Re-energising Knowledge Management:

Communication challenges, interdisciplinary intersections, and paradigm change

A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

in

Management Communication

at

The University of Waikato

by

Rachel Anne Jones

THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

2011

Abstract

Knowledge Management (KM) in the 1990s was a key upwardly-mobile management discipline. Indeed, a proliferation of articles suggested KM had the potential to make a radical departure from conventional views of organisational assets and resources, and even held the promise of transforming economies. Instead, however, KM has tended to become incorporated as a subset of traditional management. This thesis suggests that, as a result, knowledge has been perceived simply as another resource to be managed for competitive advantage. It further argues that KM need not subscribe to conventional views of management and that knowledge need not be just another resource to be exploited, hoarded, and traded. Instead, it contends that knowledge is an outcome of the process of connecting to one another in new ways and explores the field's still-unrealised potential for generating fresh approaches relevant to contemporary conditions. In seeking to revive the excitement, and rekindle the potential, that originally surrounded the field, the thesis intervenes in current debates in KM. It attends to, and expands, the existing discourses of KM while presenting the case for a re-energised understanding of the communication of knowledge. Exploring intersections with other disciplines as well as KM's own multidisciplinary base, it proposes transdisciplinary research as a productive focus for KM. In making these recommendations for KM's future, the thesis seeks to make the field more responsive to current complex and dynamic academic, organisational, and social contexts. Its overall goal is not only to ensure KM's ongoing relevance and effectiveness as a field, but to direct KM towards fulfilling its early potential.

Preface and Acknowledgements

The production of this thesis has been a team effort, and I would like to take the time to acknowledge the people who have helped me most. First, my thanks must go to Professor David McKie who in giving me freedom to roam also gave me confidence in my abilities. He astutely knew, better than I did, when I needed focused support and when I needed just good advice, and was able to provide both. I am particularly grateful for his editorial abilities which have improved my writing enormously. Thanks also go to my second supervisor Associate Professor Debashish Munshi who was unfailingly positive and prompt in his feedback. Together, my supervisory committee members were a helpful and cheerful team.

I would also like to acknowledge the University of Waikato for awarding me, an unlikely PhD candidate, a doctoral scholarship. The financial support was invaluable. Similarly, I must thank the Department of Management Communication in Waikato Management School for providing encouragement during the process and supporting me through the availability of paid employment.

This is an appropriate place to note that as a result of all the support I received I have been able to produce a number of journal articles during the PhD experience. None appear in their entirety in this thesis, but I acknowledge that parts of this document have appeared elsewhere. These include information from the articles "Constructing KM: The constraints of a narrative-told" and "Contesting definition: Metaphor, meaning, and multiplicity in KM", which both appeared in the *International Journal of Knowledge, Culture and Change Management* (volume 9, 2010 and volume 8, 2008 respectively). I have also drawn on the article "Intelligent participation: Communicating knowledge in cross-functional project teams", co-authored with David McKie, that appeared in the *International Journal of Knowledge Management Studies* in 2009. Finally, I have used some material from "PKM through communicating" that was published in 2009 in *Online Information Review* and from the conference paper *Breaking down the boundaries: Interdisciplinarity and the future of KM* published in the proceedings of the *14th Americas Conference on Information Systems* in 2008.

My last, but certainly not least, acknowledgement goes to my husband, Jim. I will be eternally grateful for the many and varied ways he supported me through what has been a challenging and eventful few years. This was a journey that we took on as a team, and he has had my back every step of the way. We are done – it's time to move on to the next stage of our lives. I promise I won't do a third one!

Table of Contents

List of Tables

List of Figures

Introduction

Whatever happened to Knowledge Management (KM)? KM in the 1990s was a key upwardly-mobile management discipline that promised to transform disciplinary organisation, knowledge construction, learning approaches, and even economies. A proliferation of articles discussed knowledge workers, knowledge organisations, knowledge waves, and even knowledge societies. As such terminology suggests, KM had the potential to represent a radical departure from conventional material production, and its associated, and inhibiting, mechanical production metaphors.

Instead, however, KM has tended to become incorporated as a subset of management, featuring in peripheral journals, or branches of information systems (IS) studies. In addition, KM has largely uncritically adopted the language and values of management, and, as a result, knowledge has simply become another resource, in the same way as raw materials and labour have been since the early days of business, employed for competitive advantage.

This thesis takes the position that knowledge is not a resource to be exploited, hoarded, traded, and so on, but is an outcome of the process of connecting to one another in new ways. From that perspective, it seeks to revive the excitement that originally surrounded KM by exploring the field's still-unrealised potential for generating different approaches, in particular, approaches that are relevant to contemporary conditions. In attempting such a revival, the thesis intervenes in current debates in KM and suggests future directions for the field that involve expanding existing discourses, connecting with other disciplines, and welcoming complexity.

Abandoning traditional methodologies in favour of extended argumentation, this thesis takes a meta-level view of KM as a field and the process of knowledge generation within that field. In doing so, it falls under the umbrella of Critical Management Studies (CMS), which Alvesson and Willmott (2003) describe as a pluralistic, inclusive movement that accommodates a variety of critical approaches. Rather than following the conventional narrative of management with its focus on getting things done efficiently, CMS appreciates how management is

embedded in wider political, social, and economic contexts. Accordingly, CMS researchers are interested in discourses, power relations, and how "objects" are formed within particular historical contexts. This thesis shifts the typical focus of study from organisations to an aspiring discipline in KM, but it also considers how the construction of the field impacts on its practice in organisations.

Informed heavily by postmodern theorists, Hassard, Kelemen, and Wolfram Cox (2008) use the term "disorganization theory" to stress the fluid, epistemologically reflexive, and pluralist methodologies central to "alternative" organisation and management studies. They argue "alternative organization studies researchers are invited to apply whatever combinations of research methods they deem useful and urged not to regard the research process as a timid adventure" (Hassard, Kelemen, & Wolfram Cox, 2008, p. 172). They particularly call for a "discursive postmodern approach to paradigm plurality" (p. 3). Along a parallel path, this thesis offers a systematic analysis of the field of KM, weighted towards elements of discourse, especially metaphor, and process reflection.

This is present structurally through a recursive process that mirrors the construction and maintenance of the field it studies in the way each chapter is reviewed and reflected upon in order to theorise the next chapter. The first two chapters function as a literature review, exploring the development of KM as an academic subject and its attendant controversies, strengths, and weaknesses. Chapter one reflects on how KM emerged, and, more specifically how it is being developed as an academic management discipline that, given the range of voices contributing to the topic, significantly impacts on organisational practice. Chapter two focuses on the controversies and conflicts that characterise current understandings of KM. With the influences that have shaped, and are shaping, KM's emergence established, chapter three explores elements of contemporary conditions that it argues must necessarily affect KM's future direction. In particular, this chapter suggests that developments in allied fields, increasingly complex organisational contexts, and pressures on the traditional managerial paradigm currently offer KM an opportunity to reposition itself as a dynamic and exciting field.

Overall, this thesis proposes that, if the field of KM is to be of continued relevance, then KM's understandings of management must be revolutionised in

conjunction with understandings of knowledge. It is not enough to have radical new ways of conceptualising knowledge if the dominant framework remains untouched. Instead, KM must challenge the dominant managerial paradigm at the same time as new understandings of knowledge emerge. Accordingly, chapter four explores how, currently, KM is firmly entrenched in the dominant mechanistic managerial outlook. Primarily, it argues that KM is constrained by its discourse, which continues to embody the values and to reflect the perspectives of a command-and-control management style. It suggests that how KM scholars talk about mental constructs like knowledge determines how those constructs are treated in practice. However, by unpacking the term "knowledge management" to reveal the assumptions KM is built on, this chapter shows that the field also offers opportunities for stepping outside that paradigm.

Chapter five offers a way forward for the vocabulary of KM. Providing a detailed analysis of the current and emergent metaphors in KM, it argues that KM can better reflect contemporary values by actively re-shaping its own vocabulary. It questions how KM can explore knowledge in new ways if it is forced by its very language into the confines of a managerial worldview that determines how knowledge is to be understood, treated, and valued. Similarly, it suggests how, by reflecting on KM's attempts to embody knowledge in language, scholars might help KM shift its language. It proposes a vocabulary that better reflects the field's current state rather than unwittingly retaining the assumptions of a worldview that is largely mechanistic, rational, and positivist.

Having explored the context of contemporary KM, subsequent chapters address the three fracture points identified in chapter two. First, chapter six tackles the failure of the field to satisfactorily define knowledge and discusses some of the emergent conceptualisations of knowledge in KM. In particular, it explores Stacey's (2001; 2003; 2007) communicative understanding of knowledge as a complex responsive process of relating, and shows how this perspective offers an alternative to the transmission model of communication that dominates KM. At the same time, CRP also reflects a shift away from a positivist managerial outlook. Chapter seven introduces the study of ignorance to KM as a way of complicating and enriching the field's understanding of knowledge and of testing its own assumptions.

Chapter eight addresses a further point of fracture – KM's division along paradigmatic lines – by advocating a transdisciplinary approach for KM's future. This approach seeks to bridge the gap between the computational and organic paradigms that dominate KM. To show the opportunity for connections between paradigms, it explores the opportunities that KM has for transdisciplinary scholarship by examining the work of scholars outside of management. Many of these scholars would not regard themselves as KM specialists, yet the work they are doing suggests new ways of understanding knowledge and offers fresh approaches towards KM. Connecting with such work offers the opportunity for innovative and exciting developments in KM. Extending this argument, chapter eight also suggests the consideration of KM as a boundary object as a way to push forward beyond the problems that a search for disciplinary status has engendered for KM.

Chapter nine considers how KM scholars might effectively engage in transdisciplinary efforts by offering the concept of "intelligent participation." It begins by exploring the difficulties inherent in communicating in cross-functional teams, before suggesting a number of competencies that individuals might bring to effect successful transdisciplinary conversations. Integrating the main arguments of this thesis, it argues intelligent participation conceptualises how scholars, and, by implication, organisation members, can enhance the quality of local connections to generate new knowledge.

This discussion is followed by chapter ten's engagement with the final point of fracture identified in chapter two – the purpose and direction of KM. It brings together innovative approaches and emergent trends that are being explored under the KM umbrella. These fresh contributions to KM are highlighted because they pay particular attention to the inadequacy of the traditional managerial paradigm, draw from work in other disciplines, and focus on the communicative aspects of knowledge. Thompson and Walsham's (2004) contextual framework is used to structure these trends to suggest one possible future for KM comes from seeing it as being about the management of individual, organisational, and social contexts that allow knowing processes to thrive.

Given the relationship between knowledge, knowing processes, and learning, it is worth noting here that KM as a field has many overlaps with the learning

organisation literature. Indeed, both fields emerged as significant areas of study during the 1990s, and can be seen as developing in parallel. Despite the many overlaps, however, this thesis focuses on research and issues that come under the KM umbrella. It does so for two reasons. Firstly, it examines the push for KM to be considered a discipline by its advocates – an issue that is not shared by scholars of the learning organisation. Secondly, the evolutionary trajectories of both fields diverged and followed disparate routes. Where Senge (1992) drew together many aspects of organisational life to develop a holistic concept that encompassed the organisation as a system, KM has developed in a more piecemeal fashion. Initially rooted in technical disciplines associated with information management, the contributions from a wide variety of perspectives have resulted in the exponential expansion, but also an accompanying fragmentation, of KM. This thesis examines the impact of both these matters on KM.

In summary, this thesis explores reasons for KM as a field failing to live up to its potential, before addressing how to reinvigorate KM for a more assured, positive, and productive contribution to organisations. Arguing that society at large feels to be on the cusp of dramatic change that will radically alter the management of organisations, this thesis contends that KM should remain a central concern of management scholars. To be effective, however, it argues for a reenergised KM able to demonstrate awareness of the important role that knowledge plays, and will continue to play, not only in the outcomes produced, but in how change occurs.

Chapter 1 – Constructing KM

Knowledge Management (KM) has visibly arrived. Search Google with "knowledge management" and more than 11 million links are returned. Search Amazon books with "knowledge management" and over 17,000 publications are available for purchase. Search the ABI/INFORM global coverage database with "knowledge management" and over 20,000 texts are offered. In such sources, phrases like "knowledge economy," "knowledge society," and "knowledge workers" similarly elicit an overwhelming number of results. Without doubt, the concepts and the vocabulary of KM have penetrated both popular and academic discourse. Despite the field's visibility, however, the early euphoria associated with the exploration of a fresh and exciting topic has dissipated, and recent publications indicate KM is a field that is dissatisfied with itself. In academia, scholars have expressed disappointment with the results of KM's implementation and the failure of the field to develop a satisfactory definition of knowledge (see Orlikowski, 2002; Gueldenberg & Helting, 2007; Hicks, Dattero, & Galup, 2007). In practice, KM has been described as the "great enigma of the business world" (Sinclair, 2007, p. 255), hailed by some as the only way forward and yet damned by others as too theoretical, impractical, and expensive (Sinclair, 2007). Nevertheless, there is a sense in the literature that, even if the concepts, implementation, and theoretical underpinnings are problematic, KM is worthy of academic attention.

Accordingly, this thesis explores the tension between KM's ambivalent status, suspected ineffectiveness, and unrealised potential and its appeal, traction, and promise. To this end, it examines the reasons contributing to why KM as a field has thus far failed to live up to its potential. It then offers possible ways of redefining and reinvigorating KM for a more confident and valuable contribution to organisations. Building on suggestions that radical change to organisations and their management is pending (Kotler & Caslione, 2009), this thesis contends that to adequately address such change KM should remain a central concern of management scholars. In support of this claim, it demonstrates that knowledge plays, and will continue to play, an important role in how such change occurs and what its outcomes are. Before this thesis suggests ways of revitalising KM for the future, however, this first chapter reflects on how KM emerged. More

specifically, it considers how it is being developed as an academic management discipline that, given the quantity, breadth, and diversity of voices contributing to the topic, influences organisational practice.

The rise and rise of KM

The term "knowledge management" did not appear in the three citation indexes of the *Web of Science* until 1986 (Wilson, 2002) and only five results from the ABI/INFORM global database are returned prior to this date. Even in subsequent years, from 1986 to 1996, the term occurred infrequently in both catalogues. Since 1997, however, the growth in the number of publications has been exponential. In 2004, Gordon and Grant (2005) used the ABI/INFORM databases to survey the literature on KM to date. Their search, using the keywords "knowledge management," but excluding newspapers, returned some 4235 records. Through further refined searches, they were able to graph a trend of increasing publications in KM that began in 1994 and appeared to peak in 2002. Their data for 2003 showed a small decrease in publication numbers, and the data for 2004 recorded a significant drop. Despite the 2004 data being incomplete (i.e., only including publications up until July of that year), Gordon and Grant incorporated it to conjecture whether the "decline" in KM publications represented the beginning of a fade from view or if it was going to level off and become a mainstay of management. They also surmised that the drop off could be an aberration. Indeed, it was. Taking 2002 as a starting point, when Gordon and Grant found there to be nearly 800 articles, I repeated their search using the same parameters. The search found a continuing increase in publications from that year. Indeed, for the full year 2004, 782 articles were published, followed by 972 in 2005 and just over 1000 in 2006. It then tracked a small decline to 916 articles published in 2007, and a rise to a peak (so far) of 1098 for 2008, before a drop off to 895 in 2009.

These figures illustrate a remarkable quantity of publications. Yet, though KM has been established, and found to be of scholarly interest, for more than ten years, its reputation is still somewhat ambiguous. It has been both lauded and criticised. In 2000, KM was described as being "not merely some passing fad, but…in the process of establishing itself as a new aspect of management and organisation and as a new form of expertise" (Hull, 2000, p. 49). In contrary fashion, Wilson

(2002) argued KM was indeed a management fad, and provided evidence of many cases where "information management" was simply and cynically replaced by "knowledge management," in part, he claimed, to spawn more money for consultants and software developers. He further accused enthusiasts of failing to critically analyse KM, and felt that KM would eventually reveal itself to be lacking in intellectual rigour. He concluded that "many academics are prepared to jump on the bandwagon - one's only satisfaction is that the bandwagon lacks wheels" (Wilson, 2002, p. 50). His doubts were more tentatively voiced by others. Blair (2002), for example, suggested some of KM "has been simply an enthusiastic renaming of existing management practices" (p. 1028) and Ponzi and Koenig (2002) questioned whether KM was merely another management fad. However, their analysis of publications suggested KM had, in fact, passed the five-year fad lifecycle and was poised to become a serious addition to management.

Accounting for KM

The ongoing interest in and proliferation of material on KM confirm that it has moved beyond being labeled as a fad, yet do not explain why it was embraced so enthusiastically. Hasan (2008) recently noted that "KM is seen as everything from the latest management fad, to its own discipline, to a trans-disciplinary mix of technology, human resources, information management and organisational science among others, but remarkably KM as a recognised area of expertise survives" (p. 26). Her comment captures the range of responses that KM continues to provoke. I find it intriguing that a topic area barely mentioned before 1990 could already have devotees advocating it as a new management discipline just over ten years later. Just why KM became such a preoccupation of scholars is complex and nuanced, as it involves the convergence of matters of academic identity and social transformation. The first two chapters of this thesis explore these issues and propose that some of the same matters that have contributed to its rise have also played a part in arresting its potential.

In the context of KM's ambivalent status, it is not surprising that KM scholars themselves have sought to account for the rapid evolution of the field. Their accounts help to legitimise KM as a budding discipline by constructing a narrative

that serves to naturalise KM's development. A Foucauldian analysis might explore this from the perspective of power driving the production of truths, arguing that "the exercise of power itself creates and causes to emerge new objects of knowledge and accumulates new bodies of information" (Foucault, cited in Townley, 1993, p. 519). This chapter, however, analyses the process of constructing a history for KM through Stacey's concepts of the "narrative told" and the "narrative emergent". On the one hand, the scholarly accounts legitimising the evolution of KM are a narrative-emergent – they are histories that Stacey (2001) describes as "reproduced in the living present of communicative action" (p. 135) but they are also "extending those histories into the future" (p. 135). Such accounts emerge in a narrative-like sequence, though the story has no obvious beginning or ending unless arbitrarily decided, has no omniscient narrator, and often has "many plots emerging simultaneously" (Stacey, 2001, p. 136). On the other hand, collectively the narratives that emerge take on the characteristics of a narrative-told. That is, over time, a roughly linear account coalesces as scholars converge on an agreed version. The narrative-told emerges as a retrospective account of experience, in which events are condensed, perspectives taken, and subplots ignored as it is shaped into a coherent story from which meaning will be taken (Stacey, 2001).

Stacey (2001) argues that told narratives are a prominent tool as people negotiate communication in the living present – individuals reflect on their experiences and select themes or aspects which they use to tell stories of their experience, thus creating identity and making sense of their worlds. This chapter argues that the same processes occur in the establishment of an academic field, and illustrates how those processes have transpired in KM. This chapter's own account, a further addition to the narrative-emergent, shows that a number of KM scholars have devoted time to explaining the sudden popularity of KM as a natural outcome of broad social movements. Later contributions have also positioned KM's rise related to particular developments in the understanding of organisations. An early example of such an account is Blackler's (1995) article, which documented KM as arising out of increasing globalisation, the development of new information and communication technologies (ICTs), and the implementation of post-Keynesian governmental policies. His supporting argument was that KM evolved from a common 1970s understanding that wealth creation was less about dependence on

resources and more about the use of specialist knowledge and competencies to manage resources (Blackler, 1995).

In similarly asserting that economists had long recognised that "economic prosperity rests upon knowledge and its useful application" (Teece, 1998, p. 55), others echoed the main influences identified by Blackler (1995). Teece (1998), for example, augmented the influences by noting a number of structural changes in the economies of advanced developed countries that highlighted "the importance of knowledge and its management" (p. 56). He identified such changes as the liberalisation of markets, the expansion of products and services, the strengthening of intellectual property systems, the growing importance of increasing returns, the decoupling of information flow from goods and service flow, the development of ICTs, and increased product architecture and fusion of technology (Teece, 1998). Teece (1998) also credited Nonaka and Takeuchi (1995) with widening the audience for literature on knowledge.

Both Blackler (1995) and Teece (1998) positioned KM as a topic that had always been of relevance, but as one attracting new attention due to allied developments. This position was supported by Wiig's (2000) proposition that KM was rooted in a long philosophical and practical history. He saw the focus of KM not just as commercially driven but also as part "of the move towards personal and intellectual freedom that started with the age of enlightenment" (Wiig, 2000, p. 2), and argued that the adoption of the "KM" term in the 1980s was a "natural evolution brought about by the confluence of many factors" (p. 2). For him, KM's intellectual roots included historic efforts to understand knowledge in philosophy, religion, psychology and social sciences, but its development was also driven by 20th century efforts to improve effectiveness in management science, cognitive sciences, and so on.

Echoing Wiig's (2000) dichotomous framework, Prusak (2001) discussed a range of antecedents to the development of KM. Intellectually, economic interest in developing increased efficiency, and the associated challenge of being able to measure intangible resources, meant that KM provided a valuable link between economics and learning. In the areas of philosophy and psychology, this was augmented because there was renewed interest in the notions of tacit and explicit knowledge. Prusak (2001) suggested that the rapid increase in the ability to store

information, and to access it more easily, also fostered interest in the type of knowledge that was not easily stored, as well as in the expanded ability to sift through large amounts of information productively. Additionally, the alignment of knowledge and economic management linked to earlier moves in sociology when Bell (1973) tried to define the post-industrial society as a knowledge-based society – a perspective furthered by Drucker's (1993) contribution. In parallel with intellectual curiosity surrounding knowledge, Prusak (2001) claims that practical developments also stimulated interest in KM. The explosion of technology raised the profile of information management, and the need to understand how users of Information Technology (IT) behave and interact with information. Across a similar time frame, the quality movement fostered a holistic view of organisations that addressed processes and goals, or, in other words, started making such organisational knowledge visible. Finally, the human capital movement emphasised the financial advantage of investing in people (Prusak, 2001).

At any rate, by the 2000s, KM was well established as a topic worthy of study. The construction of knowledge as an asset, or as a resource that might be leveraged for competitive advantage, and its subsequent appropriation by organisations, was in part made possible by the naturalisation of the narrative-emergent into a narrative-told for KM. Once knowledge was accepted as a legitimate part of organisational discourse, thanks to the collective effect of the scholarly accounts discussed above that positioned it so, other issues became the focus of the narrative-emergent. New accounts focused less on justifying the value of managing knowledge using historical precedents and social movements, and more on justifying managing knowledge by appealing to contemporary issues specifically related to organisations. Alvesson and Kärreman (2001), for example, traced the coupling of the terms "knowledge" and "management" to the development of communication networks through technology and increased interest in organisational analysis. From a different perspective, Blair (2002) came to allied conclusions in seeing KM developing through workers having different expectations of their jobs and increasingly looking to trade on their knowledge. Organisations, therefore, responded by looking for strategies that allowed them to retain knowledge amidst the growing experience of turnover in their workforces. These changes contributed to knowledge being considered as a resource, with

intellectual capital increasingly considered as having value alongside more traditional and tangible assets (Blair, 2002). This thesis explores the far-reaching implications of the construction of knowledge as an organisational resource in subsequent chapters.

Throughout the 2000s, KM scholars have continued to contribute to this narrative, further working to solidify KM's place in organisations and organisational research. In 2003, Snider and Nissen positioned KM as the result of four trends. These were the development of theories of organisational learning; the emphasis on re-engineering business processes; the advances in IT; and, the development of information systems management theory and practice. Zorn and Taylor (2004) identified similar factors, supported by advances specifically in information and communication technologies (ICTs), which contributed to the development of KM as a topic area. Their augmented list observed a trend towards knowledge work, intellectual capital increasingly being regarded as a source of organisational success, and the challenges of distributed expertise for global, networked organisations (Zorn & Taylor, 2004). A year later, Metaxiotis, Ergazakis and Psarras (2005) proposed KM had its origins in Total Quality Management, Business Process Re-engineering, Information Systems, and Human Resource Management – further entrenching KM as evolving from business concerns. Recent accounts have reiterated the reasons for KM's development. Alstete (2007) argued KM emerged as a significant movement due to the coalescence of a number of factors, including globalisation, advanced IT, the increasing service nature of products, and the rise in the view that wealth is generated from knowledge. Grossman (2007) pinpointed an increase in ICTs and the development of a global knowledge economy as being behind KM's surge.

All these attempts to establish the origins of KM offer scholarly justification of academics, particularly in organisational studies, engaging with KM as a field. The introductions of many KM articles also contribute to a coherent, linear history of KM by frequently citing the same sources as being responsible for development of the field. The similarities of the accounts mean they effectively reinforce one another and move the development of KM from a narrative-emergent to a narrative-told. Agreeing on a context that led to the emergence of KM is a means of establishing it as a subject worthy of academic interest. Additionally, once it is accepted, that context sets up knowledge as a justifiable interest of organisations.

It not only constructs a sense of KM as emerging from prevailing social, business and technological forces, but also makes it appear an inevitable and natural development of civilisation as a whole. Thus KM can be described as a response to the "real social and economic trends" (Prusak, 2001, p. 1002) of globalisation, ubiquitous computing, and a knowledge-centric view of the firm.

This chapter argues that a dominant narrative about the history of KM emerges from these accounts that build upon and draw from one another. It subscribes to Stacey's (2001) view that a history produced in the present extends that history into the future by subtly establishing patterns and expectations. In creating a historical narrative for KM, these accounts also shape KM's future and work to establish KM as a discipline. Their success is evident from comments like Heisig's (2009) assessment that "today, the increasing importance of knowledge for organizational success is hardly questionable" (p. 12). However, even as one narrative is solidified, another emerges. The new narrative-emergent, which focuses on how KM relates specifically to aspects of organisations, ironically contributes to undermining KM's chances of disciplinary status by creating divisions between scholars interested in different aspects of KM.

Disciplining KM

By the mid-2000s, as already noted, some academics were calling for KM to be granted the status of a discipline, or even asserting that it already had, or was on the verge of, such standing. Stankosky (2005) argued that KM "must be elevated to its own academic discipline" (p. 3) with sound theory, principles and a professional body pushing its development. Just a year later, Dayan and Evans (2006) described KM "as rather a young discipline" (p. 69). This is a perspective that Jakubik (2007) concurred with when she referred to KM as "a young and still very fast developing discipline" (p. 16). In the same year, Grossman (2007) reinforced her reference with his claim that KM has "started to coalesce into a unique discipline" (p. 31). More recently, Ma and Yu (2009) described KM as having "established itself as an academic discipline" (p. 175). Despite these assertions, this chapter is more circumspect, believing that developing a new discipline is a complex process. Some disciplines evolve out of established fields, in the way that molecular biology came from biology, while others emerge

through the combination of existing fields, such as social psychology's blending of sociology with psychology (Leggon, 2006). This chapter sees KM as developing through both these processes. In part, it has emerged from the established field of Information Systems (IS). Yet, it also combines aspects of management, information technology (IT), and psychology. Whether KM has achieved full disciplinary status, however, deserves consideration.

There are a number of ways a field can establish its disciplinary legitimacy. Relevant practice in the "real world" supports its claim, and Prusak (2001) had observed how, in the early 1990s, some organisations, like IBM and Xerox, were already practicing KM. The development of discipline-specific journals is also a significant marker of legitimacy and here the growth of KM's respectability has clear milestones: The *Journal of Knowledge Management* was established in 1998, *Knowledge Management Research & Practice* in 2003, and the *International Journal of Knowledge Management Studies* in 2006. Conferences are an allied means of legitimising academic activity, and KM now has some well-established and well-attended conferences. A significant conference milestone in the history of KM was the 1993 Boston conference organised by Prusak and others, which Prusak (2001) claims as the first conference specifically devoted to KM. Others soon followed with the annual International Conference on Knowledge, Culture and Change beginning in 2000, and the International Conference on Knowledge Management (I-KNOW) in 2001. Lloria (2008) rightly identifies KM-specific websites, as well as public events and seminars themed around KM, as effectively connecting those interested in KM and further developing the field's validity. An academic discipline, Leggon (2006) argues, requires a sense of territoriality. This chapter contends that the establishment of outlets for research and a sense of community in KM have built a sense of territoriality, both by claiming a clearly defined area of knowledge, and by implying that new knowledge can only be generated by legitimised insiders.

Along with recognising a sense of territoriality as defining a discipline, this chapter also agrees with Leggon's (2006) assessment that a discipline needs to be distinctive from its contributing fields. To be recognised as an academic discipline in its own right, KM should have, amongst other things, an identity that is simultaneously constructed by both commonality and difference. In other words, disciplinary identity is partly constructed by inclusion or exclusion from various

categories (Leggon, 2006). The identifying features of a discipline (vocabulary, routines, theories, codes of conduct and so on) work to establish the identity of the community by differentiating it from other communities. This can even take place to the extent that outsiders cannot participate in what its members do (Koskinen, 2005). This chapter, in adopting Stacey's (2001) narrative-based understanding of emergence, positions KM as being constructed through a series of complex communicative interactions. KM's disciplinary identity, then, hinges on difference from those outside the disciplinary boundary, as well as commonality between those within that metaphorical line (Koskinen, 2005).

By focusing on communicative interaction, this chapter highlights that an important aspect of establishing both inclusion and exclusion in an academic setting is the adoption of a unique language. An array of KM-specific acronyms and terms, such as "KT" (knowledge transfer), "CoPs" (communities of practice), and "PKM" (personal knowledge management), illustrate linguistic characteristics particular to KM. In addition to language, this chapter argues that the theories contributing scholars adhere to contribute to the construction of a discipline. Several KM scholars are working on building a stronger theoretical base (see Stankosky, 2005; Kuhn & Jackson, 2008), or calling for more theory development (see Firestone, 2008; Lloria, 2008), in order to give KM a theoretical approach distinct from other fields. Stankosky (2005), for instance, aimed to "establish a solid scientific background for KM" (p. ix) and used a bottom-up approach to theory building, which drew on existing work, to construct his four pillars framework for KM. Analysing the theoretical foundations of KM using articles from 1995 to 2005, Baskerville and Dulipovici (2006) concluded that theoretical cohesion is present and overarching theories are developing: "This presence indicates a field that is developing an independent body of theory with good groundwork and internal consistency" (p. 101). They also call KM "a solid, maturing field of study that is building out, not only from external theory bases, but also by expanding on the basis of its own theories" (p. 101). In addition to having its own vocabulary and theory, a new discipline needs to study topics different to other, established fields. In this respect KM has developed such topic areas as knowledge workers, knowledge networking, and knowledge mapping. Together, these characteristics help build a scientific community with a unified

belief system that "guides members in doing what they do" (Hazlett, McAdam, & Gallagher, 2005, p. 33).

In other words, by engaging in academic activities, the KM community is in effect, even if unintentionally, working hard to establish KM as a discipline. This chapter follows Leggon's (2006) assertion that the language adopted, the theories adhered to, and the issues wrestled with by a new discipline all contribute to the construction of a distinct disciplinary identity when compared to other fields. However, this chapter also notes that, at the same time as establishing KM's difference to other disciplines, these features of academic activity serve to unite scholars in the new area. So, as scholars focus on distinguishing themselves from those outside the field, they simultaneously stress commonality and minimise difference to establish group identity within the field, something Stacey (2001) recognises as typical of group formation. The desire for an emerging discipline to be recognised as legitimate serves as a powerful motivation for group unity. Being recognised as legitimate by the academy bestows on a new discipline the right to establish curricula; set criteria for entry, and advancement, in the field; and enter the competition for scarce institutional resources (Leggon, 2006). As Stankosky (2005) also notes, only a university, by developing a degree granting programme, can legitimise an academic discipline.

Consequently, despite the availability of journals specialising in KM, and the popularity of conferences in the field, there remain doubts about whether, to date, KM can claim to be a mature discipline. Ma and Yu's (2009) review of ten years' of KM research concludes that, because the majority of KM research is published in non-management journals, "there is still a long way to go before knowledge management develops into a full-fledged field that can support its own knowledge generation and dissemination" (p. 178). Furthermore, even though it has been adopted by practitioners and some well-known organisations, it has been abandoned by others (Sinclair, 2007). KM also has not yet established a widely-accepted theoretical framework and an accompanying methodology, both of which Leggon (2006) regards as essential for a discipline, and there is widespread disagreement about definitions of its key terms. In addition, very few universities offer KM as a major area of study. Grossman (2007) echoes the calls of others promoting KM to disciplinary status in suggesting that KM needs to become more deeply entrenched in the academic curriculum. Citing a number of studies looking

at how KM is being taught at universities, Grossman (2007) notes a high level of interest in KM at the graduate level contrasts with the infrequent inclusion of KM in the undergraduate curriculum. He argues much work still needs to be done to formalise the theories, frameworks, models and processes that are "critical to solidify KM's position as a unique and valuable discipline" (Grossman, 2007, p. 32).

Dealing with diversity

Despite a general impetus and plenty of communicative activity in the KM community towards establishing KM as a discipline, KM, then, remains at the fringes of disciplinary status. This chapter argues that KM's achievement of the status of a discipline has, somewhat ironically, been hindered by its popularity and success. The move from a tenuous narrative-emergent linking knowledge and organisations to an accepted and confirmed narrative-told that unquestioningly accepts that link has come with implications. This chapter sees one of the consequences of a naturalised history as being the surfacing of a fresh narrative-emergent. As already noted, in KM this has involved a shift from linking KM's emergence to broad social movements to linking KM to particular issues within organisations. This in turn has resulted in KM being constructed as the concern of scholars from multiple disciplines.

In effect, the construction of a disciplinary identity for KM has been stunted because it is of interest to scholars from many disciplines. Several studies have emphasised the range of disciplines contributing to KM. In 1996, KM research appeared almost exclusively in journals from three disciplines (computer science, business, and management), but, by 2001, eight disciplines, including engineering and psychology, were publishing KM articles (Ponzi & Koenig, 2002). Alvesson and Kärreman (2001) insightfully described KM as acting as an umbrella term for a wide variety of academic interests – consequently, scholars in fields like IS, organisational learning, strategic management, and innovation all perceived KM as of relevance to them. As they were concerned with more than just the number of articles featuring KM, Gordon and Grant's (2005) analysis of scholarly publications on KM also looked at the themes that appeared in these articles. They found that while "information" and "technology" were the keywords that

dominated the field, emergent themes from 1994 included "strategy," "organizational learning," "culture," "human resource management," and "power". These results remain valid to the end of 2009, and show KM has consistently been of interest to a wide range of management disciplines and strongly support claims of its multidisciplinarity.

My own reading for this thesis shows that KM's multidisciplinary appeal continues to be noted in the literature. Hazlett et al. (2005) assessed that "the development of KM theory and praxis continues to involve a wide range of disciplines and contributors" (p. 32), and their position was reinforced by Grossman's (2007) allied observation that "knowledge management draws from many different disciplines and can be applied to numerous areas of inquiry" (p. 36). The latter's analysis of doctoral dissertations in KM shows it being studied within disciplines as diverse as education, health sciences, and engineering. In 2003, Snider and Nissen made note of KM's extension into the field of project management, where it is now firmly entrenched. In addition, KM scholars have gone so far as to argue that all workers are knowledge workers (Blackler, 1995; Scheeres, 2003) positioning KM as a concern of all organisations. Dalkir (2005) and Stankosky (2005) further emphasise KM's broad application by confirming that KM is a concern not just of all organisations but of all parts of an organisation. Due to this extremely broad base of interest in KM, this chapter argues that the current status of KM may be better reflected by describing it as a multidisciplinary field than as a discipline. In doing so, it adopts Pain's (2003) definition of multidisciplinarity as being scholars from different fields working on a common issue but within the bounds of their own discipline. Importantly, because it restricts conceptual unity, multidisciplinary involves what Choi and Pak (2006) describe as a juxtaposition of disciplines that is additive rather than integrative.

In describing KM as a multidisciplinary field, the aim is to understand how the contribution of a number of disciplines to KM both enables and constrains KM's achievement of disciplinary status, and both strengthens and weakens the field (Hazlett et al., 2005). This chapter sees an advantage of KM's multidisciplinarity being the diversity of perspectives contributing to the field. Academic fields in general are increasingly coming to terms with the fact that human experience cannot be reduced to any single dimension in ways that have sparked a growing

interest “in developing new knowledge through research that combines the skills and perspectives of multiple disciplines” (Aboelela et al., 2006, p. 330). For example, the approaches to a common issue, such as knowledge transfer, are much more varied when it is not simply the domain of any one discipline. Over the past few years alone, it is possible, for example, to find relevant research on knowledge transfer from a systems perspective (Parent, Roy, & St-Jacques, 2007), an IS perspective (Hasgall & Shoham, 2008), a project management perspective (Grillitsch, Müller-Stingl, & Neumann, 2007), an organisational culture perspective (Ajmal & Koskinen, 2008), and a communication perspective (Murray & Peyrefitte, 2007). In addition, there is a broader range of outlets for publication, and therefore more opportunities to increase the impact of KM, as journals in various fields devote special issues to the topic (see Lloria, 2008, for examples). Conferences in a number of fields also offer KM streams, which increase the prospects for bringing together disparate perspectives and fostering exchange and interaction.

These opportunities that multidisciplinarity provides potentially contribute to firming KM’s disciplinary status, as they work towards broadening topics, enhancing theories and disseminating research in KM. On the one hand, a diverse range of perspectives leads to potentially richer insights and debate; on the other hand, multiple and non-convergent perspectives can also lead to confusion and misunderstanding (Hazlett et al., 2005). As Beesley and Cooper (2008) note, “part of the confusion that surrounds KM” can be attributed to its multidisciplinary roots. They particularly note that many of KM’s terms and concepts “have been adapted from other disciplines” and “have distinctly different meanings among those who use them” (p. 49). Yet, these terms are often used interchangeably and without consensus over definition.

This “unresolved conceptual variety and…lack of unanimity in the field” (Heisig, 2009, p. 13) is a problem for KM. This chapter agrees with Leggon’s (2006) claim that the communicative, epistemological, and ontological practices by which disciplines define themselves means that scholars working in particular disciplines embrace certain perspectives. Given KM’s fledgling status as a discipline, scholars are invariably shaped by the perspectives of their primary field. Such perspectives are crucial to maintaining membership and authority in that primary community. It is not surprising, then, that IS scholars tend to maintain a working

concept of knowledge that sees it as able to be codified, captured, and converted, while communication scholars tend to see knowledge as negotiated, abstract, and processual. This chapter sees the following comment from Leggon (2006) as neatly capturing one of KM's major multidisciplinary-induced difficulties:

> academic territoriality can be an obstacle to the conduct of inquiry when strict adherence to the language and perspectives of one's discipline precludes establishing some common ground with researchers from different disciplines from which creative research might develop. (p. 3)

Multidisciplinarity involves many disciplines coming to terms with particular issues around a common topic, but, at its worst, "often amounts to a dialogue of the deaf in which incompatible research approaches are pursued in parallel with little or no communication between them" (Jones, 1997, p. 107). This thesis sees the poor communication between contributing disciplines as a significant hurdle for KM to overcome.

In parallel with ontological differences, on a practical level, KM scholars with diverse backgrounds coexist in an academic environment of simultaneous cooperation and competition. Discipline development in general is marked by power struggles connected to such issues, as Leggon (2006) identifies, as the control of outlets for publication and the competition for funds and status within the university system. Hence, this chapter argues that although the KM community might wish for collective recognition and a unified sense of progress, KM scholars may also feel some frustration with divergent perspectives with the potential to exacerbate a struggle for resources and reputation. In addition, as a consequence of publication being closely connected with resource allocation and promotion, a multidisciplinary field can tend to become fragmented. Thus, scholars in IS study knowledge sharing and publish in IS journals (see, for example, Bélanger & Allport, 2008) while scholars in communication study knowledge sharing and publish in communication journals (see, for example, Child & Shumate, 2007). The likely outcome is that these articles will tend to be read only within their respective disciplines.

The probable absence of cross-disciplinary readers represents lost opportunities for potentially fruitful collaboration. Nor, I believe, is the fragmentation solely driven by institutional demands. In a chicken-and-egg situation, it is also partly a result of KM not yet being fully established as a discipline, which means scholars

in the field have another, more highly valued, disciplinary identity. Operating in relation to that identity, scholars have reputations and professional expertise to protect. This can mean they favour staying within the confines of their primary discipline's paradigms and methodologies when researching in KM. Additionally, because of the importance of legitimising academic work through appropriate channels, they may target particular journals that are respected in their own field rather than the newer, and often, therefore, less established and less highly-ranked, KM journals. A further potential disadvantage of KM's multidisciplinarity is more and more subtopics appear within the field and more and more approaches are used to study them as scholars bring theories from their own disciplines to bear on KM issues. The diffusion can contribute to an apparent lack of direction, cohesiveness, and certainty (Hazlett et al., 2005).

Conclusions

There are other consequences of having a number of disciplines, particularly those that have either a technical or a managerial orientation, participating in the construction of KM as an area of academic interest, and it is these consequences that this thesis turns to next. This chapter first explored KM's dramatic rise in popularity, which has led to many in the KM community to call for its establishment as a stand-alone discipline. The chapter has also explored how in seeking to legitimise KM as a topic worthy of interest, KM scholars have naturalised a narrative-told for KM that positions its study as crucial to organisations. Once that legitimisation had been achieved, however, the new narrative-emergent began to focus on linking KM to particular aspects of organisational experience. Highlighting KM's applicability to a broad range of organisational activities served to entice contributors from a multitude of disciplines to the field. This chapter has examined both the advantages and disadvantages of KM's multidisciplinary state. However, the next chapter particularly explores the dichotomies that have developed as a consequence of multidisciplinary input while KM earned status as a subject worthy of academic attention. It demonstrates that, though scholars use a number of strategies to justify their focus on KM, the tendency to frame the field with dualities crystallises false dichotomies, leads it to coalesce around polarised perspectives,

and, accordingly, prevents the field from effectively marrying the diverse viewpoints of its contributors

Chapter 2 – Conflict in KM

The previous chapter illustrated how KM scholars have worked to mark their territory and establish their truths through discursive practices. The chapter described the emergence of KM as a multidisciplinary field worthy of academic attention. It showed that KM has been developed primarily through scholars' continuing contributions to the literature. Communicative processes such as publishing in journals and presenting at conferences have built a body of work that is intended to be of use to organisations, practitioners, and other researchers. Further, the provision of a coherent account of the origins of KM has contributed to the legitimisation of KM in the academic literature. Scholarly accounts such as Blackler's (1995), Prusak's (2001), and Zorn and Taylor's (2004) strive to establish KM as a discipline by naturalising its development from broad societal shifts and particular organisational changes.

This process of constructing a new academic field such as KM calls to mind Townley's (1993) articulation of one of Foucault's main aims – "to indicate that although elements are part of a familiar landscape, they are not 'natural,' or part of a naturally existing order" (p. 519). That is, Foucault sought to draw attention to how a new field or discipline marks out an area for its control (Inglis, 1991) and works to make its truths or knowledge taken-for-granted assumptions. For Foucault, these goals are primarily accomplished through the use of language, or the discourse of power. Like all academic discourses, the discourse of KM is "at work in specific times and places," that is, it is historical, and "its field of force accumulates" (Inglis, 1991, p. 108). Knowledge, then, is a matter of the social, historical and political conditions under which truths are produced (McHoul & Grace, 1993). Consequently, Foucault emphasises modernity, with its dual stress on the human mind and body as the source of knowledge and the linearity unfolding of history, as a temporary but powerful meaning system. This thesis, too, though not specifically using a Foucauldian analysis, encourages the questioning of the shaping force of modernity in the form of how the positivist tradition, particularly as advocated in management studies, has influenced the development of KM.

The construction of a definitive history for KM is driven in part by the typical human (and academic), modernist pursuit of certainty, coherence, clarity and linearity (Eisenberg, 1998), but, as the previous chapter suggested, it also serves another function. In effect, the development of an evolutionary story works to unite the diverse voices that contribute to KM behind a common history – its narrative-told (Stacey, 2001). The construction of a dominant historical narrative is not the only strategy that KM scholars have used in an effort to present a united front. This chapter begins by exploring other communicative strategies used to establish an authoritative voice for KM. It then explores the tension between the use of strategies that promote academic unity and the perhaps inevitable untidiness of multidisciplinarity, particularly focusing on three points of contention in KM.

Crafting commonality

Chapter one made the claim that by establishing a naturalised history for KM, scholars have demonstrated KM's validity as an academic topic of interest. As well as justifying KM's emergence on a grand scale, however, I argue that scholars also work at a more particular level to validate KM's position in both organisational literature and organisations. In particular, this chapter identifies two common strategies that KM scholars use to cement KM's reputation – the citing of well-known KM works and the linking of KM and competitive advantage. This micro-level validation further establishes a sense of evolutionary development for KM, contributing to shift the story of KM from a narrative-emergent to a narrative-told. In addition, spending time building KM's academic reputation serves to justify scholars' own interest in, time spent on, and energy devoted to KM. When KM scholars position the article they are offering for publication as building on previous scholars' work, for example, they effectively locate themselves in a line of authority, enhancing their own reputations. As well as advancing the reputation of the field and individuals, however, these strategies also help craft a sense of shared values and subject matter amongst scholars from a wide range of disciplines. Accordingly, this chapter sees participation in the KM community as a dialectical process of self-reinforcement – scholars deliberately

make discursive moves that entrench the field, thus cementing their own reputations and developing a KM community.

To illustrate this process, this section first looks at the line of authority that is frequently called upon in the KM literature. The work of the late management guru Peter Drucker is often cited as the rationale for KM's centrality in organisational literature. Drucker was well-known and well-respected in management circles for writings that explore how humans organise. He was also lauded for his ability to foresee such major trends as privatisation, decentralisation, the rise of Japan's economic power, the importance of marketing, and the emergence of the information society (Byrne, 2005). Though he did not specifically use the term "knowledge management," Drucker's re-evaluation of the contribution of knowledge to economies and societies has been selected as a significant theme in the history of KM. In 1993, Drucker's influential book *Post-capitalist Society* described knowledge as "the basic economic resource" and identified the "leading social groups of the knowledge society" as "knowledge workers" (p.7). Drucker (1993) was arguing that the new post-capitalist society would be characterised by a divide between knowledge workers and service workers, rather than between those who have capital and those who labour.

Early articles in KM cite Drucker's comments on knowledge workers, and the move to a knowledge economy, as a reason for turning attention to the management of knowledge. Drucker's standing as a predictor of trends and a leading management theorist justified other scholars paying attention to the areas he highlighted as important. It is, therefore, unsurprising that numerous KM scholars cite *Post-capitalist Society* (Drucker, 1993) as the publication responsible for establishing knowledge as the basic resource of the now-widely-used term "knowledge society" (see, for example, Blackler, 1995; Gao, Li, & Nakamori, 2002; Fong, 2003; Zorn & Taylor, 2004; Gordon & Grant, 2005; Scheeres, 2006; Lloria, 2008). By highlighting their awareness of Drucker, and other prominent theorists who were groundbreakers in KM, authors identify and cement themselves as members of the KM community, and the KM community as connected to management thinkers with high status.

Predictably, Nonaka and Takeuchi (1995) draw on Drucker's work in their book *The Knowledge-Creating Company.* This is probably the single most influential publication in KM. Nonaka and Takeuchi (1995) themselves went on to become central figures in the KM story, and are frequently cited by KM scholars accounting for the growth of interest in KM (see, for example, Snowden, 2002; Fong, 2003; Gordon & Grant, 2005; Jackson, 2005; D'Eridata & Barreto, 2006; Lloria, 2008). What Lloria (2008) called their "transcendental study" (p. 77) first united and then divided those interested in KM. It had a profound influence on the future of KM as researchers sought to either confirm or challenge its main precepts. Among the key issues it established were an interest in "western" versus "eastern" approaches to knowledge and KM; a stress on the dualism of explicit and tacit knowledge; a focus of attention on the possibility of converting knowledge from one type to another; and a solidification of the preoccupation with knowledge as a source of competitive advantage.

The linking of knowledge and competitive advantage is the second communicative strategy that this chapter identifies scholars using to promote KM. The claim that KM is essential for competitive advantage appears frequently in the KM literature. In part, it is used to justify the uptake of KM in a variety of business-related disciplines, and thus serves as a topic to focus multidisciplinary voices around. Darroch and McNaughton (2003), for example, argued "knowledge is increasingly recognized within marketing management as a critical resource that can be managed to enhance the competitive position and financial performance of a firm" (p. 572). In project management, Fong (2003) claimed knowledge was about developing and sustaining competitive advantage in a project team setting. In the context of new product development, Carlile (2002) positioned knowledge to be "a critical but challenging source of competitive advantage" (p. 442) for an organisation.

Such claims for importing issues from KM into other disciplines could be made only, however, because earlier scholars had already cemented the link between knowledge and competitive advantage. As far back as 1992, before KM was firmly established, Kogut and Zander claimed that the central competitive dimension of what firms know how to do is create and transfer knowledge efficiently within an organisational context. Their approach involved looking at organisations as social communities where "individual and social expertise is

transformed into economically useful products and services by application of a set of higher-order organizing principles" (Kogut & Zander, 1992, p. 384). Around the same time, Winter (1993) wrote that firms are organisations that know how to do things, and, in doing so, established knowledge as the basic building block of the firm. Indeed, by the mid-1990s, a number of key academics had pointed out the importance of knowledge to the modern organisation:

> Drucker (1993) identified knowledge as the new basis for competition in the post-capitalist society; Stewart (1995) warned that companies needed to focus on what they know rather than what they own…Nonaka and Takeuchi (1995) published a ground-breaking study of the generation and use of knowledge…and Leonard-Barton (1995) published a study on the role of knowledge in manufacturing firms. (Gordon & Grant, 2005, p. 29)

By the mid-2000s, it became more commonplace for KM scholars to assert the contribution of KM to the bottom line without providing historical antecedents. Dayan and Evans (2006) simply claim that "in the hyper-competitive environment we are bound to perform within, we find the knowledge we have and the use we make of it to be the main source of our competitive advantage" (p. 69). Beesley and Cooper (2008) confidently assert that "a defining characteristic of today's knowledge-based economy is that it relies upon innovation and intellectual capital to generate economic value" (p. 49). In short, as these two citations illustrate, Drucker's (1993) predictions about the role of knowledge have become accepted as facts. This development suggests that together KM scholars have successfully naturalised the history of KM and established its position as a topic worthy of academic study. Certainly, post-2005, KM scholars are less inclined to devote their introductions to establishing KM as worthy of attention (see Edwards, 2007; Gueldenberg & Helting, 2007; Hasgall & Shoham, 2008) apparently assuming recognition of the link between knowledge and competitive advantage.

To summarise, this section finds that the identification of the impact of knowledge on competitive advantage, along with citing recognised authorities, serves to justify business scholars paying attention to knowledge in organisations. The identification repeatedly links knowledge with economic growth, organisational success, and profit. Locating KM firmly within management discourse and the ideology of new capitalism, Blackler (1995) convincingly argued that moves towards globalisation, the development of ICTs, changes to government policies, and new approaches to management led to organisations focusing on knowledge

in new ways. With this argument repeatedly reiterated in the KM literature, KM has become an accepted part of what Fairclough (2003) describes as a restructuring of capitalism that has fostered the continuance of economic expansion. In the process, knowledge has become seen as a resource for organisations to exploit, and the field of KM offers to provide the framework for managing that resource.

Point of fracture: What is knowledge?

Despite the formation of KM as a creditable field of study through the collective and cooperative communicative actions of its scholars, the development of KM has also been fraught with conflicts. Interestingly, these conflicts have typically settled around binary oppositions, and the most fundamental of these has been the division of knowledge into either explicit or tacit. This split has since been extended into a division that treats knowledge as either product or process. Before exploring the opposing conceptualisations of knowledge, however, consideration of what KM scholars do agree on about knowledge proves valuable as it demonstrates a further strategy that scholars use to construct and maintain KM's legitimacy.

