

The Paradox of Knowledge Management: Progress, Issues and Future Directions

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Abstract

This paper reviews the current status of knowledge management and its future prospects from theoretical and managerial perspectives. Technological, humanistic and intellectual capital-based approaches to knowledge management are presented and compared. Knowledge management is shown currently to be in a paradoxical state, simultaneously enjoying both high levels of interest and adoption and criticisms for failing to live up to user expectations and for being philosophically naive and conceptually confused. The current confusion surrounding knowledge management is shown to be largely due to a blurring of the conceptual boundaries between human knowledge and its disembodied representations, compounded by widely differing views as to what constitutes human knowledge. Confusion between embodied human knowledge and its symbolic representations is shown to have led to an over emphasis by firms on knowledge codification strategies, misperceived relationships between knowledge and other organizational resources, and difficulties in demonstrating how knowledge influences organizational performance. A systemic approach to future knowledge management is proposed which while repositioning knowledge as an exclusively human resource emphasizes the importance of interrelationships between knowledge, knowledge representations, and other resources. The resultant framework provides a basis for integrating currently divergent humanistic, technological, and intellectual capital-based approaches to knowledge management.

Introduction

Knowledge management is in a paradoxical state, enjoying high rates of adoption in organizations while declining in strategic status (Bain, 2007) and simultaneously fascinating and bewildering researchers (Sousa and Hendricks, 2006). This paper seeks to explain the underlying factors that have led to the paradoxical status of knowledge management and the confusion surrounding the concept.¹ The paper commences with an overview of leading contemporary approaches to knowledge management and their rates of adoption. Current issues with knowledge management are then discussed and key weaknesses identified. A future agenda is proposed for rectifying these weaknesses and developing a systemic approach to knowledge management.

1. Approaches to knowledge management

It is generally agreed that the locus of economic growth and business success in the developed world has shifted from control of tangible material and physical resources to managing human talent and associated intangibles (Drucker 1968; OECD 1981; 1996, Burton-Jones, 1999). The shift to intangibles is widely regarded as having been mainly driven by technological innovations in computing and telecommunications (Reich, 1991; Jonscher, 1994; Jorgenson et al 2005). The resultant 'economics of ideas' (Romer, 1990) while offering massive growth opportunities poses new challenges for organizations; codified representations of human knowledge once in a bit stream can be replicated at effectively zero cost, transmitted round the world in seconds, and exploited by anyone who can access them (Romer 1990). In response to these challenges, three distinct and largely divergent approaches to knowledge management have emerged since approximately the mid 1990s: technological, humanistic and intellectual capital-based.

2. Adoption of the technological, humanistic, and IC variants of knowledge management

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As a result of early moves by the IT industry during the 1990s to embrace knowledge management, *technological* approaches to knowledge management have tended to dominate the marketplace. A 1997 survey by Ernst and Young found that most leading US firms' knowledge management efforts at that time were focused on the use of intranets, data warehouses, communications networks and related tools (Ruggles, 1998). According to Scarbrough and Swan (1999, p. 4), 70% of all articles on knowledge management in 1998 focused on information Systems-based initiatives.

The greatest single impetus behind *humanistic* approaches to knowledge management has been the pioneering work of Ikujiro Nonaka and his colleagues in Japan (Nonaka, 1994; Nonaka and Takeuchi, 1995). According to the Nonakian view, managing knowledge is a craft, in which the skills of individual managers plays a key role (Nonaka, Ryoko and Konno, 2000) rather than a disembodied abstract science. Outside Japan however firms' HR functions have been slow to take a leading role in knowledge management; a survey in the late 1990s of 100 leading UK firms found that while 43% had a knowledge management initiative in place only 7% had appointed the HR function to lead it (Scarbrough, Swan and Preston, 1999).

Intellectual capital-based initiatives have largely focused on measuring and valuing human and other intellectual assets. Intellectual capital categories correspond broadly to categorizations of knowledge and its representations: human capital to individual human knowledge, relational/social capital to collective knowledge (Lin, 2001; Spender, 1996) and structural/organizational capital to codified representations of knowledge (Blackler, 1995; Roos, Pike and Fernstrom, 2005). Attempts to measure human capital effects on organizational performance are being pursued by bodies such as CIPD in the UK, however a general consensus exists that any form of standard unified approach to intellectual capital accounting is a long way off (Roos et al, 2005).

