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Value creation: the future of knowledge management

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Abstract

The paper provides a review of knowledge management (KM) literature with a focus on recent value creation trends of the KM discipline. The review spans a large spectrum of KM research ranging from the 'soft' (socio-organizational) to technical dimensions of KM, published in the academic and trade literature. An interpretive stance is adopted so as to provide a holistic understanding and interpretation of organizational KM research and models. Value creation is grounded in the appropriate combination of human network, social capital, intellectual capital, and technology assets, facilitated by a culture of change. It is argued that to be effective organizations need not only to negotiate their migration from a knowledge sharing to a knowledge creation culture, but also to create sustained organizational and societal values. The latter form the foundation of the proposed 'knowledge value creation' concept and represent key organizational and societal challenges faced by modern organizations.

1 Introduction

A knowledge-based perspective of the organization has emerged in the strategic management literature (Alavi & Leidner, 2001; Nonaka & Takeuchi, 1995). Organizational knowledge is recognized as a key resource and a variety of perspectives suggest that the ability to marshal and deploy knowledge dispersed across the organization is an important source of organizational advantage (Teece, 1998; Tsai & Ghoshal, 1998). Furthermore, it is widely acknowledged that one of the key sustainable advantages that a firm can have comes from what it collectively knows, how efficiently it uses what it knows, and how readily it acquires and uses new knowledge (Davenport & Prusak, 1998). Traditional organizations are beginning to comprehend that knowledge and its interorganizational management, as well as individual and organizational capability building, are becoming crucial factors for gaining and sustaining competitive advantages (Preiss *et al.*, 1996).

Knowledge management (KM) is a broad and expanding topic (Scarbrough *et al.*, 1999). In reviewing the theory and literature of the field (Rezgui, 2001), it is necessary to commit to an identifiable epistemic flavor of approach. Many such approaches to KM are identified, and have been categorized in various ways (Schultze, 1998; McAdam & McCreedy, 1999; Alavi & Leidner, 2001; Earl, 2001). Schultze (1998) engages Burrell & Morgan's (1979) framework in order to identify a twofold typology of knowledge within the debate about KM; objectivist and subjectivist. An objectivist approach views knowledge as objects to be discovered (Hedlund, 1994). In identifying the existence of knowledge in various forms and locations, technology is employed in the codification of such knowledge objects (Hansen *et al.*, 1999). In contrast, a subjectivist approach suggests knowledge is inherently identified and linked to human experience and the social practice of knowing, as seen for example in the work of Tenkasi & Boland (1996) and Brown & Duguid (1998).

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The paper provides an evolutionary review of KM literature by adapting and extending Firestone & McElroy's (2003) KM generations. The scope and definition of KM has evolved over the years. At present, there are two generations of KM (Firestone & McElroy, 2003). The first (past) generation tends to focus on knowledge sharing, whereas the second (present) generation on knowledge creation. However, the third generation remains unclear (Firestone & McElroy, 2003). This constitutes a gap that the study aims to address, and forms the main contribution of the paper. Drawing on existing literature, the paper develops a grounded understanding of the future of KM by arguing the case for a third KM generation, namely Value Creation. The paper is based on a wide spectrum of KM research published in the academic and trade literature. An interpretive stance (Deetz, 1996) related to the subjectivist approach is adopted to provide a holistic understanding and interpretation of organizational KM research. In adopting such a stance, it is contended that knowledge is continuously shaped by the social practice of teams, communities and institutions.

The paper, first, presents a review of knowledge sharing and creation defined as the first and second generations of KM. The following section presents a review of the proposed 'third generation KM' (value creation). The discussion section argues and develops a grounded understanding of the third generation of KM. The final section draws out the contribution of the paper and provides conclusive remarks.

2 Knowledge sharing and creation

Koenig (2002) argues that the first stage of KM focuses on information technology (IT)-driven knowledge sharing. The use of IT, in particular the Internet, Intranet, and tools for knowledge sharing and transfer can create added value to the enterprise with an emphasis on 'best practices' and 'lessons learned'. On the other hand, early KM research focuses on socialization issues, including human and cultural factors. It stresses the importance of organization learning applied from the work of Senge (1990), knowledge creation adapted from the SECI model (Nonaka & Takeuchi, 1995), and Communities of Practice (Wenger *et al.*, 2002).