This thesis has already shown that KM scholars have worked to create a broad social context for the interest in KM, and have validated KM's centrality to organisational studies by citing authoritative sources and establishing it as essential to the bottom line. The additional strategy that this section identifies is that scholars also work to establish intellectual status for KM. I argue that some authors attempt to achieve this by identifying knowledge as a traditional academic concern. Many KM scholars have taken a philosophical approach to this process, drawing on understandings of knowledge from Socrates, Plato, and Descartes. The long-established reputations of such thinkers in the history of western civilisation give weight to deliberations on the meaning of knowledge. Scholars also cite more modern philosophers like Ryle, Wittgenstein, Polanyi, and Heidegger, which serves to indicate depth of intellectual reflection (see Gueldenberg & Helting, 2007; Duguid, 2005; McAdam, Mason & McCrory, 2007; Kane, 2003; Lindkvist, 2005; Blair, 2002).

Establishing knowledge as a central concern for famous philosophers, I believe, gives some intellectual authority to an interest in KM. However, this strategy has the additional advantage of suggesting that an understanding of knowledge continues to be elusive. This chapter argues that constructing the concept of knowledge as contested and imprecise helps legitimise the ongoing debate about the definition of knowledge in the KM literature. Academics, like scientists, create and negotiate claims that things are both not known and known (Stocking & Holstein, 1993). Accordingly, by claiming that other scholars have misunderstood knowledge or KM, academics can justify their own research interests and contributions. Indeed, the genre of the research article expects, if it does not require, scholars to establish knowledge gaps and then present their work as going some way to fill those gaps. Further, as discussed in chapter one, to establish the legitimacy of organisational scholars' interest in knowledge, KM scholars needed to define it as a resource or asset that could be used for competitive advantage. Therefore, I argue, reconciling broad philosophical definitions of knowledge with a business perspective has become a significant theme within the wider narrative of KM.

The strategies for solidifying KM's place in organisational studies that this thesis has identified have, I argue, been fairly successful. Certainly, the contributions of the KM community have made knowledge a much more high profile aspect of organisations than it has been hitherto. A shared interest in elevating the academic profile of knowledge and KM, however, this chapter argues, has had the unintended consequence of creating polarised definitions of knowledge. This chapter credits several factors for driving this polarisation. These include KM's early emphasis on knowledge as a resource, its beginnings in Information Technology (IT), and Nonaka and Takeuchi's (1995) influential account of knowledge creation. Narratives emerged that deliberately challenged the authority of these perspectives, and these new narratives saw some KM scholars defining knowledge quite differently than their colleagues.

Early definitions of knowledge in KM tended to focus on knowledge as individual, explicit, capable of explication, and a higher rendering of information (Cook & Brown, 1999). These understandings of knowledge evolved under the influence of an economic perspective. The idea of the "knowledge economy" had drawn the attention of economists to knowledge, which they made, much to

scholars like Duguid's (2005) dismay, economically manageable and measurable by reducing it to explicit knowledge or information. This thesis shares Duguid's (2005) scepticism of economists' claims that "innovation, learning, and knowledge diffusion are no more problematic than the production and distribution of widgets" (p. 2). Just as the desire for economic manageability helped drive the perception of knowledge as a resource, so too did advances in communication technology. The abundance of data and information, as a result of developments in technology, led to an increasing emphasis on the ability to separate the helpful from the unhelpful, or convert the meaningless into the meaningful. Consequently, early KM studies focused on the conversion of data to information to knowledge, captured by the then-ubiquitous image of the "knowledge pyramid," with an initial focus on technology as the converter.

These emphases together established what Snowden (2002) identifies as the first phase of KM – the pre-1995 study of information and technology. In effect, scholars in this phase were interested in explicit knowledge, though it had yet to be labeled as such. They were heavily influenced by advancements in IT and allied with those perceiving KM's development as coming out of managing information. Studies in this phase focused on the capture, codification and storage of knowledge. The perspective of scholars in the first phase of KM was challenged when Nonaka and Takeuchi's (1995) *The Knowledge-Creating Company* provided a pivotal discussion of organisational knowledge. This chapter argues that Nonaka and Takeuchi (1995) unwittingly established the major fracture line of KM by making a clear distinction between explicit and tacit knowledge. Drawing heavily on the work of philosopher Michael Polanyi (1967), Nonaka and Takeuchi (1995) defined explicit knowledge as "transmittable in formal, systematic language" and tacit knowledge as "personal, context-specific, and therefore hard to formalize and communicate" (p. 59). This, according to Snowden (2002), kick-started the second age of KM, an age characterised by a preoccupation with explicit versus tacit knowledge.

Nonaka and Takeuchi (1995) described explicit knowledge as the dominant mode of the west, linking it to rational thought, and knowledge capture and measurement. In contrast, they positioned tacit knowledge as a concern of the east, linking it to nurturing relationships and knowledge creation. Their discussion provoked quite a reaction amongst KM scholars, and Ponzi (2002) argues that as a

result some began to push for the west to discard the idea that knowledge needs to be made explicit. Two camps emerged, and, subsequently, KM scholars became artificially and crudely divided according to whether they were interested in creating explicit knowledge or understanding tacit knowledge. Those focussing on explicit knowledge supposedly favoured capturing existing knowledge and using technology in support of KM. Those focussing on tacit knowledge supposedly favoured understanding the processes of knowing and managing people. In practice, however, this chapter sees the divisions as somewhat less clear-cut.

In my opinion, the label "tacit knowledge" provided a concept around which scholars dissatisfied with the definition of knowledge as a product or resource could coalesce. The KM literature provides ample evidence that not everyone had been happy with the direction that KM was moving in during its first phase. As early as 1995, Blackler had summarised the organisational literature's common conceptualisations of knowledge, pointing to an "emerging consensus that conventional views of knowledge are unacceptable" (p. 1034). The concept of tacit knowledge shifted the focus from technology to people, as it located knowledge in the minds and bodies of individuals. This shift appealed to those who rejected the idea that knowledge was something to be captured and measured. Those aligned with tacit knowledge identified with an organisational culture focus, and were concerned with understanding, connecting, and fostering the knowing processes of organisational members. This contrasted with those aligned with explicit knowledge who focused on classifying different types of knowledge in order to learn more effective means of transferring, generating and managing it (Orlikowski, 2002). Ultimately, however, both camps shared an interest in how to take advantage of knowledge for the competitive advantage of organisations.

By the mid-2000s, though, some KM scholars were becoming disgruntled with the explicit/tacit dichotomy. As Ponzi (2002) had predicted, KM scholars began to look to blend business processes, people, and technology under the KM canopy. Furthermore, prominent KM academics like Orlikowski (2002), Snowden (2002), and Walsham (2005) began to challenge the preference for knowledge being something that is possessed with the idea that knowing is something that one does. The scholars who saw knowledge as a process, not an object, characterised it as dispersed, indeterminate, and reciprocally constituted with practice (Orlikowski,

2002). In other words, they began to stress that knowledge arises out of the interaction of individuals with one another and their environment.

This shift in emphasis drew on Lave and Wenger's (1991) notion of knowledge as an outcome of socialisation, captured in their term "communities of practice." Communities of practice became the unit of focus for many KM scholars who wanted to account for how knowledge was created and shared in organisations. As a result of the increasing attention on social interaction as the basis of knowledge, additional disciplines became interested in KM. For example, communication scholars like Zorn and Taylor (2004) stake a claim for KM as organisational communication. However, even though the original dichotomy between explicit and tacit knowledge was being challenged by new perspectives joining the KM discussion, this chapter argues that it was often replaced by new dichotomies. Zorn and Taylor (2004), for example, argued that the important distinction was not "tacit-explicit, but process-product" (p. 105). A similar division was made between individual and organisational knowledge drawing on seminal papers like Cook and Yanow's (1993) discussion of organisational learning. This thesis contends that these additional dichotomies had long-term, and often detrimental, consequences for KM.

Point of fracture: Opposing paradigms

The fundamental differentiation between explicit and tacit knowledge, and knowledge-as-product and knowing-as-process, has been hugely influential in the development of KM. In effect, the divide has extended to reflect the much broader philosophical, ontological, and epistemological differences based around these two related understandings of knowledge. The differing focus of these perspectives was articulated clearly in Hazlett et al.'s (2005) attempt to capture the apparently irreconcilable views and theoretical underpinnings of KM using a paradigm-based inquiry. Drawing on Kuhn (1970), they looked for a "unified acceptance of a belief system framework" (Hazlett et al., 2005, p. 33) in KM that guided scholars as evidenced by journals, conferences, and so on, in the field. Hazlett et al. (2005) found that KM was in what Kuhn would identify as a state of pre-science. That is to say it was evolving as a discipline but remained characterised by competing schools of thought. These schools, although

consisting of members claiming similar competence in the field, often presented conflicting positions over fundamental issues and manners of approach (Hazlett et al., 2005).

In developing this work, Hazlett et al. (2005) identified two dominant KM schools of thought: the computational and the organic paradigms. The computational paradigm focused primarily on explicit knowledge and the organic paradigm on tacit knowledge. Accordingly, Hazlett et al. (2005) understood computational school scholars to be preoccupied with models, software, hardware, optimisation, and the development of linear and routine KM solutions for organisations. In contrast, they positioned proponents of the organic school as predominantly interested in people, organisational culture, context, adaptation, and a dynamic understanding of knowledge creation (Hazlett et al., 2005). Both schools were seen to bear the hallmarks of established philosophical paradigms. Hazlett et al. (2005) called these metalevel paradigms "the scientific view and the social view" (p. 36). To elaborate on that distinction, the computational school belongs to the functionalist view of knowledge as scientific truth – a Cartesian-influenced approach, in which knowledge is assumed to be formed in the mind of rational, autonomous individuals who test hypotheses against an objective reality (Hazlett et al., 2005; Stacey, 2007). In contrast, the organic paradigm is associated with a social view of knowledge, and, as such, often adopts a more Hegelian-influenced worldview, where knowledge is thought to be socially constructed through the interactions of interdependent people (see Stacey, 2007).

Hazlett et al.'s (2005) analysis reflected attitudes found elsewhere in the field. For example, Sveiby (2001), an early advocate and practitioner of KM, first noted in 1996 – although he continues to maintain the belief on his website – that KM consists of two "tracks:" the "IT-track" (para. 2), which is information management, and the "people-track" (para. 3), which is people management. Further, many KM scholars implicitly locate themselves within either the computational or the organic paradigm. Drawing on issues raised in chapter one, this thesis argues that, typically, a scholar will identify with the ontological and epistemological perspective of the paradigm most closely related to their own primary discipline's perspective. As a result, their research tends to be targeted at conferences and journals which are similarly located. As scholars then debate methods, problems, and solutions with the opposing group, a collective identity

clusters around each particular perspective (Hazlett et al., 2005). In this way, at one level, the division of KM into two opposing paradigms has tendencies that undermine the benefits that multidisciplinarity could bring.

According to Kuhn's (1970) lifecycle of scientific paradigms, a period of pre-science will typically lead to the established dominance of one school of thought, or a period of "normal science." My reading of the literature published since Hazlett et al.'s (2005) work indicates that there is a struggle for paradigmatic dominance occurring. Currently, KM is in the process of adopting a new buzz word – "KM2.0." Inspired by the popularity and philosophy of Web2.0, KM2.0 is a term that captures the present preoccupations of KM. Popular mainstream author and blogger David Weinberger (2007) describes KM2.0's emphasis on participation and rapid innovation as "a significant change in KM. And not a moment too soon" (p. 20). In effect, KM2.0 is being positioned by its advocates (see Sinclair, 2007; Gurteen, 2007; Weinberger, 2007; Sims, 2008) as having addressed the weaknesses of the IT, or what is now labeled the KM1.0, approach to KM. Where KM1.0 is characterised by explicit knowledge, technology driven knowledge sharing, top-down management, and efficient production goals, KM2.0 is seen to be about tacit knowledge, user-driven tools, freely distributed content, and improved innovation (Gurteen, 2007). Unsurprisingly, knowledge is understood primarily as explicit in KM1.0 and tacit in KM2.0. In uniting advanced technological tools with a concern for tacit knowledge and people, KM2.0 in one way undermines the paradigmatic split that Hazlett et al. (2005) identify – combining elements of both approaches. Yet, at the same time, by establishing KM1.0 as the precursor for KM2.0, it asserts the dominance of the organic paradigm, positioning KM2.0 as the improved, advanced, and progressive framework. Accordingly, the paradigmatic divide remains influential in KM, not least by shaping the next point of fracture that this chapter considers.

Point of fracture: What is KM?

Nonaka and Takeuchi's (1995) distinction between explicit and tacit knowledge was not their only significant contribution to KM. They also discussed how knowledge can be converted from one type to another. They illustrated this with their SECI model, which included the processes of socialisation, externalisation,

combination, and internalisation (Nonaka & Takeuchi, 1995). Initially, the idea of conversion was embraced by the KM community, particularly the conversion from tacit to explicit knowledge through externalisation, "a process of articulating tacit knowledge into explicit concepts" (Nonaka & Takeuchi, 1995, p. 64). Consequently, much effort in KM has gone into establishing ways that organisations can capture the tacit knowledge residing in people's heads in a formal way, thus making it explicit knowledge that can be stockpiled and used by the organisation. In recent years, however, the assumptions of this process have been challenged and re-evaluated, as scholars have taken exception to the idea of converting one type of knowledge into the other (see Tsoukas, 2003). The questioning of the processes of conversion that Nonaka and Takeuchi (1995) suggested raised another major point of contention in KM, because it required scholars to consider the goals of KM in organisations. In complicating understandings of knowledge and its movement and creation in organisations, Nonaka and Takeuchi helped focus scholars on considering exactly what is meant by the term "knowledge management."

Just as the meaning of "knowledge" is debated in the literature, however, the meaning of "knowledge management" is also contested. In fact, one well-known KM blog entry from a KM practitioner, "43 knowledge management definitions – and counting," currently lists 54 definitions and has been terminated only because the blogger has "run out of energy" (Sims, 2008, para. 9). Essentially, as Lloria (2008) confirms, "there is still no consensus regarding the classification of the different perspectives and approaches that have arisen on this topic" (p. 77). Indeed, KM has been very broadly defined, variously seen as being about information management, systems, best practice, normative control, or community building (Alvesson & Kärreman, 2001). Zorn and Taylor (2004) extend this list, noting KM can be used to denote a programme or strategy intended to manage an organisation's intellectual capital or expertise. Alternatively, it may refer to specific software applications for the management of knowledge. The small scale initiatives that manage information, such as an intranet or the appointment of a knowledge manager, can also be called KM. Finally, KM can also be used to refer to what knowledge workers, such as research scientists, actually do (Zorn & Taylor, 2004). Importantly, some scholars have pointed out that it is difficult to accurately evaluate the success or otherwise of KM if there is no common

understanding of what it is (Darroch & McNaughton, 2003; Firestone & McElroy, 2005a; 2005b).

This chapter agrees that the discord over what KM is and what it is not is problematic for the field. The observation that Firestone and McElroy (2005b) made about the "absence of consensus among both practitioners and the press about what KM is" (p. 105) remains true for KM to date. Furthermore, this chapter sees their claim that there are "outright disagreements amongst thought leaders in the field" (Firestone & McElroy, 2005b, p. 106) confirmed by Stankosky's (2005) call for more focus on management than knowledge, in contrast to Sinclair's (2007) suggestion there needs to be "more 'K' than 'M'" (p. 259). Firestone and McElroy (2005b) further argued that "conceptual drift" (p. 105) in the field needed to be faced if KM was to "become a successful professional discipline in the future" (p. 110). Other scholars have also drawn attention to a lack of unity over the meaning of key terms. Metaxiotis, Ergazakis, and Psarras (2005) surveyed the literature for areas that scholars agreed and disagreed on and found major differences over the role of IT, KM frameworks, and whether knowledge could be managed at all. They concluded that their literature review highlighted "the need to better clarify what we mean when we are using concepts such as 'knowledge' and 'KM'" (p. 14). Similarly, Hazlett et al.'s (2005) survey of the academic literature of KM noted the large number of definitions and classification schemes for knowledge, as well as a plethora of methods, models, and approaches for KM. Calling for a deeper theoretical approach to KM, Hazlett et al. (2005) proposed that it needed to move beyond a focus on developing practical applications and concentrate more on understanding its "underlying assumptions and paradigms" (p. 40).

In studying the KM literature for efforts to define KM, Lloria (2008) offered one answer to this call. Looking for common characteristics across a number of definitions, she identified five KM themes: first, KM is related to both business practice and research; second, KM goes further than information management; third, KM is made up of multiple activities; fourth, KM implies knowledge moves from being a human asset to an organisational asset; and fifth, KM's aims are varied though generally include the development of new opportunities and increased competitive advantage (Lloria, 2008). Further, Lloria examined key texts that offered rigorous academic classifications of KM, which she synthesised

across a continuum from descriptive to normative. Included in the framework were interesting divisions along cultural lines, including European, Japanese, and American perspectives, concerned respectively with measuring, creating and managing knowledge (Lloria, 2008). The study provides an interesting description of current approaches to KM, and offers scholars a framework in which to situate themselves. However, it does not suggest how to unify conceptions of KM, which is what many scholars would prefer. Even recently, Heisig (2009) suggested that a "core requirement" for KM remains the overcoming of "deficits regarding a common understanding of KM and especially the core term 'knowledge'" (p. 16).

Frustrations with fracturing

This chapter argues that KM today remains shaped by division – division that is apparent in definitions of key terms, philosophical perspectives, and understandings of the field. The fundamentally different perspectives that exist in KM have caused some to question whether "synergy and convergence" in the field is possible, or whether the KM discourse consists of "irreconcilable views" (Hazlett et al., 2005, p. 32). In particular, ongoing debate about the definitions of "knowledge" and "knowledge management" has prompted pragmatic concern amongst KM some scholars. Stankosky (2005), for example, suggested it was time to get on with the business of KM research. He stressed it was the management, not the knowledge, that is of more importance for KM and felt that a proliferation of disparate definitions means scholars "never [address] the issue of managing these knowledge assets – they merely [discuss] the question of definition" (Stankosky, 2005, p. 4). Stankosky's frustration with the field's preoccupation for definitions is shared by others, who advocate different methods for closing the debate. Thus, Darroch and McNaughton (2003) confidently (and self-referentially) proffer their own earlier definition as a final solution: "In an attempt to move the discipline forward, and after a thorough review of literature and discussion with managers, Darroch and McNaughton (2001) suggested that knowledge comprises data, information and tacit knowledge" (p. 575). Their confidence was somewhat misplaced, as several years later Beesley and Cooper (2008) still call for "commonality in KM terms" and "a common frame of reference for [the] activities that underpin KM" (p. 58), in arguing "it is time to move towards consensus on definitions" (p. 59).

Oddly, though, even as it fractures the field, this chapter sees that ongoing debate around definitions of key concepts also contributes to the construction of a stable, linear history for KM, further solidifying its academic status and its narrative-told. I argue that this is because each new definition offered inevitably builds in some way on those that have gone before, thus giving KM a sense of evolutionary, incremental progress. Moreover, the debate surrounding definitions of knowledge and KM has allowed scholars to justify their own contributions to the field as they attempt to fill knowledge gaps that have been constructed. In this sense, the discussion has contributed to building KM's disciplinary identity, as well as consolidating individual scholars' identities as they align themselves with one or other paradigmatic camp.

Unfortunately, the conceptual division of KM into the computational and organic paradigms, triggered by the division between explicit and tacit knowledge, has also, this chapter argues, restrictively shaped and inhibited the opportunities for KM to be an essential component of organisational life. Further, as KM scholars have been conditioned to wrestle with dualisms like explicit and tacit knowledge and the computational and organic paradigms, they have, unsurprisingly, conceived and articulated other dichotomies. As the chapter has described, the literature identifies divisions between individual versus organisational, eastern versus western, and cognitive versus cultural understandings of knowledge. The dichotomies that characterise understandings of knowledge occur at both the metalevel of KM scholarship and the practical level of KM implementation and thus are hugely influential.

One of the common features of the KM literature has been to overly simplify this essentially philosophical and ideological paradigmatic split along disciplinary lines. Thus, it is commonly inferred that IT-related disciplines working in KM are in opposition to management-related disciplines. Accordingly, some scholars seek to establish the dominance of one or other paradigm. Tourism management academics Beesley and Cooper (2008), for example, blame an over-emphasis on technology for KM's limited success in organisations, and argue that "trends in knowledge management research show an increasingly psychological (as opposed to technical) view of knowledge management" (p. 51). Others, however, are trying to push KM into a more holistic perspective that accommodates both people and technology. The thesis favours this direction for KM, seeing it as more

aligned with the complex, contemporary environment. Snowden's latest definition of KM, posted in September of 2009, attempts to capture the holistic approach:

> The purpose of knowledge management is to provide support for improved decision making and innovation throughout the organization. This is achieved through the effective management of human intuition and experience augmented by the provision of information, processes and technology together with training and mentoring programmes. (para. 4)

Fellow practitioner Gurteen (2009) calls Snowden's "the best definition of KM yet" (para. 3), praising its beginning with the business purpose to be achieved and following with the how to. In particular, the appeal for Gurteen (2009) is the focus on process over outcome. He argues "KM should not be about 'knowing more' - it should be about 'understanding better'" (para. 3) and stresses that such understanding comes through conversations. This thesis also endorses the increasing recognition of the role of communication in KM and explores that role in subsequent chapters.

Thus far, this thesis has argued, KM's development has been both enabled and constrained by its need to conform to academic requirements, its multidisciplinary inputs, and its early adoption of dualisms that have come to underpin the field. Yet, despite a lack of both scholarly consensus and extensive organisational endorsement, KM, according to practitioner Sinclair (2007), "continues to rise from the ashes of its predicted demise like some business phoenix" (p. 260). He rightly argues that knowledge is too fundamental to how organisations function to ever make it irrelevant (Sinclair, 2007). Knowledge and its management, can, however, be differently, and hopefully, better understood by KM practitioners and KM scholars. The next chapter argues that contemporary conditions provide an opportunity for KM as a field to be reinvigorated. Indeed, chapter three takes the position that the current social context which KM finds itself in not only invites, but necessitates a fresh approach to the management of knowledge.

Chapter 3 – Contemporary conditions to revitalize KM

Despite chapter one's observation that KM has visibly arrived, chapter two showed that its journey to acceptance has been accompanied by discontent and dissatisfaction. Indeed, since its inception, a number of scholars have questioned the direction of the field, its contribution to business, and its failure to be adopted as a full discipline by academia in general. Though the literature contains sporadic calls for the abandonment of KM – such as Wilson's (2002) scathing attack on the "'nonsense' of knowledge management" (p. 1) – scholars more often challenge its focus rather than its existence. However, notwithstanding chapter two's identification of KM's points of fracture, this thesis presents an optimistic view of KM's future and argues for its continuing relevance.

The source of this optimism rests in part on the convergence of a number of conditions that offer the possibility of a new vision of management that will revitalise and sharpen the focus of KM. In a critical insight, Drucker (1993) established the meta-context that surrounds many of the KM debates:

> Every few hundred years in Western history there occurs a sharp *transformation.* We cross…a 'divide'. Within a few short decades, society rearranges itself – its world view, its basic values, its social and political structure; its arts; its key institutions. (p. 1)

Since 1993, other observers have confirmed that insight and developed more specific aspects of the, sometimes turbulent, rearrangement (Kotler & Caslione, 2009). In the wake of the recent global financial crisis, conditions suggest that a transformative, if not necessarily cyclical, social change is in progress.

KM scholars, as discussed in chapter one, have already noted the connections between KM and social change, and have been shown to work hard to justify KM's existence by establishing it as emerging naturally from social developments. This chapter contends the KM community would benefit from ensuring KM remains responsive to changes in society, particularly in what Greenspan (2007) has termed *The Age of Turbulence*, thus positioning it as a field that is dynamic and fluid in adapting to volatility. Understanding the influence of contemporary conditions, or, to adopt Stacey's (2001) term, "the living present"

(p. 79), invites an approach to KM that requires a willingness to deviate from past practices. It also calls for building capabilities to flourish in the face of uncertainty, plurality, and change. Hasan (2008) has called attention to the pressures that these conditions place on organisations: "We currently dwell in a turbulent environment mainly driven by advances in information and communication technology (ICT) and in which elements in the environment are increasingly interrelated" (p. 27). This chapter explores the pressures the contemporary environment exerts on KM, inspired by Hasan's conclusion that "a climate of both evolutionary and revolutionary change is stressing our workplaces" (p. 27). It argues that organisations, and their related academic fields, have the opportunity to be participants in rather than observers of that change process.

Accordingly, this thesis both advocates continued attention on KM, and offers a unique and pragmatic approach to revitalising and reshaping KM for a thriving future. Before later chapters suggest how KM can be revitalised, the following discussion focuses on the contemporary conditions that present an opportunity for change in both KM and organisations - an opportunity that KM can both benefit from and drive. These evolutionary and revolutionary transformations include developments in allied fields, shifts in social values, and changes in the understanding of management.

Understanding KM's relationship with the traditional management paradigm

This chapter goes on to explore the combination of current social features that might act as a likely catalyst for a significant paradigm shift in the dominant view of management that underpins KM. First, it is worth tracking some of the challenges and also examining the origins of the long-entrenched view of managerial practice that pervades KM. From chapter one, this thesis has been arguing that three factors continue to stifle the potential of KM: the academic expectations that come with being a relatively new and still-aspiring discipline; the multidisciplinary nature of KM's contributions; and the polarising dualities that frame the field. This chapter contends that KM's preoccupation with these issues of internal inconsistency is driven in part by its attempt to reconcile the requirements of the traditional management paradigm that remains dominant in

KM with the exciting possibilities of a new and innovative field. The very idea of managing knowledge simultaneously draws on and challenges the assumptions of the larger managerial paradigm KM has aligned itself with. Furthermore, the perspective of the managerial paradigm is currently being questioned by many organisational scholars, and this questioning threatens to destabilise KM's foundations.

Social commentators, academics, and practitioners are increasingly noting the rapidly changing and complex social environment that organisations are operating within. The development of the internet, shifts in demographics, changes in values and aspirations, the rise of environmentalism, the influence of consumer power, the threat of terrorism, and instant global communication, to borrow from self-described innovation practitioner Leith's (2008) observations, have fundamentally altered the business landscape in the last ten years. Many of these social transformations potentially lead to a questioning of the assumptions that management as a practice and a discipline is built on. Indeed, I believe that these transformations make it imperative that organisational scholars contest those assumptions.

Disappointingly, because it remains largely unheeded, the call to rethink the practice and theory of management that shapes KM is not new. In 1999, Meehan argued, somewhat dramatically, that given that the "socio-historical context has radically changed and the 'rational' strategy discourse is *epistemically* incapable of making sense of this changed world" (p. 4) management was at risk of becoming redundant. A decade later, traditional management theory within KM remains entrenched and in little danger of becoming obsolete, but it is standing on shakier ground. The slowly-increasing instability of management's belief structure is in large thanks to scholars like Meehan (1999) and others who draw attention to its precarious ontological foundations. As Hasan (2008) notes, "evidence of ambiguity and complexity is everywhere" (p. 27), so much so that she argues it is pointless for organisations to try to logically comprehend their environment. Along with Hasan (2008) and other scholars like Hamel and Breen (2007) and Denning (2010), this chapter takes the position that the rational discourse of management is failing management in general and KM in particular in the context of contemporary conditions.

While joining those who seek to radically reconfigure the entrenched managerial paradigm, this section acknowledges the difficulty of the task, a difficulty that arises because the prevailing managerial worldview derives from the primary worldview of western society at large. Both perspectives have been dominated by the scientific methods that aim to generate universal context-free truths, developed during the Enlightenment. For that reason, confirming that temporal dimension, Stacey (2007) describes "the fundamental assumptions underlying today's discourse on management and organizations" as being "already clearly in place over two hundred years ago" (p. 294). Townley (1993), for example, notes that research on human resource management aims to make organisations more orderly, integrated, and efficient – values that accord with a modernist, positivist tradition.

The assumptions that underpin the managerial paradigm are derived, as Cooke-Davies et al. (2007) explain, from the mechanistic view of Cartesian philosophy, a Newtonian understanding of the nature of reality, as well as the generally accepted Enlightenment perspective of epistemology in which reality is understood via empirical research. Consequently, a rationalist view of the world informs understandings of organisations, and, subsequently, in a rarely acknowledged way, KM. Such rationality is based on the idea that "before something can be governed or managed, it must first be known" (Townley, 1993, p. 520) – an idea that this thesis claims underpins much KM research and practice. A positivist outlook also emphasises the authority of written knowledge over oral, the general over the local, the universal over the particular, and timeless principles over situated findings (Penman, 2000). Furthermore, this chapter argues that this worldview inherently values the notions of progress and improvement. Knights (1991) ascribes this positivist approach to a belief in "the ontological continuity of the natural and the social world" (p. 514). However, drawing on Foucault, Knights (1991) argues that, in emulating the outlook of the biological sciences, social sciences like management find themselves on precarious ground as human subjectivity is itself socially constituted. Foucault's work shows the inherent instability of knowledge in the social sciences, by showing the practices and technologies that construct the assumptions of the Enlightenment.

Despite recent challenges to modernity, the values of this positivist worldview have become and remain intrinsically linked with capitalism, the west's dominant

economic system, through emphasis on individual freedoms and rationality. In this system, progress and achievement in organisations, measured by profit, are achieved through competition. Competitive advantage is central to the adversarial approach to organisations that Meehan (1999) sees as inspired by the military traditions of the economically dominant countries: Organisations compete with one another, take positions, develop strategies, and deploy resources. These activities position organisations in the ideologies and discourses of new capitalism. New capitalism corresponds to industrial production within national boundaries nurtured by consumerism (old capitalism), but where it has been restructured to meet the demands of globalisation and competition (Harrison & Young, 2005). As the "most recent reincarnation of capitalism" (Harrison & Young, 2005, p. 46), it has driven the need for constant and rapid innovation and, thus, stressed the importance of knowledge to organisations. This thesis argues that KM in its early years has fit neatly into the managerial discourse of new capitalism.

In addition to reflecting the particular economic values of new capitalism, management is built on theories of cognitivist psychology and cybernetic systems (Zhu, 2007). This chapter sees a major repercussion of the values of the Enlightenment continuing to drive management theory and practice being an emphasis on humans as information processors and organisations as systems, and the language of management reflects the values of these mechanistic and systemic perspectives. The development of managerial science, computer language, and the sender-receiver model of communication reflect the influence of cognitive theories. This is because they draw from a Kantian worldview in which humans are understood as autonomous individuals who have the capacity through the use of reason to choose and realise their own objectives (Stacey, 2007). As a consequence of what Zhu (2007) and Stacey (2007) regard as poor application of Kant's ideas, however, humans are often regarded as being able to step outside the systems to which they belong and make rational choices about their development. As a result, the assumptions at the basis of modern management rest on notions of rational design and control, or, as Stacey (2007) argues:

> This systems movement has come to form the foundation of today's dominant discourse on sociology, psychology and organizational theory, so importing what is essentially the engineer's notion of control into understanding human activity. (p. 294)

The catch is, while this adversarial, rational, systemic view has been a successful and effective approach in stable, simple, and predictable environments (Leith, 2008), it is an outlook that loses its relevance in turbulent, complex, and uncertain times. Wheatley (1999) captured this notion well when she argued that "each of us lives and works in organisations designed from Newtonian images of the universe" (p. 7), and yet "the science has changed" (p. 8). This thesis reiterates and extends her claim that "the science of the seventeenth century cannot explain what we are challenged by in the twenty-first century" (p. 161). I contend that the philosophical outlook of the seventeenth century is also an inadequate perspective on which to underpin twenty-first century principles of management and understandings of knowledge. Yet, even today management remains, as Stacey (2007) puts it, largely "about rationally designing and controlling organizations" (p. 294) and, therefore, being a manager remains about being rational, autonomous, and in control.

Even when the prevailing western philosophical perspective is challenged in other fields, such as it has been by scholars of the sociology of science, for example, the management environment continues to cling to familiar models. In my opinion, at least two reasons contribute to this. First, as Hamel and Breen (2007) note, management itself is rarely the subject of its own analysis as its practice is so firmly ingrained. Revolutions in organisations may be driven by management, but they rarely occur in management (Hamel & Breen, 2007). Second, when management as an academic field attempts to embrace radically different perspectives, it tends to eventually water them down and subsume them into its dominant worldview. Zhu (2007) provides a thoughtful and articulate account of how the introduction of complexity sciences to management has suffered in this process. The result is the old management vision is "damaged, but not dead" and simply "re-emerges, only under a new set of jargons, with messier logic and poorer consistency" (Zhu, 2007, p. 447). Accordingly, the worldview inherited from the Enlightenment period continues to shape current understandings of organisations and, also, as I will argue, KM.

Future directions for management

This thesis argues that KM scholars and practitioners should challenge the received wisdom and implicit theories and assumptions that their theories and practice are built on. In doing so, it subscribes to Foucault's contention that "truth" is particular to its historical context, and is thus socially constituted and capable of revision (Gordon & Grant, 2005). Furthermore, it builds on the work of Ghoshal (2005), and Hamel and Breen (2007), who also have recently stressed that managers should question taken-for-granted assumptions in their field. As Ghoshal (2005) notes, "many of the worst excesses of recent management practices have their roots in a set of ideas that have emerged from business school academics over the last 30 years" (p. 75). Ghoshal (2005) argues that the popularisation of business education and the theories it has espoused have led to a breakdown of moral responsibility in managers. In particular, he identifies management theories that stress competition, the need to control opportunistic behaviour, and the need to offer incentives to managers to make sure they do their jobs. From my perspective, part of what Ghoshal is identifying is that management scholars, through graduate management education, are ensuring the continuation of the traditional management paradigm by passing on its values and assumptions. Ghoshal (2005) himself makes the connection:

> These influences have been less at the level of adoption of a particular theory and more at the incorporation, within the worldview of managers, of a set of ideas and assumptions that have come to dominate much of management research. (p. 76)

Like Ghoshal, Hamel and Breen (2007) are also critical of the ongoing dominance of the traditional managerial paradigm. They note the irony of modern management facilitating innovation and restructuring in other areas of organisations, while it itself is not usually revolutionised. This is despite the fact organisations like Gore and Whole Foods, case studies of which can be found in *The Future of Management*, prove that disturbing the traditional management paradigm potentially yields significant competitive advantage. For example, Whole Foods developed a management system based on non-traditional, distinctive management principles – love, community, autonomy, egalitarianism, transparency, mission (Hamel & Breen, 2007). Key to the organisation breaking free from the dominant mechanistic view of management was that the company

was started by people who had not been educated as managers, and, therefore, had a different philosophical starting point to traditional management (Hamel & Breen, 2007). Indeed, people who are trained as managers are typically inculcated into organisations in ways that do not take into account either their humanity or the slippery nature of the systems they operate within.

Unfortunately, the inventiveness and success of Whole Foods' approach, although more and more similar examples are emerging, is still more the exception rather than the norm. This thesis is not alone in arguing that the majority of organisations are still bureaucratic administrative structures based on rationality, hierarchy and accountability. Scheeres (2006), for example, notes that even when human resource and other people-centered theories came to the fore, they focused on the management and organisation *of* people over management and organisation *by* people, thus perpetuating the dominant paradigm. Similarly, I believe recent emphasis on theories that stress the problems of the command-and-control paradigm, such as social network theory and complexity theory, has not radically altered organisational structures in practice. Scheeres' (2006) assertion that post-bureaucratic rhetoric is far more prevalent than post-bureaucratic practice, which she claims leads to tension between post-bureaucratic aspirations and traditional work practices, seems irrefutable. Thus, though workers might be encouraged to use social networking tools in an organisation, for example, often the how, why, and when of that usage will be determined by management.

Given that the dismantling of old organisational structures, the abandonment of old managerial practices, and the rejection of outdated rationalist perspectives have been so difficult to implement in the past it seems fanciful to hope that such changes can be achieved in the near future. Yet, as this chapter has already pointed out, contemporary conditions suggest that the global economies at large, western capitalist societies in general, and business organisations in particular, are in the process of dramatic upheaval. The following sections highlight a number of current movements that promise to influence KM, as well as affecting general understandings of management. In particular, they explore extraordinary developments in ICTs and neuroscience, shifts in social values influenced by environmental and financial crises, and recognition of the rapidly changing and complex nature of society.

Influences on KM (1): Developments in ICTs

Chapter one showed how KM scholars, in seeking to position KM as an academic discipline, identified developments in ICTs as driving organisational interest in knowledge. As KM as a field matures, the expansion and advancement of ICTs continues to have a major impact on modern organisations and modern society. A significant aspect of the penetration of ICTs into daily life has been the blurred line between personal activities and work activities. Looking back on the 1960s and 1970s, Sinclair (2007) remembers how "we lived in a world where our work and social lives were completely separated," but claims that now, as a result of the entrance of the personal computer into the home in the 1980s "the distinction between work technology and home technology no longer exists" (p. 257). Consequently, the division between work and leisure, organisation and individual, public and private is looking increasingly fragile. In effect, we are "living and working in postmodern times where, in the context of work, geographical, epistemological, educational, and managerial boundaries are blurring" (Scheeres, 2006, p. 1). The now-oblique nature of what, in the past, have been clear-cut boundaries undermines the concept of organisations as closed systems, subject to executive control.

Different organisations are responding to this challenge to the old paradigm in different ways. Some are resisting it. New technology might provide new hurdles in terms of management practice, but it does not inherently threaten the dominance of the management paradigm – that is, the taken-for-granted values and practice associated with "managing." For example, Blossom (2009) argues that email is a tool that has "helped to automate unproductive publishing patterns of the past while missing new opportunities for more effective ways to organise communications for more productivity" (p. 134). Like earlier forms of communication, email is often used to control and manage through the distribution of information to particular people at particular times (Blossom, 2009). In other words, it is not just the availability of new technology that determines its impact – more important is how it is used. Most technology, though meant to improve productivity, ends up being about mass information production or storage or dissemination. These activities actually hinder productivity, but fit neatly into the traditional management paradigm of command and control.

In part, organisations subjugate new technologies to old ways of being because the technologies develop far more quickly than it is possible for people to imagine new ways of being (Blossom, 2009). Company policies around auction sites like EBay and Trade Me and social networking sites like Facebook illustrate how organisations impose old ways of being on new ICTs. Many organisations choose to manage Facebook and other apparently non-work sites by blocking worker access to them or developing policies around how much, how, and when they can be used. Such prohibitions are not always confined to workplace usage. These circumstances illustrate how old-style managers incorporate new technologies into the old management paradigm. However, the new technology does foster new challenges. The growing inseparability of work and private life in conjunction with such new media exists in tension with that level of managerial control. Mader (2007) discusses this tension, noting that overly restrictive organisational policies around social media that tell employees what is expected of them in their private time means those organisations risk employees disengaging with their workplace and the sanctioned social media they are encouraged to use in the carrying out of their jobs.

While some organisations regulate new ICTs to fit the old models of management, others embrace the opportunities for change that such technologies offer. Rather than fit new technologies to old managerial practices, these organisations find new organisational applications to take advantage of the new technology. For example, the bank Wells Fargo has embraced employee blogs, some made available to clients as well as employees, as a new way to disseminate information in a complex and otherwise stringently controlled industry (Blossom, 2009). The benefit of the blogs for Wells Fargo is the informality and humanity they bring to an otherwise dry sector. Moreover, the blogs are accessed by choice. Employees and clients decide if, when, and where they read the available material – their inboxes are not cluttered with unwanted and time-consuming emails. The blogs thus give power to the end-user.

This chapter believes that a significant shift in power has been one dramatic consequence of the direction of ICTs' development and their pervasive infiltration. The rise of social media means individuals now have the ability "to communicate with groups of peers without highly centralized control of publishing technology being a major factor" (Blossom, 2009, p. 12). The impact

of this is likely to be so far-reaching that Dodd (2010) describes it as "the biggest shift in culture since the Gutenberg press" (p. B13). Where once management and centralised IT departments tightly controlled organisational communication, nowadays individuals and communities of users are able to rapidly disseminate information (Sinclair, 2007). This challenges the command-and-control paradigm and its associated activity of information gate keeping (Blossom, 2009). It also has major implications for the management of knowledge. For instance, where a significant focus of early KM was on ICTs' ability to capture, store, and retrieve knowledge, recent emphasis has shifted to ICTs being used to connect people in ways that foster knowledge generation.

The ubiquity and penetration of social media and other new technologies have other implications. Organisations are also constantly having to rethink the way they communicate with their markets, manage their information technology, and develop their cultures. Improvements in digital connectivity, for example, have meant that organisations can be global, national, and local at the same time (Scheeres, 2006). New ICTs have made distributed work teams feasible and physical location less relevant. Furthermore, this organisational and technological change is occurring in the context of a society that is increasingly valuing connectivity. Shimazu and Koike (2007) note that the "expansion of a user-participation type culture" (p. 50), fostered by Web2.0 and influencing KM, puts increasing emphasis on collective intelligence – the collation of a large number of users' knowledge and judgements. Dodd (2010) goes so far as to say that "what we are now developing isn't so much Web 2.0 but Society 2.0" (p. B13). Developments in ICTs are fostering new concepts of connection that, in turn, afford new understandings of knowledge as emergent through complex processes of connectivity and interaction. It is these understandings of knowledge, which will be explored in subsequent chapters, that this thesis sees as paving the way for the revitalisation of KM.

Influences on KM (2): Findings of social neuroscience

This section offers an outline of recent findings in neuroscience to consider the potential they have, along with the new developments in ICTs, to influence the understandings and practices of KM. The emerging discipline of social

neuroscience promises to have a large impact on KM research, and this section contends that it should have that impact. An exceptionally fast-growing field, social neuroscience focuses on looking at the brain to explain how people interact. It examines how biology influences behaviour but also how social behaviour changes biology (Brooks, 2009). That is to say, social neuroscience is concerned with "the application of brain science to social interactions" (Restak, 2006, p. 3) and represents a radical new way of combining the formerly separated biological sciences and social sciences. The main premise of social neuroscience is that the brain (a biological entity) may develop and operate differently depending on social context (Restak, 2006). A range of experiments from the 1970s onward, together with the development of new brain scanning technologies, have provided fresh insight into how this occurs. They confirm, amongst other things, that "threats to social identity produce physical consequences" (Restak, 2006, p. 5) in that socialisation affects the brain's development. Such insights, while apparently far removed from KM in organisations, call into question the treatment of knowledge as the product of individual cognition. Instead, individual knowing is more likely to be the result of the individual mind connecting with others.

Of particular relevance to KM is work in social neuroscience on the controlled and automatic processes of the brain, processes that contribute to how and what we know. It turns out that the cognitive unconscious (the part of the brain that operates without our knowledge) may play a role in up to 95% of our decision making (Restak, 2006). In addition, scientists are discovering firm links between cognitive and emotional processes, and the brain and the body. These promise to dramatically transform how we understand knowledge in organisations. The categories of reason and emotion, typically kept far apart in the traditional managerial perspective, are being broken down. In their place, more complex and nuanced understandings of how humans know and decide are emerging (Brooks, 2009). Neuroscientists are finding that we can experience things without being aware that we are even having an experience, and that experiences of emotion precede cognitive responses. For example, because we process from the general to the specific and because our brains fill in a lot of missing detail, we will feel fear before cognition tells us what we have to be afraid of (Gilbert, 2007). There is a complex interplay between the unconscious emotional reaction and the conscious cognitive processing that occurs in the brain.

Furthermore, recent studies show that "once we have an experience, we cannot simply set it aside and see the world as we would have seen it had the experience never happened" (Gilbert, 2007, p. 53). Experiences become part of the lens through which we view the past, present and future. Thus one way to consider knowledge would be to view it as a layering of experiences, which raises interesting issues for KM. Counter-intuitively, neuroscience shows the least likely experiences tend to become the most likely memories. That is, our brains are prone to selecting odd and unusual experiences as the ones to "store." We then tend to use these uncommon experiences to predict the future – again with implications for KM. As Gilbert (2007) notes, memories are like impressionist paintings. Our brains store fragments of our experience, often associated with the emotions or senses, but, in the process of recalling these fragments, takes imaginative liberties in filling in the gaps. Yet, even though our reactions and the infilling are fast and automatic we still seem to have free will and control. According to Brooks (2009), "consciousness is too slow to see what happens inside, but it is possible to change the lenses through which we unconsciously construe the world" (p. 7). These findings all have import for KM. In particular they help to explain how people come to know things, often in surprising ways, and undermine the notion of knowledge based solely on reason.

Another possible contribution of social neuroscience to KM, particularly through the study of mirror neurons, lies in its demonstration of how much we are influenced by others. Mirror neurons are the neurons in the brain that become active in response to the actions of others. For example, experiments show that when observing someone reaching for a fresh cup of tea, the observers' motor cortex of the brain will become slightly active, as if they themselves were reaching for the cup (Restak, 2006). That is, other people's actions communicate directly with our brain at an unconscious level:

> The neat division between you and me breaks down and we form a unit in which each of us is influencing the other's actions at the most basic level imaginable: I am altering your brain as a result of your observations of me, and vice versa. (Restak, 2006, p. 59)

Mirror neurons have additional significance because they are crucial to the process of developing empathy. Recent studies of the brain show we are "awash in social signals" (Brooks, 2009, p. 7) and, therefore, treating people as discrete decision making creatures is ridiculous. As Brooks explains, social neuroscience

"shines attention on the things poets have traditionally cared about: the power of human attachments" (p. 7). These and other findings in social neuroscience will have to be taken into account by those researching knowledge sharing, communities of practice, collaboration, and related aspects of KM.

Influences on KM (3): Shifts in social values and economic stability

While new discoveries in allied fields should inform KM, this chapter argues that the theory and practice of KM should also be responsive to shifting social values. Echoing Drucker (1993), Senge, Smith, Kruschwitz, Laur, and Schley (2008) recently discussed how "occasionally something different happens, a collective awakening to new possibilities that changes *everything* over time – how people see the world, what they value, how society defines progress and organizes itself, and how institutions operate" (p. 5). For them "the most visible signs of this new revolution are a mounting series of environmental and social crises" (Senge et al., 2008, p. 5). They argue convincingly that these crises provide an impetus for immediate organisational change. Other signs are clearly visible. Changing social standards have recently had a major impact on organisations with an increasing number of consumers valuing ethical, social, and environmental responsibility. Aware and informed consumers interested in sustainability are likely to ignore organisations using dubious labour practices, paying scant attention to health concerns, and disregarding environmental impact. Organisations are being forced to meet the requirements of their customers, or, at the very least, manage the perception of their brand.

Changes in social values impact KM in a number of ways. Organisational members and organisations are also members of society; therefore, shifts in values at large will affect organisations in particular. For example, to foster effective KM practice in an organisation, the company's values will need to reflect, if not drive, the values of its members. In addition, new knowledge and innovation, whether in services, products or some other aspect, should be responsive to the wider social climate. Furthermore, as Russell, Wickson, and Carew (2008) explain, an outcome of a focus on the knowledge economy is that increasing proportions of the populations of a number of countries achieve high levels of education, as well as increased access to information through ICTs. The subsequent "engaged

populace" (Russell et al., 2008, p. 464) demands knowledge that is responsive, relevant, consultative, and participatory. This thesis argues that for KM to be effective, KM theory and practice needs to be flexible and responsive towards contemporary conditions.

Environmental and social crises have been compounded, but also to some extent sidelined, by the extent of the economic pressure that countries around the globe are currently experiencing. The collapse of world banking and financial markets, the effects of which were intensified by globalisation, was driven by a number of factors, including poor regulation and oversight of companies, shareholder pressure, and greedy and corrupt individuals. The consequences are likely to be far reaching. As economic journalist Rod Oram wrote in February, 2009: "This is no ordinary recession. It is not a temporary cyclical shift in the world's existing economic system. It is a permanent structural shift that is significantly reshaping the system" (p. D2). Jeff Jarvis, a prominent media figure, and author of *What Would Google Do?* expressed a similar sentiment:

> What we're going through is much bigger than a financial crisis…It's much more fundamental than a recession or depression, I really do think we're going through a great restructuring, the next era, the post industrial era, the next 'ism, whatever it's going to be. (Hunter, 2009, p. D4)

Oram, Jarvis, and other commentators' predictions – that the global financial crisis will have a significant impact on economies and organisations – give weight to Senge's at al.'s claims of a crisis-driven shift in values. A research paper for the National Endowment for Science, Technology and the Arts articulated the new direction for the restructuring, stating that the United Kingdom, "should aim to emerge [from the financial crisis] as a more innovative, greener, more sustainable and diversified economy" (Leadbeater & Meadway, 2008, para. 3). Leadbeater and Meadway's (2008) drawing together of social and economic values is core to the future of organisations. How might this affect management? This chapter supports Oram's (2009) position that, in the current climate, organisational innovation must shift from being incremental to radical, management must shift from being tactical to strategic, and relationships must move from being superficial transactions to deep connections. Further, this thesis argues that KM has the opportunity to drive such changes.

Shifts in social values on a grand scale are supported by shifts in social values at a more local level. An example of grass-roots action that could act as a catalyst to change in managerial practice is the decision of over half the members of a 2009 class of Harvard MBA graduates to take an oath promising to "serve the greater good," "act with the utmost integrity," and guard against "decisions and behaviour that advance…[personal] narrow ambitions, but harm the enterprise and the societies" (Harvard, 2009, p. B2) they serve. This commitment to values was initiated by the students to distance themselves from the perceived unethical and greed-motivated behaviour that has been at least partially blamed for the recent US banking industry crisis. Though cynical commentators have argued it might simply be a ploy to gain leverage in a tight job market, Professor Rakesh Khurana of Harvard Business School considers the oath a reflection of broad changes for "management as a whole" (Harvard, 2009, B2). In fact, Khuruna and his colleague Nohria (2008) have argued for the establishment of management as a profession with an accompanying code of conduct. They contend that this would be a way to move management from being solely about maximising profit to include "a civic and personal commitment to their duty as institutional custodians" (Khuruna & Nohria, 2008, p. 70) and help regain society's trust. The impetus to change the values of management is coming both from within and outwith the profession. This thesis argues that this is a phenomenon that KM is well positioned to influence and respond to, and that it should if it is to remain a relevant topic in organisational studies.

Responding to a rapidly changing and complex environment

The turbulence of the current social and financial climate, together with the rapid developments in ICTs and neuroscience, point to the unsuitability of the traditional management paradigm underpinning KM and to the opportunity for significant change. Most organisations are affected in some way by this new era. For Blossom (2009), contemporary conditions (particularly the existence of collaborative social media tools and citizens' reactions to global crises) will likely fundamentally change the structure of institutions. He uses the publishing industry, quickly affected by changes in ICTs, as illustrative of how institutional stability has become less important than shifting "locations and resources as

needed to respond to rapidly changing environments" (Blossom, 2009, pp. xvii-xviii). The shift in information ownership brought about the development of the Web has meant that anyone can now become a publisher, effectively undermining the role of media conglomerates that once owned both the medium and the message "end-to-end" (Blossom, 2009, p. xvii). People can create and participate in new markets that do not require traditional suppliers and brokers; they do their jobs and live their lives differently (Blossom, 2009). The traditional relationship between people and organisations is in flux.

While it can be argued that organisations in all eras have had to contend with change, what is especially significant to contemporary conditions is the speed at which change occurs. Organisations cannot afford to be the proverbial battleship, solid and reliable but able to manoeuvre only slowly. The legacy of a bureaucratic management system, however, is that it is very difficult for organisations to be flexible and adaptive. Most stories of deep change in organisations are about crisis-led, episodic change where the CEO is hero and change is a "top-to-bottom cascade of tightly scripted messages, events, goals, and actions" (Hamel & Breen, 2007, p. 43). This thesis joins with Hamel and Breen (2007) in seeing the main impediment to continuous, trauma-free renewal and adaptability as organisations' investment in old mental models and existing strategies. While people are very adaptable, organisations are usually not, as management processes and strategies tend to squash and deplete the natural resilience and creativity of workers. The consequences of this organisational inflexibility in the current turbulent environment are at least two-fold. First, managers struggle to keep up with the pace of change, and, second, conventional planning methods cannot cope with increased uncertainty. As a result, as Leith (2008) observes, tried and tested management methods are becoming ineffective.

