have access to old-timers and learn from them by being allowed to participate in practice, gradually moving from peripheral to full participation. Thus, learning is viewed as a social process rather than a purely cognitive and individual one. Here learning is viewed as situated. Situated means learning is "interactive" or "in a physical setting" with other people. Significant learning and innovation are generated in the informal work units in which people do "real work" (Brown and Duguid 1989).

2. Paradoxes of Organizing: Formal (Deliberate) vs. Informal (Emergent), Control vs. Autonomy; Integration vs. Differentiation

Organizing paradoxes are related to several tensions between theses and antitheses in KM contexts: how to approach KM? Deliberate or emergent approach? How to manage individuals and groups for effective KM? Formally or informally? How to support KM activities of individuals, groups and the organization as a whole? With control or more autonomy? How to effectively create and share new knowledge?

First, a key source of organizing paradoxes is the tension between formal (or deliberate) and informal (emergent) strategies for KM. For example, researchers emphasize deliberate strategies or planning (Mintzberg and Waters 1985) for KM and have popularized the view of knowledge as a valuable strategic asset (Davenport and Prusak 1998). A deliberate KM approach is the realization of strategic and planned patterns of knowledge creation and sharing. From the deliberate KM school,

knowledge can be managed – collected, stored, transferred and reused – and thus knowledge creation and sharing could be formally approached (Hansen 1999). Zack (Zack 1999) focuses on how to configure a firm's resources and capabilities to leverage its codified knowledge. Among Hansen et al's (Hansen, Nohria and Tierney 1999) widely adopted classification of KM strategies the codification stresses the explicit dimension of knowledge and a formal approach for the 'management' of knowledge creation and sharing using information technology.

In addition, some studies conceptualize community of practice (COP) as spontaneous forms of organizing and forums for knowledge creation and sharing. Brown and Duguid (1991) contend "communities cannot be created in a top-town fashion, but organizational structures and procedures should aim to preserve the 'healthy autonomy' of communities". Ardichvili, Page and Wentling (2002) contend COPs emerge spontaneously so KM professionals must avoid attempts to manage them.

Another key source of this paradox is the tension between integration and differentiation. Researchers assert knowledge integration is critical for effective KM and organizational success. Dougherty (1992) note that a successful product innovation in large firms requires knowledge integration among the technical, marketing, manufacturing, and sales departments. She examined the difficulty of knowledge integration and found two interpretive schemes – departmental thought worlds and organizational product routines – inhibiting knowledge integration. Senge (1990) points out that learning organizations require the ability to create systemic knowledge by integrating their various interdependent parts. Grant (1996a) asserts that the essence of organizational capability is the integration of individuals' specialized knowledge. Brown and Duguid (2001) also see the importance of knowledge integration. This led them to suggest such social strategies as translation, brokering and boundary objects. Many existing KM applications are developed for knowledge integration (Zack 1999).

In other studies there is an emphasis on knowledge differentiation. Before knowledge is integrated, each thought world or department must develop its unique, specialized knowledge. Carlie (2002) asserts that knowledge boundaries are a perpetual necessity because much of what organizations produce has foundation in the specialization of different kinds of knowledge. Boland and Tenkasi (1995) developed the concept of perspective making that refers to the process whereby a community develops and strengthens its own knowledge domain and practices.

Closely related to the above, the tension between control and autonomy (Starbuck 1992) is another source of organizing paradoxes. Researchers often emphasize the need of control for knowledge 'management'. Zack notes organizations are so complex that knowledge is fragmented, difficult to locate and share, and therefore redundant, inconsistent, or not used at all and he suggests the need of a KM architecture to configure a firm's resources and capabilities to leverage its codified knowledge. Alavi (2000) discusses the importance of 'managing' organizational knowledge and suggests that information technologies can be effectively used to (1) enhance the organization, storage, and accessibility of explicit knowledge and (2) to identify the individuals who possess the required knowledge and facilitate contact and communication between the source of knowledge and the knowledge seeker.

On the other hand, 'knowledge workers' are expected to demand high levels of autonomy (Robertson and Swan 2003), and autonomy has been considered as a key success of a knowledge creating company (Nonaka and Takeuchi 1995). Janz and Prasarnphanich (2003) argue that knowledge creation and dissemination can be facilitated by allowing knowledge workers to have the freedom to exercise authority with their knowledge and emphasize autonomy for effective KM. Hara and Kling (2002) emphasize autonomy as one of the core components of professional communities of practice (COP). Drawn from their empirical study, they argue that COPs include few training, people in them need to learn continuously, and thus autonomy is an important component.

3. Paradoxes of Belonging:
Openness vs. Closure; Cooperation vs. Competition; Community-interest vs. Self-interest

Belonging paradoxes are becoming more prevalent in today's business environment. To survive and thrive in today's competitive economy, organizations are increasingly migrating to new organizational structures in which partnerships and alliances are becoming more popular. Belonging paradoxes are reflected in such questions as Is knowledge a private property or a public one? What motivates people to share knowledge with others? Should organizations share knowledge with others? Organizations likely face more paradoxes of belonging due to their paradoxical nature of social relationships in today's interconnected and global world.