Knowledge sharing is considered as the first generation KM and is described as 'supply-side KM' as people can acquire supplied knowledge through knowledge sharing systems (Firestone & McElroy, 2003). Moreover, knowledge sharing is not only defined as the process of transmitting knowledge to target receivers, but also the process by which it is absorbed and used by people. It can be represented through the following equation proposed by Davenport & Prusak (1998):
Knowledge sharing (transfer) = Transmission + Absorption (in use)

While knowledge sharing is described as 'supply-side KM', knowledge creation is defined as 'demand-side KM' and seeks to enhance a capacity to satisfy 'demands' for new knowledge (Firestone & McElroy, 2003). Knowledge creation, viewed as the second generation of KM, is an organizational, social, and collaborative (dynamic) process involving nurturing and continuous interactions between tacit and explicit knowledge (Nonaka *et al.*, 2000; Pentland, 1995). As such, the first and second generations of KM emphasize three dimensions: socio-technical, socio-organizational and learning process.

The following subsections discuss knowledge sharing and creation related research articulated around the abovementioned socio-technical, socio-organizational, and learning process dimensions.

2.1 Socio-technical dimension

A KM System (KMS) refers to a class of information systems applied to managing organizational knowledge (Alavi & Leidner, 2001). That is, it is an IT-based system developed to support and enhance the organizational processes of knowledge sharing, transfer, retrieval, and creation. Many KM initiatives rely on IT as an important enabler, and tend for some of them to overlook the socio-cultural aspects that underpin KM (Davenport & Prusak, 1998; Malhotra, 1999; O'Dell & Grayson, 1998). The literature discussing applications of IT to organizational KM initiatives

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reveals three common applications (Alavi & Leidner, 2001): (a) the coding and sharing of best practices, (b) the creation of corporate knowledge directories, and (c) the creation of knowledge networks. One of the most common applications that falls under category (a) is internal benchmarking with the aim of transferring and sharing internal best practices (KPMG, 1998; O'Dell & Grayson, 1998).

Alavi & Leidner (2001) argue that shared knowledge spaces should be provided through KMS to create communities of users and encourage the exchange of explicit and tacit knowledge. Knowledge spaces can take the form of 'physical' (involving face-to-face interactions) or 'virtual' (online) spaces. Although IT is supposed to enable sharing of only explicit knowledge (Roberts, 2000), Bolisani & Scarso (1999) suggest that IT can also enable sharing of tacit knowledge in the form of pictures, drafts, and other means by using adapted computer applications. However, when tacit knowledge is shared, it still requires to be decoded by the human operators (Bolisani & Scarso, 1999). Markus (2001) suggests three factors in the successful reuse of knowledge shared and created in a knowledge space (e.g., knowledge repository system): (a) the costs involved in creating and using entries, (b) the incentives people have to create and use entries, and (c) the roles of intermediaries in the creation and maintenance of shared knowledge spaces and the facilitation of their use.

Despite the tendency to emphasize the role of IT in KM, there is an increase of powerful arguments for a more holistic view which recognizes the interplay between social and technical factors (Pan & Scarbrough, 1998). Therefore, a socio-technical approach to knowledge sharing is applied in many organizations. There is an example of a case study of success in knowledge sharing using this approach at Buckman Laboratories (Pan & Scarbrough, 1998). The knowledge architecture was first designed, and then a department was set up with the major responsibility of knowledge transfer. Rules have then been created for the information search system to reduce response time to customers, for example by capturing knowledge into a reusable form. This approach emphasizes the interplay between the KMS and the organizational context. It is suggested that management and leadership play a critical role in establishing the multilevel context for the effective assimilation of KM practices (Pan & Scarbrough, 1998).