Just as managers are seeking practical responses to the turbulent and uncertain environment, scholars of management are trying to find theoretical responses to the same conditions. Complexity theory, defined as "the study of how order, structure, pattern, and novelty arise from extremely complicated, apparently chaotic, systems and conversely, how complex behavior and structure emerges from simple underlying rules" (Cooke-Davies et al., 2007, p. 52), has been enthusiastically embraced by a number of management disciplines. Though offering a significant opportunity to understand organisations in new ways, Zhu

(2007) disappointingly notes that "achievements in natural complexity sciences are enthusiastically transferred into explanations of organization change and management" (p. 445), but in the process they are often made to fit the old management paradigm. For example, complexity theories are often transferred into management via the notions of "simple rules," "edge of chaos," and "fitness landscape." However, Zhu (2007) argues, management scholars fail to notice that

> if rules are specifiable and imposable they are not genuinely emerging; if organizations can be moved to and positioned at the edge of chaos they are then subject to intentional manoeuvre, not self-organizing; and if a population of strategies rather than a single strategy are employed, then more, not less, formulation and implementation is needed. (Zhu, 2007, p. 446)

Having used complexity to stress the unpredictability of the future, the need for emergence, and the failures of strategy, complexity-in-management writers are often caught in contradictions by also calling for greater foresight, organisational intervention, and more strategy (Zhu, 2007). As a consequence of their inability or unwillingness to abandon the managerial paradigm, the potential for insights from the complexity sciences to revolutionise management is lost.

Fortunately, not all management scholars using complexity theories fall into the trap of subjugating new theory to old paradigms. Zhu (2007) cites Stacey's (2001; 2003; 2007) work (to be explored in detail in subsequent chapters) as an exception to these shortcomings. When applied in their intended spirit, as Zhu (2007) cautions they ought to be, complexity theories have the potential to deliver organisations from the traditional command-and-control perspective by undermining the notions of linearity and predictability that managerial intentions are built on. Alongside complexity theories, postmodern approaches have also challenged the dominant worldview shaping understandings of organisations. Postmodern theories focus on processes rather than outcomes, challenging the site of knowledge and not seeing reality as independent of humans. Humans are seen as active agents who engage with one another and knowledge is understood to be constructed through the social processes of communication (Penman, 2000). From a complexity-driven, or postmodern, perspective, managerial control within an organisation is an unattainable goal. Accordingly, these theoretical perspectives require a fresh take on the role of management in organisations, and, on the role of KM.

Some organisational scholars, as this chapter now explores, are already using these theoretical lenses to challenge the dominant managerial paradigm and respond to complexity and change in the environment. Hardt and Negri (2000), for example, argue that changes in the global economy and organisations are leading to production being "informationalized" rather than industrialised, with the consequence of increased emphasis on social knowledge built on flexible relationships and enterprising conduct (Iedema, Rhodes, & Scheeres, 2005). In Hardt and Negri's (2000) postmodern global economy, all workers in information-centred and responsibility-based organisations are regarded as knowledge specialists, who take part in new kinds of interactions through a variety of networks. The active participation of workers in organisations and economies that are built around the flow of information threatens the notion of centralised managerial control (Iedema et al., 2005).

In this new order, information is no longer conveyed up and down the organisational hierarchy by management. Instead, all workers contribute to a responsibility-based organisation, whether as team members, representatives of a brand, contributors to problem solving, or attendees at meetings. For KM, conceptualisations of workers in this vein contrast with early understandings of knowledge workers that privileged the idea of specialists. Drucker (1993), for example, excluded production workers from his description of knowledge workers. This thesis takes the stance, along with a number of scholars, that KM is no longer about privileging traditional forms of knowledge held by a few at the top. Instead, KM, in response to contemporary conditions, needs to take a broader view where practical skills of workers and their wider practices and contextual experiences constitute new forms of knowledge (Alvesson, 1993; Scheeres, 2006).

However, even if all workers are valued as knowledge workers in a postmodern world, the shelf-life of information is decreasing as change occurs at increasing speed. This is reinforced by the shift in business towards short-term project work, multiple careers, self-managing teams, and increasing specialisation (Standen, McKenna, & Williams, 1998). In bureaucratic organisations, workers were responsible and accountable for a single, well-defined "job" – now those definitions are more fluid and often seen as a waste of knowledge and skills (Scheeres, 2006). Thus, this chapter argues that KM scholars need to realise and emphasise to the wider management community that it is not knowledge itself that

is important, but the ability to acquire it, evaluate it and make judgements about it. Knowledge workers adaptive to contemporary conditions require strong critical thinking skills and the ability to evaluate the validity and reliability of information quickly (Blair, 2002). Autonomous managers with analytical skills might be replacing middle management, but these workers can be more loyal to their skills or expertise than to their organisations. They tend to want to work in jobs where they can use and improve their skills, so they tend to be highly mobile (Blair, 2002), thus raising another issue for KM to address if it is to remain relevant. Complexity and change in society have affected the individual worker as well as the organisation. KM needs to address knowledge as it relates to both.

Reinvigorating KM in response to contemporary conditions

The rapidly changing and increasingly complex modern environment points to the need for KM to be a dynamic and fluid field if it is to remain relevant to organisations. In addition to being responsive to contemporary conditions, this thesis argues that KM also needs to question the worldview that has shaped it thus far. This chapter describes several aspects of what I see as the inherent tension between the traditional management paradigm and the contemporary social environment that KM faces. The traditional management paradigm bases its outlook on the premise of a stable, scientifically-knowable world. This perspective sees management as being about reducing uncertainty, minimising risk, and controlling operations for organisations while simultaneously maximising profit. Yet, the prevailing environment, in which organisations now operate, is characterised by rapid change, complexity, significant shifts in values, new ways of connecting, fragmentation, unexpected discoveries about the brain, and newly emergent roles for both individuals and organisations. KM as a field, I believe, needs to move away from the traditional managerial perspective to be appropriate for the evolving contemporary conditions.

Fortunately, this thesis argues, KM scholars and practitioners are currently participating in the definition and advancement of a new worldview more aligned with contemporary conditions. This worldview fosters self-management and democracy and relationships of interdependence. It stresses innovation and creativity. It rejects a linear, cause and effect model in favour of a holistic

approach and understanding the world as a complex web of interconnections (Leith, 2008; Denning, 2010). Already, the beginnings of this worldview are evident in KM. As chapter two illustrated, a number of scholars are resisting the subjugation of knowledge to the rational model, and are instead proposing understandings of knowledge that reflect complexity, processes, and relationships (see Stacey, 2001; Orlikowski, 2002; Hasgall & Shoham, 2007; Parent et al., 2007). Further, the terms "social KM," "connective knowledge" and "KM2.0" recently introduced to KM and explored in more detail later in this thesis, embody many of the characteristics of this new outlook. Given the fledgling nature of this fresh perspective, the danger is that these new themes and concepts will end up being incorporated into the outmoded, 200-year-old managerial worldview.

This chapter argues that, for its own health as a field, and for what it can add to society, KM should avoid becoming just another management discipline that supports a style of management at odds with contemporary conditions. Accordingly, it encourages KM scholars to be more reflexive about the relationship between "knowledge" and "management." While it has shown, albeit with broad strokes of the brush, how the old management paradigm conflicts with the current conditions, the following chapter moves from macro environment factors to their embodiment in language to delineate more carefully the significant impact the dominant understanding of management has had on KM. Primarily, it argues that KM is constrained by its own discourse, because that discourse embeds the values and reflects the perspective of a command-and-control management style. It further suggests that how KM scholars talk about such mental constructs as knowledge determines how those constructs are treated in practice. However, by unpacking the term "knowledge management" to reveal the assumptions it is built on, it extends this chapter by showing that the field also has opportunities for stepping outside the traditional management paradigm.

Chapter 4 – The management of knowledge

The previous chapter identified a number of contemporary conditions that present an opportunity to redefine the development of KM. This chapter extends discussion of one of those conditions – the increasing complexity of organisational environments. This thesis contends that the emergence of a worldview grounded in complexity, and challenging the traditional perspective of linear progress towards a pre-existent reality, requires a different approach to understanding how organisations can be managed. Accordingly, with particular scrutiny of how the language of KM embeds the values of the traditional outlook, this chapter critiques KM's relationship to the rationalist perspective given today's complex conditions. It further argues that, for KM to be effective in organisations, the discourse of KM needs to reflect the values and language of contemporary society rather than that of traditional management.

The chapter also looks at how to effect the process of change that such a shift in discourse requires. As a starting point it looks at assumptions that underpin the traditional managerial paradigm as factors about which KM scholars and practitioners need to be aware. It proposes that they also need to pay attention to the language they use to describe knowledge and its management, as it is in the language that these assumptions are embedded. The following discussion, by drawing attention to the fraught relationship between knowledge and its management, provides an account of the assumptions ingrained in the prevailing discourse of KM. Then, before the next chapter proposes specific ways the KM community might work to change its dominant discourse, this chapter explores ways in which the management of knowledge can be reconfigured and freshly understood.

KM in social complexity

In the Industrial Age, people were, as Ehin (2009) so succinctly puts it, "primarily hired for the use of their hands and feet instead of their minds" (para. 5), with thinking and directing restricted to managerial roles. In contrast, the current era, with its concepts like "the knowledge age," "knowledge workers," and "knowledge economies" seems to offer an opportunity for new understandings of

management to accompany new understandings of work. However, as Hasan (2008) regretfully acknowledges, the so-called Information Age has in some ways paralleled the Industrial Age – the automation of work by new technologies and the abundance of information have not really empowered the knowledge worker. This chapter agrees with Hasan's (2008) claim that "a fresh agenda is required for the KM community to ensure research and practice is relevant to this new complex environment" (p. 29), and considers it in relation to management in particular.

Calls for a new approach to the managerial aspects of KM echo similar calls for a change in focus in managerial studies in general. Denning (2010), in proposing the concept of "radical management," claims that traditional management is dysfunctional and needs to be transformed. He argues "a mental model of management is being pursued…that methodically prevents any individual management fix from permanently taking hold" (p. 8). Lamenting the lack of recent managerial innovation, Hamel and Breen (2007) similarly encourage organisations to revitalise management in response to contemporary conditions. These rallying cries for management at large are equally applicable for KM in particular. This is especially the case inasmuch as KM's often unquestioning adoption of the traditional command-and-control managerial outlook has impacted on the developmental direction and application of KM.

However, as chapter three noted, it is not easy to abandon the established managerial perspective, not least because it is so enmeshed with the broader worldview of western society. In fact, as Richardson (2008) notes, the change in worldview that necessarily accompanies a change in managerial practice, is a difficult process. He rightly argues that "the shift from a linear simplistic attitude to a nonlinear complex attitude is significantly more challenging than a simple switch from one framework/tool to another" (Richardson, 2008, p. 24). Hamel and Breen's (2007) reflection on how the ingrained nature of the management paradigm makes it difficult to develop alternatives succinctly captures the practical consequences of its dominance: "Given how little the practice of management has changed over the last several decades, it's hardly surprising that most people have a hard time imagining how management might be reinvented in the decades to come" (Hamel & Breen, 2007, p. 3).

Nevertheless, a number of KM scholars are expressing their dissatisfaction with the continued dominance of the old managerial paradigm in the new conditions. For Murphy and Pauleen (2007), the latest ICTs and the need for creative people, means "it is no longer possible to manage [individuals] in traditional ways" (p. 1008). They argue that conditions that support creative individuals (flexibility, horizontal networks, loose structures) often are in direct opposition to the dominant organisational reality (silo mentality, vertical structures, rule-based activities). This dominant organisational reality becomes absurd when, as Ehin (2009) notes, "whether we like to admit it or not, all activities and interactions between people are governed by emergent relationships or self-organization" (para. 41). Hasan (2008) sees absurdity, too, in management's attempts "to impose order by developing ever more complex systems" (p. 27) despite "the natural tendency for disorder" (p. 27) borne of complexity in the environment. Further, from his unique perspective as a consultant philosopher for managers, Saarinen (2008) argues that managers by necessity deal with the unknown, the unclear and the unfolding. In short, there is considerable evidence in the literature to suggest that complex, emergent organisational and social environments do not lend themselves to traditional management practices.

Other KM scholars have focused on the managerial worldview as being inappropriate not so much because of complex social conditions, but because of the assumptions such a view makes about knowledge. For example, Day (2005) critiques main approaches to knowledge in KM as being based either in mentalism (where abstract concepts are reified) or functionalism (where human agency is seen to be caused by biological or social events). According to Day, "what is needed is a psychological model that accounts for *both* personal expression and social context without splitting these two terms into a classical Cartesian dualism or collapsing personal expression into a pure effect of biological or social events" (p. 631). His expressionist theory of knowledge sees it as both potential and actualised. From this perspective, neither self nor knowledge is empirical – both are hypothetical conceptual unities used to explain actions (Day, 2005). Similarly, Gueldenberg and Helting (2007) challenge accepted underpinnings of KM by offering the philosophy of Heidegger whose phenomenological interpretation of how humans dwell in the world rejects the Cartesian split between the objective and subjective. This thesis joins with Day (2005), Gueldenberg and Helting

(2007), and others in questioning the philosophical underpinnings of the managerial paradigm.

Given that there is a range of scholars calling for a fresh approach, it seems pertinent to ask why the challenge of abandoning the conventional managerial outlook has not been met in KM. One answer, I believe, lies in the fact that, until now, KM as a field has been dominated by positivist scholars whose ontological and epistemological assumptions continue to support the traditional understanding of management. Such scholars, to quote Owen's (2009) neat summation, unquestioningly see "the function of management…as making the plan, managing to the plan, and meeting the plan" (para. 27). However, he continues, contemporary conditions suggest

> we can make any plan we want to, but managing to that plan is an act of frustration, and meeting that (original) plan is not only impossible, but probably inadvisable. Worst of all (perhaps best of all) it turns out that the systems we are supposed to control, to say nothing of the environment in which they exist, are so horribly complex as to defy comprehension. And what you can't comprehend is very difficult to control. (Owen, 2009, para. 27)

Thus, clinging to old belief systems about management puts KM's theoretical foundations on a collision course with the demands of the current financial, organisational, and social environment. Furthermore, these old belief systems are "ingrained in apparently objective or neutral language" (Jones & McKie, 2009, p. 182), making it difficult for them to be challenged. Yet, an inherent tension exists in the field of KM that can potentially be exploited to disrupt the connection to the traditional paradigm. That tension is found in the combination of "knowledge" and "management."

The language of (knowledge) management

A number of KM publications have reflected on the meaning of "knowledge management" in terms of the practice of KM (see Firestone, 2008; Lloria, 2008). Less attention has been given to the assumptions embedded in the union of "knowledge" and "management" and how they might shape the discourses and perspectives of KM. Alvesson and Kärreman (2001) are among the few scholars to have acknowledged the rhetorical appeal of KM as a term. In addition to noting its attractiveness, however, they highlighted that a perhaps inevitable consequence

of uniting "knowledge" and "management" was to create a subject with allure for a "wide spectrum of academic orientations" (Alvesson and Kärreman, 2001, p. 996). As discussed in previous chapters, the multidisciplinary nature of KM has meant a range of often conflicting ontological and epistemological perspectives are united under the same topic area.

These conflicts can be tracked in language. Even in KM's formative years, Gladstone and Megginson (1999) noted that the definitions and metaphors of KM were the objects of competition for various management disciplines. Beyond disciplinary differences, however, Alvesson and Kärreman (2001) also highlighted KM's implicit assumption that knowledge can indeed be managed. Insightfully, they predicted "fundamental problems with the idea of the manageability of knowledge" and understood that "the oxymoronic character" of the concept of KM would be "difficult to resolve" (Alvesson & Kärreman, 2001, p. 996). Their words have proved prophetic for the field.

The union between knowledge and management is an uneasy one as a brief comparison of the two words illustrates. It is difficult to provide a succinct denotative meaning of "knowledge." The *Collins Concise English Dictionary* (1992) gives the following:

> 1. the facts or experiences known by a person or group of people. 2. the state of knowing. 3. consciousness or familiarity gained by experience or learning. 4. erudition or informed learning. 5. specific information about a subject. (p. 724)

In contrast, "management" (when referring to the practice rather than people) is more readily defined denotatively as "the technique, practice, or science of managing or controlling" (*Collins Concise English Dictionary*, 1992, p. 804). Clearly this is just a simple dictionary definition, and I want to acknowledge that far more complex understandings of management exist in the academic literature. Indeed, Nonaka and Takeuchi (1995) trace how understandings of management have shifted from the scientific management of Taylorism to the resource-based view of organisations that tries to help companies compete in global and ever-changing environments. However, Stacey (1996), in his early call for the inclusion of complexity science in organisational theory, points out that almost all understandings of management share "an unquestioned assumption that successful organizations are systems tending to states of stable equilibrium adaptation to

their market, societal, and political environments" (p. 5). Successful management is then about identifying changes in those environments as soon as possible and aligning an organization to fit them: "In other words, success depends upon being 'in control', or at least achieving control faster than one's rivals" (p. 5). Certainly, this fundamental belief that management is about planning and organising for control of the organisation in response to change is at the core of KM.

So, even given more nuanced understandings of management than the dictionary definition suggests, within KM "knowledge" remains connotative of abstract ideas, value, education, experience while "management," in contrast, has connotations of action, business, hierarchy, control. It seems unavoidable, then, that uniting the two terms creates some linguistic and ideological tension. Framing this tension as thought-provoking, inspirational, and motivating for KM, rather than restrictive and oxymoronic, this thesis does not call for the abandonment of the term "knowledge management." Rather it argues for greater critical reflectiveness from scholars and practitioners on how "management" can best be understood in relation to "knowledge."

Such critical reflexivity has largely been missing from the dominant discourse of KM. The very early KM community uncritically accepted knowledge as part of a hierarchy by adopting ideas from IS. Data was understood as the raw material for information, information as the raw material for knowledge, and knowledge, in turn, the raw material for wisdom (Sharma, 2005). This "knowledge pyramid" influenced development of the metaphorical representation of knowledge as a product (what you got when you distilled or transformed information) and as a resource (what you used to generate wisdom). Indeed, the adoption of the IS perspective has been so pervasive that Scarbrough, Robertson, and Swan (2005) argue that "the IS community has been highly successful in colonizing the discourse of KM to advance its own agenda" (p. 204). Though understandings of knowledge have now moved on from the simplistic knowledge pyramid, the language used to describe knowledge remains dominated by the physical metaphors inherited from these beginnings. Just a few years ago, Andriessen (2008) studied the KM literature and found the dominant metaphors to be of knowledge as "a resource," "an asset," or "property." He identified these views of knowledge as commensurate with, respectively, strategic, accounting, and legal management discourses (Andriessen, 2008). Tellingly, all three dominant

metaphors take a functionalist approach that obscures the association of knowledge with social interaction, beliefs, truth, and other more amorphous aspects of organisations.

Furthermore, these common metaphors (*resource*, *asset*, *property*) of KM embody a range of assumptions about knowledge. The two most important of these for organisations are, firstly, that knowledge is a valuable resource, and, secondly, that it can be managed. Chilton and Bloodgood's (2008) assertion that "knowledge is considered to be *the* basis of competitive advantage for organizations…and its management is key to the success of the firm" (p. 77) neatly captures these assumptions. The value and manageability of knowledge are frequently stated in the KM literature. As the first two chapters of this thesis illustrated, this is in part a technique by which KM scholars justify their topic's status. As well as building the academic standing of KM as a management discipline, however, these techniques serve to entrench the dominance of the managerial paradigm.

It is thus unsurprising that Grossman (2007) claims that "in today's turbulent business environment drivers such as globalization, technological innovations, and an ever-changing work force, make the capture and codification of corporate knowledge a number one priority and a strategic imperative" (p. 37). This, and such similar claims as Wong and Aspinwall's (2004) view that "knowledge, if properly harnessed and leveraged" (p. 44) can lead to organisational success, cement the idea of knowledge as an object that can be manipulated by an organisation. Other up-to-date KM literature continues to cement both the reification of knowledge and its place in the managerial paradigm. According knowledge a false physicality through the use of language, Schmidt (2009) confidently endorses Cohen and Levinthal's twenty-year-old assertion of an organisation's ability to "identify, assimilate and exploit" (1989, p. 569) knowledge from the environment. Collectively, these citations demonstrate how the language of KM reflects and embeds the assumptions and values of the managerial paradigm. In other words, knowledge has cleverly been appropriated as an intangible organisational asset by managerial discourse, and can therefore be valued for its ability to produce competitive advantage (Meehan, 1999).

Managing knowledge

By tying the value of knowledge to competitive advantage these views perpetuate the notion that knowledge must be subjugated to the rational strategies of management (Meehan, 1999). The perceived potential of KM to positively inform management practice has led to knowledge being appropriated to help with the goal of making organisations more competitive and efficient (Harrison & Young, 2005). Yet the slipperiness of the concept of knowledge in KM invites reflection about just how appropriate it is to consider knowledge as a resource. It also brings into question whether it can, in fact, be managed in the traditional usage of the word. Moreover, even if knowledge is a manageable resource, is it justified to assume it should be managed by organisations rather than by individuals?

The objectification and appropriation of knowledge that occurs as a result of KM's development from, and rarely-questioned adoption of, the managerial worldview, has attendant consequences. First, particular types of knowledge are seen as leading to competitive advantage. Even though knowledge has always been part of organisations, it is theoretical, scientific, and technical-rationalist knowledge that has become more central than ever before. This type of knowledge is valued over other types of knowledge as it is seen as more likely to improve competitive advantage (Meehan, 1999; Tsoukas, 2003). As a consequence, Tsoukas (2003) argues, modern organisations have come to mistrust other types of knowledge – such as intuition, ad hoc practices, and personal commitment - preferring instead articulate rationality, systematic procedures, and detached objectivity. This can occur even when emphasis is placed on tacit knowledge. Although supposedly ineffable and personal, this too can be subsumed into a managerial perspective as Chilton and Bloodgood (2008) illustrate:

> not all tacit knowledge should be made explicit and…management of knowledge is possible without having to make it explicit…however, the knowledge must first be identified and classified as tacit or explicit and its strategic importance must also be identified. (p. 77)

In addition, to facilitate its management, knowledge is best perceived as a physical object. This helps to account for the dominance of metaphors that construct knowledge as an object or resource. This predominantly uncritical adoption of the language and values of the management paradigm, combined with the functionalist outlook of the field's IS antecedents, has positioned knowledge as a substantial thing that is located in the physical world (e.g., in people's heads

or in products). Grillitsch, Müller-Stingl, and Neumann's (2007) typical representation of knowledge as "embedded in structures, routines, competences, technologies" (p. 21) encapsulates this perspective. Increasingly, however, the ever-expanding number of definitions and conceptualisations of knowledge in KM threaten its perceived manageability and seeming solidity. How does an organisation control a resource that has been variously described as found in individuals (Walsham, 2002), communities (Lave & Wenger, 1991), collectivities (Lindkvist, 2005), organisational systems (Parent et al., 2007), business routines and processes (Teece, 1998), discourse (McPhee, Corman & Dooley, 2002), and practice (Orlikowski, 2002)? Unsurprisingly, the KM literature struggles to resolve tensions between knowledge and its management.

A further consequence of the union between a managerial outlook and knowledge is that knowledge is often reified as if it were separate and disembodied from the people who produce it (Meehan, 1999). This can happen even while it is argued to be socially constructed. When KM scholars promote a shift in focus from a positivist outlook to a social constructivist perspective in relation to knowledge, they often remain grounded in a modernist, rationalist outlook in relation to management. They end up, as Meehan (1999) so vividly puts it, on "epistemological banana skins" (p. 5) as they try to reconcile the discourse of management with current understandings of how knowledge is a socially interactive process. For Tsoukas (2003), part of the problem of reconciling social understandings of knowledge and management lies in the influence of the dominant social worldview: "In the social world, specialist, abstract, theoretical knowledge is necessarily refracted through the 'lifeworld' – the taken-for-granted assumptions by means of which human beings organize their experience, knowledge, and transaction with the world" (p. 419). In other words, it is difficult for both organisational members and KM scholars to question the ontological and epistemological assumptions around knowledge when they also underpin so many other aspects of daily existence.

Some KM scholars, however, have openly challenged the management paradigm's objectification of knowledge as an organisational asset. Like Tsoukas (2003), Day (2005) encourages KM scholars to reflect on their worldview, suggesting that they need to critically think about culture, the role of theory and practice, the assumptions of a cognitivist view of knowledge and so on. He argues

that locating knowledge in the human head "suggests not only the conceptual metaphors in use but the fuzziness of the discourse and the empirical work that follows from such" (Day, 2005, p. 630). Walsham (2005) also called for a change in the language used to discuss KM – "we should stop using phrases such as 'knowledge repositories', 'knowledge transfer', and even 'knowledge sharing'" – so that the focus shifts from knowledge-as-object to "how to support sense-reading and sense-giving processes, how to facilitate knowledgeable action, and how to enable effective interaction between people with different tacit power and understanding" (p. 16).

It is often a struggle, however, to completely avoid the reification of knowledge that is embedded in the language of management. Zorn and Taylor (2004), for example, in considering KM from the perspective of organisational communication, conclude that it is fundamentally concerned with sense-making, meaning, and the process and product of text construction. However, they also note, "if there is any hope of truly managing knowledge, we must have clarity regarding what it is we are attempting to manage and where it is located" (p. 108). The implication is that knowledge is both manageable and locatable. This thesis, too, struggles to avoid according knowledge a false sense of physicality. As the next chapter points out, this is partly a feature of the grammar of English as well as an outcome of socialisation into a dominant worldview. What this thesis advocates as important, though, is not so much the avoidance of reification but a critical awareness of the assumptions that reification contains.

A further effect from linking knowledge to competitive advantage and reifying it so it can be managed, is to emphasise a particular role for managers in relation to knowledge. Managers are seen as controllers of organisational prosperity (Meehan, 1999), which they achieve by breaking large tasks into small steps to increase efficiency, standardisation and profit (Hamel & Breen, 2007). The role of managers in the traditional management paradigm, according to Zhu (2007), is "to design organization strategies, policies, structures" (p. 445) and so on, that control activities to achieve coherent patterns that end in intended outcomes. It is a role that elevates discipline over adaptability, efficiency over ethics, and standards of quality over imagination and initiative (Hamel & Breen, 2007). Understanding management in this way has had a significant impact on KM. Alvesson and Kärreman (2001), for example, see the management of knowledge being treated

with a lack of sophistication because KM for the most part "treats management as something that is either self-evident and unproblematic…or…black-boxed and unexplicated" (p. 1000). Consequently, the application of the values and language of management to KM remains under-explored.

Knowledge and power

Beyond the idea of knowledge as a product or resource that can be managed, a further assumption, implicitly embedded in the language of KM and reflective of the values of the managerial paradigm, is that organisations have a right to manage knowledge. This chapter argues that the ethics of this assumption deserve questioning. Zorn and Taylor (2004) have considered this issue, rightly pointing out that the dominant metaphors of KM discourse (the *capture, harvest, extraction* and so on of knowledge) reinforce the idea that knowledge may somehow be controlled for organisational uses. They note that this "is disturbing to many" (Zorn & Taylor, 2004, p. 109). Undeniably, the very idea of knowledge as an intangible asset or organisational resource is based on the assumption that organisations own, value and control knowledge, even if it does reside in the heads of their workers. Even before KM became firmly established as an academic field, Alvesson (1993) felt that the newly emerging generation of knowledge organisations was attracted to the mystique of knowledge as a resource and a source of power. However, in a further demonstration of the dominance of the management paradigm, this was a theme that was little explored in the subsequent explosion of KM publications.

Drawing on Foucault's work in arguing knowledge is constituted by the outcomes of power struggles, Gordon and Grant (2005) make the case for a more central role for power in KM. Their study of the KM literature shows how little power has featured in the literature on knowledge. Their findings support Alvesson and Kärreman's (2001) earlier observation that very few early KM scholars questioned whether knowledge was inherently a good thing, what problems knowledge might lead to, what constraints knowledge could impose, or how knowledge might be connected with power. Where the relationship between knowledge and power was addressed, Gordon and Grant (2005) found that the "knowledge is power" dictum was preferred. This approach favours the idea that

the possession of knowledge leads to the possession of power (Gordon & Grant, 2005).

My own reading shows this remains a salient theme in the literature. Stowell's (2007) recent study, for example, regards information as the new means of production in the knowledge economy, and rightly points out that the availability of large amounts of information in the knowledge economy is not egalitarian. Access to much of the information available requires technical, financial and educational abilities, and Stowell (2007) argues that those who control its source and distribution have more power than those who do not. As well as taking this approach to power, however, this thesis supports Gordon and Grant's (2005) call for scholars to pay more attention to power as enabling, driving, and shaping the production of new knowledge. Organisations have their own meaning systems, and KM systems can either reinforce or disperse the power in those systems (Gordon & Grant, 2005) – these themes also need exploring in KM.

While in a minority, some KM scholars have considered these issues around power in the management of knowledge. Kinsella's (1999) early study on knowledge within scientific organisations emphasised the roles of power and discourse in constructing knowledge. He noted that when results generated in the labs were up for interpretation it was not science that determined which results were accepted. Instead the determining factor was what knowledge best served the organisation's interests, interests shaped by the culture and discourses of the workplace (Kinsella, 1999). Others have also highlighted the rhetorical nature of knowledge texts and their construction (see Giroux & Taylor, 2002; Zorn & Taylor, 2004; Lyon, 2005; Kuhn & Jackson, 2008). These scholars have demonstrated that what is commonly discussed as objective, explicit knowledge is in fact socially produced text that privileges and justifies particular forms of knowledge. Giroux and Taylor (2002) also pointed out that management, a community both within and beyond organisational boundaries, is a participant in the process of constructing and justifying knowledge rather than an objective administrator of knowledge as a product. Similarly, Edwards (2007) has also critiqued the assumption that knowledge is a material object, instead understanding it as a political process during which agents actively shape meanings and make choices. All these contributions call into question the

dominant assumption of KM that management can and should control and command knowledge.

Criticisms of the managerial paradigm

Incorporating KM into the existing dominant understanding of management has not been the only option for the field. In its early days, a number of critical scholars emphasised the emancipatory potential of KM. They saw KM as providing an opportunity to redistribute power in organisations: "The advocates of knowledge management have spoken from the beginning about the need to create a different kind of organization," claimed Gladstone and Megginson (1999, p. 3). Redefining workers as knowledge workers seemed to offer the bonus opportunity of redefining organisational management. Rather than privilege traditional views of knowledge held by a few at the top of the hierarchy, the skills, practices and experiences of individual workers were considered worthy of attention in KM (Scheeres, 2006). Specialist workers, in particular, were seen to carry, as Drucker (1993) had posited, the means of production and competitive advantage with them. This shifting understanding of work allowed Meehan (1999) to hold out some hope that KM could become conceptualised in a way that allowed knowledge workers to have power over their knowledge, and so undermine the managerialist paradigm (i.e., where managers hold the power in an organization). In the same way, others thought that new "knowledge workers [would] require new types of leadership style and discourse" (Harrison & Young, 2005, p. 46). Early conceptualisations of the knowledge economy also promised to dismantle the dominant organisational bureaucracies and foster workplaces that were less hierarchical, more participatory, self-managing, and focused on relationships rather than tasks (Scheeres, 2006). These scholars, like this thesis, wanted KM to call into question the traditional view of management.

Critical scholars have, however, been largely disappointed with the outcomes of KM. For example, Tsoukas (2003) complained that tacit knowledge had been misappropriated by management studies, with the result that organisations have come to over rely on theoretical, scientific knowledge to optimise their functioning. Other scholars have particularly critiqued the assumed consensus promoted by the community of practice approach to studying knowledge in

organisations (see Lindkvist, 2002; Walsham, 2005; Kuhn & Jackson, 2008). Walsham (2005) understood Lave and Wenger's (1991) approach to communities of practice to be sensitive to issue of power, but felt it was "hi-jacked to a large extent by managerialist interpreters such as Brown and Duguid, who saw only consensus within communities and implicitly supported managerial-control agendas" (p. 10). Kuhn and Jackson (2008) continued this theme, addressing "simplistic assumptions about intracommunity consensus that prevent examinations of power" (p. 456) in their study, they suggested a framework for how knowledge might be studied in organisations. Furthermore, some KM researchers have drawn attention to the way knowledge organisations largely retain the old hierarchies. Workers' increasing participation in Hardt and Negri's (2000) "informatized" organisations (discussed in chapter three) is not necessarily indicative of the demise of command and control management. Rather, managerial control is being exerted in new ways. Iedema et al. (2005) and Scheeres (2006) propose that managerial expectations of literacy, communication, shifting identities and continuous learning, for example, are used to govern workers.

Still other KM scholars have called attention to some of the risks in situating KM in a management paradigm. One such risk is that in accepting the authority and reification of "knowledge work" and other related concepts, academics are put in danger of reproducing and legitimising a particular social division of labour within capitalism. Knowledge, as Knights, Murray and Willmott (1993) argue, is present in all forms of activity and the use of a phrase like "knowledge worker," by privileging one kind of work over the other, makes that invisible. Meehan (1999) expressed similar concerns, proposing that knowledge was identified as an intangible asset in order to retain a sense of control over workers, particularly in the face of rapidly changing external conditions that threatened the role of management. He also argued that scholars, accepting "the naturalness of the dominant rational/managerialist discourse of strategy" (Meehan, 1999, p. 3), become complicit in its reproduction. This thesis advocates, at the very least, a questioning of that discourse for KM to remain relevant to organisations in light of contemporary conditions.

Alternatives to the managerial paradigm: Structural, individual, managerial

While the dominant narrative of KM suggests that many KM scholars are subscribing to and reproducing the values and assumptions of the traditional managerial paradigm, there are plenty of voices in the margins who, like this chapter, are arguing for a fresh approach. These voices are developing in parallel with comparable calls from the more traditional business management disciplines to expand the understanding of what it means to manage. Zhu (2007) notes that the influence of complexity theories has led some to realise that "organization change cannot be planned-and-implemented because change patterns emerge unpredictably in myriad local interactions" (p. 448). In this context, "visions, strategies and initiatives from leaders and managers are no more than gestures…calling forth responses from many, different, local agents" (Zhu, 2007, p. 448). This is a theme echoed by Cooke-Davies et al. (2007) in relation to project work management. In fact, Cooke-Davies et al. (2007) call for project management to "refocus attention away from managerial intervention 'from outside'" (p. 59) towards joint action achieved through conversation. The need for modern management to change its approach is driven by recognition "that we have limitations, and that we can never have complete control over the future evolution of our organizations" (Richardson, 2008, p. 13), something Richardson finds emancipating.

Within KM itself, a number of scholars are calling attention to the incompatibility of a traditional understanding of management in relationship to organisational knowledge, and they propose several ways in which management can be re-visioned. A common theme that this chapter has identified is the call for organisations to reconfigure organisational structures in ways that encourage collaboration. In *Unleashing Intellectual Capital* (2000) and *Hidden Assets* (2004), Ehin argues that organisations tend to be controlled-access systems or shared-access systems. The former are characterised by few members having access to organisational resources. The exercise of power and gatekeeping duties means the focus of the organisation is compliance to existing structures rather than the emergence of new ones. The latter gives all organisational members some autonomy in decision-making and in resource allocations. Expert power rather than position power determines outcomes and there is more emphasis on situational leadership and self-organisation in solving problems, or in pursuing

opportunities (Ehin, 2009). In shared-access systems personal commitment is emphasised over compliance. Hasan (2008) also sees the desire to impose order on complexity via large and stable structures rather than allowing multiple self-organising networks to emerge as a major cause of what she calls un-sensible organisation. The loose structure of self-organising networks, and the broader distribution of power and autonomy that these engender, are seen as crucial to emergent understandings of knowledge.

This chapter sees the theme of self-management by individual organisational members also developing in the KM literature. Malhotra (2001) argues "the concept of 'management' has been interested in very narrow terms of *control by compliance*" (p. 11) but is better understood as self-control. Individual knowledge workers, he argues, need to self-regulate and self-lead in contemporary organisations. Management's role is to nurture organisational members' self-regulation and self-leadership, and to facilitate the confidence of people to decide and act in the face of incomplete information and rapidly changing situations (Malhotra, 2001). Similar ideas underpin Hasan's (2008) notion of sensible organisation, which has the goals of emphasising human dimensions, giving people the right to have more choice in what they think and do, and fostering the democratisation of corporate knowledge.

Hasan's (2008) call for sensible organisations to re-humanise the workplace addresses similar concerns to Ehin (2009). Ehin (2009) argues that knowledge workers want personal autonomy in conjunction with some responsibility for running at least part of the organisation. Being treated as partners in, contributors to, and associates of an organisation rather than employees makes people more likely to participate in collaboration. For Ehin (2009), part of a supportive environment is giving people a voice and implicit control over their area of expertise, in order for informal networks to function more openly and thus connect with other emergent groups. These concerns surrounding individual organisational member participation are beginning to coalesce in KM under the umbrella of personal knowledge management (PKM) (see Avery, Brooks, Brown, Dorsey, & O'Conner, 2003; Jones, 2009).

A third theme in the KM literature that challenges traditional notions of management concerns the role of managers themselves. Hasgall and Shoham

(2008), for instance, position managers as participants in the knowing process within organisations. Their study found that managers who saw themselves as creators of solutions, controllers, and planners were ineffective in contrast to managers who worked at coordinating and integrating resources so that employees could respond to a situation, create a solution, or identify an opportunity (Hasgall & Shoham, 2008). This reconfiguring of the role of managers in KM can be assisted, this chapter argues, by a reconsideration of the role of the manager in the wider management literature. Finnish philosopher Saarinen (2008) has articulated a humanist approach to management by stressing that "managers are human beings and should be approached as such" (p. 1). Accordingly, Saarinen promotes the exploration of the "in-between" (p. 2) of philosophy and managerial life in such a way that managers are helped to self-lead, understand wholes, and be active in complex environments. In effect, Saarinen advocates an approach to management that encourages managers to act in their organisations as people first and managers second. This requires them to pay attention to emotion, intuition, and instinct in conjunction with rational thought and empirical data. These ideas are synonymous with the direction that this thesis advocates for KM as a field.

Saarinen (2008) also calls attention to the need for managers to get on despite the complexity of their environment and the continual presence of ambiguity and uncertainty – again issues this thesis has raised in connection with KM. Because he constructs management as being about holistic, human responsiveness to the internal and external organisational environment, he advocates that managers be more focused on context-creativity than content-creativity. Saarinen's approach is grounded in pragmatics and situational contextualism – he proposes that managers build their outlook around the question "how are we to live better lives right now?" (p. 16). Though Saarinen's "philosophy of management" sounds a little more ethereal than Hasan's (2008) "sensible organisation," Hasan, too, laments sophisticated but impersonal workplaces where "the art of making common sense decisions and judgements" (p. 30) has been lost. Amongst the characteristics of sensible organisation are the ability to acknowledge and learn from mistakes, an appreciation of people as parts of systems and networks, the valuing of diversity, the appropriate adoption of the latest ICTs, a supportive environment provided for teams, and the provision of time and space for reflection. Unlike Saarinen's, Hasan's comments are explicitly directed towards KM.

Pauleen and Harmer (2008) unite all three of these themes in their description of the "nanobot" (Nearly Autonomous, Not in the Office, doing Business in their Own Time employees). They cite a rise in full-time employees who are entrusted with extensive personal freedom, are technologically self-sufficient, and are high-achieving self-motivators. Such employees may be physically disconnected from their organisation and allowed to find "their own equilibrium between work and private lives" (Pauleen & Harmer, 2008, p. R.8). In other words, the nanobot is a new breed of knowledge worker. Clearly, however, a different type of workforce requires a different type of management. The role of management, Pauleen and Harmer (2008) suggest, is to set clear expectations, give freedoms to appropriate people, and develop a relationship based on trust. They propose "macro-management" over "micro-management." Though yet to garner much attention in academic circles, I believe Pauleen and Harmer's acronym deserves some attention from KM scholars for capturing how authentic and concrete changes in the conception of organisational structure, the individual knowledge worker, and the role of managers is beginning to manifest.

Conclusion: Knowledge + management

Despite the promise of a new order that a knowledge economy and knowledge organisations seemed to offer, it is not hard to argue that up until now KM has been colonised by the worldview and language of the traditional management paradigm. Nowhere is this more evident than in the language of knowledge. The functionalist viewpoint of the management paradigm, within which KM has positioned itself, is dominated by a vision of knowledge as a valuable resource that can provide competitive advantage. As a consequence, much effort has gone into figuring out how to include knowledge in organisations' books (Thompson & Walsham, 2004). Furthermore, as Wilson (2002) correctly saw, the coupling of "knowledge" and "management" has led to a reductive view of knowledge and a simplistic understanding of the relationship between knowledge and its management: "According to the rhetoric of 'knowledge management'…'knowledge' is now in the database, recoverable at any time" (pp. 49-50). Wilson was also extremely dismissive of the term "knowledge management," and (wrongly) predicted its demise, but this thesis argues that KM remains a valid concept.

This validity rests, however, on the KM community's ability to resist the functionalist, modernist, and scientific worldview of management (Gladstone & Megginson, 1999). While knowledge is often acknowledged in KM as constructed within organisations through social processes, the temporal, fragile, and power-related aspects of the construction, are typically not fully explored within this framework. In addition, metaphorical terms like "knowledge transfer" embody the notion of knowledge as physical matter, and set up a misleading expectation of a simple process of relocation. In doing so, they obscure the abstract, inexpressible, messy, and dynamic aspects of knowing (Allee, 1997). Consequently, this thesis argues that accepting the values and constructs of the management paradigm limits the potential of KM to face its unenviable task of managing the abstract and elusive concept of knowledge. For KM to reach its full potential, the KM community should be looking for alternative managerial approaches to cope with the complexity of contemporary conditions and direct organisations to do the same. Some KM scholars are doing just that, and this chapter has called attention to some fresh perspectives on management that exist at the periphery of KM scholarship – perspectives that question traditional structures, traditional understandings of employees, and traditional ideas about the role of managers. It has also explored how the language of KM is circumscribed by the language of management. The following chapter now focuses its attention on that language, with particular reference to the use of metaphor.

Chapter 5 – Re-imagining knowledge: Metaphors for KM

As this thesis frequently illustrates, attention to language in general, and the language of KM in particular, is critical. Accepting that the intangibility and abstractness of knowledge mean metaphors, with all their strengths and weaknesses, are inevitable, and inevitably significant, for KM, the following discussion argues that the field has yet to give them the attention they merit. This chapter follows a cluster of recent theory that makes language central to organisational theory and focuses on understanding organisations through metaphor and textuality (see Alvesson & Kärreman, 2000; Cornelissen, 2006a; Cornelissen, 2006b; Cornelissen & Kafouros, 2008a). Earlier chapters in this thesis have established that the computational paradigm and the organic paradigm identified by Hazlett et al. (2005) have been built around oppositional views of knowledge. The computational paradigm focuses primarily on explicit or "scientific" knowledge and the organic paradigm on tacit or "social" knowledge. This chapter argues that specific language and, in particular, specific metaphors, accompany this division of knowledge into two types, and contribute to the shaping of the field.

In making this argument, this chapter rejects the simple approach to language favoured in much KM literature. Instead, it comes from the standpoint, common in other fields, that language is inherently ambiguous and meaning always negotiated (Eisenberg, 1998). Accordingly, it follows on from the case made in the previous chapter for the KM community needing to become more aware of the role managerial discourse plays in shaping the field. The discussion focused particularly on the assumptions about knowledge and its management that result from KM being embedded in the dominant managerial worldview. Considering the implications of those assumptions for the future of KM, chapter four argued that for KM to remain relevant to organisations, the KM community needs to consider alternative discourses. This chapter, by extending chapter four's identification of metaphor as playing a constituent role, goes on to illustrate how alternative metaphorical conceptualisations of knowledge can help reconfigure KM for contemporary conditions.

It starts by explicating the important, but long-neglected, role metaphor plays in KM. Highlighting the significance of language in relation to theory building, it extends recent trends in the work of those KM scholars who consider time spent on honing definitions, and understanding metaphors, as necessary and productive for KM (see Hey, 2004; Jakubik, 2007; Andriessen, 2008; Firestone, 2008; Mingers, 2008). As part of this extension, it explores, using Cornelissen and Kafouros's (2008a) metaphorical framework as a basis for discussion, entrenched metaphors of knowledge in KM. The chapter uses their sense of explicatory and generative metaphors, informed and augmented by other allied research, to explain the dominance of current knowledge metaphors. Its analysis carries implications for KM, and suggests the need for KM scholars to be more reflexive about their metaphor use. Finally, the chapter closes by suggesting how metaphors for knowledge might be configured to better reflect the field's current understandings of knowledge.

Classic groundwork: The importance of metaphor

This chapter builds on classic work that recognises metaphors as a means of structuring conceptual systems, perceptions of the world and behaviours (Lakoff & Johnson, 1980). From such perspectives, metaphors not only make concepts that are vague, abstract, or complex familiar, they also construct realities and provide the potential mental operations that can be performed on concepts like knowledge. However, selecting a metaphor focuses on certain aspects of a concept and ignores or marginalises other aspects. In this way metaphors are both enabling and constricting. Lakoff and Johnson (1980) discuss some of the implications of the metaphoric constitution of reality:

> Metaphors may create realities for us, especially social realities. A metaphor may thus be a guide for future action. Such actions will, of course, fit the metaphor. This will, in turn, reinforce the power of the metaphor to make experience coherent. In this sense metaphors can be self-fulfilling prophecies. (p. 146)

Lakoff and Johnson (1980) are concerned with the ways metaphors shape human understanding of reality in general, but their findings are equally applicable to the particular. This chapter builds on their work to argue that the way academics and practitioners in a field like KM use metaphors affects the direction of that field. This is a position that has only recently been explored in KM, but which has long

had influential advocates in other management disciplines. In organisation theory, for example, Weick (1989) was a seminal voice in arguing that, in the process of theorising, researchers depend on metaphors "to grasp the object of study" (p. 529). He, and others, notably Morgan (1986), have raised awareness of why understanding the implications and assumptions of a field's metaphorical terms is important to that field.

Within KM, a handful of scholars have relatively recently drawn attention to how the language used to discuss knowledge is not only invariably metaphor-based but influences the understanding of it (see Hey, 2004; Andriessen, 2008; Firestone, 2008; Jones, 2008). Several of these authors note that many KM metaphors for knowledge objectify it. This reification of knowledge via metaphor remains endemic in the KM literature despite countervailing trends that focus on knowing as a process rather than knowledge as a thing, and on acknowledging the complex nature of knowledge. Indeed, in a congruent movement, KM scholars working in the organic paradigm struggle to find persuasive alternative images for their understandings of knowledge. In particular, they strain to find metaphors that simultaneously resist the dominant conceptualisations of the computational paradigm, yet retain resonance with the field. As a result of this paradigmatic conflict, allied with the abstract nature of knowledge and the multidisciplinary contributions, the KM literature is awash with metaphors.

Andriessen's (2008) study of the KM literature, for example, identifies more than twenty different metaphors used for knowledge with the following three being the most dominant: *knowledge as resource*, *knowledge as asset*, and *knowledge as property* (see chapter four). Significantly, all three are metaphors that reify knowledge. Andriessen's (2008) research provided the further insight that the perception of knowledge in organisations is largely determined by the metaphors used. Consequently, he concludes that they have "an enormous impact on the perceived KM problems and proposed solutions" (p. 10). Just as importantly, as Weick (1989) and Cornelissen (2006a) have noted, scholars both construct and select metaphors in the process of theorising. Those metaphors too may then be retained by the field. The result can be a confirmatory shaping of the field as further research is carried out.

In addition, this chapter aligns with the view that understanding how metaphors work is as important as understanding the effects of metaphors. Metaphor commonly associates a target domain of experience with a source domain, and maps entities, structures, and relations from one to the other (Hey, 2004; Cornelissen & Kafouros, 2008a). Because of this mapping, a metaphor is "a salient and pervasive cognitive process that links conceptualization and language" (Fauconnier, 1997, p. 168). Therefore, "metaphors are not just catchy phrases designed to dazzle an audience…they are one of the few tools to create compact descriptions of complex phenomena" (Weick, 1989, p. 529). Thanks to the impact of the work of Weick (1995) and Morgan (1986), metaphor has achieved considerable attention in organisation theory. However, as Cornelissen (2006b) notes, metaphor has often been treated in an objectivist sense, where it is considered "a deviation from, or a derivative function on, proper literal meaning" (p. 685). That is, metaphor has been seen as drawing comparison between things which bear a partial resemblance and where those similarities exist in the real world. This chapter follows Cornelissen's (2006b) argument for an understanding of metaphor, drawn from the cognitive sciences, that stresses emergent meanings – in other words, "a metaphor produces a new, emergent meaning that is more than the sum of its parts" (p. 701). It carries the implicit challenge in this insight over to KM scholarship by seeking to represent knowledge metaphorically in ways that take scholars away from entrenched views toward emergent meanings. As a necessary prelude to that activity, the following section explores the current metaphorical representations of knowledge in KM.

The state of play in KM: Current metaphors for knowledge

To guide this exploration, this section uses two significant studies that have directly addressed metaphorical language in KM. The first is Hey's (2004) descriptive study of the evolution of KM metaphors and the subsequent effects of that evolutionary path. Focusing on the data, information, and knowledge hierarchy inherited from the Information Systems (IS) literature, Hey (2004) observed how all the concepts in the pyramid were abstract and relied on metaphor to make them more accessible. Furthermore, movement up the pyramid resulted in increasingly abstract metaphors. He found data and information were typically represented as objects (*packets of data, sources of information*), but also

noted that they were often conceptualised as a liquid (*information flow*), or liquids (*data streams*), when available continuously. In comparison, Hey (2004) noted, knowledge is metaphorically more complicated. Though it can be treated as an object, it can also be seen either a liquid or as something that is internalised.

Further, Hey (2004) discovered that the differentiation between explicit and tacit knowledge has, unsurprisingly, resulted in multiple metaphors for knowledge, and these metaphors reveal how scholars struggle to find appropriate metaphors for the two types. His analysis found explicit knowledge (knowledge which supposedly can be articulated), has become unproblematically identified with metaphors that construct it as a manipulable and tangible resource. Explicit knowledge also tends to be treated in the KM literature as a solid that can be *sold, stored, recorded, copied, transmitted,* or as a viscous liquid that is *sticky*. Such treatment accords a false sense of physicality to explicit knowledge. In contrast, Hey (2004) found tacit knowledge (knowledge which supposedly cannot be articulated) is often given the properties of a thin liquid by KM scholars, who discuss its *flow* and *leakiness* - effective to the extent of implying it is more difficult to manage. Tacit knowledge is also typically represented in the KM literature as *ephemeral* or *transitory*, and, hence, not easily shared or transmitted (Hey, 2004). He goes so far as to claim that it appears as "personal, subjective and inherently local" (Hey, 2004, p. 9), so that it is captured as *residing in people's heads*. Hey's (2004) analysis of the metaphors for knowledge reveal the difficulty KM as a field has in finding an appropriate metaphor for an intangible concept. This is a difficulty exacerbated by the knowledge dichotomy that KM scholars have partially built the field around.