One key source of belonging paradox is the tension between openness and closure in the context of knowledge sharing between organizations. This tension would also be viewed as the tension between cooperation vs. competition in KM context. Researchers emphasize the need of openness. Hakansson and Snehota (1999) claim "no business is an island". Closed organizations cannot survive over the long run, and isolation simply means death (Borys and Jemison 1989). Nadler, Shaw and Walton assert that (1995) the old "kill-the-competitor" mindset is no longer appropriate. Levitt and March (1988) view learning from the experience of others as the key capability organizations must possess.

In other research, it is emphasized that there is a need to protect knowledge from others. This research stream is related to the resource-based view of firm (Wernerfelt 1984) to some extent that the concept of resources is extended to include intangible assets, and specifically to knowledge-based resources (Grant 1996b). Grant (1996b) views knowledge as residing within individuals in the organization, and the organization exists to integrate the specialized knowledge possessed by individuals. Thus, coordination within the firm, compared to interorganizational coordination, is viewed as more critical for competitive advantage. Liebeskind (1996) specifically sees a firm's competitive advantage as lying in its ability to prevent knowledge leaking across potentially porous boundaries. Liebeskind argues that firms have particular institutional capabilities which allow them to protect knowledge from expropriation and imitation. Grindley and Teece (1997) note the emergence of the increasing protection of an organization's know-how afforded by intellectual property management worldwide and emphasize the further need of managing and protecting a firm's knowledge from others through such methods as patents.

Closely related to the above, another source of tension – self-interest vs. community-interest – is related to the question "what motivates knowledge sharing between organizations?" Some authors have looked at this question at both individual and community level. Wasko and Faraj (2000) argue that reviewing KM practices indicates organizations are treating knowledge as a private good, owned either by the organization or by its members. They argue that organizations tend to view knowledge as (1) objects or (2) embedded in individuals. Knowledge as an object perspective assumes that knowledge can exist independently of human action and perception and is owned by the organization, rather than a personal asset of the individual. The knowledge embedded in individuals perspective assumes knowledge is not owned by the organization, but rather resides within the minds of individuals. In these two perspectives, it is viewed that people exchange their knowledge through market mechanisms in order to receive commensurate benefits. They are motivated by self-interest and are less likely to exchange unless provided with tangible returns such as promotions, raises, and/or bonuses, or intangible returns such as reputation, status and direct obligation from the knowledge seeker.

The third perspective proposed by the authors (Wasko and Faraj 2000) is the knowledge embedded in community perspective, suggesting knowledge supercedes any one individual, is highly context dependent and is embedded within a learning community. Some researchers have expanded the scope of the community. Brown and Duguid coined the term, "networks of practice (NOP)." Unlike COP, NOPs are occupational groups (Von Hippel 1988) or social worlds. They have practice and knowledge in common. Most members are unknown to one other. The links between members are more indirect than direct. They are notable for their extensive reach but not much reciprocity, since network members don't interact with one another directly to any significant degree. The literature (Cohen and Fields 1999; Tsai and Ghoshal 1998) puts similar emphasis on the role of intra-firm networks or communities as a critical source of organizational advantage and corporate innovation. This perspective assumes knowledge is collectively owned and maintained by the community. Therefore, knowledge is considered a public good. The motivation for knowledge sharing is not self-interest but care for the community (Wasko and Faraj 2000).

In the above section we have reviewed KM literature and identified three categories – learning, organizing and belonging – of paradoxes in KM research and practice. The next section develops a dialectical view of KM and, specifically, the three categories.

HOW TO DEAL WITH KM PARADOXES

Van de Ven and Poole (1988) cautiously note that if unacknowledged and unresolved, a paradox can drive researchers and practitioners to emphasize one pole over the other in an attempt to maintain an elusive consistency. The natural question is how to deal with these paradoxes in KM. Van de Ven and Poole (1988) mention four methods researchers use to deal with paradoxes. We adopt the last method (See Van de Ven and Poole 1988).

A DIALECTICAL VIEW: SYNTHESIS

We have conducted an extensive literature review of paradoxes in management and organizations. What follows are three syntheses–dialectical learning, dialectical organizing and dialectical belonging—that emerged from this literature review that,

taken together, amount to a dialectical view of KM. In addition, we discuss organizational characteristics (e.g., organizational architecture, leadership, information technology) necessary for these syntheses to emerge. Three syntheses are closely interrelated and mutually reinforcing each other: dialectic learning may not occur properly without dialectic organizing and dialectical belonging and vice versa. In this sense their relationship can be represented as a triadic reciprocal interplay.

1. Dialectical Learning: Paradoxes of Learning

Dialectical learning seeks both types – thesis and antithesis – of learning. The concept assumes that there is a bi-directional relationship between poles (e.g., single loop vs. double loop, exploitation vs. exploration, situated or accidental vs. purposeful). Organizations must be ambidextrous—good at both types of learning. These organizations may be called "ambidextrous organizations" (Tushman and O'Reilly 1996) that can manage both incremental and revolutionary change. Dialectical learning can occur when both types of learning are sought and present simultaneously. They should be viewed as complements rather than substitutes. Some literature is supportive of this view.