2.2 Socio-organizational dimension

In terms of business competition, trading and sharing of knowledge have become increasingly important and have forced organizations to create market spaces and places to promote knowledge sharing related activities (Choo, 2003). Interaction or conversation between people, for example, is often perceived as the simplest approach to transferring knowledge within an organization. Nevertheless, it may be inconvenient where cultural barriers exist (Davenport & Prusak, 1998). It is argued that to align knowledge sharing with organization culture, designing and implementing KM to fit the culture can be more effective than altering and changing the culture itself (McDermott & O'Dell, 2001). Moreover, organizational culture involves two dimensions: the visible dimension—'thing', and the invisible dimension—'seen but unspoken' (McDermott & O'Dell, 2001). McDermott & O'Dell (2001) confirm that organizations ought to make sharing knowledge visible to solve practical business problems by, for example, making it directly part of the business strategy, initiating it obliquely on to another key business, routinizing, matching the organization's style, and aligning reward. They repeatedly emphasize that databases, knowledge systems, and knowledge initiatives need to have a clear business purpose so that best-practice organizations could easily describe how sharing knowledge contributes to business goals. Therefore, the main reason KM programs fail may be attributed to a lack of a clear connection with a business goal.

In human terms, motivation can encourage people to share and create knowledge. In this case, Osterloh & Frey (2000) define two types of motivation in the organization: extrinsic and intrinsic motivation. First, employees are extrinsically motivated if the organization satisfies their needs indirectly, especially monetarily. For example, employees who mostly share knowledge win rewards. Second, motivation is intrinsic if an activity is undertaken for one's immediate need

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satisfaction. In other words, employees have a self-defined goal. Employees, for instance, share and create knowledge in order to improve their practices or to satisfy the need for recognition in the organization. This is in line with a case study of Lotus Development Corporation showing that people who ask previously answered questions are likely to be told where the answer can be found and advised in the future to check the database before asking such questions (McDermott & O'Dell, 2001).

Trust among people can promote a knowledge sharing culture and is important to the exchange of knowledge: 'without trust there is no knowledge sharing' (Sveiby, 1999; Roberts, 2000; Lee, 2001). Davenport & Prusak (1998) also highlight trust in knowledge sharing, noting that the transfer of informal knowledge is endangered by a particular American sense of what is and is not 'real' work.

2.3 Learning process dimension

Tacit knowledge is defined as implicit and non-codifiable knowledge that is difficult to share or that is learnt by experience, learnt by doing, and apprenticeship. To succeed in sharing tacit knowledge, it is necessary to share knowledge through know-how involving face-to-face contact between knowledge transmitters and receivers. In other words, the transfer of know-how requires a process of show-how (Roberts, 2000).

Knowledge sharing and creation is a dynamic process involving continuous learning (Gilbert & Cordey-Hayes, 1996). Gilbert and Cordey-Hayes provide a process framework of knowledge sharing and creation. The aim of this conceptual framework is to track the ability of the organization to achieve knowledge transfer by investigating the organizational processes that might encourage or prohibit learning. The model leads to the development of a set of knowledge sharing and creation routines that are reflected in the behavior of members in the organization. Further research on knowledge transfer in strategic alliances reveals that knowledge variables such as tacitness, asset specificity, prior experience, complexity, partner protectiveness, cultural distance, and organizational distance impact on the process of knowledge sharing and creation, but establishing the effects of knowledge ambiguity can fully mediate the effects of these variables (Simonin, 1999).

Nonaka *et al*. (2000) have developed the SECI model, a spiral learning model which provides an interaction process of knowledge conversion between tacit and explicit knowledge. The knowledge conversion includes four modes: socialization, externalization, combination, and internalization. Socialization highlights the conversion of tacit to new tacit knowledge through shared experience (e.g., apprenticeship). The externalization mode focuses on the conversion of tacit knowledge to explicit knowledge by creating concepts articulating tacit knowledge (e.g., metaphor, analogy and model). The combination mode refers to the conversion of explicit knowledge to new explicit knowledge that is more systematic. The internalization mode refers to embodying explicit knowledge into tacit knowledge through learning by doing. A number of application cases of the SECI model to organizational learning exist in the literature, with an emphasis on the need for an organization to have the capability of exchanging knowledge and learning (Rice & Rice, 2005). It is suggested that applying the key elements of the SECI model across organizations will create benefits for multi-organizational endeavors and provide a potentially rich area of research and managerial development in future (Rice & Rice, 2005). However, Gourlay (2003) argues that the SECI model might not be really regarded as a knowledge creation model, but a semantic information theory. Also, because the SECI model is a process model, the validation of processes must be required, not simply the survey of 'content' of the four modes (Gourlay, 2003).