The purpose of Hey's (2004) study was to demonstrate how metaphors are linked to affordances, which refer to the potential physical actions a user can perform with an object (Gibson, 1979). For example, scissors may be used to cut, or they may be used to stab, that is, they afford more than one possible action. Similarly, metaphors provide their users with the potential mental operations that they can perform on concepts like information and knowledge. Consequently, these metaphors are both enabling and restricting. Because data and information are conceptualised as physical, manipulable objects, then things can be done with them. Moreover, by implication, they can be measured (one can have *too much* data or *not enough* data), and moved (information can be *sent*). When knowledge

is metaphorically objectified similar tasks can be performed with it – it can be *transferred*, *captured*, *shared*. Yet, performing tasks with tacit knowledge is a struggle because there is no obvious metaphor that captures its essence. Hey (2004) proposed that the metaphor of knowledge as a liquid that *flows* around organisations is the closest to capturing tacit knowledge. For the purposes of this chapter, it is also worth noting his speculation around emerging meanings, in particular, the suggestion that, influenced by the development of such things as wireless technology, knowledge may soon be discussed as a gas.

Hey's (2004) analysis of KM metaphors highlights the possibility of such "mental transformations" (p. 14) accompanying each metaphor. Andriessen's (2008) later study draws attention to metaphorical analysis revealing insufficient or false argument. For him, metaphorical comparisons that emphasise shared attributes, can also, at the same time, often obscure differences between the source and target domains of the metaphor. For example, the common *knowledge as an asset* metaphor highlights the similarity of knowledge to an asset. This is done by suggesting it can be controlled by an organisation, can generate future economic benefits, can be measured, can be used in production, and can be recorded in organisational reporting systems (Andriessen, 2008). However, this metaphor simultaneously obscures the ineffability of some knowledge, its relationship to individuals, and its constantly changing nature.

This thesis sees Andriessen's (2008) valuable contribution to KM residing in his recognition that, by focussing on the similarities between domains, metaphors determine how organisations see problems and what can be understood as solutions. His conclusions bring Morgan's (1986) organisational insight that "images and metaphors are not only interpretive constructs or ways of seeing; they also provide frameworks for action" (p. 343) into KM. Thus the metaphors of KM have a significant impact on not only the way scholars and practitioners view KM, but on how they apply it within organisations. To demonstrate his point, Andriessen (2008) proposed the metaphors of *knowledge as water* and *knowledge as love* in KM workshops and observed that problems and solutions were conceptualised quite differently by participants using these constructs. Furthermore, he understood that the use of metaphors is rarely conscious and argued that, for KM to progress, scholars and practitioners must bring their "metaphors for knowledge to the surface" (Andriessen, 2008, p. 11). Both Hey

(2004) and Andriessen (2008), therefore, describe and then draw attention to the effects of metaphors in KM. Before this chapter extends their analysis of current KM knowledge metaphors, however, it analyses the shortcomings of the existing ones.

Limiting KM metaphors for knowledge: The old, the emergent, and the divided

As previously discussed, KM remains characterised by a division between those who regard knowledge as a process and those who regard knowledge as a product. The latter view, which Hazlett et al. (2005) associate with the computational paradigm, dominated KM in its early years, and remains hugely influential. Within this paradigm, knowledge is typically understood as static, rational, and acontextual (Hazlett et al., 2005), and metaphorically conceptualised along the lines of a *resource, asset* or *object* that can be *stored, captured, transferred, valued*. Other common metaphors in the paradigm include *knowledge as capital* and *knowledge as property* as in the following typical comment from Wong and Aspinwall (2004):

> The knowledge **loss** problem of small businesses gives rise to the need for proper **codification**, **storing** and **sharing** processes to be installed. Knowledge that **resides in the heads** of its employees is the key to the performance of an organization. In order to reduce the adverse effect of knowledge **loss**, organizations should have a mechanism in place to **capture, codify, articulate** and **make** their employees' knowledge **explicit**. (p. 57) [bold not in original]

Approaching knowledge as a physical entity has systemic implications. To illustrate the consequences of metaphors that objectify knowledge, Table 5-1 below provides a list of common KM metaphors from the computational paradigm, and their attributes.

Table 5-1 ***Dominant Metaphors of Knowledge***

	Metaphor	What can be done with it	Attributes
Knowledge as	object/stuff	capture, share, store, codify, lose, own, value, control, sell, copy, record, use	tangible, physical, manipulable, able to be owned, visible, common
Knowledge as	property/ possession	store, buy, sell, own, value, control, acquire, accumulate	valuable, able to be owned, tangible
Knowledge as	commodity/product	store, buy, sell, own, value, control, produce, manufacture	valuable, able to be traded, tangible, quantifiable
Knowledge as	asset	share, store, lose, own, value, control, sell, develop, invest in	tangible, valuable, desirable, measurable
Knowledge as	resource	use, share, store, lose, own, value, control, sell, copy, increase, decrease	quantifiable, locatable, abundant or scarce, valuable

Consideration of the effects of these metaphors reveals some of their embedded assumptions. The basic analysis in the table enables the affordances of each metaphor to be seen; that is, the analysis shows how the choice of metaphor for knowledge affects the perception of what can be done with it. A possible outcome, for example, is if knowledge is treated as an object it cannot then be increased or decreased in the same way it can if it is treated as a resource. Further, the attributes of each metaphor differ in small but significant ways. If knowledge is treated as a resource it suggests the attribute of sufficiency (as it can be

abundant or scarce), but this attribute does not apply if knowledge is constructed as an object (which one either has or does not have).

The metaphors for knowledge set out in Table 5-1 continue to dominate KM. Nevertheless, as stated earlier, KM has become increasingly preoccupied with understandings of knowledge that productively challenge assumptions about metaphors within that paradigm. In particular, complex, social understandings of knowledge are contesting scientific understandings of knowledge. This thesis aligns with KM scholars who argue for a move away from the explicit/tacit dichotomy towards more complex understandings of knowledge and stress the social view of knowledge typically associated with the organic paradigm. Such perspectives represent a shift away from metaphors that construct knowledge as an object to social and process-oriented understandings of knowledge (see Stacey, 2001; Koivuaho & Laihonen, 2006). From these perspectives, knowledge is connected to people, organisational culture, context, adaptation, and a dynamic understanding of knowledge creation (Hazlett et al., 2005). Rather than understanding knowledge as something that is possessed, those working within these perspectives regard knowing as something that one does. In Orlikowski's (2002) formulation, knowing is perceived as "an ongoing social accomplishment, constituted and reconstituted in everyday practice" (p. 252). Or, to put it another way, knowledge is understood as dynamic, fluid, highly contextual, and reliant on connections and communication between people. This thesis contends that useful metaphors for knowledge will aim to capture these attributes. Metaphors for knowledge that fail to embody these aspects of knowing put the language of KM at risk of becoming disconnected from its most up-do-date theories.

However, to date, those scholars who challenge the reification of knowledge, which is implicit in many of the established KM metaphors, struggle to come up with compelling images of their own. Various scholars have offered definitions of knowledge that steer it away from being constructed as an object, such as Spender's (1996) assertion that knowledge is "a qualitative aspect" of organisations as activity systems. Lyon, in his 2005 study, took the unusual step of questioning both the *knowledge as resource* metaphor and the *knowledge as process* metaphors. He disliked the objectification of the first and the implied cooperative nature of the second. Instead, he suggested that knowledge be regarded as "a struggle over meaning" (Lyon, 2005, p. 253), drawing attention to

the power relations he saw as inherent in valuing and agreeing on knowledge in organisations. Though a potentially insightful metaphor, Lyon's suggestion has failed to gain traction within the KM community at large. At least in part this is probably due to the way the metaphor challenges the notion of knowledge as a physical and therefore manageable thing.

In confirmation of the argument chapter four made about the influence of the managerial paradigm, this pull of traditional thinking hinders even those who promote an understanding of knowledge that is social, fluid, and process oriented. KM scholars struggle not only to generate durable metaphors of their own, but also to abandon the established metaphors that reify knowledge. Ajmal and Koskinen (2008), for example, understand knowledge as socially constructed, but also claim that knowledge "resides in people's minds rather than in computers" (p. 10) and "is scattered, messy and easy to lose" (p. 10). Their discourse falls into the linguistic trap of objectifying knowledge. Similarly, Jackson and Klobas (2008) discuss the "absorption of knowledge by a recipient" (p. 331) and the "expression of knowledge in a symbolic form…such that others can perceive and internalize it" (p. 331) even while advocating knowledge as constructed through "social not cognitive" (p. 329) processes. In their systems approach to knowledge in organisations, Parent et al. (2007) present knowledge as "a dynamic construct that evolves as it gets interpreted, used and re-used" (p. 84) but go on to discuss the "generation, dissemination, and absorption of new knowledge" (p. 89). In addition, despite claiming that knowledge is "viewed not as an object to be transferred, they reify it as "a by-product of interactions between individuals within a social system" (Parent et al., 2007, p. 90). This section concludes that, in concert, these examples illustrate how difficult it can be to talk about knowledge in new ways without falling back on the sedimented concepts in dominant metaphors and, especially, on the metaphorically embedded reification of knowledge.

Metaphorical frameworks: From emphasising commonality to seeking difference

However, this thesis proposes that if KM is to convincingly embrace new and complex understandings of knowledge, then change to the metaphors of KM is necessary. In effect, these emerging understandings of knowledge need to be

adequately reflected in the language of scholars and practitioners. Accordingly, I contend that KM needs a way to generate metaphors likely to be effective substitutes for the existing metaphors that objectify knowledge. There are some useful parallels in other business fields. In an extensive body of work, Cornelissen and colleagues (Cornelissen, 2005; Cornelissen, Kafouros, & Lock, 2005; Cornelissen, 2006a; Cornelissen, 2006b; Cornelissen & Kafouros, 2008a; Cornelissen & Kafouros, 2008b) have examined metaphors in organisational theory, and proposed a variety of characteristics of metaphors that indicate their likely fruitfulness for research. In particular, the predictive framework based on the domains-interaction model (Cornelissen, 2005; Cornelissen & Kafouros, 2008a) seeks to account for why particular metaphors are more effective than others. Analysing the metaphors of KM using Cornelissen and Kafouros's (2008a) framework of metaphor characteristics helps to explain both the traction of the established metaphors and the difficulty in generating effective new metaphors.

I import this framework into KM because it usefully aims to elucidate the preconditions of developing two types of metaphor – explicatory and generative. This chapter argues KM scholars could construct more effective metaphors for KM if they better understood these types and their functions. Some metaphors are used to help make the strange more familiar, as when a phenomenon is compared to another better-known phenomenon. Cornelissen and Kafouros (2008a) refer to these metaphors as explicatory in that they "organize and clarify…theoretical understanding" (p. 366). Other metaphors "may generate completely new ways of seeing, conceptualizing and understanding" (Cornelissen & Kafouros, 2008a, p. 366) and these they identify as generative metaphors. Both types of metaphor have an impact on how the target is framed and understood, but their impact is significantly different. An explicatory metaphor, as when knowledge is compared to a product, draws attention to common attributes that knowledge may share with a familiar concept. "Knowledge as product," for example, highlights the "thingness" of knowledge, its relationship to business, its tangibility, and its manufacturability. In contrast, the comparison of knowledge with love is surprising and unexpected, and requires imaginative interpretation to find the similarities. This makes it a more generative metaphor. Cornelissen and Kafouros (2008a) explain that explicatory metaphors, facilitate learning, or conceptual clarification, in that they "they improve an already existing understanding" (p.

376), whereas generative metaphors foster conceptual advances and novel insights. This chapter contends that, given that the impact of the metaphors is different, the onus is on KM scholars to understand which type of metaphor they are using and to consider implications in their deployment of metaphorical constructs.

Drawing on literature on metaphor from a variety of fields, Cornelissen and Kafouros (2008a) identify three characteristics that they argue determine the explicatory and generative impact of metaphors. The first characteristic is *within-domains similarity*, which means that a metaphorical source concept and target concept are perceived as similar and the source concept effectively captures important features of the target concept (Cornelissen & Kafouros, 2008a). The second characteristic is *between-domains distance* where the greater the difference between domains the more effective the metaphor is for generating new insights (Cornelissen & Kafouros, 2008a). Morgan's (1986) early work argues that those metaphors that are most effective balance the need for some similarity (so as not to make the metaphor ridiculous) with the need for some difference (so as to make the metaphor useful). The final characteristic is *comprehensibility* which refers to "how easy it is to understand a metaphorical comparison" (Cornelissen & Kafouros, 2008a, p. 369).

Cornelissen and Kafouros's (2008a) study of metaphors in organisational theory found that those metaphors with high *within-domains similarity* and *comprehensibility* were useful as explicatory tools, which help scholars to organise and clarify theoretical understandings. They also found that metaphor that satisfied both these criteria were useful for generating new insights. This suggested that generative and explicatory metaphors were closely related, whereas, previously, the literature had tended to treat them as mutually exclusive (Cornelissen & Kafouros, 2008a). A surprising result from this 2008 study is that Cornelissen and Kafouros found the *between-domains distance* of a metaphor was not a significant requirement for generative impact. However, this chapter treats this finding cautiously as previous research (Cornelissen, 2005; Tourangeau & Sternberg, 1982; Katz, 1992) has shown that metaphors are found to be more apt when they connect concepts from distant domains as well as meeting *within-domains similarity*. Because *between-domains distance* forces researchers to actively create resemblances across domains, it is generative (Cornelissen, 2005).

The rest of this chapter's analysis of KM metaphors confirms the earlier research in seeing generative qualities where *between-domains distance* is high even while extending the framework to a new field.

Metaphorical analysis: Tabulating the power of metaphors

Table 5-1 above captured the affordances and attributes of the dominant metaphors for knowledge in KM. Table 5-2 now applies Cornelissen and Kafouros's (2008a) metaphorical framework to key knowledge metaphors from KM to assess the likely generative and explicatory effectiveness of those images. The table includes two of the common dominant metaphors, *knowledge as resource* and *knowledge as product*, to represent the frequent reification of knowledge in KM. The metaphor *knowledge as process* that permeates the KM literature positioned in the organic paradigm is also analysed. Finally, the application of the framework incorporates Andriessen's (2008) *knowledge as love* and Hey's (2004) *knowledge as gas* metaphors, because they have been offered by those authors as potential new ways of understanding knowledge.

As can be seen from Table 5-2, established metaphors, such as *knowledge as a resource* and *knowledge as a product*, rate well on *within-domains similarity* and *comprehensibility*. I suggest that these metaphors for knowledge rank highly on *within-domains similarity* because resources and products are already associated, like KM itself, with organisations. Not surprisingly, therefore, according to Cornelissen and Kafouros's (2008a) framework, these two are more likely to be effective explicatory and generative metaphors. Their low ranking on *between-domains distance* seems not to affect their effectiveness. Even though *knowledge as resource* (capturing knowledge as a building block) and *knowledge as product* (knowledge as the end result) are essentially opposite images, both metaphors are highly comprehensible.

In contrast, *knowledge as a process* is more difficult to comprehend. It does not have the concreteness of the other two metaphors. This is true even though understandings of how the brain works when thinking suggest it could be a successful metaphor. It is equally unsurprising that the more startling *knowledge as love* metaphor, which Andriessen (2008) used in an effort to stimulate new thinking about KM, rates highly in *between-domains distance* and *within-domains*

similarity, but poorly in terms of *comprehensibility*. While it undoubtedly has the ability to generate insights, the metaphor's low comprehensibility score is likely to affect its long-term future. Along similar lines, Hey's (2004) *knowledge as a gas* metaphor is almost as unlikely to find traction in the KM literature because it ranks poorly in the *within-domains similarity* category. Nevertheless, it does provide useful insights as it extends previous KM metaphors that represent knowledge as both a solid and a liquid. *Knowledge as love* and *knowledge as gas* also appear further disadvantaged – in terms of durability – because they do not obviously draw on existing organisational metaphors, though *knowledge as love* could be linked to the metaphor of an organisation as an animate being (Cornelissen, Kafouros, & Lock, 2005).

Table 5-2 ***Characteristics of KM Knowledge Metaphors***

Characteristic	Positive Impact	Knowledge as a resource	Knowledge as a product	Knowledge as a process	Knowledge as love	Knowledge as a gas
Within-domains similarity	The degree to which the source concept captures important features of the target concept	High – captures abundance, usefulness, idea that knowledge is used in production of other commodities	High – captures usefulness, idea that knowledge is produced, value	Mid – captures idea of knowledge as cognitive process	Mid – captures knowledge as an abstract idea, links it to individual mind, but also relationships However, love and organisations have little in common	Low – captures knowledge as ethereal However, gas and organisations have little in common
Between-domains distance	The degree to which there is distance between the source and target domains of the metaphor	Low – draws on idea that knowledge is used to accomplish things	Low – draws on idea that knowledge is produced through activity	High – unexpected comparison	High – unexpected comparison	High – unexpected comparison
Comprehensibility	The degree to which people can easily understand the metaphor	High – provides a tangible image of knowledge	High – provides a concrete, manipulable comparison	Low - difficult to reconcile the noun knowledge with the idea of activity	Low – requires significant reflection to draw similarities	Mid – extends existing metaphors of knowledge as a solid and a liquid

The three categories of Cornelissen and Kafouros's (2008a) metaphorical framework applied to knowledge metaphors in Table 5-2 provide a valuable forecast of a metaphor's likely usefulness to researchers. Other factors also influence a metaphor's success. In a separate study, Cornelissen and Kafouros (2008b) describe a lifestyle or "career path" where metaphors move from "live" to "conventional" and, possibly, to "dead" (where a metaphor has evolved into an established meaning for a word) (p. 958). Live metaphors are described as suggesting "a wide range of potential meaning" (Cornelissen & Kafouros, 2008b, p. 959) and thus this chapter sees them as corresponding to generative metaphors. Conventional metaphors are those well established in a research community and so correspond to explicatory metaphors. Although the above framework does not overtly address the ability of explicatory or generative impact of metaphors to change over time, it is not difficult to make a connection.

In temporal terms, it seems likely that metaphors may be strongly generative when first proposed, but as their possibilities are explored they lose that generative impact. Consequently, metaphors that satisfy the explicatory criteria of *within-domains similarity* and *comprehensibility* become widely adopted, while those that do not rate well in these criteria are not sustained in the literature. Table 5-3 illustrates this premise. Currently, metaphors of knowledge influenced by KM's origins in IS (*knowledge as a product* etc.) are high in explicatory impact, allowing scholars to clarify and organise their understandings of knowledge. At this stage of KM's development, these metaphors have little generative impact. However, although they have been exhaustively explored in the last decade, they are likely, early in KM's emergence, to have ranked as highly generative as well. In contrast, the metaphors being proposed by those seeking to avoid the reification of knowledge (such as *knowledge as process*) because of their newness rank highly in generative impact, achieved mostly by *between-domains distance*. However, if they fail to satisfy the criteria of *within-domains similarity* and *comprehensibility* they are unlikely to become established in KM as explicatory metaphors.

5-3 ***The Impact of KM Metaphors***

	Explicatory	Generative
Dominant knowledge metaphors - e.g., knowledge as product	High	Low
Emergent knowledge metaphors – e.g., knowledge as love	Low	High

From this analysis, I predict that the more emergent metaphors currently proposed by KM scholars like Hey (2004) and Andriessen (2008), which look for fresh and complex understandings of knowledge, are unlikely to displace the well-established metaphors of the computational or scientific paradigm. In fact, it is doubtful that they will be able to co-exist for a significant length of time with the dominant metaphors. This is because, once their generative novelty has worn off, their failure to meet the characteristics needed for explicatory impact becomes evident. Until proponents of a social and processual understanding of knowledge can produce compelling metaphors of knowledge that fulfil explicatory criteria, they risk being constrained either by their contradictory use of the language of reification, or by the adoption of "out there" comparisons. This thesis sees the development of such metaphors as a key research focus for the future of KM.

Why do the current metaphors remain dominant?

The call for new metaphors becomes somewhat complicated, however, when this chapter examines additional reasons for the ongoing entrenchment of the dominant metaphors. First, KM's metaphors for knowledge, as the preceding chapter argued, reflect the field's emergence from IS. It is not only the language of IS that KM has inherited, it has also inherited that discipline's worldview. That modernist, scientific worldview takes a functionalist view of knowledge as scientific truth and is commensurate with the computational paradigm. Accordingly, scholars sympathetic to this view are preoccupied with models, software, hardware, optimisation, and the development of linear and routine KM solutions for organisations (Hazlett et al., 2005). Their approach has a clear intellectual genealogy as a Cartesian-influenced approach, in which knowledge is assumed to be formed in the mind of rational, autonomous individuals who test hypotheses against an objective reality (Hazlett et al., 2005; Stacey, 2007).

This description of worldview should sound familiar. In effect, it is much the same perspective that has traditionally underpinned the notions of management examined in the previous chapter. Indeed, chapter four argued that much of KM's language and its academic association with management reflects and entrenches an objectified, apolitical, and "scientific" understanding of knowledge. Even though, following Blackler (1995) and Lyon (2002), recent KM scholarship has recognised that the explicit versus tacit dichotomy offers a somewhat restrictive review of knowledge (Hicks, Dattero & Galup, 2007; Jakubik, 2007; Mingers, 2008), it is the worldview of management and the computational paradigm that, in conjunction, continue to dominate the metaphors of KM. Consequently, the metaphors of knowledge accurately reflect KM's historical antecedents and the governing worldview of its wider academic community. This makes them difficult to dislodge.

The difficulty is compounded because the grammar of the term itself impedes KM's ability to imagine stimulating and robust new metaphors for knowledge. The use of the verb "to have" in conjunction with knowledge objectifies it, even if we believe knowledge is socially constructed. This means, according to Wittgenstein's critique of the grammar of the verb "to have," we construct a false analogy between empirical entities and reified psychological events (Day, 2005). By associating "have" with the nouns of performative actions like *believing*,

trusting, and *knowing*, the focus has been on bodies as containers rather than on actions as socially embedded and formed by language and culture (Day, 2005). The fact that we cannot talk about *trading*, *moving*, or *touching* knowledge (or belief or trust) as we can about a car, for example, shows how grammar can misleading by implying the empirical where there is only the conceptual (Day, 2005).

Given the complexities of metaphorical constructs, it is understandable how KM scholars setting out to propose dynamic understandings of knowledge can end up using metaphors that reify knowledge. They face a struggle to overcome a number of obstacles. Firstly, the explicatory power of the dominant metaphors, and their subsequent longevity, make them difficult to avoid. Analysing KM's metaphors for knowledge using Cornelissen and Kafouros's (2008a) framework helps explain the success of some KM metaphors and the inability of others to find traction. Secondly, the dominant managerial paradigm presents a further obstacle as it also shapes the KM discourse, making the expression of alternative views of knowledge within that paradigm challenging to sustain. Finally, and perhaps most difficult to overcome, grammar leads us to regard knowledge as a possession. Having identified how these three forces act on members of the KM community, this thesis sees them as explaining why knowledge is almost always reified in KM as a commodity, an asset, and so on.

Implications for KM and opening new pathways for development

The key word, of course, is "almost," because I believe conscious effort to counter those forces is not only desirable, but possible. One path of resistance lies in the ability to predict the impact of metaphors. As Mingers (2008) has noted, "the overwhelming approach within KM is to take a resolutely functionalist view of knowledge" (p. 65), and the entrenched metaphors of KM further embed this perspective. Disappointingly, for this thesis and those in other disciplines who recognise the power of language to construct reality, Mingers (2008) observes how a large number of KM papers "take a simplistic and unquestioning view of knowledge as an objective commodity and often do not even bother to define what they mean by knowledge" (p. 65). This thesis contends that for KM to move forward as a field, and successfully engage with the innovative developments,

such as the current emergence of KM2.0 (with an emphasis on participatory, social and connective knowledge), change is necessary. In particular, it recommends that the KM scholarly community finds ways to resist the comfort of the grammatically-easy and conceptually-familiar metaphors and successfully develop compelling and insightful new ones. This chapter has imported a useful framework from organisational theory that can assist KM scholars to understand the attraction of existing metaphors and assess the likely traction of future metaphors.

This chapter also used Cornelissen and Kafouros's (2008a) framework to invite KM scholars to consider how they are focusing on metaphors for knowledge. Cornelissen and Kafouros's (2008a; 2008b) work primarily focuses on mapping large complex constructs (complex metaphors) that consist of a number of smaller components (primary metaphors), such as *organisations as machines*, *organisational improvisation as jazz*, and so on. In KM, knowledge is often metaphorically treated as a single concept and as such is mapped to other single constructs (*knowledge as asset, knowledge as gas*) and is thus treated as a primary metaphor. Yet, much of the KM literature is at pains to point out the complexity of knowledge. At the most basic level, KM recognises differences between explicit and tacit knowledge. *Knowledge as product* is probably a fair explanation for explicit knowledge, but is far less relevant to tacit knowledge, yet the two are rarely distinguished when the metaphor is used. Where authors propose more sophisticated understandings of knowledge, such as Mingers' (2008) recent valuable contribution that offers a complex description of four types of knowledge, they, perhaps unintentionally, point to the inadequacy of a single primary metaphor. In fact, each of the types of knowledge Mingers (2008) identifies (propositional, experiential, performative, and epistemological) has different objects, sources, forms of representation, and criteria for validity. Consequently, to expect one metaphor to explicate all four types seems an unrealistic goal. Accordingly, I propose that the field could be usefully augmented by the development of multiple metaphors to reflect the multivariate nature of knowledge.

Indeed, I go so far as to contend that, when KM scholars create metaphors for individual concepts in isolation from their field, they may be doing the equivalent of creating words without sentences (Weick, 1989). To avoid this kind of

limitation and open productive pathways for richer KM futures, this thesis seeks, firstly, to foster, and to contribute to, KM scholarship that constructs more complex metaphors for conveying KM as a field, and then, secondly, to find within those the analogies for individual concepts like knowledge. Sims' (2008) collection of definitions of KM refers to KM as *a philosophy, a collection of processes, an art, a conscious process, a discipline,* and *a conscious strategy*. Each of these metaphors for KM invites a slightly different metaphorical construction for knowledge. If KM is a philosophy, then perhaps knowledge is *a concept*. If KM is a collection of processes, then perhaps knowledge is the object of those processes (*a resource*), or the desired outcome (*a product*), or both. If KM is an art, then perhaps knowledge is *inspiration*, or maybe *a technique involving intuition,* and so on. This simple analysis shows that the metaphor used for the wider field of KM has a significant impact on the appropriateness of the metaphor used for knowledge. It further reinforces a guiding idea of this thesis: that the use of multiple metaphors for knowledge is inevitable and useful, but, most importantly vital to the future of a KM that is relevant to contemporary conditions.

Another route, which can be complementary rather than alternative, is to consider KM as a subset of a larger field. For example, given that KM is part of organisational theory, metaphors for knowledge could be drawn from an umbrella metaphor for organisations. That is, if KM is discussed in the context of *organisations as machines*, then perhaps knowledge could be conceived of as the *grease* that oils the machine. In contrast, if KM is discussed in the context of *organisations as culture*, then knowledge could be conceived of as *beliefs*. Cornelissen (2006b) also draws attention to how interpretation of metaphor can vary between research communities. Analysing the metaphor *organisational identity*, he shows how scholars within different communities, such as organisational communication and organisational behaviour, are likely to have quite different interpretations and applications for the same metaphor (Cornelissen, 2006b). There is no reason to assume otherwise for KM, so it is likely that KM scholars from within, say, IS compared to communication, interpret the *knowledge as a resource* metaphor quite differently. Furthermore, research paradigms are also likely to have an influence - KM scholars who take a critical approach already have a different understanding of knowledge metaphors

than those who take a functionalist approach. In fact, Gladstone and Megginson (1999) warn fellow critical scholars that "in the scramble to distance ourselves from the positivist functionalism of mainstream management" (p. 11) they might also distance themselves from a "practical need to manage knowledge" (p. 11) driven by organisations. In addition, they argue that the embracing of radical humanism as an alternative may well inhibit theory building as a consequence of the desire to escape, for example, metaphors that embed the notion of knowledge ownership (Gladstone & Megginson, 1999).

The challenge for KM scholars

The metaphors for knowledge that currently dominate the language of KM reify knowledge, albeit in different ways, and thus constrain how knowledge is seen and what actions can be associated with it. This chapter argued that KM requires new metaphors that afford a fresh perspective and better reflect the theoretical direction of the field. For those scholars searching for new metaphors to explain their conceptualisation of knowledge, Cornelissen and Kafouros's (2008a) framework provides a means of predicting the likely success of their offerings' adoption. Assessing a metaphor's "stickability" by considering its explicatory and generative potential may be crucial to facilitating the flourishing of the understandings of knowledge proposed by those scholars who seek to avoid its reification.

In addition, an important aspect of focusing attention on the language of KM is to encourage reflexivity in the field. That focus offers a way for scholars to call into question the assumptions that underpin many of their concepts, terms, and metaphors. Moreover, by paying attention to language, scholars enhance intellectual rigour through more conscious, precise, and explicit deployment of words, images, and discursive formations in their work (Firestone, 2008). In particular, in line with Andriessen's (2008) formulation, bringing KM metaphors to the surface of KM scholarship allows scholars to consider the implications of the metaphors that they are perpetuating. Critical examination of the current metaphors of knowledge in KM also leads to consideration of future developments. This chapter proposed that KM scholars seek to actively construct metaphors that better reflect the nuances of knowledge. It further suggested that

KM's metaphorical representation of knowledge also has the capacity to drive and support KM's capacity to move beyond the traditional managerial paradigm.

Numerous contributions in KM have argued for more sophisticated understandings of the concept of knowledge, but few have also called for the metaphors of KM to reflect that level of sophistication and plurality. This chapter extended those arguments for sophisticated conceptualisations of knowledge to sophisticated metaphors of knowledge, while acknowledging the constraints inherent within the wider constructs of both KM and management. Finally, this chapter set the challenge for KM scholars to generate metaphors that resonate with the field, while both providing insight and clarification for the concept of knowledge, and that resonate with the richness of other comparable fields. As Morgan (1986) declared, organisations "are many things at once" (p. 339), in a reminder that organisational scholars who limit themselves to one metaphor fail to capture the complexity and sophistication of experience. Like organisations, if not more so, knowledge is also many things at once. This idea will be explored further in the next chapter. Arguing that plural definitions for knowledge are inevitable for KM, chapter six also seeks to tackle another issue that needs attention for KM to be able to thrive in contemporary conditions – the adoption of more sophisticated communication theories.

Chapter 6 – New understandings of knowledge

This chapter begins by taking stock of the overall direction of the thesis to this point. The first two chapters of this thesis traced the history of KM and identified some of the key issues KM as a field is facing as it matures. These issues included conflict over what knowledge is, disagreement about how the field should be shaped, and lack of consensus over KM's place in organisations. The third chapter looked at the challenges that contemporary conditions present to the traditional managerial paradigm and discussed the opportunities for KM in these challenges. Chapter four then drew attention to the language of the KM community, describing how the current discourse of KM reflects and constructs the values of the discourse of management as a whole, and exploring the uneasy alliance between knowledge and its management. Chapter five went on to consider how academics and practitioners might be more reflective and deliberate about their use of metaphor in KM. It argued for the need to be aware of the assumptions embedded in those metaphors and suggested ways to provocatively, and sustainably, shape the future discourse. What this thesis has yet to address, however, is the question that remains at the heart of KM – what is knowledge?

Throughout the history of western culture, scholars have wrestled with the notion of what constitutes knowledge. In philosophy, knowledge, with Plato the early proponent of knowledge as fixed and unalterable truth, has been regarded as "a modality representing a rational agent's true and consistent beliefs" (Walton, 2005, p. 59). Centuries later, Descartes rejected the idea that true knowledge came from any source that could be proven false – in this way both dismissing sensory perception as a basis of knowledge and seeing the mind itself as the only real source (Gueldenberg & Helting, 2007). In more contemporary theory, Walton (2005) claims that scientists typically see knowledge as being based on cumulative evidence, meaning that once a proposition has been proven as true at any particular point it will remain true as the inquiry proceeds. According to most social scientists, however, knowledge is socially constructed, particular to its context, and not a universal truth waiting to be revealed (Smithson, 1989). With disagreement over what knowledge is continuing over time and across disciplines, it is not surprising that KM as a field has also not reached consensus over a definition for its key term. KM scholars offer a proliferation of suggestions. These

include a number of definitions of knowledge that, in alignment with this thesis, challenge the managerial perspective and its accompanying discourse. Yet, despite the general consensus in KM that knowledge remains unsatisfactorily defined, neither any old, nor any recently-offered definition has gained universal acceptance.

This chapter sets out to explore the limitations of dominant understandings of knowledge in KM, and to show how the desire for a definitive conceptualisation of knowledge preoccupies KM. In going on to argue that the pursuit of a perfect definition for knowledge is an inappropriate goal for KM, however, the chapter argues that the KM community might not only cope but actually flourish by encouraging multiple, complex understandings of knowledge. Extending the perspective taken in previous chapters, the chapter further contends that the successful adoption of new understandings of knowledge rests on the field's ability to dismantle the managerial paradigm that currently frames it. It augments these contentions with the fresh assertion that the old managerial perspective will not be effectively dislodged until the tired communication theories that underpin its conceptualisations of knowledge are also dislodged. It illustrates how richer communication theories need to be imported into the field to supplement the sender-receiver model that currently dominates KM, and serves to perpetuate the traditional managerial worldview. It makes the case that this model hinders the field's ability to reinvigorate itself to effectively respond to contemporary conditions. In its final sections, this chapter selects one specific communication theory – complex responsive process theory (Stacey, 2001; 2003; 2007) – that it sees as having the potential to reinvigorate understandings of knowledge and communication in KM, while successfully challenging the managerial worldview.

Weaknesses of current definitions of knowledge in KM (1): Binary oppositions

Earlier chapters identified some of the features of KM that this thesis contends limit the progress of the field. These included the expectations associated with the construction of an academic discipline, the unquestioning adoption of perspectives from KM's antecedents like IS, and the often-uncritical embracing of the traditional managerial paradigm. Though by no means all KM scholars accept these constraints for KM, previous chapters have shown the role of these features

in shaping the KM landscape. The following sections augment this list, by exploring further limitations that are restricting KM's evolution, with particular attention to the defining of knowledge.

One limitation is the binary constructs (tacit vs. explicit, individual vs. organisational, technology vs. people etc.) that have dominated the field from its inception. These binaries remain to the fore in discussions of knowledge and constrain KM from moving beyond their exclusionary oppositions. Indeed, Heisig's (2009) content analysis of frameworks in KM found that "a uniform understanding of knowledge does not exist in KM frameworks" (p. 13). Nevertheless, he found that more than half of the 119 KM frameworks studied used knowledge dichotomies, and so concluded that "dichotomies are most frequently used to describe the elements of knowledge" (p. 13). Definitions and discussions of knowledge that reflect and further embed the binary oppositions, such as those discussed in chapter two, dominate the KM literature. For example, some scholars focus on organisational knowledge (see Tsoukas, 2000; Davenport & Prusak, 1998) while others concentrate on knowledge at the individual level (see Avery et al., 2003; Jefferson, 2006). Likewise, D'Eridata and Barreto (2006) consider definitions for tacit knowledge with little reference to explicit or other understandings of knowledge.

I acknowledge that it is not unreasonable to have scholars focusing on particular types or aspects of knowledge. However, I consider that this concentration on building views of knowledge around opposing, binary terms has the attendant consequence of perpetuating the larger division between the computational and organic paradigms in KM. A significant consequence of entrenching that division is a competition for dominance, as scholars subscribing to one paradigm or the other seek to elevate that paradigm's position. As a result, some scholars within the organic paradigm, for example, focus on envisioning a future for KM that diminishes the role of technology in an attempt to undermine the computational paradigm. To illustrate, Sinclair (2007) argues "KM is far too fluid and broad a concept…to be fitted into a neat technology wrapper" (p. 256) and claims it needs to shift from a technology-driven emphasis to a user-centred emphasis. Considering knowledge to be "a product of the constant, everyday life interactions between humans and the social systems within which they are engaged" (p. 84), Parent et al. (2007) similarly criticise the preoccupation with technology in KM.

Such opinions intentionally work to reject the notion of knowledge as a product that can be captured by technology and to elevate the conceptualisation of knowing as a social phenomenon.

The effort of scholars within the organic paradigm to disparage the computational paradigm's understanding of KM and knowledge has been vociferous enough that Jakubik's (2007) review of the KM literature concludes that "the trend in KM research shows a shift in focus toward the community view of knowledge" (p. 17). Jakubik (2007) clearly positions the organic paradigm as in ascendance. However, even a brief survey of the KM literature illustrates that this claim might be challenged. IT-related research still accounts for the majority of publications in KM. According to ABI/Inform, extending Gordon and Grant's (2005) theme-based searches to the end of 2009, more than 7000 publications of just over 10,000 articles in KM contain the keywords 'information' or 'technology', with the next most frequent thematic keyword, 'strategy', appearing in just over 1500 publications. Consequently, Chilton and Bloodgood's (2008) computational-paradigm informed perception that "knowledge is created, stored, transferred, and used at all levels of an organization in an attempt to achieve the goals of the organization" (p. 75) still represents a widely held view in KM. In addition, Franco and Mariano (2007) estimate that almost 70 percent of KM publications focus on the design of information technology and accompanying problems of knowledge storage, transfer, and retrieval. Even an ad hoc perusal of journal titles listed after searching for "knowledge management" confirms the continued dominance of the computational paradigm. The majority of journals come from the Information Systems world (*European Journal of Information Systems; Journal of Information Science; Information and Management; Association for Computing Machinery* and so on). Despite five years having passed since their original data was collected this chapter concurs with Gordon and Grant's (2005) observation that "the concepts and themes which, to date, have dominated the literature, are related to information and technical disciplines" (p. 30).

Because both paradigms continue to be active in KM, this chapter argues that the field would do well to consider abandoning the binary constructs that have encouraged the taking of sides in the KM community. Instead, the KM community could willingly embrace plurality. Just as interpretations of metaphors vary between research communities (Cornelissen, 2006b), interpretations of a

concept like knowledge will also vary according to disciplinary background or theoretical bias. Even though a number of KM scholars might prefer definitions of knowledge that treat it as a product be either ignored or eliminated from KM, those definitions remain relevant as long as other KM scholars engage with them. Given KM's multidisciplinary make-up, competing views of knowledge are likely to be around for the foreseeable future.

This thesis argues that it is not the presence of alternative views of knowledge that weakens KM. Rather, it perceives that the tendency in KM to have different disciplinary communities pitted against one another in destructive oppositions, or to operate in ignorance of one another's arguments and research, fails to progress the field. This perception is supported by Wierzbicki (2007), who requests an end to the competitive division between technology- and sociology- focussed KM, with the question: "Will future managers be successful in [the] knowledge civilisation era, if they are educated on an anti-technological paradigm?" (p. 626). He calls for an approach that combines the two paradigms. Even in KM practice, the forward-looking trend is towards a combined approach with, for example, Murray (2010) seeing the future of KM in "combining soft skills with technical expertise" (p. 18). Accordingly, I align with Wierzbicki's request, in advocating future directions for KM that move beyond oppositional either/or definitions and that accommodate multiple, complex definitions of knowledge.

Approaching definitional issues from an either/or perspective both entrenches those binary divisions and fragments the field by creating a surplus of oppositional denotations for knowledge. To date, however, a willingness to foster multiple, complex definitions of knowledge has not been strongly featured in the KM literature. Nevertheless, KM's focus on binary understandings of knowledge, such as the distinction between explicit and tacit knowledge, is being challenged in a number of ways. First, some KM scholars have argued for a dualistic rather than dichotomous approach to those types of knowledge. Tsoukas (2003) proposed Polanyi's (1967) original understanding was that "tacit and explicit knowledge are not the two ends of a continuum but the two sides of the same coin" (p. 425), a position supported by Thompson and Walsham (2004) who also argued that the two types be seen as inseparable. This is a viewpoint that has been taken up in more recent publications. McAdam et al. (2007), for example, reject technologically-driven research on tacit knowledge and question whether tacit and

explicit knowledge are two types of knowledge or whether they are two dimensions of the same knowledge. These and other KM scholars seem to agree with Day's (2005) claim that the field's embracing, and misrepresentation, of Polanyi's dichotomy has "acted as a limit to Knowledge Management's further theoretical and practical development" (p. 630).

This thesis shares Day's (2005) and others' frustration at the unintentionally polarising influence of Polanyi's division. It is a position that has led to the perception of knowledge as a commodity, typical to the computational paradigm, being fundamentally at odds with knowledge as a socially constructed process, favoured by the organic paradigm. This chapter argues that dividing definitions along paradigmatic lines is too simplistic and not desirable for the future of KM. It is a position shared by others in the KM community. Snowden (2005), for one, has also suggested that KM has outgrown the tacit and explicit split. He critiques Nonaka and Takeuchi (1995) in particular for perpetuating the division, but also Probst, Raub and Romhardt (1998), who were very influential in Europe and divided knowledge into that which can be codified and that which cannot (Snowden, 2005). Both sets of scholars promoted models that use a dualistic structure that Snowden (2005) identifies as inadequate, arguing, as this thesis does, that the tacit/explicit dichotomy used to describe knowledge "too easily leads to implicit assumptions about the way in which knowledge should be managed" (p. 2) .

Not only does the dichotomy affect how scholars and practitioners think about managing knowledge, however. It also obscures some very real and compelling debate going on in the field through its oversimplification of the concept of knowledge. As Casselman and Samson (2005) rightly point out, *within* (not just between) both of KM's paradigmatic camps there is considerable theoretical and conceptual argument occurring about the nature of knowledge. Even while IT-based scholars like Chilton and Bloodgood (2008) advocate a view of knowledge as a product, other IT-based scholars like Malhotra (2001) criticise the IS-based literature on knowledge systems for ignoring "the dynamic and continuously evolving nature of knowledge" (p. 5) as well as its tacit and explicit, subjective, interpretative and social dimensions. Similarly, while acknowledging that "the knowledge-as-object approach is still influential" (p. 6), Walsham (2005), publishing in an IT journal, opposes this view and called for KM scholars to take

notice of power in KM. Further evidence that dividing knowledge according to paradigm is oversimplistic is that Hicks et al. (2007) were able to mine more than nine definitions of knowledge from only the IS-based KM literature. Multiple and heterogeneous communities exist on either side of any supposed divides, as Kuhn (2002) notes when discussing the divisions between academic and practitioner communities. This chapter extends his argument to the competing views that clearly exist within, as well as between, each KM paradigm.

Taking holistic and pluralist perspectives of knowledge, this chapter argues, is a potentially useful way to dissolve the contrived boundary between paradigms. Others who find the division between explicit and tacit knowledge an unhelpful focus for KM also tend to promote a fuller concept of knowledge. Casselman and Samson (2005), for example, critique the division between tacit and explicit knowledge, and knowledge as process (socially constructed and linked to organisational culture) and as product (an organisational asset to be managed). Instead, they suggest a holistic perspective of knowledge that takes all of these facets into account to be more advantageous. Reaching a similar conclusion, Kane (2003), drawing on the Greek philosophers, proposes KM would be better off unifying knowledge rather than breaking it into dualities. As the complexity and multi-dimensionality of knowledge becomes inescapably evident from the literature, the KM community also have to learn to live with the reality of multiple and even contradictory definitions. The divisions created by the entrenchment of artificial boundaries between technology and people, individual and organisation, tacit and explicit, and so on, have preoccupied KM for too long, I believe.

Weaknesses of current definitions of knowledge in KM (2): Pursuit of unequivocality

This section identifies what this thesis argues is the main reason that the KM community struggles with accepting plurality – the dominant ontology of KM constructs and reinforces resistance to multiple definitions of knowledge. That dominant ontology is the worldview inherited from the Enlightenment (as discussed earlier), with its accompanying belief in an independent reality and a single truth. However, the problems that this worldview brings to an abstract concept like knowledge is further exacerbated by, as Raymond Williams's (1983) puts it, the problems of meanings being "inextricably bound up with the problems

[they are] used to discuss" (p. 15). In other words, the very nature of scholarly communication, with competing ideas at its core, means a universal definition is unlikely to be found. Argument over the definition of key concepts like knowledge is as much about fighting for the status of a particular worldview as it is about semantics. Mingers (2008) connects this phenomenon specifically to KM, explaining that "radically different assumptions in terms of ontology, epistemology and methodology" (p. 62) will inevitably generate competing views as to how to define knowledge. Yet, despite the low probability of the field ever settling on a single, all-encompassing definition of knowledge, much energy is spent on the search for just that.

This chapter contends that it is the dominant worldview of management that drives the search for an unequivocal definition for knowledge. As the analysis of metaphors for knowledge in the previous chapter demonstrated, knowledge is often treated linguistically as a single concept. The accompanying implication is that knowledge should be able to be precisely defined. Consequently, numerous scholars over the last decade have offered definitions of knowledge for KM. Jakubik (2007), reviewing the KM literature from 1994 to 2004, describes 23 different perspectives on knowledge from prominent KM authors. Her study aimed to elucidate whether KM scholars were "touching the same elephant" and naming it differently or "touching many elephants" (p. 16) of the same name. She found an abundance of overlapping terminology to describe knowledge, including tacit, tacit embodied, tacit-not-yet-embodied, know-how, knowing, experiential knowledge, implicit knowledge and so on (Jakubik, 2007). These interrelated terms, which Jakubik concluded showed the emergence of four sometimes-contradictory understandings of knowledge, clearly indicate the complexity of the concept.

However, even as the field moves towards understanding knowledge as an increasingly complex phenomenon, scholars still seem to yearn for a neat, single definition for knowledge. Beesley and Cooper (2008), for example, conclude their discussion on defining KM activities by saying "it is time to move towards consensus on definitions" (p. 59). While some scholars, like Beesley and Cooper (2008) and Stankosky (2005), express disgruntlement at the inability of the field to arrive at a consensus over what knowledge is, others critique the use of overly broad definitions that end up establishing that "knowledge is everything, [and]

everything is knowledge" (Alvesson & Kärreman, 2001, p. 998). Certainly, Davenport and Prusak's (1998) oft-quoted definition, that leaves one wondering what isn't knowledge, supports this latter complaint:

> Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms. (p. 5)

Unlike some KM scholars, this thesis is less concerned with the lack of an agreed, narrow definition of knowledge, and more troubled with the, what it sees as futile, pursuit of an authoritative definition. This, I suggest, is a major weakness of the field – driven by a positivist worldview – that must be addressed to ensure KM remains relevant to organisations and responsive to contemporary conditions. Without question, there is enough evidence in the literature to establish knowledge as complex beyond a single definition. Though scholars might not agree on how to make distinctions between different types of knowledge, they largely agree that different types of knowledge exist. From Blackler's (1995) descriptions of knowledge as embedded, embrained, embodied, encultured, and encoded to Minger's (2008) assertion that knowledge can be propositional, experiential, performative, and epistemological, the number and depth of typologies of knowledge confirms the absurdity of the search for an all-encompassing definition. The definitional complexity of knowledge is reinforced by the impact of multiple definitions of KM itself. Even taking only the three main types of approach to KM identified by Lloria (2008) - measuring knowledge, managing knowledge (with greater or lesser emphasis on technology or people), and creating knowledge – a different interpretation and treatment of knowledge is possible, if not required, for each approach. Furthermore, as this chapter has already illustrated in relation to the KM paradigms, differently situated scholars with different interests will argue the position that supports their own worldview.

Weaknesses of current definitions of knowledge in KM (3): Old communication theories

Whether knowledge is conceived of as a product or a process, as explicit or tacit, as organisational or individual, or as a combination of many of these things, its value is generally accepted to come from its use or performance. To illustrate, Heisig's (2009) research found that knowledge use was the most frequent activity associated with KM frameworks. Where knowledge is considered a product stored in databases, as many proponents of the computational paradigm propose, its value comes when that knowledge is used by an organisation. Key processes from the computational paradigm include knowledge transfer, storage, codification, retrieval and so on. These processes infer the transmission of knowledge from people to technology (and the reverse), involve knowledge being recorded in some kind of language, and assume the use of knowledge in organisational routines. That is, though it may not be the central focus of the process, they require communication in some form.

In contrast, the organic paradigm proposes knowledge be understood as an activity, as something people do. Many advocates of this paradigm focus on how knowledge is communicated between community members (see Beckhy, 2003; Wenger, 2008). Even where the focus is on tacit knowledge embodied by an individual through performance, communication is involved through self-talk and interaction with the environment (Tsoukas, 2003). Accordingly, the thesis can claim that the concept of communication is intimately connected with knowledge, no matter which definition or paradigmatic outlook is adopted.

However, the field's comprehensive embrace of the transmission, or sender/receiver, model of communication adds a third check on the KM community's ability to step outside the managerial paradigm. Management in general and KM in particular have been dominated by the transmission model. This model, also known as the conduit metaphor of communication (Reddy, 1979), reduces communication to a simple process. In this process, the sender codifies their knowledge (the encoding stage) and transfers it to a recipient via one of a number of communication channels (documents, emails, telephones, etc.), who then interprets the message (the decoding stage). The transmission view of communication focuses on humans as rational information processors (Stacey, 2001). Though this functional view of communication is largely outmoded among

communication theorists, it remains firmly entrenched in KM. For example, Landaeta (2008) discusses knowledge as being "transferred from a source project to a project recipient through formal and informal networks" (p. 31). The discourse of the transmission view of communication dominates KM.

This thesis contends that KM needs to be updated by taking account of more recent and richer communication theories. Communication has been identified as a key focus by a number of KM scholars. Early on in KM, Alvesson (1993) proposed knowledge workers as language workers, suggesting language should take a central role in KM research. Later, Tsoukas (2003) reinforced this suggestion by advocating that KM scholars and practitioners find "new ways of talking, fresh forms of interacting, and novel ways of distinguishing and connecting" (p. 426) to explore the "skilled performances" (p. 425) in which people engage. Some academic writing in KM has even specifically questioned the theoretically-thin transmission model of communication. Jackson and Klobas (2008), for example, express their intention to "engage project managers with the notion that knowledge is not the discovery and inscription of predetermined facts, but is a process of continual sense-making, in which people…commit to mutually agreed views of the world" (p. 329). They adopt and promote a notion of reality that is "constructed by individuals within social groups over periods of time, mostly in conversation" (p. 330). Further, Kuhn and Jackson (2008) focus on micro-level interaction as a knowing process. They emphasise that problematic situations emerge, and are transformed by, linked individuals through interaction. Such approaches are commensurate with more up-to-date communication theories in capturing the dynamic and interactive nature of the construction of meaning and knowledge in the process of communicating. This thesis builds on and extends this work by suggesting how KM might incorporate richer communication theories.

Addressing the weaknesses: Multiplicity, paradox, and complexity

This thesis claims that KM's entrenchment of binary oppositions, pursuit of unequivocality, and clinging to old communication theories are all problems that need to be addressed to keep KM relevant. This chapter proposes one means of addressing these issues is for the KM community to go beyond just accepting

multiple definitions of knowledge to actively encouraging them. Already, a handful of KM scholars have noted that debate over meaning is critical to the KM community and, therefore, advocate ongoing discussion around the concept of knowledge rather than the establishment of an agreed definition. Jakubik (2007) comments that "it would be naïve" and perhaps "not even possible to give a holistic definition of knowledge" and similarly calls for KM to accept "different views, different approaches, and different methods" (p. 16) to better understand knowledge. Furthermore, she sees ambiguity in meaning as allowing "a range of professional groups to develop their own distinct perspectives and to contribute" to KM (Jakubik, 2007, p. 17). Accordingly, this chapter supports Jakubik's (2007) call for a pluralist epistemology of knowledge and encouragement of the questioning of the assumptions of mainstream KM proposed by Stacey (2001) and Styhre (2003). It further argues that premature closure of definitions, or avoidance of discussions considering competing definitions, may serve to stifle knowledge generation. This in turn is likely to lead to frustration with concepts that are inaccurate and inexact, and so limit the opportunity for new insights since fresh ideas and multiple perspectives invite the considering of concepts in new ways. Furthermore, it suggests that the disagreements over the conceptualisation of tacit and explicit knowledge and the relationship between them have led to research that offers more helpfully complex views of both.