Edelman and Benning (1999) examined the processes and strategies of organizations (so called dot-com) in turbulent business environments and proposed an organizational change model which depicts radical organizational change (double-loop) as emerging from a series of seemingly trivial small-scale changes (single-loop). They argue that these organizations do not set out to implement transformational (or purposeful) change; it occurs as a result of the day-to-day activities (or situated/accidental) demanded by the changing competitive marketplace.

Miner and Mezias (1996) observed two historical emphases on learning—incremental (or single-loop) and radical (or double-loop). Behavioral learning scholars (March 1981) have emphasized incremental models of learning, while other researchers (Argyris and Schon 1978) have stressed radical models of learning to solve difficult problems (e.g., innovation) in organizations. The authors believe these two distinct lines of thinking have now converged to an implicit conclusion that both learning types can enhance survival and prosperity under some conditions, but can also hurt organizations in other conditions. Thus, organizations should sustain both types of learning simultaneously so both can be complements. Similarly, Huysman (2000) has recognized some bias in learning type in the literature and found both types of learning in information system design. Her conclusion is that learning is both situated (or accidental) and purposeful.

Knott's study (2002) offers an alternative perspective on exploitation and exploration as complements rather than substitutes. The author observed that automobile industry product development appears to combine exploration and exploitation in a single activity. The author's empirical examination of product development provides insights into the exploration and exploitation of knowledge and helps us characterize the nature of their positive interdependence.

Organizational Characteristics Facilitating Dialectical Learning:

Certain organizational characteristics including organizational architecture, culture and information technology appear to be critical for dialectical learning to occur. Tushman and O'Reilly's study (1996) of successful ambidextrous organizations shows that dialectical learning is likely to occur when there are *multiple contradictory* organizational architectures, processes and cultures within the same organization.

In terms of organizational architecture, these organizations maintain contradictory structures—small autonomous groups for innovative ideas and one large-size organization for leveraging economies of scale and scope. A second commonality across these firms in terms of culture is their reliance on strong social controls. They are simultaneously tight and loose. They are tight in that the corporate culture in each is broadly shared and emphasizes norms critical for innovation such as openness, autonomy, initiative and risk taking. The culture is loose in that the manner in which these common values are expressed varies according to the type of innovation is required.

Studies in the field of information systems suggest that certain computer-based systems can facilitate dialectical learning to emerge. It has been claimed that massive information technologies are designed for single loop learning but are limited in their support for higher level processes (Argyris 1977; Stein and Zwass 1995). There has been active research in the field of computer supported cooperative work where its goal is to develop computer-based information systems to support situated and work-oriented learning (Suchman 1994).

Stein and Zwass (1995) also believe that a type of information system called Organizational Memory Information Systems (OMIS) can support double-loop learning in two ways. OMIS can support double-loop learning by 1) providing a partial

record of existing norms and standards, and 2) by providing a means to encode the outcomes of higher-level learning for future use. Ackoff (1999) argue that information systems should keep not only the outcomes of the decision-making, but so called "design rationale" (Conklin and Begeman 1988) or assumptions on which the expectations are based and the processes by which the decision was reached, by whom it was reached, and when. Malhotra (2002) propose the model of a new type of information systems called *loose tight* knowledge management systems that enable both types of learning simultaneously. Others also propose new models of knowledge management system. An example is Courtney's conceptual model of knowledge management systems called "Singerian" information systems (Courtney 2001) that enable both consensus-based and conflict-based learning in organizations.

2. Dialectical Organizing: Paradoxes of Organizing

Dialectical organizing seeks both types of organizing and likely emerges when both poles (formal vs. informal, control vs. autonomy, integration vs. differentiation) are present simultaneously. Neither too much nor too little of these opposites is desirable for successful KM. Similarly things must not be either too tightly controlled or too loosely coupled in order to have successful KM. Rather when the structural side of this relationship is kept at a minimal level, the relationship between these opposites can complement and enable each other. In organizing, in short, too little structure makes coordination difficult and creates chaos. Too much structure creates gridlock and inhibits creativity and innovation in the context of KM. Effective KM strategy to deal with organizing paradoxes requires organizations to focus on both formal (deliberate) and informal (emergent) control and autonomy and integration and differentiation. These two apparent contradictions must coexist in KM contexts.

Brews and Hunt (1999) observed the debate between planning (or formalism) and emergence (or informalism) in strategy literature. The analysis of the planning practices of 656 firms shows that formal planning and the emergent approach both form part of 'good' strategic planning, especially in unstable environments. The external environment does not moderate the need for formal planning. In unstable environments formal plans are more amendable to change. What organizations need is both "learning to plan and planning to learn." It is noted by many researchers in the literature that informal networks like COP emerge out of formal. Assimakopoulos and Macdonald (2002) studied the interplay between formal and informal knowledge networks in IT innovation and found that formal collaboration networks emerge out of informal personal networks.