3 Knowledge value creation

While knowledge sharing and creation are perceived as past and present generations of KM, it is suggested that for the future of KM, it is necessary to explore and emphasize the impact of KM on people, organizations, and society in terms of value creation (Vorakulpipat & Rezgui, 2006; Rezgui, 2007a). The relationship between value creation and KM has been discussed extensively

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in recent literature (Chase, 1997; Despres & Chauvel, 1999; Liebowitz & Suen, 2000; Gebert *et al*., 2003; Rezgui, 2007a). Moreover, Despres & Chauvel (1999) suggest that knowledge can be described as a source of value creation. Liebowitz & Suen (2000) include value creation into KM metrics for measuring intellectual capital. In terms of organization processes, Gebert *et al*. (2003) suggest that KM processes have inherent value creation capabilities. Løwendahl *et al*. (2001) propose a framework for the analysis of value creation and knowledge creation in professional service firms.

3.1 Concept definition

Several authors have argued that the quest for value creation and innovation has given a new impetus to KM research (Aranda & Molina-Fernandez, 2002; Huseby & Chou, 2003). Davenport *et al*. (1998) argue that value creation takes place and is facilitated by (a) creating knowledge repositories, (b) improving knowledge access, (c) enhancing cultural support for knowledge use, and (d) managing knowledge as an asset (Davenport *et al*., 1998). In this context, KM is perceived as a framework for designing an organization's goals, structures, and processes so that the organization can use what it knows to learn and create value for its customers and community (Choo, 1999).

A review of recent KM literature suggests that value creation is grounded in the appropriate combination of human networks (Wenger *et al*., 2002), social capital (Huysman & Wulf, 2006), intellectual capital (Liebowitz & Suen, 2000), and technology assets (Alavi & Leidner, 2001), facilitated by a culture of change (McAdam & Galloway, 2005). In fact, the concept of Community of Practice (CoP) (Wenger *et al*., 2002) was introduced as an effective social activity to share tacit knowledge. This had the effect of promoting and nurturing *human networks*, which in turn motivate people to share and create knowledge. In this context, the *social capital* of an organization emerges as an essential ingredient to help employees develop trust, respect, and understanding of others. Because of its (*social capital*) emphasis on collectivism and cooperation rather than individualism, distributed community members will be more inclined to connect and use electronic networks when they are motivated to share knowledge (Huysman & Wulf, 2006; Rezgui, 2007c). KM environments may foster *social capital* by offering virtual spaces for interaction, providing the context and history of interaction, and offering a motivational element (e.g., reward) to encourage people share knowledge with each other (Huysman & Wulf, 2006). The *intellectual capital* of an organization encompasses organizational learning, innovation, skills, competencies, expertise and capabilities (Rastogi, 2000). Liebowitz & Suen (2000) suggest a strong and positive relationship between the value creation capability and *Intellectual Capital* of an organization, pointing to factors such as training, research and development investment, employee satisfaction, and relationships development. Focusing on technology, the majority of KM initiatives involve, to a lesser or greater degree, IT (Lee & Hong, 2002). Alavi & Leidner (2001) suggest that *technology*, including KMS, is an essential asset to sustain value creation. Lastly, *change management* plays an increasingly important role in sustaining 'leading edge' competitiveness for organizations in times of rapid change and increased competition (Wheatcroft, 2000; Reddy & Reddy, 2002; McAdam & Galloway, 2005), and the future has only two predictable features—'change and resistance to change' and the very survival of organizations will depend upon their ability not only to adapt to, but also to master these challenges. The following subsections discuss aspects of value creation related to human networks, social capital, intellectual capital, technology assets, and change management. These have emerged from recent literature as major factors promoting a culture of knowledge value creation.

3.2 Human networks

Allen (2003) suggests that organizational learning should be dynamic and that intangible assets and social prosperity are anticipated to create major impacts on KM. For example, the concept of CoP (Wenger *et al*., 2002) was introduced as an effective social activity to share tacit knowledge

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in Xerox. This had the effect of promoting human networks and motivating people to share and create knowledge.