2.2 Knowledge management progress in general

A recent 2007 report, by respected management consultants Bain and Company (Bain, 2007) on the worldwide use of 25 management tools claimed that “knowledge management tools”, defined as “systems and processes to capture and share a company's intellectual assets” (Bain 2007, p. 44) have moved up from 21st place in 1996 to 8th place in 2006, based on usage, ahead of tools such as the Balanced Scorecard, Total Quality Management and Supply Chain Management. According to Bain, 69% of companies surveyed on average used “knowledge management tools” with Asia Pacific companies leading the world.

Paradoxically, according to the same Bain report knowledge management tools were rated by experienced users as being amongst the least effective of all management tools. Anecdotal evidence from leading US and UK organizations suggests a decline in knowledge management’s perceived strategic importance, and while academic journal articles on knowledge management continue to increase, knowledge management is increasingly regarded as a problematic notion (Sousa and Hendricks, 2006; Spender and Schrader, 2007).

3. Knowledge management issues

Various factors have undoubtedly contributed to knowledge management’s currently confused state; however the root cause appears to have been fundamentally epistemological, reflected in a blurring of the conceptual boundaries between knowledge embodied in individuals and symbolic representations of human knowledge in computer and other media. This epistemological issue has been compounded by widely differing views as to what actually constitutes human knowledge. To understand how these epistemological problems have arisen, we need to review briefly the evolution of what we refer to today as ‘the knowledge economy.’

3.1 The Evolution of the Knowledge Economy

Interest in knowledge as an economic and strategic resource developed in earnest after World War 2, with Hayek's work on the use of knowledge in society (Hayek, 1945). Interest grew in the 1960s with the development of human capital theory (Schultz, 1961; Becker, 1964), accelerated in the early 70s with predictions of a shift to a post industrial knowledge-based economy (Bell, 1973) and developed further in the 1990s with the resource-based view (RBV) of the firm (Wernerfelt, 1984; Barney 1991). A flurry of books and journal articles quickly followed (Quinn, 1992; Nonaka and Takeuchi, 1995; Grant, 1996; Spender, 1996; Sveiby 1997; Scarbrough, 1999; Burton-Jones, 1999; Zack 1999). The notion that knowledge could be organized and managed systematically as an organizational resource began to take hold. By the mid 1990s, knowledge management (knowledge management) had become accepted as an important new management concept. Interest in the related concept of intellectual capital management grew in parallel and intellectual capital management and knowledge management have subsequently been closely associated in management thinking (Brookings, 1996; Sveiby 1997).

During the 1950s, roughly in parallel with the emergence of interest in knowledge as an economic resource, the first mainframe computers emerged and with them the commercial application of information and communications technologies (IT). The focus of business management shifted from physical and material resources to their symbolic representations. Creating those representations has been described as the core of the information systems discipline (Weber, 1997). Drucker's (1966) 'knowledge workers' and Reich's (1993) 'symbolic analysts' progressively became the archetypes of the new economy workforce.

3.2 Growth of computational and cognitivist perspectives

As the strategic importance of both information systems and human knowledge and the strong connection between became increasingly evident, those seeking to understand

their interrelationship found an explanation in Newell and Simon's highly influential model of "the human... as an information-processing system" the 'HIP' model (Newell and Simon 1972, pp. 19-20).

According to the HIP model, human knowledge is a form of information that can be unambiguously represented and stored in computers, databases, archives and manuals as well as in people (Venzin et al, 1998). Individuals gain knowledge by absorbing data and information and creating inner representations that partly or fully correspond to the outside world. Truth is defined as the degree to which individuals' inner representations match the (objectively definable) outside world.

Newell and Simons' computational model and later connectionist computational models (Rumelhart and McClelland, 1986) were subsequently criticized by philosophers on the basis that whereas human beings can be said to 'understand' language, computers cannot, and thus computational models cannot replicate how people think (e.g., Searle, 1984). Cognitive scientists were to show that HIP is a fundamentally flawed model of human cognition (Ashcraft, 2003). Knowledge theorists further noted that information is as elusive a concept as knowledge itself, thus defining knowledge as information does not help much (Gourlay 2000). However, despite these evident flaws in the cognitivist and computational perspectives they have pervaded the information systems, knowledge management, and intellectual capital literatures (Venzin et al, 1998; Meredith and Burstein, 2000; Kakabadse et al, 2003; Roos et al, 2005).