While noting that COP should not be created in a vacuum and cannot be mandated by managers, Wenger and Snyder (2000) suggest "cultivation" as a strategy. The authors suggest managers can bring the right people together, provide an infrastructure in which communities can thrive and measure the communities' value in nontraditional ways. Such *informal* networks need certain *formal* support and organizing to prosper. The authors assert that management must be prepared to invest time and money in helping such communities reach their full potential.

Malhotra (2001) claim that many current implementations of knowledge management systems (KMS) have shown limited success and such failures of KMS implementations arise from incorrect understanding and misapplication of the notion of control as traditional, external, supervised control. The understanding of control in the mainstream model of KM ignores the interpretive, dynamic and continuously evolving nature of knowledge and the constructive, social interactive nature of knowledge creation. These controls constrain autonomy. On the other hand, he recognizes self-control as the driver of human behavior and actions across all organizational decision and task processes and acknowledges that control over employees and communities is ultimately self-imposed. It is suggested that such controls as self-control can actually *enable* autonomy and ultimately KM success.

Brown and Duguid (2001) point out the importance of the tension between control and autonomy. The emphasis on either control or autonomy likely leads to organizational failure (rigidity or chaos). They note that the best managed companies are those that can maintain both control and autonomy.

Lawrence and Lorsch (1967) focused on the tension between integration and differentiation in organizations and argued that economically high performing organizations must be both highly differentiated and well integrated. Boland and Tenkasi (1995) explored the same issue using the notion of perspective making (or differentiation) and taking (or integration). Organizations are composed of multiple communities with specialized expertise. They argue that producing knowledge to create innovative products and processes in such organizations requires the ability to make strong perspectives within a community (perspective making) as well as the ability to take the perspective of another into account (perspective taking).

Organizational Characteristics Facilitating Dialectical Organizing:

Dialectical organizing does not occur in a vacuum. Certain organizational characteristics seem critical for dialectical belonging to emerge. One emerging paradoxical idea is "small is big, beautiful and better." Several studies propose an important organizational characteristic for dialectical organizing. "Small structures actually enable emergence, autonomy and differentiation."
In this line of thinking, researchers propose the concept of "minimal structures" (Barret 1998; Hedberg, Nystrom and Starbuck 1976; Kamoche and Cunha 2001) or semistructures (Brown and Eisenhardt 1997) that allow maximum flexibility, diversity, autonomy, and creativity are needed. Others (Okhuysen 2001; Okhuysen and Eisenhardt 2002) also illustrate that *simple* structuring mechanisms, interruptions, and time pacing are central to group flexibility. By not constraining what occurs during interruptions, these mechanisms promote flexibility in approaches to change. These interruptions are central to group flexibility. Groups facing ambiguous and/or novel tasks benefit from the flexibility that interruptions provide. Structures such as the IT staff meetings and other regular university meetings are channels for knowledge flows among individuals and also provide a platform for changing and improving these flows (Okhuysen 2001; Okhuysen and Eisenhardt 2002).

A different leadership that sees such tensions and organizing paradoxes is required. This new leadership must maintain multiple, contradictory cognitive styles and behaviors. Lewin and Regine (2000) call this paradoxical leadership which fluctuates the edge of a mechanistic and organic style of leadership, between structure and less structure. Tushman and O'Relly (1996) use the notion of ambidextrous leadership which is able to see contradictions in organizing. Denison, Hooijberg and Quinn (1995) argue that there are paradoxes, contradictions and competing values in leadership behavior. Their empirical study shows that effective leaders are those who have the cognitive and behavioral capacity to recognize and react to paradox, contradictions and complexity in their environments.

The larger organizational size becomes, the larger the role of information technology for dialectical organizing becomes. As known from the information systems literature (DeSanctis and Poole 1994; Orlikowski and Robey 1991), information technologies are organizational structures which both enable and constrain human action. The majority of modern information technologies such as enterprise resource planning systems (ERP) have made organizations more rigid and stable rather than more flexible and dynamic. However, technologies are not good or bad *per se* (Hedberg and Jonsson 1978). When designed and used properly, certain information technologies play the role of semi or minimal structures for dialectical organizing, particularly in large organizational settings. For that, technologies like semistructures need to exhibit partial order, and they lie between the extremes of very rigid and highly chaotic organization (Brown and Eisenhardt 1997). Socio-technical systems theory suggests that for technologies to exhibit the characteristics of minimal structures, they should be designed according to a principle of *minimal* critical specification (Cherns 1987). This principle states that no more should be specified than is absolutely essential, and while it is necessary to be quite precise about what has to be done, it is rarely necessary to be precise about how it is to be done. This allows knowledge management systems to be both designed and emergent in "technology-in-use" (Orlikowski, Yates, Okamura and Fujimoto 1995) and ultimately supports dialectical organizing.