Intangible assets have the potential to create more value than tangible or physical assets (Vorakulpipat & Rezgui, 2006). Three factors of intangibles, consisting of human capital, external capital, and structure capital, are expected to generate future benefits and create sustained organizational and societal values (Blair & Wallman, 2001; Allen, 2003). These also relate to factors such as business relationships, internal structure, human competence, social citizenship, environment health, and corporate identity (Allen, 1999). Once created, intangible and tangible values underpin value networks and help nurture relationships between people, groups, or organizations.

Human capital can improve value creation in several ways. For example, formal and informal communication using face-to-face (including scheduled meetings) and virtual (synchronous/asynchronous) means (e.g., telephone and e-mail) are perceived as effective to promote knowledge sharing and creation. Whittaker *et al.* (1994) discuss the virtue of corporate informal communications (e.g., unscheduled meetings or any face-to-face interactions between employees). Early face-to-face meetings in team work tend to improve the team's project definition (Ramesh & Dennis, 2002), and enhance the effectiveness of subsequent electronic communications (Powell & Dent-Micallef, 1999). Therefore, a lack of human networks or communication is identified as a problem that may lead to the ineffectiveness of teamwork (Pynadath & Tambe, 2002) and may hinder any knowledge sharing and creation initiative.

3.3 Social capital

The concept of social capital has recently been researched in the context of KM (Nahapiet & Ghoshal, 1998; Lesser & Prusak, 1999; Lesser, 2000; Cohen & Prusak, 2001). The idea of social capital—physical capital, financial capital, and human capital—can be applied to create added value for firms. Because of its emphasis on collectivism and cooperation rather than individualism, distributed community members will be more inclined to connect and use electronic networks when they are motivated to share knowledge (Huysman & Wulf, 2006). In terms of socio-technical design, KM tools to support social capital are aimed to bridge various social communities. The tools may foster social capital by offering virtual spaces for interaction, providing the context and history of interaction, and offering a motivational element (e.g., score) to encourage people to share knowledge with each other (Huysman & Wulf, 2006). Tsai and Ghoshal's research reveals an association between social capital and firms' value creation (Tsai & Ghoshal, 1998). This relationship is supported by related research (Nahapiet & Ghoshal, 1998). Moreover, in terms of organizational structure, social capital helps people develop trust, respect, and understanding of others, especially in the context of a strong organizational bureaucratic culture. This contributes indirectly to value creation.

3.4 Intellectual capital

Intellectual capital has enjoyed a very rapid diffusion over recent years and is also a growing area of interest in KM. It encompasses organizational learning, innovation, skills, competencies, expertise and capabilities (Rastogi, 2000). Liebowitz & Suen (2000) report that value creation is used as a KM metric for measuring intellectual capital. The value creation metric includes training, research and development investment, employee satisfaction, and relationships development. Nonaka *et al.* (2000) suggest that learning by doing can embody explicit knowledge into tacit knowledge through Internalization in the SECI process. Also, training programs can help trainees understand themselves, and reading documents or manuals can internalize the explicit knowledge written in such documents to enrich learners' tacit knowledge. Adapted training can foster cohesiveness, trust, teamwork, individual satisfaction, and higher perceived decision quality, as highlighted in the literature (Warkentin & Beranek, 1999; Tan *et al.*, 2000; Van Ryssen & Hayes Godar, 2000; Rezgui, 2007c). In addition, intellectual property rights and confidentiality issues

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should not be overlooked as Denning (1999) suggests that external knowledge sharing poses greater risks than internal sharing as they raise complex issues of confidentiality, copyright, and in the case of the private sector, the protection of proprietary assets. It is suggested that value creation can be driven by intellectual capital, and an intellectual capital management system should be created to measure performance (Bontis *et al*., 1999).

3.5 Technology

Managing and enhancing the organizational processes of knowledge creation, storage/retrieval, transfer, and application have relied on the wide use of KMS. This emphasizes the role of technology, including KMS, in sustaining value creation (Rezgui, 2007a). The future of KM can be envisioned as (a) the emphasis on the design of KM technology to fit organization culture; (b) the ability to embed KM technology in natural surroundings, and be able to retrieve knowledge whenever and wherever it is needed; and (c) the simple and effortless use of technology to create interaction (VISION, 2003). Semantic web, natural language processing, mobility, virtual collaborative workspaces are some of the important facets for future KM (VISION, 2003).