Boisot for example refers to knowledge as both human embodied and disembodied: "Knowledge that is to be embedded in mass produced artefacts, for example, usually has to be more systematically formalized and codified than knowledge that is to be embedded more discursively in text". "...codification and abstraction, in turn, allow us to economise on the data-processing and communication efforts required to create or exploit knowledge" (Boisot, 1998, pp13-14). In similar vein Grant, referring to the

Polanyian notion of tacit knowledge (Polanyi, 1966) claims... “The primary difference between tacit and explicit knowledge lies in their transferability. Explicit knowledge is revealed by its communication: it can be transferred across individuals, across space, and across time. This ease of communication means that explicit knowledge – information especially – has the characteristics of a *public good*: once created it can be replicated among innumerable users at very low marginal cost (IT has driven these costs to near zero for most types of information)” (Grant 2002, p. 177, italics in the original). Grant and Boisot’s treatment of knowledge in individuals and its disembodied representations as effectively the same thing, a practice commonly found in the writings of other influential knowledge theorists, has had profoundly negative consequences for the development of knowledge management. These consequences are discussed in the next section.

4. Negative consequences of conceptual blurring

At the organizational level, three major negative consequences of the blurring of the conceptual boundaries between human knowledge and its disembodied representations have been:

- over focus on knowledge codification strategies
- unproblematised relationships between individual knowledge and collective knowledge
- difficulties in demonstrating how knowledge influences organizational performance

I discuss each of these consequences in turn below:

4.1 Over emphasis on knowledge codification

Confusion of knowledge with its representations has caused organizations to focus on using the power of information systems and related technologies to manage symbolic

representations of knowledge in computer and other media, typically as part of what have become popularly referred to as 'knowledge codification strategies' (Hansen et al. 1999). The assumption, implicit in such strategies, that knowledge can be disembodied and managed separately to the human knower runs counter both to the Polanyian view that all knowledge is human embodied and dependent on unconscious mental processes (Polanyi, 1966) and to modern neurological and biological evidence of how people actually think (Nightingale, 2003).

An over-emphasis on knowledge codification can often result in information systems having negative rather than positive impacts. This is because it tends to focus managerial attention on the codified representations and the systems that store and transmit them, rather than on people and their ability to create, interpret and use representations in an effective manner when needed (Haas and Hansen 2005). It has also diverted attention from the motivational and other problems associated with inducing individuals to volunteer their knowledge and organizations' ability to appropriate value from it (Grant 1991, Coff 1999, Blyler and Coff, 2003)

4.2 Unproblematised relationships between individual knowledge and collective knowledge

While collectivist constructs have been used since ancient times to refer to knowledge (e.g. 'bodies' of knowledge), such notions received a significant boost from computational models of human mental functioning. While computational models of cognition have now become largely discredited, the notion of collective knowledge remains popular and largely unproblematised; industry surveys for example typically rate 'knowledge sharing' as a major knowledge management activity (Saberwhal and Saberwhal 2007). Despite the continuing popularity of collectivist notions of knowledge, theorists have still not explained satisfactorily how heterogeneous individually held knowledge can become collectively held (Felin and Foss 2004) and many fundamental questions remain unanswered regarding the general concept of shared cognition (Walsh

and Ungson, 1991; Walsh, 1995; Cannon Bowers and Salas 2001). Little wonder that knowledge sharing schemes in organizations have met with mixed success (Scarborough and Swan, 1999).

4.3 Difficulties in demonstrating how knowledge influences organizational performance

Instead of taking a systemic approach and exploring how an organization's business processes, its human knowledge resources, the representations of that knowledge in systems, and the organization's other resources (e.g., brands), all relate in their influence on organizational performance, organizations have instead focused on individual components of these linkages – primarily the effects of systems and processes. The net result is that few firms today can demonstrate how investments in knowledge/human capital influence their performance (Lepak and Snell 1999). Still fewer can show how interdependencies between people and information systems affect performance. In view of this, it is not surprising that the perceived strategic importance of both human resource management and information systems functions has declined in organizations and their services are increasingly outsourced (Carr 2003; Morley et al. 2006).