That is not to say that KM scholars should take a haphazard approach using the term "knowledge." Indeed, the failure to define knowledge at all is one of the main frustrations of the field (see Mingers, 2008). Alvesson and Kärreman (2001) are typical in complaining that "a common take on knowledge seems to be to accept or side-step the inherent problems of defining the concept but go on and use it anyway" (p. 999). In relation to the equally-contested concept of "knowledge management," Firestone (2008) wisely suggests scholars state their definition upfront. This is a practice that is also appropriate concerning knowledge. What this thesis advocates is the practice of defining the term *in the sense it is being used in a particular context*, such as in a journal article. My rationale is that being explicit about the context-sensitive definition allows an audience to evaluate the ideas presented in light of that particular usage of the term. Such a definitional approach also goes some way toward revealing the author's ontological and epistemological assumptions.

In addition, the focus on defining knowledge in context makes it possible for the KM community to live with paradoxical definitions of knowledge. Stacey (2003) defines paradox as "a state in which two diametrically opposing forces/ideas are simultaneously present, neither of which can ever be resolved or eliminated" (p. 328). Accepting that definitions of knowledge may be paradoxical could allow KM scholars to abandon the pursuit of a single definition of the term. This idea is not without support in KM. Leading KM practitioner Snowden (2002) proposes that KM's focus should be on the acceptance of the paradox that knowledge is both a thing and a flow. He compares this concept of knowledge to physicists breaking out from the Newtonian era who had to come to accept that electrons are both waves and particles. If one looks for waves, that's what one finds; if one looks for particles, that's what one finds. In KM, if scholars look at knowledge as a thing that's what they see; if they look at knowledge in different ways they will have different insights (Snowden, 2002). As argued in previous chapters, however, KM's status as an emerging discipline and its identification with the managerial paradigm make it difficult for the field to accept apparently contradictory definitions for one of its key concepts.

I would argue that an important question for KM in terms of knowledge, then, is how can the field flourish when multiple definitions of one of its key concepts co-exist? This thesis's response to that question is to nurture the ability of the field to adopt multiple theoretical perspectives not just of knowledge, but of other key concepts and practices. This ability will enable the exposure of, and resistance to, the ontological and epistemological assumptions of the discourse of management critiqued in chapter four. That would increase KM's receptivity to plurality. The functionalist, empiricist outlook of management and its tendency to search for single truths is fundamentally at odds with the multiple, abstract, inexpressible, messy, and dynamic aspects of knowledge (Allee, 1997) that this thesis advocates. Equally important to countering the epistemological and ontological assumptions of KM, however, are the introduction and acceptance of a broad interpretation of communication that goes beyond the transmission of information. In KM, communication is often perceived as simply a tool to be used in the transfer or construction of knowledge: This thesis argues that it has far more important a role.

This is not to say that the thesis advocates rejecting the managerial perspective and its accompanying transmission model of communication entirely. After all, it

is hard to deny that in some circumstances the sharing of knowledge involves the transmission of information from one person to another, and hard to ignore that, to a certain extent, this process can be managed. Furthermore, given that this chapter is promoting multiplicity, it would be hypocritical to seek to eliminate significant perspectives from the field. Because the transmission model has been the dominant model of communication in KM for so long, however, I argue that the time has come to introduce, and begin to institute alternative communication theories relevant to knowledge. These theories have received far less attention in the KM literature than other disciplines. This is in part because the transmission model is so well-known and widely accepted, but also because relatively few KM scholars have recognised or stressed the significant role that communication plays in knowing. This thesis attempts to demonstrate the centrality of communication to knowledge and therefore to KM. The communicative practices of constructing KM as a discipline have been explored in chapters one and two, and chapters four and five demonstrated the significance of the language used to explore KM. This chapter concludes by paying overdue attention to the role of communication in knowing and knowledge in organisations.

Communicating knowledge: Complex responsive process theory (CRP)

There are, of course, many management scholars in general and KM scholars in particular who argue knowledge to be socially constructed, and, therefore, see it as unavoidably linked to communication (see Lave & Wenger, 1991; Alvesson, 1993; Edwards, 2007; Cooke-Davies et al., 2007; Jackson & Klobas, 2008; Kuhn & Jackson, 2008). These social constructionist perspectives often include recognition of power, politics, and emotions. They also typically emphasise sense-making, the development of interpersonal relationships, and engagement in informal and unstructured communications (Snider & Nissen, 2003). Interestingly, an allied movement is occurring in Information Management, where Vreeken (2005), for example, has argued that the modernist, functionalist understanding of information fails to attend to its socially-constructed, interpretative, and meaning-making aspects.

In this thesis, however, I draw on a particular understanding of the communication of knowledge – Stacey's (2001) complex responsive process theory (CRP). I

emphasise CRP because it is a theory that "places self-organizing interaction, with its intrinsic capacity to produce emergent coherence, at the centre of the knowledge creating process in organizations" (Stacey, 2001, foreword). Over a number of years, Stacey (2000; 2001; 2003; 2007) has sought to erode KM's entrenched assumptions about both knowledge and its management. He argues that CRP provides a theoretical underpinning for a fresh understanding of knowledge as an interactive, local communicative process occurring between interdependent people in the context of organisations. This approach provides a platform, albeit with some augmentation explored in future chapters, with the potential to reinvigorate KM.

In forming the platform, CRP takes "an evolutionary concept of knowledge as meaning continuously reproduced and potentially transformed in action" (Stacey, 2001, p. 189). Drawing from complexity theory in general and complex adaptive systems theory in particular (Cooke-Davies et al., 2007), CRP equates knowledge with meaning, and sees both as emergent in the communicative interaction between people. Further, and in common with other scholars interested in KM like Alvesson (1993), Edwards (2007), and Kuhn and Jackson (2008), CRP sees language as being used to negotiate and (re)produce self-identity, social status, and power relations at the micro-level of human interaction. In fact, CRP reminds of Foucault's emphasis on the ascending analysis of power, where infinitesimal practices (techniques and tactics) from the lowest level of society are shown to construct hegemonic forms of power (McHoul & Grace, 1998). Accordingly, this thesis proposes that CRP does greater justice to complex human interactions than the transmission model of communication that underpins the majority of research in KM.

In addition, CRP proposes that the process of interacting generates knowledge. In doing so, CRP provides a different emphasis to other relationship-centred theories, such as the community of practice and network models well-established in mainstream KM. CRP puts greater stress on the actual processes of relating instead of on relationships as discrete entities. Accordingly, CRP offers a far more action-based, and comprehensive account of communication. It is one that includes feelings and bodies, not just words (Stacey, 2001), and thus takes into account the human feelings that neuroscience is now showing are intimately connected to knowledge. In CRP, people are understood to respond directly to the

content and context of one another's speech and actions, and thus construct a living social relationship in the moment. Stacey (2000; 2001) argues that repeated thematic patterns give some stability to the reproduced knowledge while deviations from patterns potentially create new knowledge. This is contrary to typical understandings of knowledge in KM which sees (tacit) knowledge as located in the minds of individuals in the form of representations of external reality stored as memory and (explicit) knowledge located in artefacts (Stacey, 2001). Stacey (2001) argues that people evoke and provoke responses in each other rather than share mental content in the traditional sense of the transmission model. Accordingly, CRP regards the stored symbols of explicit knowledge as communicative tools that "have no meaning until they are used as tools in the process of communicative interaction" (Stacey, 2001, p. 189).

This perspective contradicts KM's largely rational, normative, and positivist outlook, and western society's tendency to treat knowledge as something that can be objectified and accumulated. In particular, and in accord with this thesis, Stacey (2001; 2003) critiques the tendency of KM to build theory about knowledge around binary constructs, constructs that are typically dichotomous (either/or) or a dualistic (both/and). These binaries position knowledge as both tacit and/or explicit, individual and/or organisational, an object and/or a process. Both dichotomy and dualism satisfy the logical precept that requires the elimination of contradictions or paradoxes. That is, knowledge is either one thing or the other (dichotomy) or it is two separate but related things (dualism). To address this weakness, Stacey (2001; 2003; 2007) adopts the perspective of Hegel to move towards a dialectical understanding of knowledge, which accepts the presence of opposing ideas (Stacey, 2003).

Where most of KM is built on the assumptions of a Cartesian and Kantian outlook (see chapter three), which regards individuals as knowing subjects who experience the world, Hegel offers an alternative view. Hegel's philosophy does not separate individuals from the social, regard systems as outside of human consciousness, or see unfolding as a linear process. Rather, as Zhu (2007) summarises, consciousness exists in humans' lived experience in local situations, the self and the social are mutually forming, and time is circular and paradoxical "in the sense that the future is changing the past just as the retelling of the past is changing the future" (p. 451) in the living present. Stacey (2001; 2003)

understands Hegel's philosophy as a transformational teleology, where there is no causality acting on humans. Instead, interactions, relationships and identities all emerge and self-organise into patterns "that are continually reproduced and potentially transformed" (Stacey, 2001, p. 197).

The implications are substantial. For one, a CRP perspective therefore sees knowledge as dynamically created out of continuous interactions – whether those interactions are between scholars in a field or members of an organisation. The social understanding of individuals positions organisations as processes of communicative interaction: "Organisations are patterns of power relations sustained by ideological themes of communicative interaction and patterns of inclusion and exclusion in which human identities emerge" (Stacey, 2003, p. 329). CRP's emphasis on organisations as processes focuses on attention on the day-to-day interactions of organisational members rather than the typical tasks of planning, strategising, and controlling (Luoma, Hämäläinen, & Saarinen, 2007). The decentring shift in focus from strategic management, to the everyday interactions that CRP theory moves centre stage, means that common understandings of knowledge and typical goals of KM must be re-evaluated. This lends additional support to the aligned arguments of this thesis for reconsideration, reconfiguration, and re-energising.

Towards a CRP-informed KM

Stacey's ideas offer an interesting and innovative way forward for KM, yet they have not been widely adopted. I would contend that they remain at the margins of work in the field in part because understanding KM from this perspective requires a significant shift in worldview away from the traditional managerial paradigm. In particular, a CRP lens would require managers to surrender the idea that they can manage through command and control. Richardson (2008) notes the same phenomenon when talking about introducing complexity thinking into management in general. He argues "complexity thinking actually requires us to spend a little more time thinking, and a little less time working" (p. 13). He goes on to explain that complexity thinking means accepting one's limits, especially about what organisations can plan and pre-determine. CRP's vision of organisations as "self-organising patterns of conversation, of meaning, in which

human identities emerge" (Stacey, 2003, p. 330) and knowledge as a continually emergent and self-organising process of relating, redefines the goals of KM.

Managers, from a CRP perspective, are participants in organisational life, not controllers of it. They may have the ability to disseminate their gestures to a wider audience than the average employee, but they have no control over the response to those messages (Stacey, 2001). Further, designing and implementing KM initiatives, or organisational changes to support KM initiatives, is pointless from a CRP perspective because universal prescriptions do not address the micro-level of each interaction that occurs in the living present. While typical KM interventions may affect the organisation in a number of ways, for Stacey (2001) they are rarely about the process of knowing. Because, from a CRP perspective, knowledge is seen to emerge moment by moment in patterns of relating, the future becomes somewhat predictable based on past experiences. Moreover, it is also perpetually under construction in the process of interaction so is simultaneously unpredictable (Cooke-Davies et al., 2007). Consequently, the notion of organisations planning and controlling the generation and dissemination of knowledge becomes redundant. In addition, discourses of extracting, storing, and using knowledge are no longer applicable. In fact, Stacey (2001) argues, in line with Richardson (2008), that understanding knowledge as a process means accomplishing more by doing less.

What a CRP perspective does advocate for KM, and this thesis supports this call, is attention to the "specific, unique situations in which people are already creating and obstructing new meaning, new knowledge" (Stacey, 2001, p. 230). By arguing knowledge is produced in the ordinary, everyday conversations in organisations, this theory gives a central role to a non-transmission view of communication. Stacey (2001) argues that KM should be focused on "the evolution of knowledge as participative self-organization" (p. 229). The social nature of knowledge, self-identity and communication requires a focus on what people are doing in the living present rather than what they might be imagining about an unknown future. It requires looking at who and how people and themes are being included and excluded in organisational conversations. CRP thus shifts the focus in KM from management of a whole system to paying attention to the only thing that individuals can actually control – their own participation in their own local situations in the moment (Stacey, 2001).

This chapter argues that the focus on participation of individuals in organisational conversations that Stacey calls for is also applicable to the field of KM. As knowledge in organisations emerges from interactions amongst members, so, too, knowledge in an academic field like KM emerges from scholars' gestures and responses. The earlier exploration of the development of KM illustrated how meaning and knowledge are continuously (re)produced through communicative gestures. Citing established authority figures, developing a history, and using the language of management establish communicative patterns that provide some stability to KM's identity. In contrast, the inclusion of new ideas represents the opportunity for transformation and the generation of new understandings and knowledge. From this perspective, debate over meaning, metaphor, and language is critical to the KM community: It is active participation in these debates that is most likely to provoke original ideas, invoke novel patterns of communication, and, therefore, result in new knowledge. From a CRP perspective, the apparent paradox between competition and cooperation, tension and anxiety, generated by plural understandings of a key concept is essential to the process of generating knowledge.

Conclusions

This chapter attempts to show that for KM to have multiple understandings of knowledge, while challenging, is not inherently fatal for the field. Definitional proliferation is healthy for KM, and, to borrow from Richardson (2008), "not a disease that needs to be eradicated" (p. 18). As Richardson (2008) observes, in the context of organisational management, forcing unification on a fragmented field does little more than paper over the cracks, and limits opportunities for rich insights in the process. The same might be said of KM's attempts to force conceptual unity. This chapter, therefore, encourages the KM community to move away from binary constructs and to accept plurality. Choosing to embrace and cultivate paradox rather than eliminate contradictions offers the potential to generate new knowledge and stimulate new insights (Stacey, 2001; Jackson, 2005). Accordingly, this chapter adopts Eisenberg's (1998) view that divergent discourses need not be, and indeed cannot be, fully integrated or resolved.

Further, this chapter positions communication as a unifying concept for the multiple definitions of knowledge. It argues that the process of communicating is implicit in the definitions and use of knowledge and therefore central to KM. It further contends that the confines of the traditional understanding of communication – as the transmission of messages – is no longer sufficient for KM theory and practice. Accordingly, this chapter concludes that pluralistic understandings of knowledge should be supported by richer understandings of communication. It offers CRP as a theory that combines radical understandings of knowledge and communication with the resulting potential to reinvigorate KM. The next chapter looks to another source that offers fresh ways to understand knowledge and provides support for multiple definitions of the concept. Rather counter-intuitively, this source is the study of ignorance.

Chapter 7 – Ignorance and knowledge

The previous chapter made a case for KM's adoption of multiple and complex understandings of knowledge, in conjunction with the utilisation of richer communicative theories. It focussed on CRP as a specific theoretical lens for combining fresh approaches to knowledge and communication with a coherent challenge to the managerial paradigm. This contestation is one that the thesis continues to identify as essential to the reinvigoration of KM. This chapter takes advantage of another benefit for KM of CRP by showing how, in drawing on complexity theory, CRP calls attention to the role of the unknown in organisational life. In considering the unknown, my research found that, typically, scholars, as Smithson's (1989) extensive study found, describe it in terms of uncertainty and ambiguity. They then concentrate on the goal of reducing or eliminating these characteristics of the organisational environment. In addition, much management practice, such as the development of mission statements and strategic plans, is focused on anticipating and controlling future outcomes. This pursuit of knowledge, truth, and certainty has resulted in the marginalisation of a concept that has a close relationship with knowledge – ignorance. This thesis argues that in KM, even though the complexity of knowledge is extensively explored in the KM literature, the corresponding complexity of ignorance remains unattended to. Furthermore, it contends that this neglect is detrimental to the future development of KM.

In seeking to redress the imbalance, this chapter introduces considerations of ignorance to the KM discourse. It begins by seeking to explain the neglect of ignorance in the KM literature, and does this by drawing on the relationship between the language and outlook of the managerial worldview previously discussed in relation to knowledge. However, emphasising developments in complexity theory and neuroscience as increasingly prominent forces across related fields of study, this chapter argues for an alternative worldview that allocates a more central role to ignorance in KM. Consequently, it argues for a dialectical relationship between knowing and not-knowing in both the organisational and academic context. The chapter also presents an overview of ignorance – by bringing together a range of taxonomies from several disciplines. Although the KM community already knows that knowledge is a complex

concept, the chapter, by also appreciating the complexity of the complementary concept of ignorance, seeks to deepen the field's comprehension of both. Finally, it suggests how the KM community paying attention to ignorance may serve KM well in enhancing its relevance to contemporary conditions.

Explaining the neglect of ignorance: Language and worldview

As earlier chapters have established, the KM community has spent much energy wrestling with its understandings of knowledge. Though there is little consensus about how best to define knowledge, the field does seem to agree that it is a multi-dimensional and complicated concept. One goal of this chapter is to establish ignorance as a similarly complex, multi-faceted, and socially constructed phenomenon. A second goal is to draw attention to the dialectical relationship between knowledge and ignorance, exposing the dynamic relationship between these two concepts. Before suggesting how the KM community might better engage with ignorance, and thus enrich its understanding of knowledge, it is worth exploring why KM has not explored ignorance to date. This section sees two main factors contributing to the neglect of ignorance. First, just as the language of knowledge has affected the study of knowledge, the language of ignorance has impacted on the study of that phenomenon. Second, the dominance of the worldview of the managerial paradigm has also limited the attention ignorance has received.

Given the case this thesis has made for the shaping power of language, the contrasts in the language of knowledge and ignorance are worthy of exploration. The KM community has predominantly regarded knowledge as a resource to be used to pursue competitive advantage (see earlier chapters). Moreover, as chapter five showed, the dominant metaphors of KM construct knowledge as a thing to be acquired, accumulated, and used in that pursuit. In contrast, ignorance has been absent from the KM discourse. This is at least partially explained by the fact that ignorance is not reified in the same way knowledge is; it is not treated as a commodity, an intellectual asset, or social capital. Whereas knowledge is treated as a possession, ignorance is regarded as a state ("I have knowledge" versus "I am ignorant"). As a result, language offers many more possibilities for discussing knowledge directly than it does ignorance, as ignorance can only be expressed

passively or by negating knowledge (Smithson, 1989). For example, someone can say "I don't know what the capital of Australia is," but there is no verb from ignorant they can use ("I ignore the capital of Australia"*). The verb form of ignorance has quite a different use. If an individual *knows* something, they have knowledge. If they *ignore* something, however, the implication is that they know of it but choose not to engage with it. Ignorance is linguistically a fundamentally different concept to knowledge.

Furthermore, just as metaphors filter KM's view of knowledge, metaphors similarly shape views on ignorance. Given that ignorance is usually thought of as the antonym of knowledge it is not surprising that some of the metaphors for ignorance are the opposite of those for knowledge: Where knowledge may be discussed in terms of light (*see the light, he's a bright boy, the light bulb came on*) ignorance is seen in terms of darkness (*it's a blind spot; we were kept in the dark*). There is also some correspondence with the notion of knowledge as residing in people's minds when someone thought of as ignorant is described as *empty-headed*. However, unlike knowledge, ignorance is not referred to as a liquid or solid. Rather, it is associated with the senses. Phrases used with ignorance often relate to a lack of vision: It is possible to talk about *being blind, in the dark ages, blindfolded, not having the foggiest*. We can also be *deaf* to knowledge. Things are said to be *concealed, hidden, obscured, untold, unheard,* and *unspoken*. Interestingly, given the debate over the conceptualisation of knowledge as knowing-in-practice, some linguistic references to ignorance point to it as the absence of experience rather than information (*wet behind the ears, green*). Also, other language indicating ignorance sees it as a state of partial knowledge (*vague, uncertain, half-baked, ill-informed*). By far the majority of conceptualisations, however, express ignorance as a lack (*unexplored, unheard of, have no clue, have no idea, have no inkling*).

This chapter also sees the contrasting connotative aspects of ignorance and knowledge as having played a part in the failure to attend to ignorance in KM. Ignorance has inherently negative connotations – it is a state which is generally viewed pejoratively. In contrast, the KM literature views the acquisition of knowledge as positive and encourages this process. In general society, though individuals may not always want to hear what others know, knowledge is typically associated with wisdom, expertise, and high status. Ignorance, in

contrast, is seen by most people as a lack, and associated with stupidity, poor education, and closed-mindedness. One exception to ignorance as negative is the notion of a clean slate – where value is given to a lack of prior knowledge.

The grammatical, metaphorical, and connotative aspects of ignorance as a linguistic term, as this chapter argues, undoubtedly contribute to its neglect, but perhaps a more significant driver in relation to KM is the dominant worldview of the managerial paradigm. This thesis has argued that the command-and-control perspective of management dominates KM. The positivist worldview that accompanies this perspective suggests that ultimate truths are simply waiting to be discovered. Accordingly, the organisational literature tends to use the umbrella term "uncertainty" to cover anything unknown (Smithson, 1989). This chapter notes that Smithson's (1989) twenty-year-old observation that if ignorance was acknowledged at all in the organisational literature, it was generally termed ambiguity or uncertainty – and discussed with reference to how it can be eliminated – still holds true. To date, the area of ignorance most comprehensively studied remains the hidden economy, that is, the "creation and maintenance of systematic ignorance" (Smithson, 1989, p. 252) that allows the black market, fraud, and other aspects of semi-organised crime to flourish. Such studies have looked at the conditions within individual organisations that allow fiddles to occur (Mars, 1982) as well as the greater social structures that support tax evasion and illegal economic activity (Mattera, 1985).

This chapter argues that when ignorance is studied from a positivist perspective, the motivating belief is that making ignorance visible renders it easier to be eliminated. Consequently, as Harvey, Novicevic, Buckley, and Ferris (2001) suggest, an organisation adopting the values of this perspective might focus on identifying ignorance that leads to poor decision making and then work on reducing that ignorance. Similarly, from a positivist position, Smithson's (1989) breakdown of *error* into eleven sub-categories offers a detailed diagnostic tool that could facilitate organisational members identifying the source of their errors. Workers might use it to identify gaps in their knowledge and the ignorance that leads to error, allowing them see where they went wrong, and thus making it easier to eliminate this type of ignorance. This chapter acknowledges that the analysis of error is crucial to organisations as error potentially leads to costly mistakes, so sees a role for such approaches. However, focusing solely on the

reduction and elimination of ignorance misses the additional prospect of seeing ignorance as a chance to learn and cultivate innovation.

An approach that embraces ignorance instead of seeking to reduce it fosters mistakes as learning opportunities. Jungck (1996) promotes this perspective, arguing that "allowing ourselves to make considerable mistakes to learn from leads systematically to the possibility of generating more new ideas" (para. 14). Rather than being admonished by authority for a mistake, people can use errors as an opportunity for collaborative learning, self-reflection, thus making them acceptable part of the process of acquiring or generating knowledge (Jungck, 1996). This chapter argues that what makes the most sense for the way forward in KM is to integrate these two approaches, that is, to see ignorance as both an opportunity and a cost. To do this KM scholars need to learn more about the juxtaposition of organisational knowledge and ignorance, so they recognise that both knowledge and ignorance can be functional or dysfunctional within organisations.

This chapter sees an additional problem with the positivist worldview favoured by the managerial paradigm. It notes that because the existing literature predominantly looks at how to eliminate or absorb uncertainty, little attention is paid to how and why ignorance is constructed. This approach also tends to neglect the understanding that organisations are social constructs that serve someone's interest and preserve someone's way of looking at the world (Jungck, 1996). In addition, ignorance in the form of uncertainty is typically treated as a feature of the organisational and physical environment rather than a product of the organisation itself (Smithson, 1989). This chapter calls for KM to explore ignorance, its socially constructed nature, and the role of ignorance in developing knowledge, as supporting the generation of radical new ways of seeing and doing things. Changes in worldview come with immense social and personal upheaval (Jungck, 1996). However, as chapters three, four, and six have argued, a new managerial worldview more aligned with contemporary conditions is gaining momentum.

Driving ignorance into KM: An alternative worldview

This new worldview is not without precedent. Historically, the concepts of knowledge and ignorance have long been associated. In ancient Greece, knowledge and ignorance were frequently contemplated in relation to one another, with Socrates often credited for specifying that wisdom comes from an awareness of one's ignorance. Later, in the fifteenth century, Nicollas of Cusa developed the concept of "learned ignorance," which proposed that combining knowledge and ignorance through recognising the limitations of knowledge enabled reasoning of uncertain conclusions (Harvey et al., 2001). Harvey et al. (2001) pinpoint the Enlightenment period of the late seventeenth century as the turning point when reasoning on known truths emerged as the dominant paradigm, and empirical and mathematical sciences became ascendant. From that time, ignorance increasingly faded from common discourse. However, just as, as this thesis has argued, many of the values of the Enlightenment are currently being usefully questioned in a range of academic fields, the neglect of ignorance is also worth challenging. Consequently, several centuries later, ignorance is receiving some academic attention once again. This change in focus, the chapter argues, is assisted by a post-modern perspective (that sees knowledge as socially constructed rather than divinely decreed or scientifically discovered), complexity theory (that stresses the emergence of an unknown future), and social neuroscience (that exposes the limits of an individualistic, solely-cognitive approach to knowledge). Together, these phenomena are crafting a worldview that challenges the paradigm that has dominated for the last few hundred years.

A significant aspect of this emergent worldview is a mounting emphasis on the unknowability of the future, which is, in part, driven by the increasing influence of complexity theory. In discussing the relationship between complexity thinking and management, Richardson (2008) highlights how

> complexity thinking is about limits, limits to what we can know about our organizations. And if there are limits to what we can know, then there are of course limits to what we can achieve in a pre-determined, planned way. (p. 13)

Similarly, Stacey (2001) positions CRP as explaining emergence as the movement of human action towards an unknown future that is under perpetual construction. Furthermore, both Stacey (2005) and Saarinen (2008) stress organisational leadership in complexity as being about having the courage to carry on in the face

of the unknown. Stacey (2005) goes so far as to claim that "one recognised as a leader has a greater capacity to live with the anxiety of not knowing and not being in control" (p. 14). The unknowability of the future that complexity theory stresses, this chapter contends, provides a much needed impetus for ignorance to be a significant aspect of KM.

It is not just complexity theory, however, that is highlighting a future that is unknowable. Developments in psychology and neuroscience help to explain why imagining the future of organisations, and striving to achieve that future through strategic plans, might not be an effective goal. Gilbert (2007) explains that "imagination works so quickly, quietly, and effectively that we are insufficiently skeptical of its products" (p. 26). That is, as Gigerenzer (2007) succinctly puts it, "brains make things up" (p. 41). Furthermore, what individuals imagine is always biased by the present. Imagination is particularly ineffective at telling people how they will feel and think about future events when those events are occurring, so even if they correctly predict a future event they are often unable to predict their reaction to it, particularly their emotional response (Gilbert, 2007). Furthermore, Gigerenzer (2007) makes a case for the virtue of ignorance when attempting to predict future events. Where the future is unknown, such as in predicting the future performance of stocks based on past performance, it is impossible to know which information is useful and which arbitrary. Therefore, it is a better strategy to ignore all previous information than try to develop complex formulas that attempt to account for possible futures.

Moreover, people rarely notice what is absent when they imagine their futures. Human brains are primed to notice the presence of things rather than the absence of things. Brain experiments show that when people visually attend to something their brains selectively focus on that thing to the exclusion of others, thus affecting how they perceive and respond to the world (Restak, 2006). Gilbert (2007) describes this process by noting how statisticians use both the presence and absence of something to establish causal relationships, that is, to account for co-occurrences and non-co-occurrences. Yet, he contrasts, the human brain, when seeking causality, more naturally looks for what did happen and fails to "search for, attend to, consider, and remember information" (Gilbert, 2007, p. 109) about what did not. As Francis Bacon said, "contemplation usually ceases with seeing, so much so that little or no attention is paid to things invisible" (cited in Gilbert,

2007, p. 110). In addition, people tend to treat the details of future events that they do imagine as very likely to happen, but correspondingly treat the details that they don't imagine as if they are not going to happen. These recent findings in neuroscience point to the futility of managers and organisations paying too much attention to planning for the future. They also draw attention to how the brain comes to "know" and "not know" (and how it makes errors in predicting) and therefore support this chapter's call for a return to the unified study of knowledge and ignorance.

Recognising the relationship between knowledge and ignorance

KM, by its very name, is concerned with knowledge. Accordingly, KM scholarship typically takes the perspective of the knower and the known. Several scholars, for example, propose carrying out knowledge audits so organisations understand how knowledge fits with current practices and can springboard into a KM strategy (Henczel, 2001; Liebowitz, Rubenstein-Montano, McCaw, Buchwalter, & Browning, 2000; Choy, Lee, & Cheung, 2004; Perez-Soltero, Barcelo-Valenzuela, Sanchez-Schmitz, Martin-Rubio, & Palma-Mendez, 2006). Currently available knowledge audits, however, reflect the biases of the IS approach to KM – asking what people know, where knowledge is located, and how knowledge can be managed and used in the quest for competitive advantage. The study of ignorance emerges from a different perspective than the study of knowledge, and, consequently, its emphases differ. That study is more likely to ask what it is that people don't know; to explore what might be hidden, obscured, or misunderstood within an organisation; and to look at how ignorance might be managed and affect the quest for competitive advantage.

To an extent the academic emphases follow general social emphases. The basic definition of ignorance, "lack of knowledge, information, or education" (*Collins Concise English Dictionary*, 1992, p. 643), does little to advertise its multi-faceted and complex nature. Defining ignorance as an absence acts to obscure its presence, and defining it in relation to knowledge implies a dichotomous either/or relationship between knowledge and ignorance. This chapter argues that rather than being conceptualised as antonyms, ignorance and knowledge are more usefully considered complementary. It positions ignorance as a product of people,

social structures, and their interaction, in the same way as knowledge. It sees ignorance as also, therefore, "driven by human motivations, goals, values and interests" (Smithson, 1989, p. 218). Consequently, this chapter agrees with Smithson's assertion that "norms and social arrangements that promote ignorance are woven not only into the micro-order of social interaction, but also into higher-level cultural and social institutions" (Smithson, 1989, p. 237). In other words, the properties of social life are present within organisations. Ignorance, I argue, therefore should be of interest to organisational scholars, and especially KM scholars.

To date, however, very few discussions of knowledge within KM concern themselves with ignorance. While, as mentioned earlier, more than 20,000 articles are returned on a search of the ABI/Inform databases between 1986 and 2009 using the phrase "knowledge management," only 20 of those also contain the keyword "ignorance." Likewise, books on management, and specifically on KM, rarely include the word "ignorance" in their indexes (see, for example, Nonaka & Takeuchi, 1995; Davenport & Prusak, 2000; Dalkir, 2005). Over the last decade or so there have been only two major articles addressing ignorance in the context of management (Thompson, 1997; Harvey et al., 2001) and just one book chapter (Schneider, 2006) discussing ignorance in relation to KM.

Similarly, only a few general management scholars have looked at ignorance. Concerned with the shaping of academic knowledge, Thompson (1997) explored the deliberate use of ignorance as a means of hegemonic control among academics in the field of economics. Working in management education, Standen, McKenna, and Williams (1998) similarly advocated the adaptation of ignorance paradigms for teaching business students how to cope with complexity, ambiguity, and uncertainty. Significantly, this was done with the aim of better equipping them for the modern workplace.

In contrast to KM in particular and management in general, other disciplines that are concerned with knowledge have explored the significance of ignorance. In the 1990s, scholars in science education and the sociology of science drew attention to the role of ignorance in their fields (see Kerwin, 1993; Jungck, 1996; Stocking & Holstein, 1993). Kerwin, Witte and colleagues at the University of Arizona, for example, highlighted the importance of understanding, acknowledging and

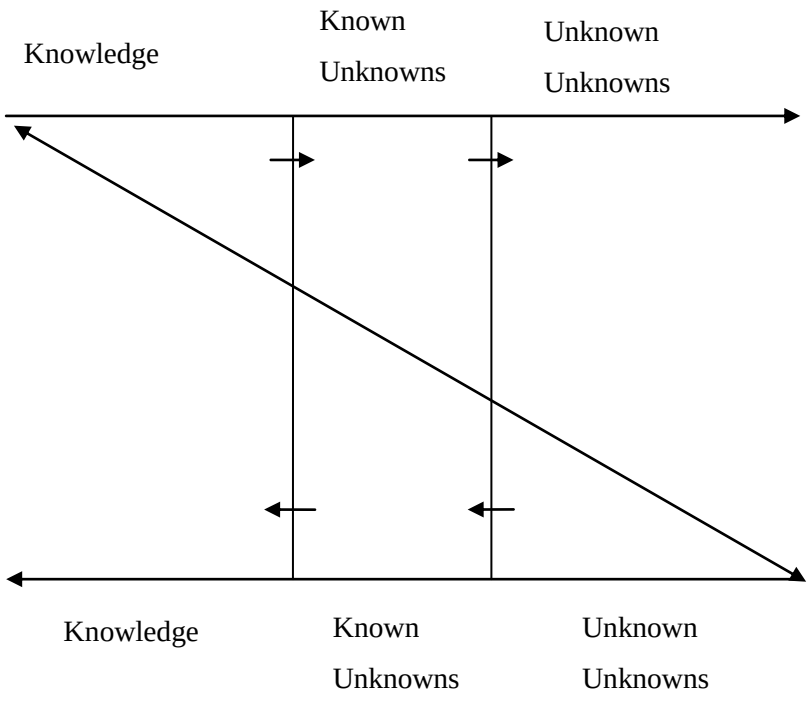
managing ignorance in the training of physicians (http://www.ignorance.medicine.arizona.edu). Jungck (1996) promoted similar attention to the role of ignorance in science curricula, questioning the premise of knowledge being "transferred" to students via teachers and controlled experiments. Perhaps the most definitive account of ignorance, however, is *Ignorance and Uncertainty: Emerging Paradigms* by psychologist Michael Smithson (1989), who sought to capture what he claimed was an emerging "widespread but unobvious trend in Western intellectual culture" (p. vii) toward interest in ignorance.

In arguing that KM scholars should attend to ignorance, this chapter draws heavily from Smithson's (1989) important contribution. One of his major observations was that ignorance is made possible by several properties of social life, namely the nature of language, social interaction processes, and social norms. Firstly, language is flexible and ambiguous enough to permit inadvertent partial understanding or deliberate misunderstanding. In short, individuals can be vague, indexical, and non-specific in their use of language, or they can choose to lie, obscure, and confuse (Smithson, 1989). In addition to the vagaries of language, many social norms encourage the construction of ignorance. For example, Smithson (1989) observes that expectations regarding self-disclosure can be dictated by social status and role, as can behaviours governed by secrecy and privacy, both aspects of ignorance. Smithson (1989) also pointedly notes that these social norms, and the linguistic distortion they encourage, make ignorance probable rather than possible. Sharing his perception, this chapter extends it to the specific contention that it is perilous to ignore ignorance when studying knowledge.

Furthermore, the relationship between knowledge and ignorance is not zero sum. As knowledge increases, whilst a part of ignorance is eliminated, paradoxically ignorance also increases. In other words, the more people know, the more they know they don't know. This chapter represents this dialectical, paradoxical relationship between knowledge and ignorance diagrammatically in Figure 7-1. Rather than only seeing ignorance as the starting point of knowledge, it shows that knowledge can also be seen as the starting point of ignorance. The top part of the diagram shows the latter, illustrating how as knowledge is increased ignorance is also increased. Beyond increasing individuals' awareness of what they don't

know (*known unknowns*), however, increased knowledge also hints at many more discoveries to come. This raises awareness of what remains beyond reach (*unknown unknowns*). That is, the more knowledge one has about a topic, the greater one's awareness of what remains unknown becomes. Simultaneously, as individuals discover new things, represented by the lower half of the diagram, they change the type of ignorance from what they are unconscious of not knowing (*unknown unknowns*) to what they know they don't know (*known unknowns*). It is *known unknowns* that inspire people to seek new knowledge, thus increasing the overall stock of knowledge. Given the complexity of the relationship between the two concepts, this chapter argues that an understanding of ignorance in organisations is just as crucial as an understanding of knowledge. Accordingly, the following section presents taxonomies of ignorance developed in a range of fields that may be useful for KM.

Figure 7-1 ***The Paradoxical Relationship between Ignorance and Knowledge***



Taxonomies of ignorance

This chapter has highlighted the opportunity contemporary conditions, in terms of shifting worldview, offers to introduce the study of ignorance into KM. It has also established a dynamic, dialectical relationship between knowledge and ignorance. It now goes on to summarise existing taxonomies of ignorance to illustrate the concept's inherent complexity. Table 7-1 provides a comparative summary of the major taxonomies of ignorance developed by scholars from a range of disciplines in the last three decades, each of which is briefly discussed below. The first column lists the domains of the "ignorance map" developed by Kerwin and colleagues at the University of Arizona. The ignorance map charts six domains of ignorance. The second column contains a simplification of Smithson's (1989) tree diagram of ignorance. Smithson's major division between *errors* and *irrelevances* is shown, with relevant subdivisions provided in brackets. This is followed by Harvey et al.'s (2001) and Schneider's (2006) taxonomies of organisational ignorance. The categories of each taxonomy are presented in such a way as to show overlap with the six domains of the ignorance map.

Table 7-1 ***Summary of Taxonomies of Ignorance***

Kerwin (1993)	Smithson (1989)	Harvey et al. (2001)		Schneider (2006)	
Known unknowns – all the things we know we don't know	Irrelevances (undecidability)	Pragmatic		Positive	Protective
				Inspiring	
Unknown Unknowns – all the things we don't know we don't know		Pluralistic	Probabilistic	Ignored	
Errors – all the things we think we know but don't	Errors (distortion, incompleteness)	Pluralistic	Populistic		
Denials – all the things too painful to know so we don't	Irrelevances (taboo)	Pluralistic			
Taboos – dangerous, polluting or forbidden knowledge	Irrelevances (taboo)			Protective	
Unknown Knowns – all the things we don't know we know					

This chapter sees the ignorance map developed by Kerwin and colleagues (used to assist in teaching medical students) as a particularly comprehensive and comprehensible taxonomy (www.ignorance.medicine.arizona.edu/ignorance.html). The first of the six domains is *known unknowns*; that is, the things individuals know they do not know. A second domain, *unknown unknowns*, refers to things people are not aware that they do not know. Third, the category *errors* is defined as things that people think they know but in fact don't. The fourth and fifth domains identified in the ignorance map are *taboos* and *denials*. *Taboos* include knowledge that is constructed as forbidden and dangerous (for example, knowledge that is culturally assigned to women and forbidden to men). Individuals are kept, or keep themselves, ignorant of taboos because it is better not to know. The category of *denials* is a similar kind of ignorance where individuals ignore those things that are painful to them, such as memories of childhood trauma. Rather than being things that individuals are unaware of, *denials* are on the periphery of consciousness but are not pursued. The final domain is the *unknown knowns*, which are the things individuals are not aware that they know (for example, a person may be unaware they are able to fix a machine until they find themselves in a situation where that skill is needed).

Smithson's (1989) ignorance framework has less breadth but more depth than the ignorance map in its provision of categories and sub-categories of ignorance. The two main divisions Smithson (1989) makes are between *errors* and *irrelevance*, where *errors* refers to ignorance as an incorrect cognitive state and *irrelevance* to things people choose not to be aware of. *Errors* is the more multi-faceted category, which includes errors that come from distorted facts (through confusion and inaccuracy) and those that come from incomplete information (such as uncertainty and absence). Uncertainty is further divided into vagueness (inclusive of fuzziness and non-specificity), probability, and ambiguity. Ignorance from *irrelevance*, in contrast, stems from a lack of topicality, taboo, and undecidability (Smithson, 1989). Smithson's (1989) analysis of ignorance is influenced by his mathematical background, and this chapter sees its main strength as potentially delivering a comprehensive analytic tool for organisational errors.

With particular reference to organisations, and thus overtly relevant to KM, Harvey et al. (2001) developed an alternative typology of ignorance. Their four-

part taxonomy, informed by research in the social sciences, includes *pluralistic*, *populistic*, *probabilistic*, and *pragmatic* ignorance. *Pluralistic* ignorance is the type of ignorance that occurs when individuals privately reject a belief, practice or opinion, but they assume that everyone else accepts it (Harvey et al., 2001). In organisations this can be manifested in teams, where approbation may be expressed for ideas in order to conform with perceived group norms. This happens even despite contradictory private attitudes. That is, "individuals, motivated to behave in a norm-congruent manner, are 'ignorant' in recognizing the social motive force of group identification of other group members" (Harvey et al., 2001, p. 453). This concept has some overlap with "groupthink" but is less about the group forging a cohesive identity to the exclusion of outsiders and more about the individual's inability to correctly judge behaviour in others.

Where *pluralistic* ignorance is an issue of individual psychology, *populistic* ignorance is a social issue. Populistic ignorance refers to the collective sharing of false ideas (Harvey et al., 2001). This type of ignorance is systematic and socially constructed by populations of unrelated individuals (Harvey et al., 2001). The third type of ignorance discussed by Harvey et al. (2001) is *probabilistic* ignorance. This type stems from the individual's desire to have linear, cause and effect, learning experiences. Rather than seeing that changing contexts can lead to discrete events, people tend to "refuse to believe that their past experience does not improve their judgment and decisions, and that managing from specified ignorance may be a more appropriate approach" (Harvey et al., 2001, p.455). This results in difficulties in training people to think in non-linear ways. *Probabilistic* ignorance does not just work at the individual level though – it may also be systemic. People may be manipulated into expecting certain outcomes based on how they are presented with prior knowledge, which they are unable to validate themselves (Harvey et al., 2001). For example, scientists spent many years attempting to elucidate the structure of DNA, based on the erroneous knowledge that DNA was a protein. It was not until the error was detected, after many resources and much time spent, that headway was made (Kerwin, 1993). The final type of ignorance identified in this taxonomy is *pragmatic* ignorance (Harvey et al., 2001), which roughly equates to *known unknowns* in the ignorance map. *Pragmatic* ignorance refers to the practical need to give up the pursuit of knowledge in order to make a timely decision in changing and complex situations.

Harvey et al.'s (2001) description of *pragmatic* ignorance corresponds well with Schneider's category of *positive* ignorance. Schneider (2006) regards *positive* ignorance as functional and conscious. It involves individuals deliberately picking and choosing what they learn and know based on their needs. The second type of ignorance Schneider (2006) identifies is *protective* ignorance, a more subconscious functional ignorance. This is the kind of not knowing used when faced with the need for speedy decisions. Individuals reach a point where they cannot afford to spend time and energy accumulating more information and knowledge so they reach a decision in a state of ignorance (Schneider, 2006).

As well as identifying two functional forms of ignorance, Schneider's (2006) KM-specific taxonomy describes two dysfunctional forms: *ignored* and *inspiring* ignorance. *Inspiring* ignorance is somewhat oddly labelled as dysfunctional, given that it is defined as the ignorance that drives people to seek information and knowledge, and Schneider (2006) sidesteps explanation of this category by claiming it as commonly known in KM. She more clearly defines *ignored* ignorance, the fourth type. This takes two forms. First, it is the manipulated ignorance that a third party imposes through the selective filtering of information. As Schneider (2006) notes, organisations filter information out of necessity, but when it becomes applied intentionally to encourage wrong decisions, such as in the case of selective truths, withholding of information, or disguise and fraud, it becomes manipulative. Secondly, *ignored* ignorance is that which individuals don't know that they don't know; the gaps in their knowledge of their knowledge (Schneider, 2006). These gaps limit the choice of solutions and ways of seeing. Schneider (2006) rightly suggests that the prevention of such manipulated ignorance needs to be a focus of KM, arguing, as this thesis has, that KM has "hardly included the analysis of power and interest in [its] models" (Schneider, 2006, p. 107).

Overall, this chapter sees that the currently available taxonomies of ignorance make two significant contributions to KM. First, they move KM beyond a simplistic notion of ignorance as the lack of knowledge. Indeed, the differing emphases and categories of each taxonomy point to ignorance as an area that could be much more finely delineated in the literature. The complexity of ignorance further exposes the inadequacies of the simplistic notions of knowledge that this thesis has already critiqued. For example, explicit knowledge, as defined

by the KM literature, has no obvious counterpart in any of the ignorance taxonomies because the notion of explicit knowledge fails to capture the dynamic complexity of knowing and not knowing. Accordingly, the taxonomies of ignorance point to the value of a theoretical lens like CRP because it pays attention to ongoing, dynamic processes. Though Stacey (2001) does not address ignorance specifically, this chapter argues that the nature of CRP provides scope for the analysis of ignorance in conjunction with knowledge. Second, the taxonomies provide a welcome challenge to the managerial paradigm's reductionist view of knowledge as certain truth, and ignorance as uncertainty that can be eliminated. By highlighting the complex, socially constructed nature of ignorance, KM's positivist leanings are destabilised.

Managing ignorance in KM

Including the study of ignorance in KM, this chapter argues, will help to keep KM relevant in the face of the contemporary conditions outlined in chapter three. The acceptance of the world as unpredictable, dynamic, and non-linear, compelled by developments in neuroscience and complexity theory, requires a shift in the dominant ontology and practice of management and KM. Acknowledging the role of ignorance in KM and the impossibility of full knowledge can help researchers to focus on how to make ignorance work for, rather than against, organisations. For Jungck (1996), a key element of the context necessary to make this happen is the ability to accept a degree of chaos: "Chaos provides the constant source of disequilibration, the awareness of complexity, and sensitivity to initial conditions" that create a dynamic rather than static environment (para. 21). Using the example of Canon's disposable photocopier drum famously being inspired by a beer can, Gray (2003) similarly argues that though new knowledge is often generated when familiar ideas come together in unfamiliar combinations, it is impossible to predict exactly what chaotic combinations will be inspiring. For KM, this might mean that managers need to resist the impulse to use the known to deal with the unknown and instead encourage exploration of ignorance, to prevent thinking from becoming prematurely bounded (Gray, 2003).

Indeed, an understanding of ignorance recognises the limitations that knowledge imposes. An accumulation of knowledge has traditionally been seen as a

prerequisite for promotion. In the present-day knowledge economy, paradoxically, past experience can be a hindrance (as it becomes quickly antiquated and leads to limited ways of seeing). Consequently, the ability to rapidly learn and "forget" can be more valued skills (Harvey et al., 2001). The value of forgetting is also acknowledged in the neuroscience literature. Gigerenzer (2007) explains that forgetting is seen as the by-product of "a system adapted to the demands of [its] environments" (p. 23) while perfect memory is considered a fit with "a completely predictable world, with no uncertainty" (p. 23).

Ignorance is also often recognised as a necessary state for innovators, entrepreneurs and others in creative roles, as they perform better and more creatively without the weight of prior knowledge of others. A number of scholars have explored this (see Murphy & Pauleen, 2007; Schneider, 2006; Gray, 2003; Snowden, 2002). Their studies confirm that basing everything on prior knowledge, experience, and facts can stifle creativity and innovation, and lend some support for experimentation based on gut feeling. Though they do not always name it as such, this chapter would say that, in effect, these scholars are promoting ignorance.

It is not just ignorance that leads to creativity that is relevant to KM. *Protective* (Schneider, 2006) or *pragmatic* (Harvey et al., 2001) ignorance promote taking calculated risk, and, at times, risk taking and timely action can be more important than a grasp of all the facts. This type of ignorance is based on *argumentum ad ignorantiam*, which "represent everyday examples of reasoning in which an agent searches for something, finds it or not, and then draws an appropriate conclusion" (Walton, 2005, p. 67). The arguments are defeasible as they are based on searches of incomplete databases but they are arguments that are intelligent guesses and help to provide forward momentum while more evidence is collected. The conclusions that people adopting this type of ignorance reach will be tentative, and may even need to be retracted later (Walton, 2005). Nevertheless, it is pragmatic for people to accept actions based on such arguments because the arguments are reasonable, particularly because the notion of absolute truth and knowledge is now under challenge. Given the rapidly changing nature of the contemporary organisational environment, this chapter argues that KM could benefit from considering how these types of ignorance could be understood and appropriately applied.

A further feature of the current complex environment of organisations is the abundance of information. Davenport and Beck's (2001) research shows that a high percentage of workers feel overwhelmed by the amount of information they receive, and many managers believe important decisions are delayed and affected by too much information. Both dealing with an excess of information, and dealing with a shortage of time, require a focus on learning what Schneider (2006) terms the "stop rules" (p. 105) of knowledge. That is, rather than focusing on the maximising of knowledge, the traditional cornerstone of KM, the individual's focus moves to deciding when enough knowledge is enough. Considering this same issue, Davenport and Beck (2001), through what they term the "plug principle," propose setting limits through policy and technology on how much information is distributed and where. For them, organisations need to focus on limiting the circulation of information that bombards workers in such a way that people still can find what they need but have the unnecessary reduced. Davenport and Beck (2001), along with Schneider (2006), make sensible suggestions about how to tackle the overload of information. These suggestions include the possibility of charging information providers to send information, filtering information through technology, better managing information flow, letting go of informational offers, and fostering netiquette.

These suggestions also take the emphasis of KM away from being about capturing all knowledge. This can be more productive as the capturing approach often leads to little more than stock piling of documents and files that end up being infrequently accessed. The excessive amount of information that plagues the modern organisation supports the concept of *positive* ignorance (Schneider, 2006) in KM. Managing information flow is already seen as an appropriate goal for KM. This chapter shows that managing information also means managing ignorance. Such management involves being able to quickly determine what is needed, and what is not, and what is critical given the current onslaught of information and the rapidly changing nature of the environment (Harvey et al., 2001). The chapter positions this approach as a better adaptation to the rapidly changing and time-constrained contemporary environments and can be justified when searching for, and incorporating, more knowledge may be an inefficient use of time with little or no productivity gain. It follows Schneider (2006) in sometimes urging organisational members to "deliberately choose to protect themselves from the

burden of knowledge" (p. 102) and worth considering as a significant part of KM strategy.

Knowing about ignorance

Until now, KM has predominantly ignored the concept of ignorance. Yet, this chapter has argued ignorance is critical to KM because of its epistemological connection with knowledge. Both are socially constructed and defined by one another. Ignorance is not a black hole of nothingness in comparison to the richness of knowledge. Rather it is a complex and rich space dialectically formed when KM scholars delineate knowledge. Stocking and Holstein (1993) use an insightful metaphor that illustrates the connection between ignorance and knowledge. They see the relationship captured in the way art teachers ask student artists to look not at the figure they are drawing but at the space around the figure. This chapter argues that knowledge and ignorance are inextricably linked in a similar way, and, therefore, any evaluation of knowledge should be complemented by an evaluation of ignorance.

It is not just epistemology that connects ignorance and knowledge, however. Increasingly sophisticated understandings of what knowledge is and how we come to know are undermining the notion of knowledge as universal truth. As this thesis continues to argue, that notion has ontologically dominated KM. Furthermore, its associated managerial style is not well suited to such contemporary conditions as swift change and ongoing uncertainties. Developments in technology and science are making people increasingly aware of how complex the world is, and just how little is known about it (Smithson, 1989). As people come to realise that they cannot ever know all there is to know, it makes sense to start asking what it is that is not known and cannot be known. As Richardson (2008) notes, "complexity 'thinking' is the art of maintaining the tension between pretending we know something, and knowing we know nothing for sure" (p. 21). This chapter concludes that KM has to come to terms with simultaneously managing knowledge and ignorance.