Knowledge-support infrastructures, knowledge architectures, and knowledge discovery have emerged as key areas that underpin artificial intelligence research (Baskerville & Dulipovici, 2006). In this context, Artificial Intelligence is playing an important role in building the theoretical foundations of modern KM (Baskerville & Dulipovici, 2006). It is important to build KM tools that automate the human cognition process (Baskerville & Dulipovici, 2006). Knowledge-based (expert) systems (KBS) are perceived as a set of contemporary tools that support growth of recognition of the distinctly human quality of knowledge. The development of KBS involves a variety of functionality (e.g., holistic decision-support systems) enabled by effective knowledge and software engineering practices (Wiig, 1997; Studer *et al*., 1998; Mirchandani & Pakath, 1999). First, knowledge-support infrastructures are important for modern KM because most KM components extend the human ability to store and access knowledge, thereby aiding the human process of sharing and creating knowledge. For example, group support systems provide advanced features such as variable structured database storage, workflow programming, and rationale explication for capturing explicit knowledge. Second, knowledge architectures focus on knowledge modeling and ontology development. Knowledge modeling explores various strategic models for organizing KBS, with a focus on data and knowledge representation (Vaishnavi *et al*., 1997). Ontologies provide a shared and common understanding of some domain that can be communication across people and computers (Benjamins *et al*., 1999; Rezgui, 2007b). As knowledge bases in KBS will increasingly rely on ontologies for clear specification of their characteristics and views, knowledge ontologies are good candidates for creating intelligent knowledge retrieval components (Holaspple & Joshi., 2003; Rezgui, 2006). Third, knowledge discovery aims to extract knowledge from knowledge warehouses such as data warehouses. Knowledge discovery builds on the earlier work in data mining techniques for intelligent data analysis and efficient querying of large databases and data warehouse (Baskerville & Dulipovici, 2006).

As such, the next generation of KM will be impacted and shaped by changes in IT and artificial intelligence development, and by the changes expected in people-centric practices to support innovative works (Wiig, 1999). Artificial intelligence can potentially make a major contribution to KM within the context of KMS as a broad socio-technical system. Wiig (1999) argues that next generation of KMS will involve several developments in the field of artificial intelligence. The latter include intelligent agents, natural language understanding and processing, reasoning strategies, and knowledge representations and ontologies. KMS will continue to progress and will bring considerable change to a number KM applications, including 'portable offices' that roam anywhere with their owners; communication handling systems that organize, abstract, prioritize, make sense of, and in many instances, answer incoming communications; intelligent agents that not only will acquire desired and relevant information and knowledge, but will reason with it relative to the situation at hand (Wiig, 2002).

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3.6 Change management

Organizational change involves a number of issues, including IT diffusion and adoption and human factors. In terms of human factors, adapting organizational policies to motivate employees to share and create knowledge by providing monetary reward or recognition is suggested by a number of authors, including Rus *et al*. (2002). On the other hand, technology adoption in organizations should not be overlooked. Davis (1989) through his established Technology Adoption Model argues that perceived usefulness and perceived ease of use impact on the level of innovative use of information systems and that this effect is mediated through the behavioral intentions to use. Christiansson (2003) also agrees that the study of the change process is necessary to create the requisite organizational and societal values. A KM maturity roadmap is an important milestone to enable organizations to assess the effectiveness of their KM implementations in the future.

Discussion

While the previous sections have provided a comprehensive literature that best characterizes knowledge sharing and creation research, the discussion here aims to argue and justify the case for the proposed third generation of KM, namely: Value Creation. Very few articles have discussed or explored what would form the future generation of KM (Vorakulpipat & Rezgui, 2006). Koenig (2002) anticipates that next generation KM will focus around taxonomy development and content management, whereas Snowden (2002) believes based on perceived trends that the next generation will promote an in-depth understanding of organizations as engaged in sense-making, and will adopt scientific management and mechanistic models to nurture KM. However, Firestone & McElroy (2003) argue in their literature on KM generation that taxonomy development and content management research are already established. Moreover, this is part of coordinating and sharing already existing knowledge. This, therefore, represents an extension of knowledge sharing and creation (past and current generation KM), not the future of KM. Also, they argue that Snowden's proposed concept (2002) does not pave the way to future KM as it relates primarily to knowledge sharing and creation. These arguments confirm the uncertainty related to the focus of next generation of KM because various and sometimes conflicting propositions have been made by different scholars (Firestone & McElroy, 2003).