In terms of knowledge integration and differentiation, Boland et al (Boland 1994) propose the design of flexible electronic communication systems for perspective taking and perspective making. This communication system combines two representation techniques – cognitive maps and narrative structures – for constructing and sharing knowledge effectively among different communities of practice.

3. Dialectical Belonging: Paradoxes of Belonging

Dialectical belonging seeks both types of belonging, and likely emerges when both poles (organizational closure vs. openness, competition and cooperation) are present simultaneously. Neither too much nor too little of these opposites is desirable for successful KM. Organizations today face problems in remaining open to the environment at the same time as securing the closure needed for effective coordination among a limited number of partners (Jessop 1997). They operate through an unstable and mutually implicated balance of cooperation and competition. Effective KM strategy to deal with belonging paradoxes requires organizations to focus *simultaneously* on both closure and openness and competition and cooperation.

The relationships between businesses have been of great interest in the marketing literature, and two strategies for B-to-B relationships have existed: transactional and relational (Styles and Ambler 2003). Transactional strategies draw on the framework of monopolistic competition and are short-focused profit maximization. On the other hand, relational strategies

emphasize long-term mutually beneficial relationships between organizations and industrial networks, interaction to develop and build these relationships and a focus on variables such as trust, cooperation, commitment and dependence. There has been a shift in emphasis in B-to-B relationship from transaction to relational (Day and Montgomery 1999). Transactional and relational strategies have been promoted as alternative strategies in the literature. However, recent work suggests that these two forms of strategies coexist in real business contexts, and employing both strategies simultaneously can lead to better organizational and industrial performance. For example Styles and Ambler (2003) argue that (1) business executives will not trade off short term with long term considerations but emphasize both long term relationship and short-term (discrete) transactions, (2) an organization will see negotiation as being both competitive and cooperative rather than one or the other or neither and (3) an organization that emphasizes both transactional and relational strategies will perform better than an organization that adopts only one or neither. They note that transactional and relational strategies do not merely coexist, but they reinforce each other.

Brown and Duguid (2000) suggest the existence of two types of knowledge networks – community of practice (COP) and network of practice (NOP). A COP is an intraorganizational knowledge network while a NOP is an interorganizational network. They emphasize the need and promotion of both types of networks for effective KM strategy.

Holmqvist (2003) notes that two themes characterize the organizational learning literature: one focuses on intraorganizational learning processes, and another focuses on interorganizational learning processes. The author stresses the need to cross-fertilize these themes of organizational learning by proposing a dynamic model of organizational learning within and between organizations. This cross-fertilization is important in order to understand how organizations may cope with the fundamental organizational learning problem of addressing exploitation and exploration. It is proposed that exploitation and exploration occur both within and between organizations and that they are deeply interlaced through intra- and interorganizational learning processes.

Organizational Characteristics Facilitating Dialectical Belonging:

Organizations see how COPs and NOPs presuppose each other through intra- and interorganizational learning. Intraorganizational learning (or COPs) creates conditions for interorganizational learning (or NOPs). Interorganizational learning (or NOPs) creates conditions for intraorganizational learning (or COPs). Certain organizational characteristics are critical for dialectical belonging to emerge.

Most of all, KM strategy needs a new mindset of organizational boundary and the nature of competition. Mason (1993) suggests that learning organizations must see competitors more as a means of learning than as a hostile threat. Moore (1996) argues that the complex, interdependent nature of today's business relationships is best understood as a form of ecosystem. He suggests that an organization be viewed not as a member of a single industry but as part of a business ecosystem that crosses a variety of industries. "In a business ecosystem, companies coevolve capabilities around a new innovation: they work *cooperatively* and *competitively* to support new products, satisfy customer needs, and eventually incorporate the next round of innovations" (p. 76).

Brown and Duguid (2000) propose an ecological perspective on organizational belonging by noting "The leaking of proprietary knowledge may represent a significant loss to the firm that loses it. If it flows to where it will be more effectively used, the region as a whole, by contrast, gains. Moreover, the firm faced with such a loss may try to seal itself off from the system as a whole. But such isolation can be quite damaging. Firms that feed into the ecology will, by networks of communities, feed off it. Closing off these routes isolates a firm in situations where isolation easily means death."

Specific mechanisms can be utilized to facilitate dialectical belonging. Lyytinen et al's (Lyytinen, Rose and Yoo 2002) empirical study of software firms offers specific learning mechanisms for organizations seeking and utilizing dialectical belonging. They distinguish two mechanisms to speed up exploration; distributed gate-keeping and extended grafting of external knowledge; and two mechanisms to speed up exploitation. These mechanisms rely on both internal and external knowledge sources and explore the combination of intra and interorganizational learning. Firms moved their technological and business expertise to the front line through the decentralized and distributed organization of gatekeepers. These gatekeepers became the nexus of fast exploitation through their position in peer networks. Another mechanism that enabled fast exploration was extensive grafting through codified external knowledge and skill sourcing. A shift towards using simple rules and design artifact-based exploitation enabled vicarious learning through trials and the consecutive refinement of cognitive frames that enabled fast exploitation. When combined with informal knowledge transfer in peer networks, this

resulted in the more frictionless and agile mobilization of cognitive resources. Their study implies that knowledge is constantly recreated though dialectic interlacing of intra- and interorganizational learning in learning organizations.