5. A future agenda for knowledge management

I suggest three critical elements are required to rebuild knowledge management and position it at the core of modern management theory and practice:

1. A managerially relevant theory of the firm that explains the firm's role in a knowledge-based economy.
2. Clarification as to what managing knowledge means in an organizational context
3. A conceptual framework for integrating currently divergent approaches to managing knowledge and its representations.

Each of these three elements is separately discussed below:

5.1 A knowledge-based theory of the firm

As Phelan and Lewin (2000) note, every time a firm's directors consider whether to vertically integrate or enter a new line of business, an entrepreneur decides whether he or she can beat the market, or a manager makes a make or buy decision, they are all implicitly or explicitly utilizing a theory of the firm. A robust theory of knowledge management clearly requires a robust knowledge-based theory of the firm.

Theories of the firm address two fundamental questions: why firms exist and what determines their boundaries (Holmstrom and Roberts, 1998; Langlois and Robertson, 1995). Production (value creation through translation of inputs into outputs) requires numerous types of specialized knowledge (Grant 1996). Individuals, being boundedly rational (Simon 1976), must specialize in the knowledge they acquire. According to knowledge-based theory, the firm provides a coordinative mechanism for integrating individuals' disparate specialized knowledge and through its internal structures and policies it provides a superior mechanism to the market for knowledge protection (Nelson and Winter, 1982; Kogut and Zander, 1992; Nonaka, 1994; Grant, 1996; Liebeskind, 1996; Spender, 1996).

Understanding the purpose of the firm as the integration and protection of disparate knowledge moves knowledge centre stage. Managing knowledge becomes simply what firms must do – and do well – to survive and succeed. This imperative can only be met if organizational stakeholders gain a better understanding of what managing knowledge means in an organizational context, the topic addressed next.

5.2 Understanding knowledge in organizations

Figure 1 provides a typology of knowledge in organizations. In this typology, the term knowledge is used to refer to all human mental faculties including feelings and emotion or 'affect' (Neisser, 1976; Nussbaum, 2001; Frijda 2006) as well as higher order cognitive

processes (Ashcraft, 2002) and the use of these faculties, thus human behaviour (Cook and Brown, 1999).

Knowledge is assumed to be subjectively determined by individuals. The horizontal axis reflects the degree of assurance or certainty individuals have regarding their knowledge. The vertical axis reflects the extent of individuals' conscious awareness of what they know. While not precisely aligned with codifiability, individuals' level of conscious awareness is closely associated with their ability to signify or represent what they know (Nightingale 2003). Such semiotic capabilities range in sophistication from pre verbal signals (e.g. body language) to mathematical or linguistic symbols (Dewey and Bentley 1949; Gourlay 2002) and to other types of signs (Hawkes, 1974; Noth 1990).

The bottom two quadrants in Figure 1 thus represent tacit knowledge/knowing (Polanyi 1966) which can only be represented using difficult to codify pre verbal signals (Gourlay 2002). In contrast, the top two quadrants represent explicit mental processes/behaviours which can be symbolized in speech acts (Austin, 1975; Searle 1969) or via use of mathematical or other sophisticated symbolic systems (Gourlay, 2002). The top right quadrant represents that which individuals feel certain about and can represent symbolically in a highly codified form. The bottom right quadrant represents that which is tacitly known but which is difficult to codify, much of it procedural or 'how to' knowledge (Ryle, 1949). The top left quadrant denotes that which individuals can describe explicitly as the limits of their present knowledge, their zone of learning. The bottom left quadrant represents uncertain feelings and perceptions which individuals cannot properly identify and describe, i.e., what they 'barely know' and in the extreme their total ignorance.