By comparing and discussing the taxonomies of ignorance that have been developed in several disciplines, this chapter has introduced a multifaceted understanding of ignorance to the discussion of knowledge. It has also explored

the complex relationship between knowledge and ignorance, and so challenged the hegemony of the dominant managerial paradigm that seeks to eliminate uncertainty. Clearly, identifying the types of ignorance in organisations is just the first step in incorporating an understanding of ignorance into KM. This chapter has established how and why this is a rich area for future research in KM. The study of organisational ignorance in conjunction with the study of organisational knowledge might reveal such key aspects as incorrectly held knowledge; the influence of power relations on organisational knowledge and ignorance; and known unknowns that might shape future innovation. This chapter has also shown that a number of other fields are studying ignorance, even if KM is not. Similarly, other fields are studying knowledge in ways that KM is not. The following chapter now turns to other disciplines' consideration of knowledge. In doing so, it demonstrates that KM can be augmented by attending to how other fields are positioning the study of knowledge. Furthermore, it suggests that a transdisciplinary approach to KM may be a productive means of connecting to those other disciplines.

Chapter 8 – Revisioning KM: Bridging boundaries

Up to this point, the thesis has claimed that KM needs to move beyond the divisions that have characterised it in recent years. It has specifically proposed that KM could do this by questioning the fundamental assumptions of the managerial paradigm and allocating communication a more central role in the management of knowledge. To particularly address conflict surrounding the definition of knowledge in KM, it has recommended that the KM community accept plural understandings of what it means both to know (and not know) and to communicate.

This chapter builds on the acceptance of plurality in addressing another ongoing conflict in KM – the division along paradigmatic lines that is a consequence of the KM community's multidisciplinary composition. The divisions between the computational (technical) paradigm and the organic (social) paradigm are so entrenched that Hazlett et al. (2005) have supposed KM might not follow the normal path of paradigm development as "the very nature of KM may not lend itself to a monistic process whereby paradigms compete for dominance" (p. 39). Pondering this issue, Argote (2005) wondered if there was even any need for KM to reconcile or choose one of its paradigms as typically occurs as a discipline develops, suggesting that perhaps both could co-exist. This thesis takes a different view from Argote (2005), arguing that encouraging both of KM's paradigms to co-exist indefinitely serves to maintain the polarised nature of the field. Accordingly, this chapter suggests an alternative path for KM – integration of the two perspectives – through transdisciplinary research.

It does so by engaging with research in disciplines outside of management, and by exploring ideas of communication and knowledge from those fields. It sees going beyond the discourse of management in search of potential allies for KM as serving at least two purposes. First, it demonstrates that scholars outside of KM are also wrestling with issues surrounding knowledge. These scholars, functioning within their own disciplines and outside of the KM community, are less restricted by the paradigmatic divisions that preoccupy KM specialists and therefore potentially offer fresh approaches. Second, as KM scholars attempt to adjust their understanding of the world in line with contemporary conditions, the move to

engaging with other scholars' work opens their access to a collective wisdom across fields.

The chapter proposes that the ideas that non-KM scholars are exploring may suggest ways for KM scholars to develop a more integrated approach to their own field, especially in breaking down the boundary between the "technical" and the "social" in KM scholarship. Engaging with these other communities paves the way for transdisciplinary research that might assist in ameliorating the multidisciplinary fragmentation of KM identified in chapters one and two. The theories from other fields that this chapter focuses on reflect and address current issues, like complexity, that similarly concern KM scholars. Furthermore, these particular theories show that other disciplines are also looking to break away from the worldview inherited from the Enlightenment, and so establish additional common ground with KM. Significantly, in light of the transdisciplinary future it advocates for KM, the chapter proposes envisioning KM not as a stand-alone discipline, but as a boundary object that is constructed by many communities.

Building bridges

This thesis argues that the KM community has thus far struggled to integrate the work of its contributing disciplines. The range of contributing perspectives has tended to coalesce around oppositional views regarding KM and its concepts. It is about people or technology, knowing or knowledge, tacit or explicit, individuals or organisations. Contending that the polarisation of perspectives is not the best possible outcome for KM, this chapter proposes that a more productive future lies in a more inclusive approach. In doing so it challenges the common beliefs that "disciplinarity [is associated] with rigor and interdisciplinarity with dilettantism" (Pray, 2002, para. 13), and that scientific, deep and specialized knowledge is associated with particular disciplines. Instead, as it explores alternative paths for KM, this thesis aligns more with Geraldi et al.'s (2008) provocative understanding of a discipline "not as a branch of knowledge, but rather as systematic training in obedience to regulations and authority" (p. 586). Less controversially, but equally pertinent, is Choi and Pak's (2006) observation that "life is multiple disciplinary [and] real world problems are rarely confined to the artificial boundaries of academic discipline" (p. 357). Subscribing to these views, this thesis takes the

position that human experience cannot be reduced to a single dimension and encourages growing interest "in developing new knowledge through research that combines the skills and perspectives of multiple disciplines" (Aboelela et al., 2006, p. 330).

That position is supported by other scholars who have sought to move KM from being merely a multidisciplinary field to a topic that unites perspectives. For example, Jackson (2005) argues that KM could benefit by engaging with the field of critical systems thinking, thus "avoiding intellectual pitfalls" (p. 187) common to emerging disciplines and enabling ready translation of insights into practice. In addition, Gueldenberg and Helting (2007) suggest an interdisciplinary approach is required to achieve some consensus over the definition of knowledge. However, this thesis takes the position of Lloria (2008), who claims "what is required is *transdisciplinary research* that goes beyond mere interdisciplinary research activity" (p. 79) [italics in original].

As the foregoing discussion suggests, a clear differentiation of the terms multidisciplinarity, interdisciplinarity, and transdisciplinarity would be useful. Accordingly, this chapter employs Choi and Pak's (2006) accessible definitions and metaphors of these concepts. Multidisciplinarity, they conclude after an extensive literature review on the use of these terms, "draws on knowledge from different disciplines but stays within the boundaries of those fields" (Choi & Pak, 2006, p. 359). It is comparable to a salad where all ingredients are mixed but intact and distinguishable. Interdisciplinarity is better compared to a stew, where the ingredients are partly distinguishable, as it "analyzes, synthesizes and harmonizes links between disciplines into a coordinated and coherent whole" (Choi & Pak, 2006, p. 359). Payne (1999) similarly highlights the synthesised nature of interdisciplinarity when he defines it as the "bringing together and interweaving [of] content, methods, and research strategies of various existing fields of study" (p. 176). In contrast, transdisciplinarity integrates disciplines in a context that "transcends each of their traditional boundaries" (Choi & Pak, 2006, p. 359) in the same way that a cake is a product of ingredients that are no longer distinguishable or recognisable. Choi and Pak (2006) regard the three approaches as points on a continuum: multidisciplinarity is an additive approach, interdisciplinarity an interactive approach, and transdisciplinarity a holistic approach.

A fourth approach related to the multiple disciplinary studies defined above – postdisciplinarity – warrants some attention, as it appears to offer some promise of being able to address KM's silo issue. Postdisciplinarity, sometimes referred to as non-disciplinarity, is a research approach that suggests scholars ignore disciplinary structures and borders altogether and instead examine social phenomena from philosophical beginnings to logical ends, unlimited by the boundary of a particular discipline (Pocock, 2008). Post-disciplinary scholars "roam freely across territory we now see carefully fenced off into politics, psychology, sociology, economics, philosophy etc" (Sayer, 2001, p. 89). Though running the risk of being criticised as haphazard and disorganised, the value of this approach lies in forcing researchers to question and develop their own ontologies and epistemologies, rather than starting with a discipline's worldview. Markley (1991) heralded this approach as a "radical force" that would reshape disciplines in the 1990s, replacing the shopworn "posts" (p. 337) like postmodernism and post-marxism.

Unfortunately, postdisciplinarity in practice has failed to live up to postdisciplinarity in theory. Though its ideals are commendable, such as scholars following ideas and connections wherever they lead, the practice of such an approach is difficult. This chapter takes the position that scholars are never fully able to be ontological and epistemological "clean slates." Even if not aligned with a particular discipline, social and cultural norms will have established some assumptions about the nature of being and knowing. Further, the success of postdisciplinarity to some extent relies on universities, the institutions that validate academic knowledge, and academia at large, abandoning disciplinary structures. Though postdisciplinary research has admirable goals, I see it as unlikely to be a unifying approach for KM. Instead, this thesis sees transdisciplinary research in KM as offering a more pragmatic and promising future for the field.

Advantages of a transdisciplinary approach for KM

Transdisciplinarity, this chapter argues, affords KM the best possibility of breaking down its artificial (organic and computational) paradigmatic boundaries. In promoting transdisciplinarity in academia, Gibbons, Limoges, Nowotny, Schwartzman, Scott, and Trow (1994) distinguish between "mode one" knowledge production (disciplinary, scientific, empirical knowledge) and "mode

two" knowledge production (transdisciplinary, reflexive, contextual knowledge). Interestingly, their distinction between the types of knowledge scholars produce reflects the preoccupations of KM's paradigms. Gibbons et al. (1994), and this thesis, argue not just for more type two production, but for interaction between the modes. Certainly, the "limitations of research conducted in academic 'silos'" (Morgan, Kobus, Gerlach, Neighbors, Lerman, Abrams, & Rimer, 2003, p. S12) is well documented, and is of particular pertinence to KM given its fragmented, multidisciplinary history. Transdisciplinary research acknowledges the contributing scholars' grounding in particular disciplines. Importantly, however, it also invites them to transcend those groundings and together develop new perspectives that "look at the dynamics of whole systems in a holistic way" (Choi & Pak, 2006, p. 359), thus avoiding the silo phenomenon. Transdisciplinary research is also particularly appropriate for addressing problems and areas that are broader than any single discipline. This matters for KM because, as already noted, knowledge and its management are a concern of areas as diverse as psychology, engineering, health science, education, neuroscience, and business (Grossman, 2007). In addition, Magill-Evans, Hodge, and Darrah (2002) note that transdisciplinary "knowledge can be disseminated more broadly because it truly applies to more than one discipline" (p. 225).

Rather than approaching KM piecemeal, I recommend transdisciplinarity as a more productive space where scholars can collaborate and can re-conceive KM. Such an approach may create consensus about how to tackle particular issues in organisations and lead to the provision of coordinated services or a comprehensive approach as it has in other multiple disciplined areas (Choi & Pak, 2006). Furthermore, I argue that being open to new understandings of concepts, as scholars collaborating in transdisciplinary projects would necessarily be, could help scholars clarify and articulate their own working definitions, while also assisting them to understand that singularity of meaning is not necessarily an achievable or desired goal. Transdisciplinary research's specific intent to generate new knowledge is also appropriate to KM as a young and developing field.

Two factors drive the advantages of transdisciplinary research to KM that this section has argued above. First, the history of the development of KM has led to transdisciplinarity being appropriate as a unifying tool for KM in its current stage. Second, the likely outcomes for organisations and researchers suggest

transdisciplinarity may be a fruitful approach for KM. I now offer a third reason why transdisciplinarity benefits KM, and that is its ability to bring together not only scholars from different disciplines, but also scholars and practitioners. This ability comes from transdisciplinary project teams being able to drive their agenda according to their make-up and focus.

There are at least two perspectives on transdisciplinary research's intended focus, both of which point to its usefulness for KM. On the one hand, some view its purpose as unifying disparate, specialised knowledge (Aram, 2004), thus providing a more holistic framework for a given topic. On the other hand, others consider transdisciplinary research as a means of transcending disciplines and working towards systemic social change (see Jantsch, 1972; Kockelmans, 1998; Filemyr, 1999). In fact, Stokols (2006) identifies the single largest benefit of transdisciplinary research in general is that it may lead to fundamentally new conceptualisations of scientific and social phenomena beyond traditional discipline boundaries. Current research on sustainability provides a clear contemporary example that illustrates the benefits of a transdisciplinary approach to a complex social problem (Cronin, 2008).

This thesis contends that transdisciplinarity in KM could fulfil both purposes. That is, it could both combine diverse perspectives and transcend those perspectives. This is a position that has some support. Klein (1996), for example, allows that transdisciplinary research can be either driven by the aim of unifying science or driven by social intent; it is the scholars who determine the focus (Aram, 2004). Accordingly, KM scholars who engage in transdisciplinary research are able to determine whether they focus on developing theory for the field or addressing issues in organisations. Often, the end-goal will be determined by the make-up of the transdisciplinary team, as Stokols' (2006) study finds. Transdisciplinary scientific research teams, where all members are academics, are more likely to be working towards the development of new theories, methodologies, academic publications, and so on, whereas transdisciplinary teams that combine research scientists and community practitioners are more likely to intend the "translation of scientific findings into community-problem solving strategies" (Stokols, 2006, p. 69).

Accordingly, transdisciplinary research may be both about developing knowledge for social utility and forwarding scientific understanding. Taking a balanced approach, Nowotny, Scott, and Gibbons (2001) note the interaction and interdependence between science and society and call for "richly contextualized, socially-robust, and epistemologically eclectic" knowledge that doesn't abandon "the basic conditions which have underpinned the production of reliable knowledge" (pp. 198-199). Their recognition of the need for transdisciplinary research to balance pragmatism and good science mirrors KM's need for the same. The academic KM community presents an opportunity for the development of transdisciplinary research teams who could work to develop new conceptual frameworks, methodologies and empirical studies. Yet, KM is not just about scientific knowledge – it is also a field developed to be of practical application and relevance to organisations. Accordingly, the KM practitioner community could potentially combine with the KM academic community to build transdisciplinary teams that aim to translate scientific findings into organisational-problem solving activities.

This chapter does not simply advocate transdisciplinary research amongst scholars who identify themselves as KM specialists, however. It also argues that KM could benefit by tapping into the expertise that exists outside of its obvious community. Many scholars who do not regard themselves as KM specialists work on areas relevant to refreshing KM. Knowledge, communication, and systems are just some of the areas of import to KM that other disciplines are researching. Connecting scholars in these areas with those specialising in KM offers an opportunity for innovative and exciting developments in KM. More than just being united by topic, however, those "external" theories demonstrate how scholars in other disciplines are looking to dismantle the traditional ontology and epistemology of science and embrace a worldview that is non-linear, emergent, and complex. In other words, they too are looking for ways to respond to contemporary conditions. Interestingly, they are doing so in ways that align specifically with CRP, which this thesis has argued deserves more attention in KM, further establishing it as a useful theoretical lens. Integrating similar theoretical frameworks like these, using multiple study designs and methodologies, and drawing from the perspectives and skills of a number of disciplines could benefit KM immensely.

Allies in knowledge

KM is not the only field interested in the study of knowledge. Connectivism, or connective knowledge, is a relatively recent understanding of knowledge that has emerged through the combination of research in computer science, neuroscience, and network theories. The theory of connectivism (Siemens, 2004; Downes, 2006; 2007) understands knowledge in a way that reflects the emergence of a new worldview, discussed in chapter three, in response to contemporary conditions. It draws from the principles of chaos, complexity and self-organisation and is "driven by the understanding that decisions are based on rapidly altering foundations" (Siemens, 2004, "connectivism," para. 2). Connectivism asserts that knowledge is distributive, located not in any particular place but formed by a dynamic network of connections that emerge from experience and interactions within a knowing community (Downes, 2006). It challenges the traditional understanding of knowledge as a product, asset or resource in KM by positioning it as dynamic rather than static. Even though connectivism is grounded in technical disciplines, its perspectives reflect the concerns of KM's organic paradigm with its understanding of knowing as a process. Accordingly, connectivism goes some way to confirming this chapter's point that theories of knowledge outside of KM are not confined to paradigmatic camps.

Knowing something means having a particular organisation of connections, and Downes (2007) argues that these connections can be strengthened, can change, or can be forgotten. Connectivism thus values the capacity to know over what is known, and identifies the ability to see connections between fields and concepts as a core skill (Siemens, 2004). Accordingly, connectivism, like CRP and commensurate with a significant argument of this thesis, explicitly rejects cognitive theories of knowledge (with their attribution of physical qualities to mental concepts) and the allied transmission view of communication. Instead, connectivism looks at how the brain uses connections between components rather than how it stores or represents meaning in units (Downes, 2006). In doing so, it draws from neuroscience's discovery that consciousness is an emergent property, "a phenomenon that arises in part as a result of the sheer *number* of interconnections among neurons in the human brain and that does not exist in any of the parts or in the interconnection of just a few" (Gilbert, 2007, p. 74). Rather

than envisaging the brain as a single computer that processes and stores information (akin to the transmission view of communication), Downes (2006) likens the brain to a computer network. In a computer network "patterns of input phenomena – such as sensory perceptions – cause or create patterns of connections between neurons in the brain" and these associative connections "form when the two neurons are active at the same time, and weaken when they are inactive or active at different times" (Downes, 2006, pp. 5-6). Presented with a multitude of phenomena, the brain seeks, perceives, and organises sensory input into patterns.

When individuals claim to "know" something they are making inferences based on context, salient patterns, their memory of past salient patterns, and the emergence in the moment. In other words, knowing is a process of organising and connecting phenomena in different ways. The stronger the network of connections, the more deeply the knowledge is held and repeated use of such connections leads to the development of expertise (Downes, 2006). Like CRP, this theory of knowledge stresses the influence of past social interactions on present, emergent connections because prior experience affects which connections are regarded as salient. Therefore, connectivism stresses the interpreted nature of all knowledge, while noting that the perception of connections itself is an interpretation and the connections assumed may have no physical reality (Downes, 2007). I identify this as a usefully different perspective on knowledge than appears in most KM literature associated with the computational perspective.

In addition, because it rejects the transmission model of communication, a connectivist understanding of knowledge stresses a social constructionist perspective of communication. In common with CRP, it understands that the individual and the social are interdependent, seeing "meaning…[as] an emergent property of the set of specific interactions between people" (Downes, 2007, p. 9). It is through the connections between speakers that meaning arises, so both individual minds and social groups (that have certain characteristics), are networks that can know. However, connectivism makes a distinction between private knowledge and public knowledge. Private knowledge arises from the connections and associations of an individual's neurons. In this way connectivism allows for a knowledge (called subsymbolic) inexpressible in language, what in traditional KM would be called tacit knowledge. This is the type of knowledge

that emerges through use of the physical body as well as internal dialogue. Public knowledge, in contrast, is the result of a complex set of interactions and behaviours that is interpreted and recognised by the public domain. According to this theoretical perspective, the highly educated have internalised an expert level of public knowledge (Downes, 2007).

This chapter sees that one of the consequences of understanding knowledge as emergent from participation in interactions, as CRP and connectivism both do, is that the validity and value of knowledge becomes particularly fragile. This is a problem that both theories address. Stacey's (2001) discussion of CRP concedes that knowledge is not inherently good. For Stacey, because knowledge is intimately tied with self-identity and power-relationships, transformation in communication can be either positive or negative. The turn-taking process of interaction depends on expectations people have of each other, and their sense of accountability for self and others. Thus it is to be expected that communication involves conflict, tensions, anxiety, and ideological clashes (Stacey, 2001). In contrast, the connective theory of knowledge examines the potential pitfalls of interdependence in a different way. If there are no connections, no knowledge is generated, but a poorly connected network can rapidly disseminate and perpetuate "incorrect" or negative knowledge through the cascade phenomenon (Downes, 2006). Downes (2007) sees the fact that there is no physical manifestation of a network that interpretation can be checked against, and that it is impossible to view a network, that one is part of, objectively, as weaknesses. The socially interpreted nature of connections cautions that connective knowledge is prone to inequalities as particular viewpoints and power structures can dominate those interpretations (Downes, 2007).

To avoid the cascade phenomenon and be effective, Downes (2007) argues networks need to meet a number of criteria that balance full connectivity with checks against competing and contradictory impulses. These include being decentralised so that no point of connection has undue influence, having no intermediary filters, and being immersed in everyday life. Further, effective networks require diversity so they include a range of points of view and different people interacting. Diversity helps to address inequalities as it reduces the influence of a small number of highly connected nodes (Downes, 2007). Networks also require a level of autonomy that allows a significant number of

individual knowers to act as individuals within the network, rather than representatives of particular organisations. True networks are also more than an aggregate of information; they show evidence of connections produced through interaction. Related to this, the openness of networks is important to their effectiveness. New perspectives must be able to be heard and interacted with rather than silenced or ignored (Downes, 2006). It is dynamic participation in the network that perpetuates and transforms connections, and it is the active connections that connectivism perceives as knowledge. These criteria for effective networks in connectivism are likely to provide equivalent criteria for the effective management of knowledge in organisations. They have been covered at some length in order to illustrate how theories of knowledge outside of KM's traditional disciplines are likely to yield significant insights for KM.

Allies in communication

Connectivism's explicit concern with the generation and dissemination of knowledge makes it directly relevant to KM. Theories in other disciplines may be less concretely connected to knowledge, but are potential allies for KM because they share common themes. Chapter six, emphasising CRP as an appropriate theoretical lens, argued that the KM community could benefit from accepting multiple definitions of knowledge. It also suggested that at the same time KM scholars should pay more attention to the importance of communication in relation to knowledge and its management. Similar perspectives are nascent and garnering attention in other disciplines and, hearteningly, some reject the transmission model of communication. In addition, these theories also stress communication's intrinsic role in complex understandings of knowledge.

Two examples illustrate the reconfiguring of understandings of communication in fields that have been dependent on the transmission model. First, Shanker and King (2002), who are social scientists in philosophy, psychology, and anthropology, note the emergence of a new paradigm of communication in ape language research. Arguing that the transmission model of communication led to stereotyping of animal communication as functional and stimulus bound, they explore how a dynamic systems understanding of communication has fostered a

new approach to and understanding of communication skills in great apes and humans.

Taking a similar stance, psychologists Fogel and Garvey (2007) propose the notion of "alive communication" as complementary to the static understanding of communication "based on the metaphor of signal and response" (p. 252). Basing their research on studies of infant behaviour, they envisage each instance of communication as new or "alive" and therefore constantly changing. Their research advocates a self-organising, emergent understanding of communicative interactions, as well as the acceptance of contradictory, co-existent communication theories. Fogel and Garvey (2007) are aware that the notion of "alive communication" sits uncomfortably with their fellow behavioural scientists traditionally committed by worldview and training "to think in terms of discrete units and modules" (p. 256), and so take the time to justify their approach. They argue that while "discrete, bounded, objectified, totalising entities may feel scientifically safe and predictable" such entities, "unfortunately, also diminish, control, reduce, and contain" (Fogel & Garvey, 2007, p. 256). Their argument parallels the claims this thesis makes for the restrictive nature of the dominant worldview of the management paradigm. Fogel and Garvey (2007) go on to say that thinking in discrete units also leaves "no room for spontaneity, growth, and transformation" (p. 256), again echoing the position of this thesis and other scholars who seek to reshape management's, and KM's, responsiveness to contemporary complexity.

In line with earlier emphasis on metaphor, and especially the difficulty the KM community has had in constructing successful metaphors, it is worth examining the metaphors that those outside KM employ. To capture the dynamic understanding of communication that they propose, Fogel and Garvey (2007) adopt the metaphor of "aliveness." This emphasises the organic, energetic, evolutionary nature of creating meaning. Along similar lines, Shanker and King (2002) call communication a dance. This metaphor, prevalent in ape and infant language research, perceives participants in an interaction as continuously establishing and sustaining "a feeling of shared rhythm and movement" (p. 606) and thus the interaction as endlessly active and interactive. The dance metaphor draws attention to the creative aspects of communication. It is envisaged as a co-regulated, creative activity of continual adjustment where emergent meaning is

highly contextualised (Shanker & King, 2002). Both sets of researchers also stress the systemic nature of the communication process.

Allies in systems

Allies can also be found beyond those that directly address knowledge and its communication. This section looks at how apparently peripheral theories in other disciplines also have the potential to contribute to KM. Despite Stacey's (2001; 2003) explicit rejection of systems theory, for example, this thesis sees a role for it in KM. There is certainly an increasing body of literature introducing systems thinking to KM (see Wierzbicki, 2005; Jackson, 2005; Gao, Li, & Nakamori, 2002; Gao, Li, & Nakamori, 2003; Parent et al., 2007). To date, however, most systems approaches to KM fit within the computational paradigm and their functionalist perspective is primarily what Stacey rejects. This section argues, however, that the adoption of a systems perceptive does not automatically align one with a static view of knowledge and organisations. Indeed, appropriately applied, it suggests the benefit of systems theory for KM is in allowing a dynamic view of social systems like organisations. As a result, knowledge can then be understood as emerging from the daily interactions between people in the context of the social systems within which they connect.

In particular, this section focuses on Systems Intelligence (SI), a systems-based theory that attends to the actions of individuals within social systems. SI is a notable exception to mainstream systems thinking because it focuses on the local interactions that CRP and connectivism identify as crucial to the emergence of knowledge. This thesis proposes that SI's encouragement of individuals' ability to function successfully within the complex world of continually emergent systems in which they live (Hämäläinen & Saarinen, 2004; 2006; 2007; Jones & Corner, 2007), offers potential insights and fresh perspectives to KM. Drawing from and extending notions of intelligence (Gardner, 1993; Goleman, 1995; Goleman, 2006) in combination with the structure of systems thinking (Senge, 1992), it positions SI as combining the structure and holistic perspective of systems thinking with an emphasis on the abilities and responsibilities of a person. However, rather than just seeking to account for the way things are as individuals interact with their complex environments, SI looks to drive and foster positive

change. SI scholars' goal is to provide a theoretical but pragmatic framework which helps people develop their intuition, reflectiveness, and communicative abilities so they can act in knowledgeable ways. In other words, SI suggests how people might effectively participate in a complex environment by encouraging them to facilitate, and to participate in, processes of self-reflection and self-regulation.

Unlike traditional systems thinking, SI does not advocate stepping outside the system to analyse the best way to move forward. Rather, it maintains that as systems are complex and emergent, individuals cannot ever remove themselves from them and study them separately and objectively. Accordingly, SI is attuned to a fresher, more dynamic worldview than previous systems theories. Furthermore, because systems can never be observed externally, in a rare acknowledgement of the role of ignorance, SI admits that people must manage to go on in life with partial knowledge of the contexts within which they are placed. Synergistically with the main arguments of this thesis, SI emphasises the personal, subjective elements of systems, and the fragile and dynamic nature of knowledge.

Usefully for KM, SI explains and explores how people use intuition, critical self-reflection, and communicative abilities (that is, their systemic intelligence), to make decisions as they move into an unknown future: "Systems Intelligence is a capacity in the human being that involves instinctual, intuitive, tacit, subconscious and unconscious and inarticulate aspects that cannot be straightforwardly reduced to a full-fledged and transparent cognitive dimension" (Hämäläinen & Saarinen, 2004, p. 16). Stowell (2007) has called attention to the fact that self-reflection is a skill that is crucial to dealing with complex environments and abundant information, and the ability to reflect on one's own behaviour within a system is critical to SI. The systems intelligent person is attuned to the relationship of the parts to the whole, the dependency of the parts on each other, and the whole to them and them to the whole. In this SI shares the emphasis of connectivism – it is the connections between entities that matter rather than the entities themselves.

Along with intuition and critical self-reflection, skilful communication is another capability that SI sees as intrinsic to the ability to effectively interact within systems. That is because communication is the process which builds the systems people live in and the process by which change is effected. In its emphasis on

action and transformation resulting from communicative interaction, SI is analogous to CRP. The conversational life of organisations is of primary importance to SI and CRP, and systems intelligent individuals are understood to be able to consciously or unconsciously identify communication patterns and also understand their contingent nature. They are open to behaving unpredictably, and differently, to change the tone, direction, or outcomes of an interaction. Just as the system both enables and constrains communication, so communication has the capacity to maintain, or to alter, the system.

As well as promoting a dialectical understanding of communication and systems, SI recognises the dialectical relationship between individuals and organisations. This allows it to shed light on this relationship for KM. SI's emphasis is simultaneously personal and systemic as it views people and their environment as interconnected and interdependent. Thus SI, in common with CRP and connectivism, removes the artificial binary opposition between individual and organisation. Instead, SI invites individuals to view organisations and their place in them as part of a series of interconnections and interrelations. SI advocates a holistic viewpoint – a recognition that an individual is part of the system both affected by and able to affect the wider structure, and interconnected with others in the structure. If the systemic nature of people's context is made visible, they may be able to focus more clearly on the way systems enable and constrain, not only their own daily existence, but the actions of others.

With this awareness comes personal responsibility – a concept in line with the contemporary values discussed in chapter three. There is an ethical component to SI that proposes that systems intelligent individuals are able to act in ways that are not motivated just by self interest but also in ways that seek to enhance and improve the system and its impact on others. SI advocates using the inquiry mode of systems thinking (Senge, 1992) where an individual takes an open-minded and constructive approach to engaging with others. In common with a CRP view of communication, systems intelligent people are receptive to the resonances of people's emotions, facial expressions, and gestures. It presupposes that people are able to think beyond the boundaries of their own egos and are willing to act to improve the system, not just for their own benefit but for the benefit of all parts of the system and the good of the system itself (Hämäläinen & Saarinen, 2004). SI thus helps to align personal and organisational goals by highlighting the

interdependence of the individual and the organisation and works towards the flourishing of both. This thesis sees the challenge for KM as to similarly integrate the abilities and goals of the individual with the characteristics and goals of the system.

Integrating perspectives through the use of boundary objects

It is not just individual and organisational goals that require integration in KM. This thesis has pointed out that KM as a field also lacks integration, and this chapter has argued that KM's future lies in transdisciplinary research seeking to unify disparate perspectives into a new and shared vision. This section suggests that conceptualising KM as a boundary object may be an effective way to connect disparate scholars to one another and facilitate transdisciplinary research.

The proposed reconceptualisation of KM as a boundary object, and its advocacy of transdisciplinary research in KM, depends on the ability of the KM community to emphasise points of commonality as much as points of difference. Boundaries between different disciplines or paradigms are typically seen as lines of demarcation. Work on communities of practice, for example, tends to look at how particular communities distinguish themselves from other groups, often through their communicative practices. However, boundaries can also be sites of integration, where "social, organizational and discursive" space is shared (Wilson & Herndl, 2007, p. 131). Instead of seeing boundaries as barriers I suggest they be reconfigured as the permeable membrane between communities, the point where overlap between communities occurs (Wilson & Herndl, 2007). Boundary objects, then, play a role in assisting communities to see where they overlap with others, as well as where they differ from others.

The concept of a boundary object initially gained popularity through the work of Star and Griesemer (1989). They developed the concept to account for artefacts such as maps and collections (within the context of museum studies) coming "to form a common boundary between worlds by inhabiting them both simultaneously" (Star & Griesemer, 1989, p. 412). They proposed that boundary objects can facilitate people from different communities better understanding one another because they are "objects which are both plastic enough to adapt to local

needs…yet robust enough to maintain a common identity across sites" (Star & Griesemer, 1989, p. 393). In management, they are commonly understood to be organisational artefacts that allow activity to occur, despite the basic incommensurability of groups involved in a task (Wilson & Herndl, 2007). Boundary objects typically include prototypes, design drawings, reporting forms and so on. They appear in the KM literature largely as a means of facilitating communication and assisting knowledge transfer between communities of practice (Carlile, 2002; Bechky, 2003; Koskinen, 2005). Koskinen and Pirinen (2007) also regard boundary objects as stored knowledge, in that they are the product of collaboration between distinct individuals or communities. For example, a new product can be understood as a boundary object in which knowledge is embedded, created through the input of different departments in an organisation.

Despite a significant number of studies on the use of boundary objects, their success is not assured. Boundary objects that are successful in some settings will be unsuccessful in others (Carlile, 2002). Indeed, they may end up reinforcing rather than bridging boundaries (Levina & Vaast, 2005), and they themselves can become a point of conflict (Koskinen, 2005). However, communication associated with boundary objects is invariably conceptualised using the transmission model of communication. Thus work on boundary spanners, for example, sees these individuals as mapping between knowledge domains, translating between parties, and "interpreting information into an understandable form for other groups or individuals" (Koskinen & Pirinen, 2007, p. 14). From the less linear understanding of communication that this thesis advocates, knowledge is emergent from communicative processes. Such a view of knowledge creation helps explain some of the criteria that have been identified as characteristic of successful boundary objects. These include the co-creation of the boundary object through the interaction of participants (Miller, 2005) and the allied evolution of, rather than imposition of, boundary objects. Boundary objects imposed on groups are generally unsuccessful. Instead, objects are given meaning in use when they are "symbolically incorporated into the ongoing dialogue about the practice – a constant, reflexive, reaffirmation of what the object means in the given context" (Levina & Vaast, 2005, p. 340).

KM as a boundary object

This chapter proposes envisaging the field of KM as a boundary object to bring together disparate communities. In many ways KM already is and always has been a boundary object. As the early chapters of this thesis have shown, rapid technological, social, and organisational change fuelled interest in the role of knowledge in organisations. Scholars from a variety of disciplines began to explore knowledge and its management from their disciplinary perspectives. The development of KM as a field with a common vocabulary and unifying theories through scholarly communications mirrors the path of the co-construction of a successful boundary object. Unfortunately, differences in the ontological outlooks, methods, discourses, and routines of the disciplines contributing to KM meant that the field fragmented. This chapter argues that these differences could perhaps be ameliorated by scholars perceiving KM as a boundary object rather than a discipline. In particular, it contends that if scholars were to approach the construction of KM in a spirit of collaboration through transdisciplinarity then KM could develop a simultaneously cohesive, and yet more diverse, body of knowledge.

This strategy of conceptualising KM as a boundary object constructs it as both a tool for the transdisciplinary communication process and a product of the transdisciplinary communication process. That is, KM becomes paradoxically both an agent in the production of itself and the thing that is produced. As a tool for the knowing process, a boundary object functions as an item that connects the communities of practice involved in its creation. As a product of the knowing process, a boundary object partially captures the knowledge that emerges from the process. Furthermore, instead of scholars seeing themselves as located *within* KM as a discipline, they can position themselves as working *on* KM while located within another discipline. This resembles the way managers are encouraged to work *on* rather than *in* their businesses. Regarding KM as an object bringing together scholars that have a common interest but also different perspectives might reduce the expectation that all KM scholars should share a similar outlook in the forging of a discipline. Each contributor or contributing community can bring a unique history or different outlook to the field but the common purpose of developing KM provides a means of identification with other parties. The issues of managing knowledge could then be tackled in a neutral, democratic space with a more holistic approach than currently occurs.

Developing transdisciplinary teams with KM as a boundary object around which scholars from different disciplines can communicate will take more than good intentions. It will also need practical measures. While KM conferences potentially provide a forum for transdisciplinary interaction, in practice they tend to be specialised or located within defined paradigms. For example, the International Conference on Knowledge, Culture and Change tends to take a people-centered view (the organic paradigm) of KM while the International Conference on Technology, Knowledge and Society tends to be more technology driven (the computational paradigm). In publishing, often discipline-specific journals will have special issues devoted to KM, but while this introduces KM to that discipline it does not necessarily help to engage scholars across disciplines. Specialised KM journals do provide an outlet for work from several disciplines, but again the tendency is for the journal to subscribe to one paradigm or another. The *Journal of Information and Knowledge Management*, for instance, takes a positivist, technical focus. To give transdisciplinarity practical impetus, conferences could offer streams that invite transdisciplinary work. They could also hold forums that deliberately create conversations between disparate scholars. Individually, scholars can make the effort to share research methods, perspectives, theories and concerns and enrich the fabric of KM. As Russell et al. (2008) note, "transdisciplinarity is a practice, not an institution" (p. 470). In other words, this chapter argues that the KM community needs to engage in the practices that its research indicates is necessary to generate knowledge.

Conclusions

Given the current diverse and fragmented nature of the KM community, this chapter has argued that new ways of doing things and new ways of engaging with others need to be explored. It has made a case for the KM community to engage not only with its own members but with members of other academic communities. In particular, it has proposed that transdisciplinary research that reconfigures KM as a boundary object might be a fruitful path for KM. This path is offered for a number of reasons. First, as this thesis has already established, KM is unavoidably multidisciplinary. Moreover, because of its multidisciplinarity, KM has tended to develop around opposing paradigms that fragment the field. Transdisciplinarity offers a way to amalgamate those paradigms. Third, knowledge and its management are concerns of many aspects of organisations. Therefore, it is relevant, if not imperative, to seek input from a number of disciplines. Finally, if

KM in practice in organisations is cross-functional, then KM as an academic field would do well to reflect that and consider research that addresses KM holistically. These characteristics of KM suggest transdisciplinary research is appropriate for the field. I believe the KM community needs to take note of Hansson's (1999) point that "most breakthroughs of lasting importance have been the result of cross fertilization between different scientific disciplines and traditions" (p. 339).

Certainly, transdisciplinarity aims to provide insights beyond those offered by disciplinarity. It offers KM the opportunity to cultivate "truly new perspectives that are more than the sum of their parts" (Magill-Evans et al., 2002, p. 225). Adopting a transdisciplinary approach may also allow KM scholars to successfully address complex problems that involve the overlap of social, scientific, organisational, environmental, and technological concerns. Accordingly, it has the potential to unite the varied perspectives of KM researchers and research KM problems holistically with an approach commensurate with contemporary conditions. As Cooke-Davies et al. (2007) insightfully comment, "we do not learn to view the world differently because [problem-solving] provides us with new and different answers; rather we view the world in new and different ways, and so [solve problems differently]" (p. 51).

Stokols (2006) uses the phrase "collaborative readiness" (p. 69) to describe the likelihood of a transdisciplinary team's success. Collaborative readiness encompasses both the contextual factors, which are largely institutionally-driven, and the team members' personal commitment to common goals and courteous communication. Part of collaborative readiness is the acknowledgement that participation in effective transdisciplinary research requires "extensive preparation, practice, and continual refinement" (Stokols, 2006, p. 69). Time must be spent cultivating common ground, articulating goals, anticipating and resolving conflict. Further, Stokols (2006) calls for future research in transdisciplinarity to establish a taxonomy of factors that might affect collaborative readiness. In the next chapter of this thesis I offer the concept of "intelligent participation" to describe how individuals might best enable their own collaborative readiness. In doing so, I combine the major themes of this thesis – the principles of transdisciplinary research, complex understandings of communicating knowledge, and values that reflect contemporary conditions – and shift the emphasis from KM as a field to KM in practice.

Chapter 9 – Intelligent participation: The communication of knowledge in transdisciplinary teams

The previous chapter recommended conceptualising KM as a boundary object that then becomes the focus of transdisciplinary research. It also identified potential allies from other disciplines that the KM community could engage with. Supported by a cluster of theories that understand knowledge as patterns of connections emergent from dynamic interaction, I argued a transdisciplinary approach to KM is likely to yield innovative and pragmatic solutions to the problems of managing knowledge in organisations. Translating the ideals of transdisciplinary research into pragmatic action, however, presents a challenge. While the term "collaborative readiness" (Stokols, 2006, p. 69) identifies the contextual factors that influence the likelihood of transdisciplinary success, it focuses on the resources and capacities of the group rather than the resources and capacities of individual participants. This chapter offers the concept of "intelligent participation" to unpack the individual (rather than group or institutional) contribution to collaborative readiness. In doing so, it highlights three significant shifts this thesis has argued are essential to reenergise KM for contemporary conditions: the need for a transformation in worldview, the need to understand knowledge as connection, and the need to emphasise communication as part of the knowing process.

The chapter begins by exploring some of the obstacles that transdisciplinary KM teams might face in practice. Transdisciplinary scholarly teams, just like organisations, can be understood as "self-organising patterns of conversation, of meaning, in which human identities emerge" (Stacey, 2003, p. 330). Due to their very make-up, though, transdisciplinary teams could be described as a series of potentially incommensurable conversations, as members from diverse communities of practice attempt to self-organise around sometimes conflicting goals. As a consequence, members of such teams need to be able to employ task-oriented communication that will be found in established patterns of relating and thus provide some stability. Nonetheless, they simultaneously need to communicate in ways that allow the questioning and abandonment of prior actions

and practices so as to engage in creative dialogue, new integrations, and innovation (Eisenberg, 1998).

Stokols (2006) acknowledges that researchers often have "little awareness of the collaborative constraints and tensions" that they are likely to "encounter as they work together over several months or years" (p. 69). Unrealistically high expectations of cooperation, ambiguous goals, conflicting values, and contrasting worldviews tend to invoke tensions within a transdisciplinary team. This chapter takes on the challenge of articulating how the constraints and tensions that transdisciplinary teams experience could be addressed, in particular by identifying the personal skills and characteristics that transdisciplinary team members might foster to make transdisciplinary collaboration a more positive experience.

Challenges of transdisciplinary research

Though the goals and benefits of transdisciplinary research identified in chapter eight are clearly relevant to KM as a field, the adoption of this approach does not guarantee successful tackling of KM issues. As Hansson (1999) notes, successful research cannot be produced on demand, and a number of factors present hindrances to the success of transdisciplinarity. For example, Magill-Evans et al. (2002) identify transdisciplinary team members' other responsibilities as a possible impediment to success. This aligns with Stokol's (2006) recognition that transdisciplinary research's labour-intensiveness can be a hindrance. Another allied impediment to transdisciplinary research is that its "potential scientific and community benefits…may not be evident for several years" (Stokols, 2006, p. 68) or even decades, frustrating both participants and supporters. This major drawback is emphasised by those studying transdisciplinarity in a number of contexts, including Morgan et al. (2003) in research on smoking, Choi and Pak (2007) in research on medicine, and Magill-Evans et al. (2002) in research on neuroscience. This thesis contends, however, that the delay in results may not be such an impediment for KM, as scholars inclined to engage in transdisciplinary research on KM are likely to focus on organisation-specific problems rather than the larger, social and complex problems of some other fields. Accordingly, results may well appear more quickly than in other fields.

This chapter does, however, identify KM's youth as a potential impediment to the practice of transdisciplinary research as KM does not necessarily have the academic status to attract sufficient attention, time, and funding. Funding is one of many significant practical barriers to transdisciplinary research. Choi and Pak's (2007) comprehensive literature review also names insufficient time allowed for projects, institutional structures and procedures hampering team efforts, and lack of guidelines for multiple authorship in research publications as potential pitfalls in transdisciplinary work. Many of these practical barriers are institution-based, including poor selection of the disciplines involved in a project and poor selection of the team members – generally the result of team composition being determined by the hierarchy of an organisation. These issues overlap with what Stokols (2006) identifies as contextual factors that influence the prospects of successful transdisciplinary research, though Stokols also adds physical proximity, electronic linkages, and technical support. Institutional support, including a commitment to make necessary changes in workplace structure and routines, appears essential to the success of transdisciplinary teams.

Institutional pressures can contribute to the interpersonal conflict inevitable in transdisciplinary research teams. In addition, the impact of departmental politics, the history (if any) of previous relationships between team members, and clashing personal styles may fuel team conflicts (Magill-Evans et al., 2002; Stokols, 2006). Consequently, a dominant theme in the literature is the enormous impact communication has on the effectiveness of transdisciplinary research (see Stokols, 2006; Wickson, Carew, & Russell, 2006; Hansson, 1999; Morgan et al., 2003). These scholars note the tendency for transdisciplinary teams to experience tension and conflict as individuals with different "principal goals, educational background[s], and worldviews" (Stokols, 2006, p. 69) come together to collaborate.

Earlier chapters paid attention to the importance of worldview in KM, and the significant impact of worldview they argued for is confirmed elsewhere. Much research on transdisciplinary teams, for example, contends that a major source of conflict is the clash between oppositional views about the nature of reality (Aram, 2004). The positivist and social constructivist perspectives, broadly representative of the computational and organic paradigms in KM, represent two camps in what Aram (2004) terms the "science wars" (p. 386). Philosophical differences about

whether the world exists independently of human knowledge of it or whether humans' way of perceiving constructs the world in a particular way is a potential area for conflict (Aram, 2004). These findings support this thesis' contention as to why KM has struggled to develop a cohesive body of work. In addition, a discipline's ontological bias often determines preferred methodology, and discipline-informed individual preferences for qualitative methods over quantitative methods, for example, may lead to conflict (Choi & Pak, 2007). From this perspective, the division of KM into opposing paradigms is predictable and comfortable, as it fosters connections between those who already have common outlooks and approaches.

Comfort and predictability are not, however, the best ingredients for the transdisciplinary recipe. In keeping with the theory of new knowledge generation argued by CRP and connectivism, Aram (2004) notes, "the notion of incommensurability between ontological views…creates an invaluable intellectual dynamism" (p. 387). Similarly, for Choi and Pak (2006) "ambiguous and incongruous juxtaposition of heterogeneous information elements that are related through the operation of a transdisciplinary interface is likely to stimulate the emergence of new knowledge" (p. 357). That is, even though it may be a frustrating process as seemingly incommensurate perspectives collide, transdisciplinary research can lead to "a-ha" moments. This position echoes Stacey's (2001) understanding that "it is in their struggling to understand each other in fluid, spontaneous conversational exchanges that people create new knowledge" (p. 182). In other words, though diversity of contributing perspectives may lead to ambiguity and equivocality, and tension between inquiry and advocacy, positivity and negativity, and focus on self and focus on other (Stacey 2001), these stresses are essential to the process of generating knowledge. For that reason, this thesis strongly recommends transdisciplinary approaches to KM because they provide the opportunity to exploit KM's intrinsic multidisciplinarity in terms of generating greater insight.

Managing conversations that are paradoxically both cooperative and conflicting, however, inevitably challenges participants. Misunderstanding is likely to be a common occurrence. Stacey (2001) argues that this may lead to frustration and stress, resulting in participants wanting to withdraw from the interaction. Further, when a conversation has the potential to disrupt everyday patterns of being, it also

has the potential to threaten continuity of identity, leading to anxiety in participants. Finally, conversations that offer the possibility of transformation often threaten established power relations. Those in power may seek to close such conversations down as the threat of a shift in power becomes manifest (Stacey, 2001). Thus, while KM may indeed benefit from integrating theoretical frameworks from different disciplines, using multiple study designs and methodologies, and drawing from perspectives and skills of a number of disciplines through transdisciplinarity, successfully carrying out transdisciplinary research requires sophisticated communication skills. As a result, KM scholars, like others working in transdisciplinary team settings, will need to mobilise particular communicative skills and attitudes to collaborate in efficient and effective ways.

Intelligent participation: Engaging with transdisciplinary communication

The pressures explored above might be an inevitable part of the successful integration of transdisciplinary teams. That is not to say that they are easily overcome, nor that they cannot be consciously addressed. The cross-functional nature of a transdisciplinary research team presents particular communicative difficulties. These frequently emerge in the process of attempting to integrate contributions and perspectives. Rather than focusing on problems, this chapter seeks to articulate the attitudes and capacities that might reduce their impact. It describes and promotes the concept of intelligent participation as an attitudinal orientation, albeit it one with material outcomes, to transdisciplinary knowledge communication. The focus is on the quality of participation of each individual member. That is, intelligent participation unites the themes of this thesis by calling for each individual to attend to their beliefs and outlook (worldview), the ways in which they relate to each other (connection), and their participation in conversation (communication).

Intelligent participation takes a holistic approach that understands worldview, connectivity, and communication as contributing to knowledge. It embraces the arguments of CRP (Stacey, 2001) and connectivism (Downes, 2006; 2007) in understanding new knowledge emerges when new connections and patterns of relating are established. In effect, it accepts that moment-by-moment interactions

construct individual and group identity, meaning, and knowledge simultaneously. Intelligent participation adopts the CRP understanding that it is crucial to treat relationships as ongoing processes rather than discrete entities. Intelligent participation thus combines the notions of considered (self) reflection – to be found in the learning and intelligence literature (Ayas & Zeniuk, 2001; Senge, 1992; Hämäläinen & Saarinen, 2006) – and dynamic interaction – to be found in communication and complexity literature (Stacey, 2001; 2003; Cooke-Davies et al., 2007; Richardson, 2008). It also draws attention to the communication of knowledge as an emergent phenomenon, thus advocating a shift in worldview from a linear, rational and positivist perspective to a non-linear, dynamic, complex, and socially-constructed outlook. Indeed, intelligent participation can help identify, as a useful way forward in practice, competencies to enable transdisciplinary team members to interact successfully.

Intelligent participation: Attending to worldview

Intelligent participation also revives consideration of the impact of KM's generally unquestioned and unacknowledged worldview. Just as the KM community's acceptance of the outlook of the managerial paradigm has shaped the field as a whole, the worldviews of individuals within transdisciplinary teams shapes the experience of those groups. Hansson (1999), from a base in policy science, is among a number of researchers studying cross-disciplinary teams who have noted that "an ability to understand the ways of thought" (p. 341) of others is crucial to successful collaboration. This section argues that being able to articulate one's own ideological and ontological position is the first step to being able to comprehend someone else's outlook. Reflecting on and communicating their worldview is a means whereby team members can see how their own ways of being, and their own patterns of knowing, are contingent on their identification with a particular community and its interaction patterns and expectations.

Understanding worldview includes an appreciation of the role of the social systems one belongs to and the beliefs structured by these. Senge (1992), for example, sees people as largely being unaware of the systems they are part of even while adopting a system's worldview as their own. Understanding that team members have different sets of assumptions about the best way to proceed, as well

as different values, helps each individual to understand the contingency of their own assumptions (Fong, 2003; Wilson & Herndl, 2007). If individuals are able to consider the context that has produced their own position and how their analysis of the topic under consideration might compare to others' then it may be possible to create shared goals and consequences. Similarly, individuals will ideally be able to imagine how changes that they want might affect other team members and collaborate with those thoughts in mind (Wilson & Herndl, 2007).

The benefits of understanding the socially constructed, and therefore fragile – in terms of being open to being deconstructed – nature of one's worldview are important for transdisciplinary teams. Interestingly, and commensurate with my arguments for the acceptance of plurality and paradox, some studies of transdisciplinarity in practice emphasise the ability to negotiate perspectives and to accept differences rather than automatically trying to reconcile them. Aram's (2004) research, for example, found that scholars working within transdisciplinary teams were reluctant to identify with either an objectivist or a constructivist approach to the nature of reality. He speculated one of two causes for their ability to either accept both or commit to neither extreme. First, it may be a pragmatic result of participating in transdisciplinary work, allowing researchers to get on with joint research without extensive philosophical debate. Alternatively, it may be a cause of researchers' participation, a fluid approach toward ontology indicating a predilection for transdisciplinary work.

It may be impossible to find the motivation behind the willingness to accept that ontology may be negotiated. However, there is evidence that collaboration founded on this principle is likely to be more successful than collaboration when participants are rigid in worldview. This is partly because transdisciplinary teams form around the concept of inclusion and exclusion, drawing attention to shared characteristics in order to differentiate themselves from those outside of the team. Stacey (2001) describes the group formation process as drawing on two kinds of logic. First, groups follow a symmetric logic, stressing what individual members have in common and minimising difference to establish the group identity. Simultaneously, they employ asymmetric logic in that they focus on the differences they have with those outside the group, while obscuring any similarities they might have with them. Magill-Evans et al. (2002) note how their own transdisciplinary group went through the first part of this process as they

"had to search for commonalities rather than differences in theoretical perspectives and relinquish their personal and discipline-specific approaches" (p. 223) to overcome philosophical differences. They describe a collaborative process by which the transdisciplinary group selected a unifying theory to ground their work (Magill-Evans et al., 2002). Stokols (2006), too, explains that differences are accepted but commonalities are what are highlighted as "contrasting values and conflicts of interest are negotiated and accepted, if not entirely resolved" (p. 68).

The process of negotiating a shared worldview for the group makes issues of identity integral to transdisciplinary communication processes. In the case of members of academic disciplines, for example, scholars can be intensely territorial both as they claim an area of knowledge as their own and as they insist that new knowledge can only be generated by legitimised insiders (Leggon, 2006). In addition, the communicative, epistemological, and ontological practices by which disciplines define themselves means that scholars working in particular disciplines embrace certain perspectives (Jones, 2008). These are crucial to maintaining membership and authority in their community. Nevertheless, when a transdisciplinary team comes together that identity is called into question.