Certain information technologies are necessary to support dialectical belonging to emerge. Studies suggest that while communication technologies such as intranet do not necessarily make a strong COP or cause intraorganizational learning to occur, they are a complement to face-to-face COPs (Hara and Kling 2002; Kraut, Steinfield, Chan, Butler and Hoag 1998). However, the role of information and communication technologies such as interactive electronic feedback, newsgroup and Listserve (ICT) is significant for NOP/interorganizational learning. For example, studies show that ICTs play an important role in connecting people and maintaining NOPs (Brown 1998) and facilitate interorganizational learning (Scott 2000). ICTs ease the difficulties strangers have with contacting individuals across hierarchical, geographical, and organizational boundaries (Constant, Sproull and Kiesler 1996; Haythornthwaite 2002). Scott's (2001) empirical study of IT use for interorganizational learning also shows that IT facilitates interorganizational learning through allowing users to monitor suppliers and do interactive modeling and communication with partners.

CONCLUSION

In conclusion, the contribution of this article is to identify paradoxes by organizing KM literature and to offer an alternative perspective on KM. While empirical study is needed, we expect that the alternative view can induce researchers to look at KM phenomena *dialectically* and provide practitioners with a means of addressing the increasingly paradoxical world that they confront.

REFERENCES

1. Ackerman, M., and Malone, T. "Answer Garden: A Tool for Growing Organizational Memory," Proceedings of the ACM Conference on Office Information Systems, Cambridge, MA, 1990, pp. 31-39.
2. Ackoff, R.L. *Ackoff's Best: His Classic Writings on Management* John Wiley & Sons, Inc., New York, 1999.
3. Alavi, M. "Managing Organizational Knowledge," in *Framing The Domains OF IT Management: Projecting the Future Through the Past,* R. Zumd (ed.), Pinnaflex, New York, 2000.
4. Argyris, C., and Schon, D. *Organizational Learning. Reading* Addison-Wesley Pub Co., Reading, Mass., 1978.
5. Argyris, C., and Schon, D. *Organizational Learning II. Reading* Addison-Wesley Pub Co., Reading, Mass., 1996.
6. Arnold, M. "On the Phenomenology of Technology: The Janus-Faces of Mobile Phones," *Information & Organization* 2003.
7. Assimakopoulos, D., and Macdonald, S. "A Dual Approach to Understanding Information Networks," *International Journal of Networking and Virtual Organizations* (1:1) 2002, pp 1-16.
8. Barret, F. "Creativity and Improvisation in Jazz and organizations: Implications for Organizational Learning," *Organization Science* (9:5) 1998, pp 605-622.
9. Boland, R., and Tenkasi, R.V. "Perspective Making and Perspective Taking in Communities of Knowing," *Organization Science* (6:4) 1995.
10. Brown, J.S. "Internet Technology in Support of the Concept of "Communities of Practice": The Case of Xerox," *Accounting, Management & Information Technology* (8) 1998, pp 227-236.
11. Brown, J.S., and Duguid, C.P. "Situated Cognition and The Culture of Learning," *Educational Researcher* (18:1) 1989, pp 32-41.
12. Brown, S.L., and Eisenhardt, K.M. "The Art of Continuous Change: Linking Complexity Theory and Time-Paced Evolution in Relentlessly Shifting Organizations," *Administrative Science Quarterly* (42) 1997, pp 1-34.
13. Cameron, K.S. "Effectiveness as Paradox: Consensus and Conflict in Conceptions of Organizational Effectiveness," *Management Science* (32:5) 1986, pp 539-553.
14. Carlie, P.R. "A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New Product Development," *Organization Science* (13:4) 2002, pp 442-455.
15. Cheng, Y.-T., and Van de Ven, A. "Learning the Innovation Journey: Order out of Chaos," *Organization Science* (7:6) 1996, pp 593-614.
16. Cherns, A.E. "Principles of Sociotechnical Design Revisited," *Human Relations* (40) 1987, pp 153-162.
17. Clegg, S.R., Cunha, J., and Cunha, M. "Management Paradoxes: A Relational View," *Human Relations* (55:5) 2002, pp 483-503.
18. Cohen, S.S., and Fields, G. "Social Capital and Capital Gains in Silicon Valley," *California Management Review* (41:2) 1999, pp 108-130.
19. Conklin, C.W. "Capturing Organizational Memory," Proceedings of the GroupWare '92, 133-137, San Mateo, CA, 1993.
20. Constant, D., Sproull, L., and Kiesler, S. "The Kindness of Strangers: The Usefulness of Electronic Weak Ties for Technical Advice," *Organization Science* (7:2) 1996, pp 119-135.
21. Cook, S.D., and Yanow, D. "Culture and organizational learning," *Management Inquiry* (2:4) 1993.
22. Courtney, J.F. "Decision Making and Knowledge Management in Inquiring Organizations: A New Decision-Making Paradigm for DSS," *Decision Support Systems*) 2001.