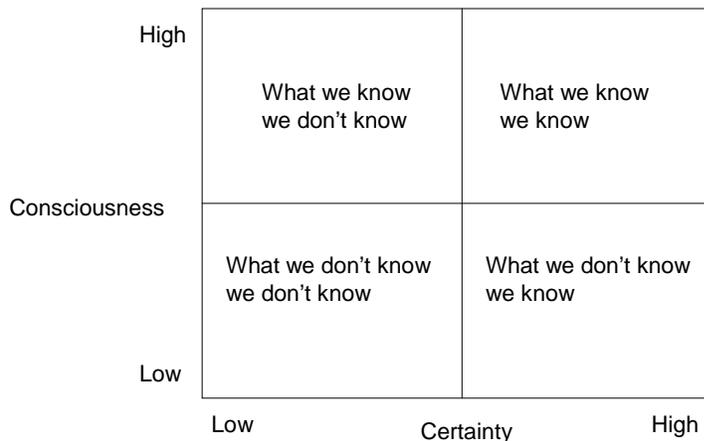


Figure 1: Knowledge in organizations

Some theorists following the linguistic tradition (Wittgenstein, 1922; Bergmann, 1957) suggest that knowledge management should restrict its focus to that portion of knowledge in the top right quadrant, i.e., knowledge that is codifiable using linguistic or mathematical symbols. Schreyogg and Geiger (2007) claim that such an approach would reduce some of the confusion surrounding the notion of knowledge management by restricting its focus to so called 'scientific' knowledge.

There are however some major problems with a focus on scientific knowledge, particularly in firms. First, the conscious knowledge depicted in the top right quadrant of Figure 1 and individuals' ability to codify it has been shown to be dependent on the types of unconscious/tacit mental processes (Polanyi, 1966) reflected in other quadrants of the model. Second, as Schreyogg and Geiger admit, the exclusion of knowledge which is tacit or otherwise difficult to represent is to exclude precisely that which is important to firms' competitive advantage (Barney, 1991), i.e., knowledge which is complex, causally ambiguous and thus difficult for competitors to identify and imitate.

In short, knowledge management needs to incorporate a view of knowledge in

organizations which reflects all the types of knowledge depicted in Figure 1. For these reasons, terms such as cognition or human capital may arguably better convey what we mean by knowledge in organizations. Whatever term is used to describe knowledge, a key implication of the knowledge typology shown in Figure 1 is that knowledge codifiability varies significantly - hence the need for a variety of techniques and media to represent and communicate it.

Having identified the key features of a knowledge based theory of the firm and the need for a more inclusive concept of human knowledge, which both defines human knowledge and the relationships between knowledge and its representations, it is time to move on to the third element needed to rebuild and reposition knowledge management: an integrated knowledge management framework.

5.3 Towards an integrated knowledge management framework

If knowledge is an exclusively human resource then perhaps knowledge management should be vested primarily in the HR function. A fundamental weakness with this approach is that knowledge integration cannot be achieved solely by managing people, since people depend on other resources – importantly information systems. To enable knowledge integration in organizations, I suggest that a ‘*systemic*’ approach (Checkland 1981; Jackson, 2000) is needed to understanding and optimizing the interrelationships between people and the organizational resources they use. As an initial step towards a systemic approach to knowledge management, I propose the following basic framework (Figure 2), which I describe in the sections that follow. This framework could be extended and improved by including reference to analysis, goals, objectives and points of feedback, as commonly included for example in performance technology models (Van Tiem, Moseley and Dessinger, 2004). I propose the model in its current (admittedly primitive) form merely to highlight aspects of knowledge acquisition, use and representation which I see as fundamentally necessary to achieving knowledge integration.