The authors argue that the third generation of KM will focus and revolve on value creation. In fact, once knowledge is shared and created, it is necessary to establish the 'impact' this has on people, communities and society (Vorakulpipat & Rezgui, 2006). Recent research (Rezgui, 2007a) confirms that effective KM can lead to value creation and has the potential to increase organizational innovation. Although the current design of organizational KM processes tends to be fairly prescriptive, with an approach governed by quality, time and cost, but with little emphasis on innovation and value creation, organizations have the potential of introducing a paradigm shift, promoting customer centered and product/service performance-driven development approaches where intangibles such as intellectual capital, customer and society values transcend the traditional practices that concur to the delivery of product and services. Performance-driven processes place the client in the centre of organizational dynamics with a commitment to ensure full satisfaction and value to customers, employees, and ultimately, the society.

This is best illustrated in the field of sustainability. Although new techniques, tools and practices are being used and experimented to promote sustainable developments, the collective learning and advancement of sustainability is hampered by the inability of making sense and exploiting effectively the large amount of knowledge generated by individuals across teams, projects, and organizations (Wetherill *et al*., 2007). Although knowledge related to sustainability may take the form of codified documents, drawings, products, standards and directives, it is also inherent in human actors' skills, interactions, experiences, and lessons learned. This is an area where KM processes could impact positively on product and service development to promote values

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that would achieve higher order human and societal impacts than merely sharing or creating knowledge. Hence, the 'value' dimension of the proposed third generation KM.

However, the right KM diffusion strategy should be put in place to develop and nurture core organizational competencies, and create intellectual capital (Rezgui, 2007a). The concept of social capital has recently been adopted within the KM community (Nahapiet & Ghoshal, 1998; Lesser & Prusak, 1999; Lesser, 2000; Cohen & Prusak, 2001). Social capital has been applied to create value for end-users and organizations (Danchev, 2006). It has been shown and argued earlier that a true value creation culture can be found through the right combination of human networks, social, intangible, and technology assets where issues such as change management, learning, and trust must be blended successfully toward the vision of knowledge-enabled value creation (Vorakulpipat & Rezgui, 2006; Rezgui, 2007a).

An organizational system of shared values is often labeled as the organization's culture (Spender, 1998). Research on organizational culture is complex and diverse. Recent work has identified a wide range of distinctive socio-cultural features in organizations (Okunoye, 2002; Wagner *et al*., 2003; Chatzkel, 2004; Burrows *et al*., 2005; Wei *et al*., 2006), including individualism/collectivism, conscientiousness, power distance, and gender (masculinity/femininity) (Hofstede, 2001). It is suggested that a true value creation culture can only be established if these distinctive socio-cultural issues are factored effectively into any KM diffusion and adoption initiative.

Conclusion

The paper has presented a discussion of KM and generations of KM based on a comprehensive review and synthesis of a broad range of relevant literature. The paper develops a grounded understanding of value creation anticipated as the future of KM. KM has major implications in the learning capability of an organization and its ability to adapt to an ever changing and competitive business environment. Therefore, migration from knowledge sharing and creation to value creation is necessary.

It is worth noting that the proposed review adopts a subjectivist approach as knowledge is inherently identified and linked to human experience and the social practice of knowing, resulting in the need for a subjectivist approach. However, the subjectivist approach adopted throughout the review is limited to, and focused on, understanding the implementation and organizational implications of KM initiatives and technology.

The paper argues that it is important for researchers conducting KM-related research to understand the various factors affecting the attainment of value-creating KM. The authors recommend further exploratory studies on value creation within specific organizations so that to validate the value creation model proposed in this paper. Similarly, practitioners will be better able to manage knowledge within their organizations if they take into account factors affecting value creation. The authors hope that the present review will contribute to the ongoing debate on KM and its future evolution.

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