23. Davenport, S., and Prusak, L. *Working Knowledge* Harvard Business School Press, Cambridge, MA, 1998.
24. Day, G., and Montgomery, D.B. "Charting New Directions for Marketing," *Journal of Marketing* (63) 1999, pp 3-13.
25. Denison, D.R., Hooijberg, R., and Quinn, R.E. "Paradox and Performance: Toward a Theory of Behavioral Complexity in Managerial Leadership," *Organization Science* (6:5) 1995, pp 524-540.
26. DeSanctis, G., and Poole, M.S. "Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory," *Organization Science* (5:2) 1994, pp 121-147.
27. Dougherty, D. "Interpretive Barriers to Successful Product Innovation in Large Firms," *Organization Science* (3:2) 1992, pp 179-202.
28. Edelman, L.F., and Benning, A.L. "Incremental Revolution: Organizational Change in Highly Turbulent Environments," *Organizational Development Journal* (17:4) 1999, pp 79-93.
29. Eisenhardt, K. "Paradox, Spirals, Ambivalence: The New Language of Change and Pluralism," *Academy of Management Review* (25:4) 2000, pp 703-705.
30. Grant, R.M. "Prospering in Dynamically Competitive Environments: Organization Capability as Knowledge Integration," *Organization Science* (7) 1996a, pp 375-387.
31. Grant, R.M. "Toward a Knowledge-based Theory of the Firm," *Strategic Management Journal* (17) 1996b, pp 109-122.
32. Grindley, P., and Teece, D.J. "Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics," *California Management Review* (39:2) 1997, pp 8-41.
33. Grover, V., and Davenport, T.H. "General Perspectives on Knowledge Management: Fostering a Research Agenda," *Journal of Management Information Systems* (18:1) 2001, pp 5-21.
34. Hakansson, H., Havila, V., and Pedersen, A. "Learning in Networks," *Industrial Marketing Management* (28) 1999, pp 443-452.
35. Hansen, M. "The Search-Transfer Problem: The Role of Weak Ties in Sharing Knowledge across Organization Subunits," *Administrative Science Quarterly* (44) 1999, pp 82-111.
36. Hara, N., and Kling, R. "IT Support for Communities of Practice: An Empirically-based Framework," WP-02-02, Center for Social Informatics, Indiana University.
37. Hedberg, B., and Jonsson, S. "Designing Semi-Confusing Information Systems for Organizations in Changing Environments," *Accounting, Organizations and Society* (3:1) 1978, pp 47-64.
38. Hine, M., and Goul, M. "The Design, Development, and Validation of a Knowledge-Based Organizational Learning Support System," *Journal of Management Information Systems* (15:2) 1998, pp 119-152.
39. Holmqvist, M. "A Dynamic Model of Intra- and Interorganizational Learning," *Organization Studies* (24:1) 2003, pp 95-123.
40. Huber, G.P. "Organizational Learning: The Contributing Processes and the Literatures," *Organization Science* (2) 1991, pp 88-115.
41. Huysman, M. "Rethinking Organizational Learning: Analyzing Learning Processes of Information Systems Designers," *Information and Organization* (10) 2000, pp 81-99.
42. Janz, B.D., and Prasarnphanich, P. "Understanding the Antecedents of Effective Knowledge Management: The Importance of a Knowledge-Centered Culture," *Decision Sciences* (34:2) 2003, pp 351-384.
43. Kamoche, K., and Cunha, M. "Minimal Structures: From Jazz Improvisation to Product Innovation," *Organization Studies* (22:5) 2001, pp 733-764.
44. Knott, A.M. "Exploration and Exploitation as Complements," in: *The Strategic Management of Intellectual Capital and Organizational Knowledge,* C.W. Choo and N. Bontis (eds.), Oxford University Press, Oxford, 2002, pp. 339-358.
45. Lawrence, P.R., and Lorsch, J.W. "Differentiation and Integration in Complex Organizations," *Administrative Science Quarterly* (12) 1967, pp 1-47.
46. Levitt, B., and March J, G. "Organizational Learning," *Annual Review of Sociology* (14) 1988, pp 126-146.
47. Lewis, M.W. "Exploring Paradox: Toward a More Comprehensive Guide," *Academy of Management Review* (25:4) 2000, pp 760-776.
48. Liebeskind, J.P. "Knowledge, Strategy, and the Theory of the Firm," *Strategic Management Journal* (17:Winter) 1996, pp 93-107.
49. Linger, H., and Burstein, F. "Learning in Organizational Memory Systems: An Intelligent Decision Support Perspective," Proceedings of the The 31st Annual Hawaii International Conference on System Science, 1998, pp. 200-207.
50. Lyytinen, K., Rose, G., and Yoo, Y. "Learning in High Gear" Hyper-learning and Dynamic Capability in Seven Software Firms," *Sprouts: Working Papers on Information Environments, Systems and Organizations* (2: Fall) 2002, pp 1-35.
51. Malhotra, Y. (ed.) *Organizational Controls as Enablers and Constraints in Successful Knowledge Management Systems Implementation*. Idea Group Publishing, Hershey, 2001.
52. Malhotra, Y. "Information Ecology and Knowledge Management: Toward Knowledge Ecology for Hyperturbulent Organizational Environment," in: *Encyclopedia of Life Support Systems (EOLSS)*, UNESCO/Eolss Publishers, Oxford, UK, 2002.
53. March J, G. "Footnotes to Organizational Change," *Administrative Science Quarterly* (26) 1981, pp 563-577.
54. March, J.G. "Exploration and Exploitation in Organizational Learning," *Organization Science* (2:1) 1991, pp 71-87.