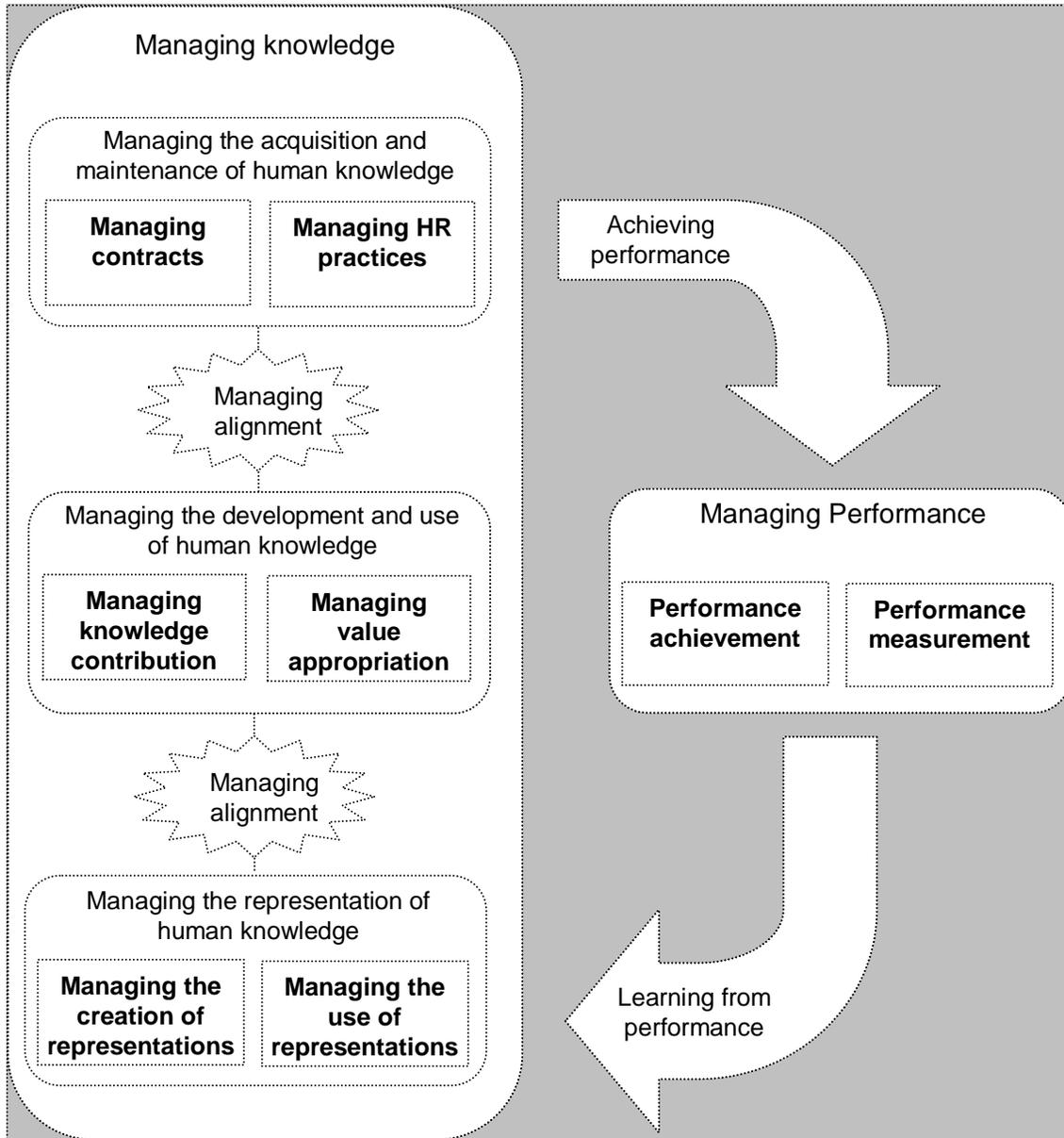


Figure 2: A systemic approach to managing knowledge in organizations

5.3.1 Managing knowledge acquisition and maintenance

Given that knowledge resides in people, a central function of knowledge management is to obtain the right people. This requires the organization to manage:

- The process of acquiring the right knowledge suppliers by contracting with them.

- The process of keeping the right knowledge suppliers by providing them with appropriate human resource practices (which traditionally comprise job design, recruitment, training, compensation, and performance appraisals).

Motivated by the need to address these two responsibilities, there have been increasing attempts to provide strategic rationales for firms' HR procurement and HR management practices since Atkinson's (1984) work on the "flexible firm," and Miles and Snow's (1984) work on "make or buy decisions," but few knowledge-based or related approaches have emerged (Matusik and Hill, 1998; Lepak and Snell, 1999). Addressing this gap will require knowledge-based strategies and techniques that can enable management to determine and maintain congruence (Grant, 1996) or fit between:

- a) An organization's strategic needs
- b) Suppliers' knowledge characteristics
- c) Work contracts used
- d) Human resource practices

Obtaining such fit, and maintaining it over time, requires the organization to be flexible. I term this 'knowledge supply flexibility,' i.e., the ability of the organization and its suppliers to adapt to new demands (Atkinson, 1984; Sanchez, 1995; Volberda, 1998). Managing such flexibility, therefore, is an important element of knowledge management.