This occurs because human (inter)action perpetually (re)produces identity (Cooke-Davies et al., 2007). As a result, "authentic dialogue is always chancy because identity, not just meaning, is always at stake" (Eisenberg, 1998, p. 101). In transdisciplinary teams, from a complexity and CRP perspective, self identity and group identity are perpetually (re)constructed in the process of relating to one another. This view marks a notable shift from the dominant notion of human subjectivity, which sees individual minds as self-contained, discrete, and relatively stable. The shift matters because it increases the chance for transformation and innovation through conversation.

The process of adopting new ways of communicating, and therefore generating new knowledge, frequently involves rejection of old knowledge in the form of past practices, beliefs, or systems. In this way, the adoption of new knowledge inherently undermines a sense of identity because it means letting go of something that has constructed one's identity and place in the group previously (Parent et al., 2007). As Eisenberg (1998) observed, if people have a fixed notion of self that they regard as unalterable, they tend to fragment local systems and interactions

because their attachment stresses difference and separation. Acceptance of the shifting nature of self-identity is crucial to successful transdisciplinary conversation so that participants can adopt a mode of inquiry that draws from the knowledge bases of many disciplines. In other words, a fluid self-identity enables them to see in different ways (Leggon, 2006). Ideally, participants will understand aspects of their identity such as their own communicative practices (vocabulary, organisation and so on) as habitual rather than intrinsic. Still, getting researchers from different disciplines to talk to one another, rather than talk past one another, is a challenging goal, at least partly because of the anxiety and tension inherent in cross-disciplinary interaction.

A specific source of anxiety to be found in transdisciplinary teams is the need to cope with paradox. Wickson et al. (2006) note that in trying "to integrate different knowledges and epistemologies, as well as theory and practice, the TD [transdisciplinary] researcher will inevitably face the problem of paradox" (p. 1054). In other words, they will not always be able to reconcile opposing views. From a more positive angle, Henagulph (2000) observes the importance of paradox to stimulate creative thought and so highlights the value of intuition in conjunction with rational thought and the ability to pay attention to the "logic of the included middle" (para. 9), which allows for plurality rather than insisting on duality. This lends further weight to my earlier contention that KM needs to acknowledge the role of intuition – as social neuroscience and Systems Intelligence both advocate.

Furthermore, this thesis has stressed KM's need to adopt a more pluralistic view of knowledge and accept paradox. The notion of different levels of reality (Henagulph, 2000) is one theoretical lens that might assist transdisciplinary team members to live with paradox. In essence, such an approach offers dialectics over binary divisions, in allowing things to be "both A and non-A" (Wickson et al., 2006, p. 1054), by proposing that concepts exist at different levels of reality. If team members can accept the idea of different levels of reality, then they can reconcile apparently paradoxical notions. Paradox does not just exist at the theoretical or philosophical level for transdisciplinary teams. Indeed, as Fong (2003) notes, cross-functional teams are typically required to integrate, yet be diverse; to meet stringent requirements, yet adapt to changing needs; to use

existing knowledge patterns, yet generate new ideas in the face of problems. That is, their very practices are often paradoxical.

In addition to having an outlook comfortable living with paradox, transdisciplinary team members will also ideally embrace a worldview that accepts the uncertain nature of reality. When individuals communicate with one another they jointly commit to a temporary shared social reality that is continually altered by each gesture and response (Eisenberg, 1998). There is no possibility of fixing meaning as each turn taken is unpredictable and alters the emergent meaning. Yet, as illustrated earlier, much of the language used to describe knowledge implicitly suggests it is indeed fixed (and even stable and permanent). This thesis identifies knowledge as continually emergent in the processes of relating, and thus as temporal and variable. This chapter builds on that to contend that it is, therefore, crucial that members of cross-functional groups work with the knowledge that no interaction is entirely predictable and thus the future is always uncertain.

Therefore team members need to understand that the communication is oriented, as Stacey (2001) notes, towards a future that is essentially unknowable, although it can be anticipated and can be, indeed, has to be, constructed by the process of interaction. Humans constantly balance the desire for certainty and a fixed self-identity with the knowledge that they operate in an inherently uncertain world, with an unknowable future (Eisenberg, 1998). Accordingly, a key transdisciplinary research skill involves having the courage, despite lack of control and certainty, to carry on working creatively together (Cooke-Davies et al., 2007). Simpson and Barnard (2000), amongst others, have argued that organisational leaders require the ability to balance the paradox of acting "believing the action to be correct" but "not knowing for certain that it is" (p. 235). I argue that, in fact, all members of transdisciplinary teams need to be able to commit to a course of action as if the future was predictable even while working in an environment characterised by emergence and uncertainty (Eisenberg, 1998). Being able to act in the face of an unknown future is a key capacity of intelligent participation.

Intelligent participation: Attending to connectivity

This thesis has identified knowledge, along with worldview and identity, as emergent. Earlier chapters have argued that knowledge is constructed through the process of interacting and making connections. In the academic world, transdisciplinary interaction provides an opportunity to make new complex connections. Stokols (2006) explains that transdisciplinary team members require a commitment to "an ethic of resolute openness, tolerance, and respect towards perspectives different from one's own" (p. 68). A flexible worldview helps connectivity by facilitating openness to new ideas and the development of empathy toward other team members. It also facilitates team members abandoning strongly held beliefs in the face of new ideas, and so opens up possibilities for transformation. Other capacities also contribute to the ability to develop such connections.

First, the transformation of established patterns of communicating and knowing into new patterns depends on responsiveness in the presence of diversity (Stacey, 2001; Suchman, 2006). The wider the variety of perspectives that can be introduced into a conversation, the greater the opportunity for new associations to form and reproduce into new patterns of meaning (Suchman, 2006). This chapter endorses CRP's contention that transformation is more likely to occur when participants are disparate and small differences can be amplified into major discontinuous changes in understanding (Stacey, 2001). Connectivism, too, emphasises the need for requisite variety in that effective networks need to include a diverse range of perspectives so as to generate knowledge with greater validity (Downes, 2007). Accordingly, this chapter argues that the establishment of transdisciplinary research teams in KM is one way to provide that diversity. Debates and differences in opinion and perspectives caused by diversity in such teams are likely to stimulate divergent thinking (Fong, 2003; Mitchell & Nicholas, 2006).

Diversity, however, is about more than including a range of people with different experiences and backgrounds. Diversity also comes from including a range of themes in conversations and responsiveness includes participants' ability to form new associations between those themes. Themes pattern the experience of being together and tend to be reproduced with little variation – as habits and traditions. However, challenging and changing these themes can encourage spontaneity and

liveliness (Stacey, 2001). Promoting informal conversations, as well as formal communications, is crucial to simultaneously (re)producing and transforming patterns of connectivity. McDermott (1999) describes how oil company Shell requires its community leaders to "walk the halls" (p. 115) to keep informal and varied connections, or what McDermott calls "schmoozing" (p. 115) flourishing.

Transdisciplinary teams, by the nature of their make-up and purpose, are predisposed to accepting diversity, but they also need to effectively engage with that diversity. The recognition of knowledge's relationship to interaction affirms the value of a high level of interactivity in transdisciplinary teams, in both formal and informal settings (Handzic & Chaimungkalanont, 2004). Such levels of interaction, combined with depth of personal expertise, foster dynamic environments (Hasgall & Shoham, 2008). However, attending to connection also requires responsiveness. Responsiveness is about participants' ability to see that meaning arises in interaction. That is to say that rather than a relatively static and uncomplicated process of decoding, or (mis)interpreting what is intended, meaning is not the property of a gesture itself but depends upon the response to that gesture (Suchman, 2006). Communicating through a series of gestures and responses, accompanied by a willingness to explore new ideas, are at the heart of most research. Therefore, given the nature of academic enquiry, transdisciplinary research teams are likely to be responsive as their members will be professionally oriented to exploring new ideas. However, they also need to work at attending to the dynamic nature of communicating meaning, so as not to focus on communication in terms of the transmission model.

As well as the capacity to be responsive in a context characterized by diversity, attending to the emergence of knowledge through connectivity requires an appreciation of the role of power in communication. Power relations are an inherent aspect of any relationship, and an understanding of the influence of power is another capacity of intelligent participation. Relationships are formed through communication processes and the transdisciplinary team emerges from the patterns formed, sustained, and developed out of ongoing processes of relating (Stacey, 2001). As noted in the previous chapter, Fogel and Garvey (2007) characterise systemic communication, such as is found in teams, as being "alive communication" (p. 251), to emphasise the futility of belief in stability and certainty. Aliveness helps conceptualise relationships as "never completely at rest,

never fully defined, never satisfactorily contained within categories" (Fogel & Garvey, 2007, p. 256), and suggests that each interaction offers multiple possibilities. Consequently, all participants in a transdisciplinary team experience and contribute to the emergence of organisation (Simpson, 2006), and power is inherent in that process.

In the process of communicating, as noted earlier, humans construct individual and social (transdisciplinary research team) identity by choosing whom and what to include and exclude (Stacey, 2001). However, this classifying of objects, people, topics, methodologies and so on, is often the right of management so can reflect the distribution of power. When such classifications become systemic, they can embed dominance, which affects work practices by enforcing appropriate interpretations, actions, and self-construction (Kuhn & Jackson, 2008). As Cooke-Davies et al. (2007) further confirm, language is used to communicate, and, simultaneously, negotiate social status and power relations. As a result, agreeing to, suggesting, promoting, or resisting classifications can become possible discursive moves in the process of relating (Kuhn & Jackson, 2008).

Another communication issue relevant to power stems from the acknowledgement that information is a power resource. It therefore follows that, as knowledge emerges through social interaction, the form in which it appears gives preference to particular interests. What certain participants consider to be valid and legitimate can determine what is considered to be invalid or not legitimate within a group. This can have a clear political dimension that reflects the distribution of power. For example, one person instructing another legitimises, or delegitimises, roles for participants based on the perception and valuing of information as a resource (Kuhn & Jackson, 2008). Similarly, in Eisenberg's (1998) estimation, attempts to fix meaning and establish certainty of knowledge are acts of power and control. A group's appreciation of how power is constructed through communication "reveals much about the kinds of human beings who can grow and develop there" (Eisenberg, 1998, p. 99).

Intelligent participation: Attending to communication

Power, from a CRP perspective, lies less in the individuals, or the relationships, themselves and more in the processes of relating between individuals. This thesis

takes the position that issues relevant to power, including connecting through relationships and sharing worldviews, are negotiated through communication. If they are to disrupt patterns and communicate across disciplinary or paradigmatic lines, KM scholars in transdisciplinary teams will need to see through others' eyes and to unsettle their habitual patterns of communicating. Therefore, participation in effective transdisciplinary research requires willingness to change one's perspective and suggests an openness to recognising and responding to unfamiliar communication patterns. Transdisciplinary research forces people out of their comfort zones and demands "unwavering commitment to sustained and mutually respectful communications" (Stokols, 2006, p. 68). However, transdisciplinary team members need to communicate in ways that further not only efficiency and stability but also creativity and innovation. Thus, communication skills in general, and the ability to deal with tension and disagreement in particular, are key requirements for successful transdisciplinarity.

The more individuals have in common with the people they communicate with, the greater the shared understanding. Conversely, when widely divergent participants communicate, the chances of misunderstanding increase. Transdisciplinary conversations, therefore, involve a precarious balance between integration and diversity. As Simpson (2006) notes,

> in groups that have well-established ideas and have known one another a long time, there is a tendency for there to be too little diversity….in groups where participants share little in common, there may be too much diversity and communication may disintegrate. (p. 479)

Integration amongst members is crucial to effective teamwork and communication, but the integration must not be complete to the extent that it eliminates difference (Hasgall & Shoham, 2008). Unsurprisingly, much of the literature on transdisciplinarity concludes that "different communication styles" (Magill-Evans et al., 2002, p. 224), "inadequate communication" (Choi & Pak, 2007, p. E229), and "interpersonal tensions" (Stokols, 2006, p. 69) are a feature of such groups. Accordingly, conflict is recognised as an inevitable feature of transdisciplinary research.

Consequently, conflict management and consensus-building skills are important personal competencies for participants in transdisciplinary teams. Stokols (2006), in considering the particular communication difficulties facing transdisciplinary

teams, emphasises that the "terms of engagement" (p. 68) are qualitatively different to those in other types of teams. He points out that a number of case studies on academic transdisciplinary teams stress that tensions and conflicts evoked by differing disciplinary worldviews and interpersonal styles "must be confronted and resolved" (p. 68). Conflict can be minimised with sufficient preparation, and "higher levels of communication about collective goals and potential conflicts at the outset of a collaborative project can improve the team's prospects for subsequent success" (Stokols, 2006, p. 70). Along with conflict, anxiety is likely to be a characteristic of transdisciplinary communication as team members bring diverse patterns and expectations to interactions. When people experience anxiety they tend to work, through discursive and other moves, to eliminate its cause. The challenge for transdisciplinary teams is that free-flowing conversations need enough anxiety to permit the emergence of novelty, but not enough anxiety to cause communication disintegration through the use of defensive routines (Simpson, 2006; Houchin & MacLean, 2005).

Finally, this section also contends that transdisciplinary team members need to be able to reflexively monitor the process of communication that constructs their future. It is a position supported by Wickson et al. (2006), who argue that individual researchers need to "reflect on how their own frames of reference/values/beliefs/assumptions etc have shaped the conceptualisation of the problem as well as the development of the method of investigation and the solution" (pp. 1053-54). In effect, this thesis makes the same argument about transdisciplinarity in KM that Cooke-Davies et al. (2007) make for cross-functional project leaders when they argue that leaders of project teams need to be reflexive about their own participation in relating; be sensitive to the qualities of conversational life (and so enable free flowing conversation); have adequate anxiety management to cope with unpredictability and paradox; and consider the ethics and morality of actions. The difference that this thesis argues is that intelligent participation applies to all participants in a team – not just the leaders.

Wickson et al. (2006) also note the importance of the reflexivity of the team as a whole. They stress the importance of reflection for the actual research process, as well as particular communicative interactions. Typically, scholarly research in a field like KM is a delayed process of gesture and response through the publication of research articles. Where diverse perspectives are deliberately brought together

in the more temporally-immediate environment of a transdisciplinary team, the disruption of old patterns of connecting and communicating is intensified. The process of generating knowledge, however, must involve conflict, tension, and anxiety (Stacey, 2001), because it is fresh and potentially uncomfortable input that disrupts old patterns of communicating and allows new ones to emerge. Due to the tense nature of this process, Wickson et al.'s (2006) call for communal reflection is pertinent. They argue against bodies of knowledge from contributing disciplines being accepted as fact. Instead, aligned with the ideas of intelligent participation, Wickson et al. recommend that such knowledges be deconstructed and rebuilt through reflective collaborative processes. Intelligent participation gives each individual participant responsibility for how they communicate, and asks them to pay attention to team processes as much as product.

Conclusions

The chapter offers the concept of intelligent participation to promote an effective transdisciplinary team environment to foster transdisciplinary research in KM that is capable of re-energising the field for a progressive future. The capacities of intelligent participation have been identified through a careful reading of the literature on transdisciplinary research, and also by adapting perspectives from CRP and dynamic systems. They represent the synthesis of several themes of this thesis. In particular, intelligent participation seeks to address what this thesis has identified as limitations of the typical KM literature. First, intelligent participation acknowledges the weakness of uncritically adopting a worldview (with its attendant ontological and epistemological assumptions), and, instead, it encourages a flexible rather than fixed approach to philosophical outlook. Second, it rejects a static view of knowledge and the transmission model of communication in favour of a dynamic understanding of knowledge creation through processes of connection. Finally, the introduction of intelligent participation encourages consideration of the micro processes of communication in conjunction with the macro processes of organisation within KM. It illustrates how theoretical understandings of how knowledge is communicated can inform the practice of being effective participants in transdisciplinary research projects.

In summary, intelligent participation unifies the major argument of this thesis by suggesting a range of capacities for transdisciplinary team members. It argues that they should be able to reflect on their own worldview and to attend to relationships and identity as well as tasks; they should be encouraged to welcome diversity and be open to change; they should pay attention to emergence in the present; and, they need, in order to do this, to be able to manage conflict, cope with anxiety, and understand the influence of power. These capacities can support people to make the necessary shift to thinking and acting in the face of uncertainty and in focusing on the living present rather than an unknowable future (Simpson, 2006). This shift encourages an associated shift from knowledge as a product of communication to knowledge as emergent in the process of communication.

In concert, the last two chapters have argued, and illustrated, how KM can be enriched by dissolving the perceived boundaries between its own paradigms and its contributing disciplines. They offer transdisciplinary research as one means of achieving this. Their approach affirms the call in the broader management landscape for an acceptance of the complexity present in life and the acceptance of a variety of perspectives in studying that life (Hamel & Breen, 2007). The following, and final, chapter of this thesis will explore another prospective path for KM in light of that complexity – a focus on the role of context. In doing so, it will address the remaining issue identified in chapter two as dividing the field – concern over what KM is, or can be, given contemporary conditions.

Chapter 10 – The future of KM: Individual, organisational, and social contexts

This final chapter provides an appropriate point to consider the main arguments of this thesis. The opening chapters of this thesis provided an overview of the history of KM and a snapshot of the present state of the field. In particular, the second chapter identified three areas of conflict in KM inhibiting the progress of the field: division over the definition of knowledge, opposition between the computational and organic paradigms, and disagreement over the conceptualisation of KM itself. Chapter three argued that engaging with these conflicts in the light of contemporary conditions might reinvigorate KM. Emphasising the importance of a congruent, more open, and revised worldview for KM, chapter four discussed the impact of KM's positioning within the traditional management paradigm and the accompanying vocabulary of that management paradigm. It suggested, given the latest developments in management, that the KM community reflect the complexity of current management conditions and address the shaping influence of the dominant language. Accordingly, chapter five called for more attentiveness to the vocabulary and metaphors of KM so that the discourse engages more comprehensively with contemporary conditions and possibilities.

Having called attention to some of the managerial assumptions entrenched in KM as an academic field, and shown how these assumptions are embedded even at the micro-level of language, the next two chapters addressed the first point of conflict in KM: disagreement over the definition of knowledge. Looking at fresh understandings of knowledge and knowing processes, chapters six and seven discussed how KM is being enriched, and can be further enriched, by the incorporation of up-to-date communication theories and by acknowledging ignorance as a dimension of knowledge. Chapter eight presented support for the inclusion of enriched views of communication. In particular, it focused on those that go beyond the transmission model, and knowledge in KM by showing how other fields associated with the study of knowledge are converging around similar conclusions that differ from those in mainstream KM. Chapter eight also suggested how to bring together the computational and organic paradigms through scholars adopting a more transdisciplinary approach to the study of KM and through treating the field as a boundary object. Finally, the penultimate chapter

introduced and developed the concept of intelligent participation to capture the characteristics that make transdisciplinary conversations in KM most likely to be successful.

This chapter now goes on to address the third point of identified conflict in KM – the disagreement over exactly what KM is. Again, as in chapter six's consideration of the definition of knowledge, this chapter does not presume to provide a definitive answer to a question that has occupied the field since its inception. Instead, the chapter considers KM's future in light of the arguments made by this thesis to date. In other words, it explores how organisations can manage knowledge conceived as emerging from micro-processes of relating or connecting and as a dynamic phenomenon. Already, as chapter three noted, some recent theoretical approaches in the management literature in general are moving organisations away from the "command and control" paradigm to a more interdependent, less hierarchical, emergent form of organisation. A number of KM scholars and practitioners are adopting such approaches – for example, the work of Stacey (2001) and Downes' (2006; 2007) challenges the possibility of organisations managing knowledge. Accordingly, this chapter proposes that a fruitful direction for KM lies in the possibility of organisations engaging more with the management of contexts that lead to knowledge rather than the management of knowledge itself.

In calling attention to the possibility of context management, this chapter draws on and extends the understanding of context proposed by Thompson and Walsham (2004). These scholars acknowledge the fluidity of context, and recognise the implications of context emerging from the interaction between individual and organisation. This chapter adds a social component to their framework, and suggests that KM can be understood as the provision of individual, organisational, and social contexts that allow knowing processes to flourish. Ultimately, it concludes by noting that organisations can really only manage part of context. However, it argues that organisations can work to most effectively develop the contextual components that they can manage by attending to the components of context beyond their control.

KM and context

As has been noted in previous chapters, the initial focus of KM was on capturing, codifying, externalising, and storing knowledge. In effect, then, early KM was about de-contextualising knowledge – removing it from individuals for storage in databases accessible by all organisational members. With its emphasis on organisations seeking to capture knowledge that could be reused at a later date, KM was promoting a "best practice" model. Yet, as Billing (2009) notes, "best practice and its forebear benchmarking both divert attention from the people and the context, focusing entirely on the disembodied prescription or model, as though it can be implemented anywhere and get the same successful result" (para. 6). Consequently, this notion of KM has been criticised as fundamentally flawed because it removes knowledge from its context and fails to take into account the idiosyncratic behaviours of people (Snowden, 2003; Gurteen, 2009).

As the field progressed, an increasing number of KM scholars conceptualised knowing as an activity (rather than knowledge as a product), with context becoming an essential component of KM. Even Nonaka and Takeuchi (1995) proposed that their spiral of knowledge development – often used to justify a focus on explicit knowledge – only works in the presence of enabling conditions. By this they shifted the emphasis to the role of organisations being about providing an appropriate context for innovation to develop: "The organization supports creative individuals or provides contexts for them to create knowledge" (Nonaka & Takeuchi, 1995, p. 59). They also argue that knowledge "is context specific and relational" (p. 58). Blackler (1995), an early proponent of knowing as an activity, recognised that little was known about the ways in which people's understanding of their activities changed as a consequence of the developing complexity of the contexts within which they were working. Consequently, he stressed that a key characteristic of knowledge is its situatedness. Giroux and Taylor (2002) confirmed this insight in their summary of the literature on tacit knowledge to date. They specifically noted that many KM scholars were positioning tacit knowledge as being located not in individual cognition but in action within a situation. Others have similarly highlighted how individuals only know what they know when they need to know it. Snowden (2002) in particular pointed to how new contexts lead to the emergence of knowledge and called for KM to "focus more on context and narrative" (p. 5) than knowledge content.

However, although context was becoming increasingly prominent in the literature as an important aspect of KM, detailed explorations of what context was remained absent. For example, Tsoukas (2003) noted "the nature of organizational knowledge and its relation to individual skills and social contexts has been inadequately understood" (p. 412).

Tsoukas' (2003) own work stresses the contextual nature of tacit knowledge claiming that it emerges "in the context of carrying out a specific task" (p. 415) and that "knowing is always a contextual issue" (p. 418) yet never elaborates on what constitutes context.

Where KM scholars did explore context, there was not much consensus over how it was constituted. Nonaka and Konno (1998) proposed Ba as a shared physical, virtual, or mental space that provides a foundation for knowledge creation as a "context which harbors meaning" (p. 40). Snowden (2002), on the other hand, proposed that context consists of levels of abstraction (the individual ability and desire to share knowledge) and culture (shared values). Thompson and Walsham (2004) argued that knowing as an activity

> demands a more sophisticated conception of context than the rather confused images which appear currently within the organizational literature, which shows a tendency to view context as either fixed, and static, or as wholly emergent, conjured, as it were, out of "thin air." (p. 726)

They argued that context needed to be more closely examined because none of the existing literature that addressed context effectively captured its three major aspects: the relationships between the shared and non-shared aspects of a situation, the emergent configuration of those aspects (the context itself), and the resulting new aspects that then influence the next contextual configuration (Thompson & Walsham, 2004). Accordingly, they identified five components of organisational context they saw as essential to fully understanding KM.

Thompson and Walsham (2004) based their framework on Blackler's (1995) typology of knowledge. Before abandoning these to advocate a knowing-as-process perspective, Blackler had summarised the existing competing approaches to knowledge (particularly in the organisational learning literature) into embrained, embodied, encultured, embedded, and encoded knowledge. Thompson and Walsham (2004) argued for those types of knowledge to be resurrected and

better understood as the "contextual inputs" (p. 736) described in Table 10-1. They positioned the analysis of context as the background essential to the analysis of knowing, the foreground of KM. All the inputs of context relationally combine in the process of knowing to generate meaning (Thompson & Walsham, 2004). That is, the knowing process occurs in the midst of ever-changing background inputs, which combine to influence the knowing process, but are also altered by the knowing process. Therefore, there is a dialectical relationship between knowing and context – and the richer the context, the richer the knowing process.

Table 10-1 ***Contextual Inputs***

Contextual Components	Attributes
Embrained	An individual's psychological predispositions and aptitudes, which affect relational pattern of context likely to form. Latent 'mental potential'.
Embodied	Physiological and sensorimotor routines through which each individual sustains physical interaction with the world (e.g., ability in motor skills, differences in perception of sounds, light).
Encultured	The historical process of socialisation and acculturation through which shared meanings are reached in the individual's mind.
Embedded	Visible organisational components such as technology, routines, hierarchies, procedures. All these relate to each other e.g., budget affects technology.
Encoded	Explicit forms of knowing i.e., information. Does not become knowledge until animated in relation to other equally important types of context.

(Adapted from Thompson & Walsham, 2004, pp. 736-41.)

Thompson and Walsham (2004) present context as a performative prism with three subjective elements (embrained, embodied, encultured) and two intersubjective elements (embedded and encoded) that "fuse completely in a unique configuration to a particular experience-in-activity" (p. 742). In effect, they expose how context is made up of both these non-shareable and shareable aspects. This is a key insight for KM because of its implications for the ability of organisations to manage context. Thompson and Walsham (2004) stress that context is "always generated in the individual" (p. 736) rather than located in the physical world. This leads them to conclude that the practice of KM in organisations needs to pay attention to all aspects of the components rather than those typically regarded as organisational. Augmenting Thompson and Walsham's descriptions with the arguments of this thesis, the following sections explore these components in detail.

Components of context: Embrained, embodied, encultured, and emotioned

The defining characteristic of the first three contextual components is that they are non-shareable. For Thompson and Walsham (2004), embrained input to context refers to the cognitive abilities of an individual and also serves as a reminder that all the contextual inputs are related within the individual mind. Accordingly, context is always unique to an individual. However, in focusing on cognition, Thompson and Walsham (2004) overlook the impact of emotion on knowing processes. Chapter three noted the increasing influence of neuroscience on the understanding of how people come to know things, how memory works, and how people interact. The latest developments in neuroscience have changed the way scientists understand the relationship between emotion and cognition. Much work in KM has treated knowing as straightforwardly cognitive. However, as scholars learn more about how the brain works, it becomes increasingly difficult to justify the separation of cognition and emotion. Accordingly, this chapter proposes that the non-shareable components of context be extended to include emotion as well as cognition, and therefore suggests the additional term of "emotioned" context.

Traditionally, management scholars "treat humans as ultra rational creatures because they can't define and systematize the emotions" (Brooks, 2009, p. 7). However, the latest developments in neuroscience recognise that the brain

operates differently depending on social context and that "thinking and emotionality are inextricably intertwined" (Restak, 2006, p. 52). Consequently, the once unquestioned division between reason and emotion is being broken down as more complex and nuanced understandings unite the hard and soft sciences (Brooks, 2009). Recent work in KM has been influenced by this. For example, although Beesley and Cooper (2008) present a quite conventional view of knowledge-acquiring, utilising and generating processes, they locate that view within a somewhat radical contextual framework of affect. They see affect as consisting of cognition, communication, and social contingencies, particularly as these relate to emotions. Further, they emphasise that these affective issues are underpinned by values, attitudes, and belief systems. In other words, emotional responses influence the meanings attributed to incoming information based on underlying values, attitudes, and beliefs (Beesley & Cooper, 2008). In a similar effort that seeks to maintain a claim for the position of hard systems thinking in KM, Wierzbicki (2007) seeks to combine "the rational, intuitive and emotive heritage of humanity" (p. 631) in the study of knowledge. Emotion must find a place in KM and this chapter proposes regarding it as an aspect of context.

The embodied component of context (i.e., the physiological filters and patterns that individuals use to interact with the world), is the second subjective input into context. Thompson and Walsham (2004) argue that "physiologically embodied processes are…invoked through our interaction with the world, and are already affected by our prior activities" (p. 738). This understanding of individual physiology on context echoes Stacey's (2001) argument that knowledge is communicated through gestures that are the often unconscious reaction of the body to a stimulus. These reactions are informed by past patterns of reaction but unfold uniquely in the immediate context of the interaction in which they occur. For Stacey (2001), knowing occurs through physical responses of the body as much as the mental responses of the mind to gestures. This component is also closely linked to Polanyi's (1967) description of tacit knowledge, with its emphasis on whole body experience and highly personal skillful action. Tsoukas (2003) drew attention to tacit knowledge as described by Polanyi as necessarily involving "the personal judgement of a human agent" (p. 413) as individuals interpret data and experience cognitively and sensorily, such as when reading a map. In other words, tacit knowledge uses both the mind and the body. Therefore,

the accumulated physical experiences of the body form an aspect of context. Clearly, embodied context is subjectively constructed, as each individual has varying experiences and histories of interacting.

The encultured contextual component that Thompson and Walsham (2004) identify at first appears to be an intersubjective component because it involves recurring social processes. They acknowledge that repeated communication between groups of people may result in similar shared behaviours and communicative practices, and thus a shared contextual input may develop. Communities of practice are a well-known example of what appears to be a shared encultured context. However, though communally experienced, each individual has their own unique understanding of organisational, or group, culture at any given time. That is, meaning is based on social processes but is subjective and recreated each time by the individual, hence this is a subjective component. Thompson and Walsham (2004) emphasise that the encultured component is in effect the historical residue of previous knowing events, and thus is individually experienced. In particular, intersubjectively-formed, but subjectively-held, expectations about the likely intentions of others are a powerful contextual ingredient to the process of knowing.

In summary, the embrained, embodied, and encultured components of context are constituted by the individual and their cognitive, emotional, and physical experience of the world and their subjective understanding of social relations. It is important to note that these components are never static. Every new experience potentially alters the subjective contextual components and thus they are constantly being constituted and re-constituted. Because all of these components are both dynamic and unique to individuals, it becomes problematic for organisations to consider managing them as part of the context management that might be the practice of KM. Indeed, critical scholars might argue that the organisational attempt to manage these aspects of context is, in itself, a form of ideological control. In contrast, the organisational components of context discussed in the following section, lend themselves to management processes.

Components of context: Embedded and encoded

The two organisational components of context that Thompson and Walsham (2004) identify are the embedded and encoded components. The embedded contextual component may be thought of in terms of organisational systems, such as formal procedures, roles, rules, and technologies. The encoded contextual component is concerned with "information conveyed by signs and symbols" (Blackler, 1995, p. 1025), typically conflated with knowledge. However, when they focus on encoded material, such as by building knowledge repositories, organisations remove symbols from the overall context through which they derive meaning and value. For example, Blossom (2009) argues that if social media and other technologies are adopted in isolation as embedded components of context then they are unlikely to foster knowing processes. Nevertheless, because of the high visibility of the embedded and encoded aspects of context in organisations, they receive a disproportionate amount of attention in KM. Unfortunately, that attention does not always equate to effective outcomes. Hamel and Breen (2007) note that management's typical focus on breaking tasks into small steps with associated standards and rules works against innovation. For example, rules preventing people from collaborating across departments hamper knowledge processes. Ehin (2009) similarly cites restricted web access that prevents people from downloading helpful resources as an example of ineffective context control.

In effect, the embedded and encoded components of context have become the focus of KM. Many organisations practice a form of KM that is driven by the desire to command knowledge through the control of organisational context. Indeed, it is a common observation that management's difficulty in relinquishing control results in organisations attempting to impose order on essentially disordered processes like knowledge creation. Hasan (2008) is particularly aggravated by what she sees as organisations deterring people from using their imaginations in the "name of security, safety and accountability" (p. 27). She is not alone. Hamel and Breen (2007) express the same sentiment when they note that organisations tend to depress and exhaust people's natural flair and creativity. A source of further frustration for Hasan (2008) is that despite research showing most new knowledge creation takes place in small groups and teams, informal social groups are often not recognised by organisations. Accordingly, those groups don't have the "capacity, authority, responsibility and recognition" (Hasan, 2008, p. 28) to fully contribute to organisational emergence. An aversion to

individual and unauthorised initiative while the organisation as a whole strives for innovation is contradictory. Nevertheless, this chapter contends, it is symptomatic of the tension between organisations attempting to manage their own context while failing to consider individual contextual components.

In other words, organisations tend to focus on controlling the embedded and encoded contextual components but fail to note that individuals' capacity for making connections is affected as much by the subjective components of context as the organisational components. Some KM scholars are beginning to point this out to the KM community. As noted in chapter four, Hasan (2008) calls for "sensible organisations" that re-humanise the workplace and pay attention to the needs of organisational members as human beings, not just employees. She sees the characteristics of sensible organisation including an appreciation of people as parts of systems and networks, the valuing of diversity, a supportive environment provided for teams, and the provision of time and space for reflection (Hasan, 2008). Similarly, Ehin (2009) calls for more personal autonomy for employees. He also promotes the use of shared-access systems, which allow workers to contribute to decision-making processes, as these are attentive to individual contextual components as well as organisational contextual components. Both Ehin and Hasan are pushing for organisations and scholars to recognise the enormous influence of the subjective components of context.

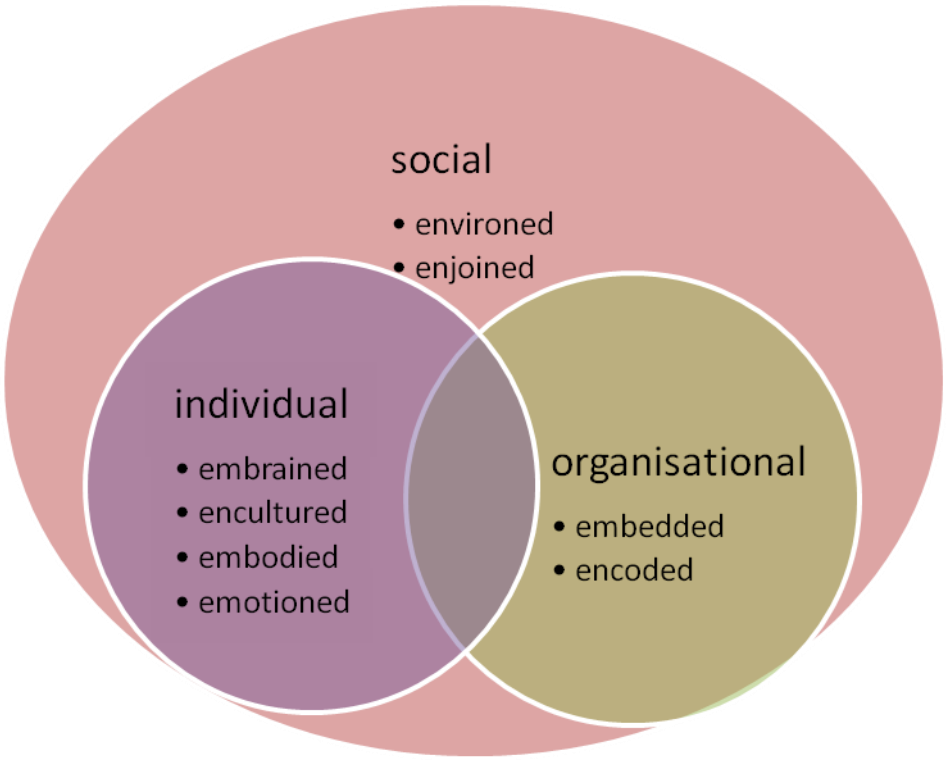
By demoting explicit knowledge (encoded) and organisational tools and processes (embedded) from the focus of KM to just a part of context, Thompson and Walsham's (2004) framework reconfigures KM. I believe this reconfiguration is commensurate with the other emerging ideas in KM that have been explored in this thesis. In particular, their emphasis on context as an emergent phenomenon corresponds with similar understandings of knowledge. As previous chapters have shown, knowledge is being increasingly understood as emergent from dynamic processes of interaction, participation, and connectivity. It is no longer tenable to treat knowledge as stable mental content that individuals or organisations store over time. However, although Thompson and Walsham's framework provides a much more detailed conceptualisation of context than previously available in KM, I believe they do not pay enough attention to the social aspects of context.

Additional social components: Environed and enjoined within, and beyond, the organisation

In addition to Thompson and Walsham's (2004) focus on the dynamic and emergent nature of context, the main contribution they make to KM is to call attention to the relationship between the five components they identify. In proposing a dialectical relationship between those components they hope to encourage organisations to focus less on embedded and encoded context, and to adopt a more holistic and rich-context approach to KM. In contrast to these strengths, the main weakness this chapter identifies in their framework is the narrow focus on organisations. In effect they treat organisational context as a closed system, consisting solely of individual members' subjective elements and organisationally dictated intersubjective elements. Hence the encultured component refers to the individual's enculturation within the organisational culture only. Similarly, the embedded component consists of "explicit organizational components" (Thompson & Walsham, 2004, p. 740).

Yet, organisations and their members are unavoidably situated within wider social contexts – economic, political, religious, and so on. This chapter argues that these wider systems must impact on the components of context, particularly given that individuals within an organisation will experience these social systems differently. Accordingly, I believe Thompson and Walsham's (2004) framework would be strengthened by the incorporation of a social component for context, as included in Figure 10-1. This wider social component brings in necessary aspects of collective experience outside the organisation that may, or may not, be common to organisational members. Even though the social experiences of individual organisational members will vary, all individuals will nevertheless have some social experiences. This is why I have drawn the social circle to incorporate both individual and organisational components. For example, an individual's worldview could be considered a social component of context; individual organisational members will have a way of seeing the world, and though it may not be shared with all organisational members, it is likely shared with other members of society.

Figure 10-1 ***Components of Context***



The social component of context is comprised of the varying aspects of contemporary conditions. Like other aspects of context, contemporary conditions may be regarded as systemic, dynamic, and emergent. I have suggested two contextual components that make up social contextual inputs: environed and enjoined. The environed aspect of context refers to the broad, surrounding contemporary setting in which organisations and their members find themselves. Examples of environed aspects of context that may affect both the organisational, and the individual, context include the adoption of new social values (e.g., sustainability), the availability of new technologies (e.g., social networking), and the breakthroughs in relevant fields (e.g., neuroscience). The enjoined aspect of social context is intended to capture the social connections of both individuals and organisations. For example, the primary organisation is likely to have relationships with other organisations and individuals are likely to be connected to other people external to their organisation. Those connections are likely to

influence the performative prism of context through which each individual engages in knowing.

The introduction of a social component to Thompson and Walsham's (2004) contextual framework helps accommodate the implications of a fluid understanding of context for KM. Organisations can no longer regard themselves as closed systems that are able to control their environments: They are fluid collections of connections that are shaped by their individual members and by the societies in which they are located. If, as Thompson and Walsham (2004) propose, context is the relationship between shared and non-shared inputs at a particular point in time that emerges in action, then the definitive management of context is going to prove just as elusive as the definitive management of knowledge. Just as organisations cannot control how individuals come to know, they cannot control individuals' composition of context. At best, organisations can manage the embedded and encoded aspects of context, and have some influence on the encultured component. However, organisations cannot manage embrained, embodied or the wider social aspects of context.

Furthermore, where the embedded and encoded aspects of context could be said to be enforced by the organisation, the social components (environed and enjoined) may be externally imposed and interact dynamically with the individual components. The embodied aspect, for example, can be understood to be the effect of interaction between the physiological capabilities of an individual and the socially normalised response shaped by past experience. In other words, all the components of context are constructed through a complex interplay between individual agency, organisational management, and enforced social norms. Both knowledge and context are complex, emergent phenomena and so are inherently resistant to management. Yet, organisations must find a way of managing, in the sense of coping with, rather than controlling, these complexities.

A fresh theoretical response for KM

The understanding that context evolves from the complex interaction between individual, organisational, and social components, and that these affect the patterns of interaction and connection that generate knowledge, has implications for KM. Indeed, I argue that it demands a fresh theoretical approach to KM.

Chapter three called attention to the fact that the traditional managerial paradigm is derived from a greater social worldview based on the search for context-free truths. This thesis however has drawn from a range of disciplines to establish that single truths are elusive and no knowledge can be context free. If all knowing is contextual, shaped by a particular combination of inputs, then traditional managerial practices are inadequate. Change in managerial practices, however, needs to accompany change in philosophical approach. A number of KM scholars are coalescing around a pragmatic sensibility as the way forward for KM.

This pragmatic sensibility sees ideas and actions as connected and understands all experiences as learning experiences. It rejects the notion of a single truth, and, accordingly, promotes action in the face of uncertainty. Further, as Zhu (2007) so aptly puts it, a pragmatic sensibility shows "an eagerness to capitalize on the unanticipated and unexpected, a conviction that validity of knowledge depends on the consequences of acting upon it, [and] an enjoyment in conversation with situated agents about possibilities for change" (p. 453). For pragmatics, it is temporal conversations within a community that guide action and determine participative consensus rather than any higher appeals to scientific truth or reason. Accordingly, this approach fits well with the fluid conceptualisation of both knowledge and context that contemporary conditions require.

Furthermore, for the pragmatist, knowledge is grounded in action. The acceptance of knowledge as temporary and provisional does not preclude action. Instead, individuals and communities must make the best decisions they can to achieve the outcomes they desire with that incomplete, potentially even incorrect, knowledge. The future is always uncertain, so "rather than looking for an ahistorical 'final context'" they "begin with a 'contingent starting point' and rely on a 'temporary resting place' constructed by communities for guidance of immediate action" (Zhu, 2007, p. 461). That the starting point and resting place may change as knowledge shifts is both inevitable and embraced.

A number of KM scholars have begun to look to pragmatics as a theoretical and philosophical frame for KM. David Gurteen, a leading and high-profile practitioner, recently argued that KM "would do better not to focus on idealistic solutions but to focus on the small, pragmatic things that we could do on a day-to-day basis to move ourselves forward" (2009, para. 4). Others also encourage a

pragmatic approach, arguing that knowledge often emerges through voluntary collaboration when people are confronted with a problem or an opportunity. Ehin (2009) contends that "where conventional approaches consistently fail to bring success, more pragmatic approaches need to be found and applied" (para. 44). Hasan (2008) sees KM's role as encouraging and developing an organisation's capacity to sensibly organise, and practitioners, she argues, "need pragmatic common sense" (p. 26). Their comments parallel Saarinen's (2008) concept of philosophy for managers which he sees as a challenge to traditional paradigms in favour of "situational contextualism" (p. 15), or "philosophy that works" (p. 15). Saarinen (2008) argues that managers need to concern themselves "with the situational, with the everydayish" (p. 15) and with thoughts and emotions, as they seek to improve and inspire while acting responsibility and with awareness of processes.

While it makes sense to argue for a pragmatic approach that accepts the fluid, emergent nature of both knowledge and context, such an approach does seem at odds with the notion of "knowledge management." What might KM look like given the acknowledgement that most aspects of context and knowing are unmanageable? The following section explores some developments in the practice of KM that indicate how organisations might effectively approach KM given these conditions.

A fresh practical agenda for KM

One of the significant contemporary conditions that has influenced KM in recent years has been the rapid rate of change in communication technologies. In KM's early days, McDermott (1999) cautioned that IT might inspire KM, but that it would be incapable of delivering it if it treated "cultural issues" (p. 104) as secondary. Though providing many opportunities for KM, communication technologies have also been a source of frustration for the field as it has developed. Hasan (2008) argues that modern organisations are a confusion of traditional structures and networks, and old and new information technologies, which are difficult to effectively combine. This is an observation that Idemea (2003) has also made, in relation to ongoing tensions between post-bureaucratic aspirations and traditional work practices. The muddle of approaches supports

Thompson and Walsham's (2004) claims that organisations fail to account for aspects of context in relation to one another. This point is illustrated when considering how cumbersome information technology systems and procedures hamper the adoption of modern, community-creating web-based applications, and force users to behave in particular ways – an aspect of embedded context. The entrenched mental models of how things should be done in a typical command-and-control management style, which are themselves an encultured component of context, make it difficult for new paradigms to be adopted.

Technology has played a dominant role in KM since its inception, but the rapid development and ubiquity of social media have placed a new focus on the fusion on the role of technology (organisational context), the participation of individuals (individual context), and common connective practice (social context). Gurteen (2007) calls this movement "social KM" (para. 1). This movement represents a significant shift in KM described by leading practitioners as a change in emphasis from "collection" to "connection" (Dysart, 2008, p. 32; Asthana, 2009, para. 2). To a large extent social KM is driven by social media, defined as "any highly scalable and accessible communications technology or technique that enables any individual to influence groups of other individuals easily" (Blossom, 2009, p. 28). As Ehin (2009) argues, knowledge cannot be "managed out" of people: It can only "be allowed to emerge within co-evolving and mutually beneficial relationships" (para. 11-12). This thesis concludes that fostering these relationships, with the help of social media, is part of the essence of social KM.

Social KM is useful as a term because, while it incorporates the use of social media tools (like wikis, blogs and tagging), it also acknowledges the variety of contextual inputs that influence the processes of interaction that generate knowledge. Blossom (2009) argues that the embedded contextual component of technology matters, but that people matter more. In fact, they will actively choose to be influenced by or influence others through their use of social media. Social media blur the lines between home and work, individual and organisation, and user and producer. This chapter argues that the effective adoption of social media in organisations to enhance knowledge interaction depends on the performative prism through which individual organisational members interact with social media. Organisations can manage the embedded and embrained inputs by providing the technology and guidelines for its use. They can influence the

encultured aspect by encouraging community practices. However, they cannot manage how individual organisational members might feel about social media, nor how their use of social media in their personal lives might affect their expectations of its use in the workplace.

The success stories around the adoption of social media into KM programmes in organisations seem to come from those where managers have considered context as part of their initiative. They have responded to the increasing popularity of participatory web technology in wider life and recognised that their members are already familiar with these tools. They have then provided them in the workplace in the spirit that they were intended to be used. For example, outside of the workplace, an individual can control their social media communication (e.g., by deciding who they allow to contact them on Twitter or LinkedIn). They can also decide who sees what they produce by choosing where they publish their content. Further, individuals can subscribe to content they want, and choose where it is delivered to (email or mobile phone, for example) and in what format, saving time that used to be spent searching for information. Social media are meant to make it easier to collaborate. Accordingly, well-designed and well-used organisational social media eliminate gatekeepers (both human and technological) from organisations. Thus they allow members to freely contribute and to freely access information and look to achieve the right balance between freedom and interdependence (Blossom, 2009).

Examples from a number of organisations illustrate these principles. Cisco, the global supplier of computer network technologies for businesses, uses "Ciscopedia" – a wiki that is used to record common terms and methods used throughout the organisation (Blossom, 2009). They also use I-Zone, another wiki, to collect and build new ideas for products from staff. "Everything at Cisco is set up to encourage collaboration and openness," according to NZ manager Geoff Lawrie (cited in Sykes & Springall, 2009, p. 2). Electronic retailer Best Buy established an employee-only website (BlueShirtNation.com) that enabled its sales people (who are engaged with customers in their stores, so must access it after hours) to share tips, exchange experiences, and apply for funding to try out new ideas. Those staff members who participate in the website have proven more likely to stay with the company (Blossom, 2009). These organisations have adopted social media for organisational purposes, but have accepted that people's

participation is voluntary. The organisations are managing the embedded and encoded aspects of context, but allowing the use of social media to emerge from the interaction between individual, organisational and social components of context.

Cadbury UK has also developed its KM programme around developing a rich context for member interaction. For example, they found that "internal competition between individuals and teams represents a significant obstacle to productive conversation" (Goodman, 2009, "the conversation," para. 1). Cadbury found that recognising people's emotional needs by appreciating and rewarding collaboration and acknowledging people who contribute good ideas helped overcome this issue. They also began holding separate meetings for general discussion and decision making, and found that this offered a useful way to promote open conversation. After feedback from staff indicated open plan offices were a mixed blessing, the company is also actively looking at ways it can encourage collaboration while at the same time allowing people spaces to work without distraction. Cadbury UK's KM programme uses communities of practice within the organisation but also Open Innovation Teams that focus on collaborating with people outside Cadbury through websites that seek input on developing recipes, processes and products (Goodman, 2009). In other words, Cadbury UK is managing the embedded and encoded aspects of context, but in a way that accepts knowledge as emergent and acknowledges that how its members think, feel, and act is important.

An alternative practice of social KM can be found in Gurteen's "knowledge cafés." These gatherings of people interested in KM are based on cooperative communication. They are structured loosely, meant to be fun, intended to foster voluntary participation, and are aimed at establishing networks and encouraging the unexpected. Attendees listen to a brief presentation, discuss topics and questions in small groups, then reconvene as a larger group. There is no intended outcome – rather the focus is on the process of building productive relationships and promoting empathy and understanding (Goodman, 2009). Gurteen models knowledge cafés so that participants can then return to their organisations and implement them there, where they can help to avoid misunderstanding, create synergy, develop relationships, and build a more pleasant workplace. As well as running knowledge cafes internally, organisations are increasingly seeing the

benefit of holding open knowledge cafés, where they invite external participation (Goodman, 2009). For example, a recent open knowledge café at Cadbury in the UK brought together KM experts, scientists, engineers, civil servants, educators, and charity workers – all drawn by their interest in KM, their use of social media (which were used to advertise the café), and the promise of free chocolate (Goodman, 2009). In effect, the knowledge cafés are providing dynamic, context-rich environments for knowing processes, and these are permitted to emerge and self-evolve in contrast to being managed and controlled.

Another example of KM practice that provides a context-rich environment is the technique of Open Space Events. Pioneered by Harrison Owen in the 1980s, open space events are self-organising sessions, typically with large numbers of participants, meant to address a central theme of strategic importance (Leith, 2009). They run under four principles and one law, stated at the outset, but are otherwise ungoverned (Owen, 2009; Leith, 2009). They are often used for new product development, knowledge sharing, and bringing organisations and communities together. Also known as "unconferences," open space events have no invited speakers, no leaders, and have no preset agenda, though they do begin with a facilitator providing a framework. Written reports with action points are produced in the process of an open space event so participants have something to take home. Typically the larger events are followed up by small project teams who implement the actions decided upon (Leith, 2009). The organisation running them provides a loosely structured embedded and encoded context, but allows the individual and social aspects of context to emerge in the process of interaction.

Participation, for example, is voluntary. Individuals make a commitment to attend because they feel passionate about the topic. Consequently, during the event, they tend to be actively engaged – both emotionally and cognitively – as listeners and contributors. Furthermore, the "law of two feet" tells participants to use their two feet and move on when they find themselves in situations where they "are neither learning nor contributing" (Owen, 2009, para. 12) or where they feel miserable. This simple rule is effective because it is underpinned by the belief that happy people are productive people. In addition, it makes the individual responsible for their own learning and participation – there is no committee, no facilitator, or no speaker that a participant can blame for a boring experience. Owen (2009) has also observed that it allows participants to intensely engage until they reach

saturation point, when they walk away to cool off, before re-engaging. He thinks the "common concern to achieve resolution keeps people together" (para. 15) while the law allows them to separate when open conflict threatens. The law also gives people permission to behave as they would like to without the usual guilt (Owen, 2009) – rather than mentally checking out but feeling compelled through politeness norms to physically remain, people are given the right to get up and leave when they have had enough. The voluntary participation and the law of two feet are both organisationally managed components of context, but they are relationally connected with individual contextual components, concerning people's minds, feelings, bodies, and routines of behaviour.

The management of the organisational contextual aspects of open space events also affects the social contextual aspects. Owen (2009) argues that open space events are most appropriate when issues with high levels of complexity and potential conflict need to be solved, and diverse groups of people need to collaborate to solve them. That is, the events are based on a pragmatic sensibility, addressing real-world problems in the present. In addition, abandoning the command-and-control paradigm typical of large meetings allows participants to truly self-organise. They can connect with new people, foster effective working relationships, and become part of a large community as well as small work teams. Owen (2009) sees a direct correlation between the success of these self-organising events and the conditions governing complex adaptive systems. These conditions mirror some of the essential pre-conditions for self-organising systems in biology (see Kaufmann, 1995), such as high levels of diversity and complexity, inner drive towards improvement, living at the edge of chaos and sparsity of connections (in the sense that connections are not established in advance).