55. Mason, R.M. "Strategic Information Systems: Use of Information Technology in a Learning Organization," Twenty-Sixth Annual Hawaii International Conference on Systems Sciences, IEEE Computer Society Press, 1993, pp. 840-849.
56. Miller, D. "The Architecture of Simplicity," *Academy of Management Review* (18:1) 1993, pp 116-138.
57. Miner, A., and Mezias, S.J. "Ugly Uuckling No More: Pasts and Futures of Organizational Learning Research," *Organization Science* (7:1) 1996, pp 88-99.
58. Mintzberg, H., and Waters, J.A. "Of Strategies, Deliberate and Emergent," *Strategic Management Journal* (6:3) 1985, pp 257-272.
59. Moore, J. *The death of competition* HarperCollins Publishers, Inc., 1996.
60. Nadler, D.A., Shaw, R.B., and Walton, E.A. *Discontinuous Change: Leading Organizational Transformation* Jossey-Bass, Inc., San Francisco, CA, 1995.
61. Nelson, R., and Winter, S. *An Evolutionary Theory of Economic Change* Belknap Press of Harvard University, Cambridge, MA, 1982.
62. Nonaka, I., and Takeuchi, H. *The Knowledge Creating Company* Oxford University Press, New York, 1995.
63. Okhuysen, G.A. "Structuring Change: Familiarity and Formal Interventions in Problem-Solving Groups," *Academy of Management Journal* (44:4) 2001, pp 794-808.
64. Orlikowski, W., Yates, J., Okamura, K., and Fujimoto, M. "Shaping Electronic Communications: The Metastructuring of Technology in Use," *Organization Science* (6:4) 1995, pp 423-444.
65. Orlikowski, W.J., and Robey, D. "Information Technology and the Structuring of Organizations," *Information Systems Research* (2) 1991, pp 143-169.
66. Ramesh, R.W., Andrew B. "Claims, Arguments, and Decisions: Formalisms for Representation, Gaming, and Coordination," *Information Systems Research* (5) 1994, pp 294-325.
67. Robertson, M., and Swan, J. "Control - What Control? Culture and Ambiquity Within a Knowledge Intensive Firm," *Journal of Management Studies* (40:4) 2003, pp 831-858.
68. Robey, D., and Boudreau, M. "Accounting for the contradictory organizational consequences of information technology: theoretical directions and methodologies implications," *Information Systems Research* (10:2) 1999, pp 167-185.
69. Ruggles, R. "The State of the Notion: Knowledge Management in Practice," *California Management Review* (40:3) 1998, pp 80-89.
70. Senge, P. *The Fifth Discipline: The Art and Practice of the Learning Organization* Century Business, 1990.
71. Starbuck, W. "Learning by Knowledge-Intensive Firms," *Journal of Management Studies* (29:6) 1992, pp 713-740.
72. Stein, E.W., and Zwass, V. "Actualizing Organizational Memory with Information Systems," *Information Systems Research* (6:2) 1995, pp 85-117.
73. Styles, C., and Ambler, T. "The Coexistence of Transaction and Relational Marketing: Insights from the Chinese Business Context," *Industrial Marketing Management* (32) 2003, pp 633-642.
74. Suchman, L. "Working Relations of Technology Production and Use," *Computer Supported Cooperative Work* (2) 1994, pp 21-39.
75. Wang, S. "Organizational Memory Information Systems: A Domain Analysis in the Object-Oriented Paradigm," *Information Resources Management Journal* (12:2) 1999, pp 26-37.
76. Wasko, M., and Faraj, S. "It is What One Does": Why People Participate and Help Others in Electronic Communities of Practice," *Journal of Strategic Information Systems* (9) 2000, pp 155-173.
77. Weick, K. *The Social Psychology of Organizing* Addison-Wesley Publishing Company, Inc., 1979.
78. Wenger, E., and Snyder, W. "Communities of Practice: The Organizational Frontier," *Harvard Business Review* (Jan/Feb) 2000, pp 139-145.
79. Wernerfelt, B. "A Resource-based View of the Firm," *Strategic Management Journal* (5) 1984, pp 171-180.
80. Zack, M. "Managing Codified Knowledge," *Sloan Management Review,* Summer 1999, pp 45-58.