5.3.2 Managing knowledge development and use

Once an organization has obtained the right people, it needs to reap the benefits that can stem from them working together in the best manner. Inevitably, some elements of this work will require people to apply their *existing* knowledge, while other elements will require people to explore new ways of doing things (hence creating *new* knowledge), either individually or by interacting with others (March 1991). Similarly, some elements of this work will require more *explicit* knowledge while others will require more *tacit* knowledge. Although these distinctions between knowledge creation/use and explicit/tacit knowledge are important, and much researched (Nonaka,

1994, Loebbecke and Wareham, 2003, Cook and Yanow 1993; Cook and Brown 1999), Figure 2 emphasizes two processes that must be managed well regardless of an organization's situation. That is, regardless of an organization's emphasis on knowledge creation/use or its relative stock of explicit/tacit knowledge, it is crucial that:

- its knowledge suppliers are willing to contribute their knowledge, and
- it is able to appropriate the benefits that stem from its suppliers' contributions.

Suppliers' willingness to contribute their knowledge is important because human knowledge, being embodied, is individually owned and often tacit, thus individuals have considerable discretion over its use (Blackler, 1995, Scarbrough, 1999). The same factors make it difficult for firms to appropriate the benefits from its use, a critical feature of firm performance, hence the need for special organizational abilities in this area. Indicators of an individuals' willingness to contribute include continuance at work, organizational citizenship behaviour and task performance (Allen and Meyer, 1990; Tsui et al, 1997; Van Dyne, Graham and Dienesch, 1994). Managing the processes and structures associated with these factors and measuring their effectiveness thus becomes a critical management responsibility.

In addition to its discretionary attributes, the idiosyncratic and tacit nature of suppliers' knowledge (Spender, 1996; Nahapiet and Goshal, 1998) implies the need for policies and procedures to be specifically designed to aid organizational appropriation (Grant, 1991; Coff, 1999). Key components of organizations' knowledge appropriation capabilities include policies and procedures to mobilize human knowledge (Cohen and Levinthal, 1990), capture value from knowledge assets (Teece, 1998), build organizational capabilities (Teece and Pisano, 1998) and support talent retention and succession planning strategies (Rothwell, 2005). Thus, managing such components is an important element of knowledge management.

In Figure 2, I highlighted the importance of aligning the acquisition and maintenance of knowledge and its development and use. Fortunately, work on the first activity can have a direct positive effect on its alignment with the second activity. This is because if individuals have the right knowledge for their jobs and have been hired with the right contracts and HR practices, they are much more likely to contribute their knowledge and organizations are much more likely to be able to appropriate the benefits that stem from their knowledge. For instance, research shows that individuals are more motivated to perform a task if they have sufficient knowledge to perform it and when their personal goals and the task goals are aligned (Bandura, 1977). Likewise, higher levels of fit will tend to assist an organization's ability to appropriate value, because the organization will have access to more suitable knowledge resources and will be able to tailor contractual arrangements to appropriate as much of this value as possible (Coff, 1999).

5.3.3 Managing knowledge representation

Among the many important areas of focus when managing information systems, two areas stand out as particularly important in a knowledge management context:

- Managing the creation of representations
- Managing the use of representations

Although, as we have seen, knowledge and its disembodied representations are distinctly different phenomena with different attributes, requiring very different management strategies, human beings communicate through such representations, typically using information systems to do so. Creating better representations is therefore not only central to information systems research and practice (Weber, 1997) but fundamental to the firm as knowledge integrator and thus to knowledge management. Research and development in this area to date however has been surprisingly limited and rarely conducted from a knowledge management perspective (instead usually limited to a technical perspective, focused on artificial intelligence, e.g.,

Sowa, 2000). A multidisciplinary approach involving information systems, knowledge management, and other specialists would be beneficial.

While systems for helping people express and represent their ideas as accurately as possible are clearly critical, how the subsequent representations are interpreted and used is equally important for knowledge management. However, despite a great deal of research on the factors that predict if people will use an information system (Venkatesh et al. 2003), most of this research has considered the system to be simply a generic tool (Orlikowski and Iacono 2001), with little consideration given to the specific representational nature of such systems. Very little research has examined how people use information systems designed for knowledge management (Haas and Hansen 2005). More importantly, the general question of how people do (and should) use representations is a much under-researched topic (Suchman 1995). Much more research is needed so that practitioners can learn how to build better systems for creating transferring and using representations so as to optimize human cognitive processes and the application of human knowledge to organizational tasks.

It is important to re-emphasize at this point that human knowledge cannot be transferred, any more than an individual's personality can be transferred. Nevertheless, the notions of 'collective knowledge' and 'shared cognition' are useful metaphors, because they emphasize the potential for individuals to have similar, albeit separate and distinctive mental models (Cannon- Bowers and Salas, 2001). Better representations and better use of representations can certainly help workers to understand each other better and information systems-based techniques are particularly helpful for this purpose where the knowledge involved is highly codifiable, as discussed earlier (see Figure 1 above).

Figure 2 emphasizes the need for an organization to align its development and use of knowledge and its creation and use of knowledge representations. This is important for

two reasons. First, an organization must know what knowledge it needs and what knowledge it has before it can decide what knowledge it should represent in systems. Second, for workers to apply their knowledge in tasks (or create new knowledge via learning), they must often use information systems. As a result, an organization must ensure that its workers use the representations for the right tasks and in the right way. In short, given the importance of knowledge *and* knowledge representations, and their complex interrelationships, greater integration and coordination of information systems, human resource management and other management functions is necessary if an organization's knowledge management efforts are to be successful.

5.3.4 Managing performance

Managing organizational performance entails:

- Managing performance achievement
- Managing performance measurement

The systemic approach taken using this framework provides a foundation for a practical methodology that managers can utilize to improve and measure their organizations' performance. As noted earlier such a framework could be enriched by adding the types of additional features typically found in conventional performance technology models, however the framework as described shows how managers can improve their methods for acquiring, maintaining, developing, using and representing human knowledge in order to achieve their performance goals.

Following the precepts of evidence-based management (Pfeffer and Sutton, 2006), four additional activities that managers should also undertake include measuring the drivers and components of strategic alignment, i.e., the fit between people and strategy and between people contracts and HR practices. To track the process by which fit leads to organizational effectiveness, firms should institute initiatives to measure and track knowledge suppliers' willingness to contribute their knowledge and the firm's capacity

to appropriate value from suppliers' knowledge. Managers also need to institute measures to identify the relative effectiveness and efficiency of the systems and processes they use for representing knowledge and using knowledge representations. Finally, managers need to learn from their organization's performance and adjust its knowledge management efforts accordingly.

6. Conclusions

knowledge management is currently in a paradoxical state, the subject of continuing interest and attempts at implementation, yet increasingly criticized by practitioners for having failed to live up to expectations and by theorists for being a problematic concept. Given its continued adoption there are obvious risks that previous mistakes will be repeated, unless the underlying causes of the current confusion surrounding knowledge management can be correctly identified and rectified. This paper has argued that the major underlying cause of knowledge management's present problems has been epistemological, reflected in a blurring of the conceptual boundaries between human knowledge and its disembodied representations, compounded by widely differing views as to what actually constitutes human knowledge. This conceptual blurring has been largely brought about by the popularity of cognitivist and computational perspectives of knowledge, combined with the IT industry's dominance of the knowledge management agenda.

Resolving the confusion surrounding knowledge management requires that firms' stakeholders first understand and accept the role of the firm in the modern economy as primarily the integration of disparate human knowledge. Second, what is perceived as human knowledge in an organizational context needs to include both certain and uncertain knowledge, conscious and unconscious knowledge, tacit and explicit knowledge, affect and behaviour. Given human bounded rationality and uncertainty, the organizational challenge is largely about managing in the absence of perfect knowledge, thus highlighting the importance of a managerial focus on learning and

imaginative risk taking, rather than solely on exploiting what is known. Thirdly, a systemic approach to knowledge management is required which focuses on optimizing relationships between individual and collective human knowledge and other tangible and intangible resources to leverage organizational performance.

As part of a systemic approach to knowledge management, individual organizational functions, such as information systems, human resource management and marketing need to reconceptualize their roles from a knowledge perspective and to focus and integrate their efforts accordingly. For organizations that are successful in adopting a systemic approach to knowledge management, the need to differentiate between knowledge management and management as such should eventually disappear – for most organizations achievement of that goal is currently some way off.

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