Owen (2009) argues that open space events demonstrate that traditional managerial control is not only unavailable, but also unnecessary. I posit that the success of open space events lies with both the acceptance of self-organisation and the provision of a context-rich environment. Perhaps just as important though is that open space events address the various components of context. Individuals choose to participate and are in control of that participation. This is because they are able to walk away (embodied) when not cognitively engaged, or when emotionally discontent (embrained). They can also move from group to group, choosing who they interact with and how (encultured). The four principles, the

law, and the loose framework provide embedded contextual components and the take-home copies of the outcomes the encoded components. Pragmatically, the opportunity to be addressing a complex problem as a large group that is allowed to self-organise fulfils the social components of context. Because all these dynamic contextual elements are allowed to emerge, the connections people make, and the interactions they have, are more likely to result in knowledge generation.

The future of KM

In 1997, Quintas, Lefrere, and Jones, defined KM as "the process of continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities" (p. 387). A decade later, KM has shifted away from acquisition and exploitation of knowledge by organisations to the encouragement of individual knowing processes. In chapter two, I commented on the positive attributes of Snowden's (2009) latest explanation of KM and it is worth re-examining it here:

> The purpose of knowledge management is to provide support for improved decision making and innovation throughout the organization. This is achieved through the effective management of human intuition and experience augmented by the provision of information, processes and technology together with training and mentoring programmes. (para. 4)

Certainly, Snowden's definition recognises the relationship between individual contextual components, like intuition and experience, and organisational contextual components, like the provision of systems and technology that support knowledge processes. However, in claiming KM provides support for the essentially pragmatic goals of better decision making and innovation via "effective management" of individual and organisational contextual inputs, Snowden weakens his offering. It seems to me that the current trends in KM explored in this thesis suggest that KM is less about the management of knowledge and more about the provision of relationally-rich contexts that allow knowing processes of interaction to occur.

Recently, Heisig (2009) argued that the "holistic nature of KM requires additional consideration of a variety of context factors" (p. 7) and argued that the task of KM is "to work toward the management of the organisational context" (p. 14) so that

core KM activities are enabled. This thesis sees Thompson and Walsham's (2004) in-depth analysis of the components of context, and their positioning of it as a dynamic relationship between these components rightly challenging the notion of organisations being able to manage context, let alone knowledge. The addition of social components of context that this chapter has proposed makes this possibility even more unlikely.

However, that is not to say that organisations have no control over context. As Ehin (2009) notes, organisational context is to some extent manageable, or at least adjustable. Saarinen (2008) takes a similar view when considering the role of managers in organisations. He argues that, from managers, context-creativity is more important than content-delivery, and stresses that for managers to deliver on the creation of context they must regard their emotions as allies rather than distractions. In other words, even if organisations cannot control how individuals develop context through their performative prism, they can provide a supportive environment for the emergence of knowledge by attending to multiple aspects of context. They can manage the embedded and encoded aspects of context, but must also attend to the needs of individuals and consider the wider social environment, and, most importantly, how those aspects all relate to one another.

This thesis argues that the future of KM will likely be characterised by organisations' ability to provide fluid, adaptable, and agile structures and processes that can incorporate diversity and creativity. In other words, organisations will manage embedded and encoded aspects of context in relation to individual and social aspects. This can be accomplished through the adoption of appropriate technologies, including social media, but also via the fostering of a culture that makes work fun and supports informal as well as formal interaction. In this way, organisations will encourage the connections, participation, and collaboration that engender knowing. However, organisations also need to accept the complexity of their environment and that environment's emergent nature, and, accordingly, not attempt to impose traditional structures to establish order.

The same processes apply to the field of KM, which has been the focus of much of this thesis. New knowledge will be best generated in KM when members of that community attend to the individual, organisational, and social components of

context. The thesis concludes by restating the following as key recommendations for re-energising KM and for making it relevant to contemporary conditions:

- responding to dynamic social movements;
- reflecting on the worldview driving KM research;
- acknowledging the shaping influence of language in KM;
- accepting plurality and paradox;
- embracing fresh understandings of communication;
- using transdisciplinarity to enrich the KM context;
- engaging with scholars beyond traditional disciplinary boundaries;
- conceptualising KM as a boundary object to foster paradigm change; and
- attending to one's intelligent participation in KM conversations.

Conclusion

Final remarks

The major original contribution of this thesis is its recursive illustration of the more reflective future it espouses for KM. In effect, the thesis encapsulates triple-loop learning or "the notion of continual reflection on the learning process, the contexts within which learning occurs, and the assumptions and values motivating the learning and influencing its outcomes" (Yuthas, Dillard, & Rogers, 2004, p. 239). Based on the work of Argyris and Schön (1974), triple-loop learning moves beyond following the rules (single-loop learning) and changing the rules (double-loop learning) to learning about learning. In other words, this thesis does not simply ask if KM is doing things right or doing the right things, but asks KM scholars and practitioners to reflect on the how they decide what is right for KM and the values and perceptions behind that drive those decisions. The purpose of triple-loop learning is to take a holistic look at the context that has created patterns that drive, in this case, the field and thus provide the opportunity for transformation (http://beta.ctcdata.org/wiki/index.php/Triple_Loop_Learning) and that has been my aim for this thesis.

Because I believe in the possibility of transformation, this thesis presents a hopeful and distinct vision for the future of KM. Taking the ambiguous status of the field as a starting point, I have argued that KM remains essential to organisations and should, therefore, have a dynamic and meaningful future. The strength of the vision I propose comes from its holistic approach, which dissolves the false boundaries and divisions that have evolved to stymie the development of KM. Though by no means suggesting that this is the only possible future for KM, I have made a strong case for a number of ways KM might enrich its contribution to organisations. An important part of that case has been the questioning of the traditional management paradigm that underpins KM. In particular, I challenge entrenched assumptions about the nature of knowledge, and the continued application of theoretical lenses that ensure the dominance of this outlook. I argue that KM cannot flourish with the command-and-control understanding of organisations that currently dominates the field, so offer alternative, more up-to-date perspectives that better suit the contemporary conditions that KM must adapt

to. These fresh theoretical perspectives are augmented by specific directions that KM might take to enhance its contribution to organisations.

Unintentionally, this thesis ended up both adopting the theoretical perspectives proffered and following the suggestions made for the reinvigoration of the field. In effect, the process of writing this thesis reflects the process of reinvigoration for KM. To explain, this thesis determined that knowing about knowing, such as by understanding how knowledge is socially constructed and determined by the nature of our brains, helps individuals become more reflective knowledge workers. In my own experience, studying the continuing evolution of KM as an academic topic has definitely made me more aware of the meta-processes of knowledge construction in academia. In addition, reading literatures from diverse disciplines new to me and from ontologically different viewpoints has broadened my horizons. I have expanded my own worldview and developed a better understanding of my own and others' positions – and the fluidity and fragility of those. Networking with scholars from other disciplines has also meant I am now more exposed, connected, and receptive to new ideas. Theories like CRP and connectivity regard this openness to diversity and change as essential to the generation of knowledge, and thus crucial to KM.

Similarly, increasing numbers of scholars are allocating communication, abandoning old theories for fresh perspectives, a central place in KM. Exploring knowledge and communication has certainly enriched my understanding of the relationship between them, and, I believe, positively affected my own knowing and communicative practices. Keeping in mind contemporary conditions and correspondingly looking for emerging trends has led to me being more responsive to changes in society and the field. KM scholars at the fringes of the field are arguing for, and providing, swift and progressive responses from KM to social change. Together, the ideas I have advocated for KM as a whole, and have myself experienced in the production of this thesis, have helped me individually to more intelligently participate in the world as a knowledge worker. Accordingly, I can say with conviction that embracing these perspectives, skills, and experiences will enrich the knowing process for KM as a field, for individual scholars, and for organisational members.

I introduced the term "intelligent participation" to encompass the range of perspectives, skills, and experiences that this thesis advocates. An understanding of meta-processes and worldview, a willingness to engage with diverse perspectives, a fostering of communicative skills, a responsiveness to complexity and change in society, and a balancing of individual and systemic needs, characterise intelligent participation. If organisations can foster contexts where their members have the ability to reflect on and change their ways of being to generate new knowledge, I believe KM will be essential to organisations for a long time to come. I have taken the position that if KM is to be reinvigorated for the future it needs not only to challenge tired notions of knowledge, but also tired assumptions of management. Revisiting each chapter of the thesis provides a useful recap of its central themes, main arguments, and original contributions.

Summary

The vision I offer for a flourishing future for KM is built through successive chapters that articulate a number of themes. Chapters one and two at one level serve as a literature review, summarising the evolution and current state of KM. At another level, they illustrate how communicative acts work to establish socially constructed knowledge as an unquestionable reality. In particular, the first chapter examined the origins of KM, noting the influence of academic traditions and social transformations on its development. Whereas others who have traced the history of KM have primarily sought to account for the focus on knowledge as an organisational resource, in a unique contribution, I focused on how those very accounts themselves shape a narrative for KM. This narrative, I argue, is motivated by the general requirements of academic communicative traditions and specifically driven by academic scholars interested in KM seeking to establish the field as a discipline. However, the range of disciplines publishing under the KM umbrella is paradoxically both a help and a hindrance to the cementing of KM as a topic worthy of ongoing academic and organisational attention. On the one hand, the diverse range of offerings assists to establish KM as a pervasive concern for organisations and thus scholars. On the other hand, this same diverse range of offerings tends to fragment the field by contributing to a lack of coherence, unity, and overlap.

This paradox became the focus of chapter two, where I investigated how KM scholars have wrestled with the consequences of KM's being both a young and multidisciplinary topic. Tracing the communicative strategies that KM scholars use to justify interest in KM, this chapter showed how the construction of knowledge as crucial to organisations' bottom lines has been a major influence on the legitimisation of KM. Together with the naturalisation of a history for KM, the acceptance of knowledge as an economic resource has ensured a continuing interest in KM. This interest remains in spite of a number of conflicts which have come to characterise the field: arguments over what knowledge is, what ontology and epistemology should be at the basis of KM, and what KM itself actually involves.

Continuing with a meta-level approach to the field, I argue that these conflicts serve contradictory purposes. In one sense, academic argument about definitions, ontology, epistemology and praxis justify continued interest in KM as a topic – if there were no arguments then the field would stagnate even further. In addition, such arguments seem inevitable given the multidisciplinary contributions to KM. However, in another sense, the conflicts have clearly polarised the field, influencing scholars to adopt a dualistic either/or approach to opposing ideas. Importantly, though, as these first two chapters illustrated, the "natural" history of KM and therefore the existence of these dichotomies are largely constructions of the communicative activities of KM scholars. Drawing attention to the socially constructed nature of the field of KM is an important and original contribution of this thesis. Though numerous scholars attest to the socially constructed nature of knowledge itself, few take a meta-perspective of KM as an academic field and explore how the development of KM in organisations is strongly influenced by the communicative strategies of the academics who advocate its importance and research its impact. Highlighting how knowledge about KM is contingent, and exposing it as a fragile construct that is thus capable of revision, is crucial if KM is to adapt to changing contexts.

Changing contexts became the focus of chapter three. This chapter showed the opportunity to reconfigure and revitalise KM exists now by examining the contemporary conditions that are influencing organisations. In particular, this chapter highlighted developments in information and communication technologies and neuroscience, shifts in social values influenced by environmental and

financial crises, and changes in the understanding of management as encouraging a new direction for KM. This chapter established that reinvigorating KM necessarily involves more than myopically concentrating on issues specific to the field. Rather, the direction I advocate for KM requires taking into account wider contemporary conditions and broad social trends. KM will more likely succeed in organisations if it is shaped by and relevant to society as a whole. Furthermore, chapter three contended that the reinvigoration of KM must include a reinvigoration of management. Though KM as a field has spent much time debating the concept of knowledge, the fundamental assumptions that underpin the notion of management are less often examined in the context of KM. Given the current global economic climate, however, common management practice is being scrutinised more closely than ever, creating a context potentially receptive to change. This climate presents an opportunity that should be fruitfully exploited by KM.

While chapter three drew attention to the shifts in the understanding and practice of management occurring in society at large, chapter four concentrated on the relationship between knowledge and management more specifically in the KM context. This exploration found that, currently, KM remains firmly entrenched in a mechanistic managerial outlook. Constrained by its own language, KM embodies the values and reflects the perspective of a command and control management style. Unpacking the term "knowledge management" revealed both the assumptions of that managerial outlook and the opportunities for stepping outside that paradigm. Chapter four then advocated challenging the dominant managerial perspective to realise the potential of KM, including by shaping the KM discourse to better reflect contemporary managerial values and directions. In suggesting this path, I advocated a new attention to the language of KM, so that KM scholars work to both reflect contemporary conditions and drive change through their discourse rather than allow traditional paradigms to dictate future directions for KM.

The analysis of the metaphors of KM in chapter five provided a specific way in which KM scholars, and practitioners, might attend to the assumptions embedded in the field by attending to the language they use to describe knowledge. Presenting a detailed examination of metaphors for knowledge in KM, this chapter also makes an original contribution to the field by importing the

theoretical frameworks of Cornelissen and Kafouros from Organization Studies to analyse the likely success of adoption of new metaphors. This chapter equips those interested in KM with a tool to assist them to make vocabulary decisions that affect the shaping of KM as a field and thus contributes significantly to KM methods and literature.

Subsequent chapters develop around the framework of the points of fracture identified in chapter two as fragmenting KM. Chapter six returned to the issue of disagreement over what knowledge is. Arguing that KM scholars' attempts to define knowledge, whether dichotomous or dialectical in approach, tend to search for a single, all-encompassing definition, this chapter advocated the acceptance of multiple and complex definitions for knowledge in KM. It called for the abandonment of the pursuit of a single definition in favour of context-specific definitions. Further, it advocated according prominence to rich communication theories as a means by which KM as a field might cope with complex and sometimes contradictory definitions of knowledge. In particular, this chapter contended that Complex Responsive Process (CRP) theory addresses communication and knowledge for organisations in a way that allows for the existence of paradox and plurality, while simultaneously rejecting the assumptions of a managerial paradigm.

Chapter seven called attention to a significant but neglected aspect of knowledge – ignorance. In a significant contribution to KM, this chapter brings together a range of literature from multiple disciplines, and presents a taxonomy of ignorance that shows the complexity of the topic and its relationship to knowledge. This chapter captured how approaching the world through a dialectical lens alerts us to the rich and mutually-forming aspects of experience, helping us to attend to absence as well as presence, and the instability of taken-for-granted constructs such as knowledge. I identified the language of ignorance and the ongoing dominance of the managerial paradigm, in particular its goal to remove ambiguity and uncertainty, as contributing to the marginalisation of a topic of consequence to KM. As a final point, chapter seven illustrated how KM might directly address, acknowledge, and understand ignorance, particularly in light of the contemporary conditions identified in chapter three shaping KM's future.

Addressing the second point of conflict in KM identified in chapter two – division along paradigmatic lines – chapter eight paradoxically both added to the plurality of definitions in KM and offered a way to integrate those definitions. To do so it drew on theories of knowledge from disciplines outside of management. The chapter thus offers KM fresh perspectives on knowledge from scholars unconstrained by the specific demands of managerial discourse, imports ideas that reflect contemporary conditions from other fields, and shows the fragility and artificiality of KM's "technical" and "social" paradigms. In particular, this chapter explored understandings of knowledge commensurate with viewing it as a dynamic communicative process. These perspectives included Downes' notion of knowledge as connectivity, Hämäläinen and Saarinen's idea of Systems Intelligence, and Fogel and Garvey's concept of "alive communication." The common themes of communication, emergence, ethics, complexity, and self-organisation that drive these theories are directly relevant to KM and could be harnessed to contribute to the revitalisation of KM for contemporary conditions.

Rather than just importing ideas from other disciplines, however, and potentially ending up subsuming them into the dominant management paradigm of KM, and thus watering them down, in chapter eight I posited transdisciplinarity as a productive way forward. Accordingly, the chapter also proposed that reconceptualising KM as a boundary object that lies between disciplines, rather than a discipline in itself, might work towards better integrating the perspectives of diverse KM scholars. As a field of interest to many disciplines, I argued, KM provides a chance to blur disciplinary boundaries in pursuit of innovative research that is responsive to the rapidly changing social context.

Chapter nine explored in some conceptual depth how transdisciplinarity might offer a future for KM that potentially heals some of the paradigmatic rifts that currently plague the field. In doing so, it integrated the main arguments and contributions of this thesis by considering the particular communicative challenges that transdisciplinary teams face. In presenting the original concept of "intelligent participation", this chapter highlighted the importance of the following themes of this thesis:

- The need for attentiveness to the implicit assumptions of the managerial worldview, and the subsequent ability to flourish in an environment of complex emergence;

- The benefits of connecting in diversity, with its accompanying difficulties in merging of perspectives;
- The fruitfulness of a rich understanding of communication and the capacity to employ a range of communicative skills.

I drew these themes together and demonstrated that individual communicative capacities are crucial to the generation and communication of knowledge, by applying them to the communication of knowledge in transdisciplinary teams. Accordingly, this chapter was able to conclude that transdisciplinary team members would do well to value both themselves and others in each local interaction, while at the same time understanding their location in a dynamic, systemic context. Intelligent participation thus emerges as a framework through which members of such teams can engage productively in communicating knowledge, uniting the main themes of this thesis in practical guidelines for organisational participation in KM.

The third and final point of conflict identified in chapter two – the division over what KM itself exactly is and where it should be going – was tackled in chapter ten. This chapter fostered an appreciation of the complexity of context as a newly emergent trend in KM that this thesis identifies as critical for shaping KM into the future. Issues of context in KM include the contemporary challenge to the managerial paradigm, the multidisciplinarity of KM as a field, and the adoption of a complex, communicative approach to knowledge. Furthermore, these issues are both theoretical and practical for the field. Chapter ten examined these new trends using Thompson and Walsham's contextual framework, concluding that a possible future lies in seeing KM as being about the management of individual, organisational, and social contexts that allow knowing processes to thrive.

Limitations and future research

In many ways, my own journey in writing this thesis, as well as the thesis itself, reflects the path I envisage for KM. A doctoral thesis comes with academic expectations – of style, of content, of form. It should be scientific; it should be based on evidence; it should be an original contribution to an established body of work. In other words, the traditional expectations of academia share much in common with the traditional expectations of management, as both have been built

on the same worldview. Knowledge is understood as rational, capturable, and reflective of a pre-existing reality. Yet, a doctoral thesis also provides the opportunity to undermine these assumptions. Increasingly, academia is understanding and acknowledging the subjective nature of writing and researching, allowing the once frowned-upon authorial subject to emerge. Further, while a doctoral thesis is the neatly-packaged product of a long and inherently messy process of coming to know things, the value is recognised as being in the process of the study – not necessarily the final product. A thesis also provides scope for individuals to challenge long-held beliefs about a subject area, even as they conform to the requirements of how that challenge should be presented. Accordingly, a thesis embodies the tensions between product and process, individual and institution, established traditional and contemporary responsiveness that exist in KM.

As noted above, the process of writing this thesis ended up mirroring, and no doubt also driving, the methods for creating knowledge it advocates for revitalising KM. In parallel, this thesis also ended up challenging some of the expectations of a doctoral thesis in Waikato Management School, even as it conformed to others. Where the majority of theses are built around fieldwork and the collection of data, the structure and content of this thesis reflects a conceptual study that has developed a sustained argument throughout.

Critics of this non-traditional approach might argue that the thesis lacks empirical data to support its claims. It does. However, I believe the strength of this thesis lies not in proving its claims, but in drawing together work from a wide range of disciplines to form a cohesive argument regarding possible future directions for KM and thereby introducing fresh ideas to the field. Furthermore, by avoiding the kind of positivist research that the academy more typically sanctions as knowledge, this thesis embodies its own premise that certain kinds of scientific knowledge are not the only types of knowledge that contribute to society. Besides, there is substantial scope for future empirical research to substantiate the ideas explored within this document at a later date. For example, this thesis invites research that goes into organisations to investigate metaphors of knowledge, how ignorance is constructed, and the use of boundary objects in cross-functional teams, to name just a few. Thus this thesis sets the scene for a rich future body of work.

Unfortunately, a natural limitation of relying on other literature to form the basis of my argument lies in the impossibility of incorporating all the relevant KM and non-KM material. As Nie, Ma, and Nakamori (2009) note, "getting an overview" of an emerging research field is problematic because any such field is likely to be broad, and because "practically it is infeasible" for researchers "to read all those papers and then summarize them" (p. 630). Accordingly, I acknowledge that my exploration of the KM literature is not all-inclusive, but I believe it is comprehensive and I believe I have incorporated a representative range of KM studies. From other disciplines, I have deliberately focused on studies I came across that had resonance for me in relation to KM. I defend this process by arguing that the process of knowledge generation inevitably involves the subjective selection and filtering of information. I contend that the presentation of novel ideas and interpretations outweighs the need for an exhaustive, multi-discipline literature review. The lack of a single theoretical lens applied throughout might also invite criticism, but I opted for a non-traditional approach here, too. Instead, the majority of the thesis is informed by the complex responsive process approach to communication, explicitly dealt with in several chapters. In addition, I have introduced and applied other existing theoretical lenses in new ways to KM.

Furthermore, this study is a little different from the norm in that it has focused on the meta-level of KM as a discipline rather than the specifics of KM in organisations. I believe this meta-level focus is valid for two reasons. First, and primarily, the process of developing a discipline is a process of knowledge generation. Scholars working independently and collectively around a new topic, gesturing and responding to one another, mirrors the process of knowledge creation in an organisational setting. Thus insights taken from studying the generation of knowledge in KM may be applied to organisations. Second, I believe there is scope to call for academics to be more reflective of their own knowledge construction processes and assumptions, particularly given that the knowledge that they generate is likely adopted by and thus influential on the processes of KM in organisations. If scholars attend to the metaphors they use, or if scholars respond more quickly to contemporary conditions, for example, then organisations might do the same.

Closing

Despite the naysayers' predictions, KM is neither dead nor nonsense. It would be over-reaching, however, to describe it as a healthy and flourishing discipline. At the moment, KM drifts somewhere in between these two extremes, of continuing interest to many scholars and organisations, and yet not consistently delivering on its promise. A central aim of this thesis has been to explore how KM's continuing popularity and increasing longevity exist paradoxically with its somewhat fragmented state and dubious record of success. The polarities that typify KM, and exist at both the meta-level of KM scholarship and the practical level of KM implementation, are, I have argued, impeding the progress and potential of the field. Notwithstanding KM's ambivalent status, however, this thesis has argued strongly for the continued relevance of KM as a field of study.

KM's relevance, though, depends on the field's capacity for reinvention in response to contemporary conditions. Drawing on emerging social trends, innovative work in KM, and fresh ideas from other disciplines, I proposed that revitalisation could occur through several means. First, I argue for scholars and practitioners to attend to the constructive powers of the language of KM. By doing this, they may become more aware of the power of language over their own knowledge practices and uncover the assumptions embedded in the current language of KM. Furthermore, adjustment of the language of KM is an important step in extricating KM from the traditional managerial paradigm and its attendant assumptions and worldview. This will provide the opportunity for scholars and practitioners to see knowledge in organisations in fresh ways.

Second, I promote the field's ability to live with complex understandings of knowledge and encourage the adoption of theoretical lenses that facilitate this. In particular, I draw heavily on CRP throughout the thesis, believing it a comprehensive and useful lens through which to explore the crucial dynamic relationship between knowledge and communication. This theory helps reinvigorate KM by offering a fresh understanding of knowing as a self-organising, emergent process that occurs in interaction. Further, CRP is aligned with recent developments in neuroscience and developing theories in other fields and is thus up-to-date. Adopting such a theoretical lens will likely lead scholars and practitioners to develop and foster innovative and appropriate approaches to knowledge in organisations.

The third means of revitalising KM that I offer is the implementation of transdisciplinary approaches to the study of KM. This thesis demonstrates that knowledge is not the providence of management alone, and, in fact, much exciting and groundbreaking work around knowledge is occurring in other disciplines, some directly related to the knowing process in organisations. For KM to remain relevant, it needs to not only be aware of this work, but to engage with it. Transdisciplinarity provides a challenging but potentially productive means of doing that. While identifying a number of advantages to transdisciplinarity, I also note its difficulties. However, I propose that reconceptualising KM as a boundary object for the purposes of transdisciplinary study might overcome some of the difficulties inherent in this type of research. If KM can be forged, at least in part, through transdisciplinary study, I believe it will offer more holistic and wide-ranging approaches to knowledge than it currently does.

Finally, I argue that KM, to remain relevant and vital, needs to be responsive to the contextual vagaries of the knowing process. That is, KM needs to be adaptable enough to take into account the broad social context, specific organisational contexts, and the dynamic contexts that individuals find themselves in. One way to achieve contextual responsiveness is for the field to attend to emergent social trends and developments. In addition, paying attention to non-traditional sources may help the KM community to be more flexible toward and accommodating of emerging ideas, and thus make revolutionary rather than evolutionary changes, instead of relying solely on the still-valuable but slowly-developing traditional academic sources. When the KM community recognises the communicatively constructed nature (context) of its own divisions and thus assumes a fresh perspective of the field, members may engage in exciting new ways with what it means to know and what it means to manage knowledge.

Though there is some chance that my newly published articles and thesis represent just another number to add to the KM statistics on ABI/INFORM included in chapter one, I hope that my understanding of KM and how it may be shaped by and responsive to a dynamic and continually-emergent future will resonate with others. KM has already proven itself as a topic worthy of academic and organisational attention. It now needs to actively avoid being watered down into just another aspect of management. Knowledge is too important to who we are as humans to be relegated to such a role. This thesis has thus offered

significant, viable, and realisable means for KM to achieve ongoing relevance, attention, and prominence.

References

Aboelela, S. W., Larson, E., Bakken, S., Carrasquillo, A. F., Glied, S. A., Haas, J., & Gebbie, K. M. (2006). Defining interdisciplinary research: Conclusions from a critical review of the literature. *Health Services Research, 42,* 329-346.

Ajmal, M. M., & Koskinen, K. U. (2008). Knowledge transfer in project-based organizations: An organizational culture perspective. *Project Management Journal, 39*(1), 7-15.

Allee, V. (1997). 12 principles of knowledge management. *Training & Development, 51*(11), 71-74.

Alstete, J. W. (2007). An assessment of knowledge growth stages in organizations. *Knowledge Management Research & Practice, 5*(1), 54-63.

Alvesson, M. (1993). Organizations as rhetoric: Knowledge intensive firms and the struggle with ambiguity. *Journal of Management Studies, 30,* 997-1015.

Alvesson M., & Kärreman, D. (2001). Odd couple: Making sense of the curious concept of knowledge management, *Journal of Management Studies, 38,* 995-1018.

Alvesson M., & Kärreman, D. (2000). Taking the linguistic turn in organizational research: Challenges, responses, consequences. *The Journal of Applied Behavioral Science, 36*(2), 136-158.

Alvesson, M., & Willmott, H. (2003). Introduction. In M. Alvesson & H. Willmott (Eds.), *Studying management critically* (pp. 1-22). London: Sage.

Asthana, A. (2009). The next big thing in knowledge management. Retrieved 12 May, 2009, from http://www.knowledgeboard.com/item/3017

Andriessen, D. G. (2008). Stuff or love? How metaphors direct our efforts to manage knowledge in organisations. *Knowledge Management Research & Practice, 6*(1), 5-12.

Aram, J. D. (2004). Concepts of interdisciplinarity: Configurations of knowledge and action. *Human Relations, 57,* 369-412.

Argote, L. (2005). Reflections on two views of managing learning and knowledge in organizations. *Journal of Management Inquiry, 14,* 43-48.

Argyris, C., & Schön, D. (1974). *Theory in practice: Increasing professional effectiveness.* San Francisco: Jossey-Bass.

Avery, S., Brooks, R., Brown, J., Dorsey, P., & O'Conner, M. (2003). Personal knowledge management: Framework for integration and partnerships.

Retrieved 18 February, 2008, from http://www.millikin.edu/pkm/pkm_ascue.html

Ayas, K., & Zeniuk, N. (2001). Project-based learning: Building communities of reflective practitioners. *Management Learning, 32,* 61-76.

Baskerville, R., & Dulipovici, A. (2006). The theoretical foundations of knowledge management. *Knowledge Management Research & Practice, 4*(2), 83-105.

Bechky, B. (2003). Sharing meaning across occupational communities: The transformation of understanding on a production floor. *Organization Science, 14,* 312-330.

Beesley, L. G. A., & Cooper, C. (2008). Defining knowledge management (KM) activities: Towards consensus. *Journal of Knowledge Management, 12*(3), 48-62.

Bélanger, F., & Allport, C. D. (2008). Collaborative technologies in knowledge telework: An exploratory study. *Information Systems Journal, 18*(1), 101-121.

Bell, D. (1973). *The coming of post-industrialist society: A venture in social forecasting.* New York: Basic Books.

Billing, S. (2009). Why "best practice" is a fallacy (at best). Retrieved 29 October, 2009, from http://www.changingorganisations.com/2009/10/why-best-practice-is-a-fallacy-at-best/

Blackler, F. (1995). Knowledge, knowledge work and organizations: An overview and interpretation. *Organization Studies, 16,* 1021-1046.

Blair, D. C. (2002). Knowledge management: Hype, hope or help? *Journal of the American Society for Information Science and Technology, 5,* 1019-1028.

Blossom, J. (2009). *Content nation: Surviving and thriving as social media changes our work, our lives, and our future.* Indianapolis: Wiley.

Brooks, D. (2009, October 14). The young and the neuro. *International Herald Tribune,* p. 7.

Byrne, J. A. (2005, November 28). The man who invented management. *BusinessWeek,* 96-106.

Carlile, P. R. (2002). A pragmatic view of knowledge and boundaries: Boundary objects in new product development. *Organization Science, 13,* 442-455.

Casselman, R. M., & Samson, D. (2005). *Moving beyond tacit and explicit: Four dimensions of knowledge.* Proceedings of the 38th Hawaii International Conference on Systems Sciences, (pp. 1-10). Retrieved 11 June, 2007, from http://csdl2.computer.org/persagen/DLAbsToc.jsp?resourcePath=/dl/proceedings/&toc=comp/proceedings/hicss/2005/2268/08/2268toc.xml&DOI=10.1109/HICSS.2005.446

Child, J. T., & Shumate, M. (2007). The impact of communal knowledge repositories and people-based knowledge management on perceptions of team effectiveness. *Management Communication Quarterly, 21*, 29-40, 43-54.

Chilton, M. A., & Bloodgood, J. M. (2008). The dimensions of tacit & explicit knowledge: A description and measure. *International Journal of Knowledge Management, 4,* 75-91.

Choi, B. C. K., & Pak, A. W. P. (2007). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 2. Promoters, barriers, and strategies of enhancement. *Clinical & Investigative Medicine, 30,* E224-E232.

Choi, B. C. K., & Pak, A. W. P. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. *Clinical& Investigative Medicine, 29,* 351-364.

Choy, S. Y., Lee, W. B., & Cheung, C. F. (2004). A systematic approach for knowledge audit analysis: Integration of knowledge inventory, mapping and knowledge flow analysis. Retrieved 20 May, 2007, from http://www.jucs.org/jucs_10_6/a_systematic_approach_for;internal&action=noaction&Parameter=1182812803855

Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: The two faces of R&D. *Economic Journal, 99,* 569-596.

Collins Concise English Dictionary (3rd ed.). (1992). Glasgow: HarperCollins.

Cook, S. D., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science, 10,* 381-400.

Cook, S. D., & Yanow, D. (1993). Culture and organizational learning. *Journal of Management Inquiry, 2,* 373-390.

Cooke-Davies, T., Cicmil, S., Crawford, L., & Richardson, K. (2007). We're not in Kansas anymore, Toto: Mapping the strange landscape of complexity theory, and its relationship to project management. *Project Management Journal, 38*(2), 50-61.

Cornelissen, J. (2005). Beyond compare: Metaphor in organization theory. *Academy of Management Review, 30,* 751-764.

Cornelissen, J. (2006a). Making sense of theory construction: Metaphor and disciplined imagination. *Organization Studies, 27,* 1579-1597.

Cornelissen, J. (2006b). Metaphor and the dynamics of knowledge in organization theory: A case study of the organizational identity metaphor. *Journal of Management Studies, 43,* 683-709.

Cornelissen, J., & Kafouros, M. (2008a). Metaphors and theory building in organization theory: What determines the impact of a metaphor on theory? *British Journal of Management, 19,* 365-379.

Cornelissen, J., & Kafouros, M. (2008b). The emergent organization: Primary and complex metaphors in theorizing about organizations. *Organization Studies, 29,* 957-978.

Cornelissen, J. P., Kafouros, M., & Lock, A. R. (2005). Metaphorical images of organization: How organizational researchers develop and select organizational metaphors. *Human Relations, 58,* 1545-1578.

Cronin, K. (2008). Transdisciplinary research and sustainability. Retrieved 29 April, 2010, from http://learningforsustainability.net/pubs/

Dalkir, K. (2005). *Knowledge management in theory and practice.* Amsterdam: Elsevier.

Darroch, J., & McNaughton, R. (2003). Beyond market orientation: Knowledge management and the innovativeness of New Zealand firms. *European Journal of Marketing, 37,* 572-593.

Davenport, T. H., & Beck, J. C. (2001). *The attention economy: Understanding the new currency of business.* Boston: Harvard Business School Press.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know.* Boston: Harvard Business School.

Day, R. E. (2005). "Clearing up 'implicit knowledge': implications for knowledge management, information science, psychology, and social epistemology". *Journal of the American Society for Information Science and Technology, 56,* 630-635.

Dayan, R., & Evans, S. (2006). KM your way to CMMI. *Journal of Knowledge Management, 10*(1), 69-80.

Denning, S. (2010). *Radical management.* Retrieved January 31, 2010, from http://www.stevedenning.com/slides/RadicalManagementPrefaceIntroduction-jan10-2010.pdf

D'Eridata, M. A., & Barreto, C. (2006). How does tacit knowledge proliferate? An episode-based perspective. *Organization Studies, 27,* 1821-1841.

Dodd, J. (2010, January 11). New media rewriting marketing theory. *The New Zealand Herald,* p. B13.

Downes, S. (2006). Learning and connective knowledge. Instructional Technology Forum. Retrieved 22 March, 2009, from http://it.coe.uga.edu/itforum/paper92/paper92.html

Downes, S. (2007). An introduction to connective knowledge. In T. Hug (Ed.), *Media, knowledge & education - Exploring new spaces, relations and dynamics in digital media ecologies.* Innsbruck: Innsbruck University

Press. Retrieved 13 November, 2008, from http://www.downes.ca/post/33034

Drucker, P. F. (1993). *Post-capitalist society.* Oxford: Butterworth-Heinemann.

Duguid, P. (2005). "The art of knowing": Social and tacit dimensions of knowledge and the limits of community of practice. *The Information Society, 21*(2), 109-118.

Dysart, J. (2008). IFLA: Monitoring the pulse of KM. *Information Today, 25*(9), 32. Retrieved 12 May, 2010, from http://www.infotoday.com/it/oct08/index.shtml

Edwards, T. (2007). Organizational politics and the "process of knowing": Understanding crisis events during project-based innovation projects. *European Journal of Innovation Management, 10,* 391-406.

Ehin, C. (2009). Unmanaging knowledge: How to tell the boss to back off. *Smart People.* Retrieved 19 November, 2009, from http://www.smartpeoplemagazine.com/2009/05/unmanaging-knowledge/

Ehin, C. (2000). *Unleashing intellectual capital.* Woburn, MA. Butterworth-Heinemann.

Ehin, C. (2004). *Hidden assets.* Norwell, MA: Kluwer.

Eisenberg, E. M. (1998). Flirting with meaning. *Journal of Language and Social Psychology, 17,* 97-108.

Fairclough, N. (2003). *Analysing discourse: Textual analysis for social research.* London: Routledge.

Fauconnier, G. (1997). *Mappings in thought and language.* Cambridge: Cambridge University Press.

Filemyr, A. (1999). Interdisciplinarity as commitment to social change. *Network: Issues and Ideas, 16,* 8-13.

Firestone, J. M. (2008). On doing knowledge management. *Knowledge Management Research & Practice, 6*(1), 13-32.

Firestone, J., & McElroy, M. W. (2005a). Doing knowledge management. *The Learning Organization, 12,* 189-212.

Firestone, J., & McElroy, M. W. (2005b). Guest editorial: Has knowledge management been done? *The Learning Organization, 12,* 105-111.

Fogel, A., & Garvey, A. (2007). Alive communication. *Infant Behavior and Development, 30,* 251-257.

Fong, P. S. W. (2003). Knowledge creation in multidisciplinary project teams: An empirical study of the processes and their dynamic interrelationships. *International Journal of Project Management, 21,* 479-486.

Franco, M., & Mariano, S. (2007). Information technology and knowledge management processes: A qualitative analysis. *VINE: The Journal of Information and Knowledge Management Systems, 37,* 440-451.

Gao, F., Li, M., & Nakamori, Y. (2003). Critical systems thinking as a way to manage knowledge. *Systems Research and Behavioral Science, 20,* 3-19.

Gao, F., Li, M., & Nakamori, Y. (2002). Systems thinking on knowledge and its management: Systems methodology for knowledge management, *Journal of Knowledge Management, 6*(1), 7-17.

Gardner, H. (1993). *Frames of mind: The theory of multiple intelligences* (10th ed.). New York: Basic Books.

Geraldi, J. G., Turner, J. R., Maylor, H., Söderholm, A., Hobday, M., & Brady, T. (2008). Innovation in project management: Voices of researchers. *International Journal of Project Management, 26,* 586-589.

Ghoshal, S. (2005). Bad management theories are destroying good management practices. *Academy of Management Learning & Education, 4,* 75-91.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge: The dynamics of science and research in contemporary societies*. London: Sage.

Gibson, J. J. (1979). *The ecological approach to visual perception.* Boston: Houghton Mifflin.

Gigerenzer, G. (2007). *Gut feelings: The intelligence of the unconscious.* New York: Penguin.

Gilbert, D. (2007). *Stumbling on happiness.* New York: Vintage.

Giroux, H., & Taylor, J. R. (2002). *The justification of knowledge: Tracking the translations of quality*. Montreal: Universitié de Montreal.

Gladstone, B., & Megginson, D. (1999, July). *Metaphors of knowledge management: What you see is what you get.* Paper presented at the Critical Management Studies Conference, Manchester, England. Retrieved 2 February, 2009, from http://www.mngt.waikato.ac.nz/ejrot/cmsconference/1999/documents/Information%20Knowledge/km-met11.pdf

Goleman, D. (1995). *Emotional intelligence.* New York: Bantam Books.

Goleman, D. (2006). *Social intelligence.* New York: Bantam Books.

Goodman, J. (2009). Sugar rush at the knowledge café: How conversation is bringing KM back to the people. *Smart People.* Retrieved 29 October, 2009, from http://www.smartpeoplemagazine.com/2009/10/sugar-rush-at-the-knowledge-cafe/

Gordon, R., & Grant, D. (2005). Knowledge management or management of knowledge? Why people interested in knowledge management need to

consider Foucault and the construct of power. *Tamara: Journal of Critical Postmodern Organization Science, 3,* 27-38.

Gray, D. (2003). Wanted: Chief ignorance officer. *Harvard Business Review, 81*(11), 22-24.

Greenspan, A. (2007). *The age of turbulence.* New York: Penguin Press.

Grillitsch, W., Müller-Stingl, A., & Neumann, R. (2007). Successful sharing of project knowledge: Initiation, implementation and institutionalization. *The Electronic Journal of Knowledge Management, 5,* 19-28.

Grossman, M. (2007). The emerging academic discipline of knowledge management. *Journal of Information Systems Education, 18,* 31-37.

Gueldenberg, S., & Helting, H. (2007). Bridging 'the great divide': Nonaka's synthesis of 'western' and 'eastern' knowledge concepts reassessed. *Organization, 14,* 101-122.

Gurteen, D. (2009). On best practice and thinking for yourself! Gurteen Knowledge Letter issue 112. Retrieved 29 October, 2009, from http://www.gurteen.com/gurteen/gurteen.nsf/id/best-practice-thinking

Gurteen, D. (2007). KM goes social. Retrieved 12 February, 2009, from http://www.slideshare.net/dgurteen/km-goes-social-talk-for-gmaa-sydney-oct-2008-presentation

Hamel, G., & Breen, B. (2007). *The future of management.* Boston: Harvard Business School Press.

Hämäläinen, R. P., & Saarinen, E. (Eds.). (2004). Systems intelligence – discovering a hidden competence in human action and organizational life, Helsinki University of Technology, Systems Analysis Laboratory, Research Reports A88, October 2004.

Hämäläinen, R. P., & Saarinen, E. (2006). Systems intelligence: A key competence in human action and organizational life. *Reflections: The SoL Journal, 7*(4), 17-28.

Hämäläinen, R. P., & Saarinen, E. (Eds). (2007). *Systems intelligence in leadership and everyday life.* Espoo, Finland: Systems Analysis Laboratory, Helsinki University of Technology.

Handzic, M., & Chaimungkalanont, M. (2004). Enhancing organizational creativity through socialization. *The Electronic Journal of Knowledge Management, 2,* 64-74.

Hansson, B. (1999). Interdisciplinarity: For what purpose? *Policy Sciences, 32,* 339-343.

Harrison, C., & Young, L. (2005). Leadership discourse in action: A textual study of organizational change in a government of Canada department. *Journal of Business and Technical Communication, 19,* 42-77.

Hardt, M., & Negri, A. (2000). *Empire.* Cambridge, MA: Harvard University Press.

Harvard MBA graduates commit to more virtuous path. (2009, June 9). *The New Zealand Herald*, p. B2.

Harvey, M. G., Novicevic, M. M., Buckley, M. R., & Ferris, G. R. (2001). A historic perspective on organizational ignorance. *Journal of Managerial Psychology, 16,* 449-468.

Hasan, H. (2008). Back to the future for KM: The case for sensible organisation. *Knowledge Management Research & Practice, 6*(1), 26-30.

Hasgall, A., & Shoham, S. (2008). Knowledge processes: From managing people to managing processes. *Journal of Knowledge Management, 12*(1), 51-62.

Hassard, J., Kelemen, M., & Wolfram Cox, J. (2008). *Disorganization theory: Explorations in alternative organizational analysis.* London: Routledge.

Hazlett, S. A., McAdam, R., & Gallagher, S. (2005). Theory building in knowledge management: In search of paradigms. *Journal of Management Inquiry, 14,* 31-42.

Heisig, P. (2009). Harmonisation of knowledge management – comparing 160 KM frameworks around the globe. *Journal of Knowledge Management, 13*(4), 4-31.

Henagulph, S. (2000). The three pillars of transdisciplinarity. Retrieved 3 May, 2010, from http://www.goodshare.org/pillars.htm

Henczel, S. (2001). The information audit as a first step towards effective knowledge management. *Information Outlook, 5*(6), 18-23.

Hey, J. (2004). *The data, information, knowledge, wisdom chain: The metaphorical link.* Retrieved March 8, 2007, from http://ioc.unesco.org/oceanteacher/oceanteacher2/02_InfTchSciCmm/DIKWChain.pdf

Hicks, R. C., Dattero, R., & Galup, S. D. (2007). A metaphor for knowledge management: Explicit islands in a tacit sea. *Journal of Knowledge Management, 11*(1), 5-16.

Houchin, K., & MacLean, D. (2005). Complexity theory and strategic change: An empirically informed critique. *British Journal of Management, 16,* 149-166.

Hull, R. (2000). Knowledge management and the conduct of expert labour. In C. Pritchard, R. Hull, H. Willmott, & M. Chumer (Eds.), *Managing Knowledge* (pp. 49-68). London: Macmillan.

Hunter, T. (5 April, 2009). Google power. *Sunday Star Times*, D4.

Iedema, R., Rhodes, C., & Scheeres, H. (2005). Presencing identity: Organizational change and immaterial labor. *Journal of Organizational Change Management, 18,* 327-337.

Inglis, F. (1991). *Media theory: An introduction.* Oxford, UK: Blackwell.

Jackson, M. C. (2005). Reflections on knowledge management from a critical systems perspective. *Knowledge Management Research & Practice, 3*(4), 187-196.

Jackson, P., & Klobas, J. (2008). Building knowledge in projects: A practical application of social constructivism to information systems development. *International Journal of Project Management, 26,* 329-337.

Jakubik, M. (2007). Exploring the knowledge landscape: Four emerging views of knowledge. *Journal of Knowledge Management, 11*(4), 6-19.

Jantsch, E. (1972). Towards interdisciplinarity and transdisciplinarity in education and innovation. In L. Apostel, G. Berger, & G. Michaud (Eds.), *Interdisciplinarity: Problems of teaching and researching in universities* (pp. 97-121). Paris: The Centre for Educational Research and Innovation of the Organization for Economic Creation and Development.

Jefferson, T. L. (2006). Taking it personally: Personal knowledge management. *VINE: The Journal of Information and Knowledge Management Systems, 36,* 35-37.

Jones, M. (1997). It all depends on what you mean by discipline… In J. Mingers & F. Stowell (Eds.), *Information systems: An emerging discipline?* (pp. 97-112). London: McGraw-Hill.

Jones, R. (2008). Contesting definition: Metaphor, meaning, and multiplicity in KM. *International Journal of Knowledge, Culture and Change Management, 8*(3), 111-116.

Jones, R. (2009). PKM through communicating. *Online Information Review, 33,* 225-236.

Jones, R. & Corner, J. (2007). Systems Intelligence and its relationship to communication theories. In R. Hämäläinen & E. Saarinen (Eds.), *Systems intelligence in leadership and everyday life* (pp. 239-249). Espoo, Finland: Systems Analysis Laboratory, Helsinki University of Technology.

Jones, R., & McKie, D. (2009). Intelligent participation: Communicating knowledge in cross-functional project teams. *International Journal of Knowledge Management Studies, 3,* 180-194.

Jungck, J. R. (1996). Ignorance, error, and chaos: Local learning/global research. *Japanese Journal of Contemporary Philosophy or Modern Thought, 24,* 363-376. Retrieved 3 April, 2007, from http://www.beloit.edu/~biology/ignorance.html

Kane, H. C. M. (2003). Reframing the knowledge debate, with a little help from the Greeks. *Electronic Journal of Knowledge Management, 1,* 33-38.

Katz, A. N. (1992). Psychological studies in metaphor processing: Extensions to the placement of terms in semantic space. *Poetics Today, 13,* 607-632.

Kaufmann, S. (1995). *At home in the universe: The search for laws of self-organization and complexity.* New York: Oxford University Press.

Kerwin, A. (1993). None too solid: Medical ignorance. *Knowledge: Creation, Diffusion, Utilization, 15,* 166-185.

Khuruna, R., & Nohria, N. (2008). It's time to make management a true profession. *Harvard Business Review, 86*(10), 70-77.

Kim, S., & Trimi, S. (2007). IT for KM in the management consulting industry. *Journal of Knowledge Management, 11*(3), 145-155.

Kinsella, W. J. (1999). Discourse, power, and knowledge in the management of "Big Science." *Management Communication Quarterly, 13,* 171-208.

Klein, J. T. (1996). *Crossing boundaries: Knowledge, disciplinarities, and interdisciplinarities.* Charlottesville, VA: The University of Virginia Press.

Knights, D., Murray, F., and Willmott, H. (1993). Networking as knowledge work: A study of strategic interorganizational development in the financial services industry. *Journal of Management Studies, 30,* 975-995.

Kockelmans, J. J. (1998). Why interdisciplinarity? In W. H. Newell (Ed.), *Interdisciplinarity: Essays from the literature* (pp. 67-96). New York: College Entrance Examination Board.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science, 3,* 383-397.

Koivuaho, M., & Laihonen, H. (2006). A complexity theory approach to knowledge management – Towards a better understanding of communication and knowledge flows in software development. *The Electronic Journal of Knowledge Management, 4,* 49-58.

Koskinen, K. (2005). Metaphoric boundary objects as co-ordinating mechanisms in the knowledge sharing of innovation processes. *European Journal of Innovation Management, 8,* 323-325.

Koskinen, M., & Pirinen, A. (2007). Boundary actors in user-developer communication. Proceedings of the 30th Information Systems Research Seminar in Scandinavia IRIS 2007 (pp. 1-18).

Kotler, P., & Caslione, J. A. (2009). *Chaotics: The business of managing and marketing in the age of turbulence.* New York: AMACOM.

Kuhn, T. (2002). Negotiating boundaries between scholars and practitioners: Knowledge, networks, and communities of practice. *Management Communication Quarterly, 16,* 106-112.

Kuhn, T. S. (1970). *The structure of scientific revolutions.* Chicago: University of Chicago Press.

Kuhn, T., & Jackson, M. H. (2008). Accomplishing knowledge: A framework for investigating knowing in organizations. *Management Communication Quarterly, 21,* 454-485.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.

Landaeta, R. E. (2008). Evaluating benefits and challenges of knowledge transfer across projects. *Engineering Management Journal, 20,* 29-38.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* New York: Cambridge University Press.

Leadbeater, C., & Meadway, J. (2008). Attacking the recession: How innovation can fight the downturn. Discussion paper. Retrieved March 25, 2009, from http://www.nesta.org.uk/publications/reports/assets/features/attacking_the_recession_paper

Leggon, C. B. (2006). Traditional academic disciplines: Obstacles or opportunities to the conduct of research and inquiry. Retrieved February 13, 2008, from www.tpac.gatech.edu/nsfworkshop/essays/Leggon.doc

Leith, J. M. (2009). Open Space Technology. Retrieved October 30, 2009, from http://www.jackmartinleith.com/?page_id=17

Leith, J. M. (2008). Worldviews 1, 2 and 3. Retrieved June 17, 2009, from http://www.jackmartinleith.com/documents/three-worldviews.doc

Levina, N., & Vaast, E. (2005). The emergence of boundary spanning competence in practice: Implications for implementation and use of information systems. *MIS Quarterly,* 29, 335-363.

Liebowitz, J., Rubenstein-Montano, B., McCaw, D., Buchwalter, J., & Browning, C. (2000). The knowledge audit. *Knowledge and Process Management, 7,* 3-10.

Lindkvist, L. (2005). Knowledge communities and knowledge collectivities: A typology of knowledge work in groups. *Journal of Management Studies, 42,* 1189-1210.

Lloria, M. B. (2008). A review of the main approaches to knowledge management. *Knowledge Management Research & Practice*, *6*(1), 77-89.

Luoma, J., Hämäläinen, R. P., & Saarinen, E. (2007). *Coping with complexity: Systems thinking, complex responsive processes, and systems intelligence* (working paper). Espoo, Finland: Helsinki University of Technology, Systems Laboratory.

Lyon, A. (2005). 'Intellectual Capital' and struggles over the perceived value of members' expert knowledge in a knowledge-intensive organization. *Western Journal of Communication, 69,* 251-271.

Ma, Z., & Yu, K. (2009). Research paradigms of contemporary knowledge management studies: 1998-2007. *Journal of Knowledge Management, 14*(2), 175-189.

Mader, S. (2007). How a poor HR policy on Facebook at work can affect wiki use. Retrieved June 17, 2009, from http://www.ikiw.org/2007/11/06/how-a-poor-hr-policy-on-facebook-at-work-can-affect-wiki-use/

Magill-Evans, J., Hodge, M., & Darrah, J. (2002). Establishing a transdisciplinary research team in academia. *Journal of Allied Health, 31,* 222-226.

Malhotra, Y. (2001). Organizational controls as enablers and constraints in successful knowledge management systems implementation. In Y. Malhotra (Ed.), *Knowledge management and business model innovation* (pp. 326-336). Hershey, PA: Idea Group.

Markley, R. (1991). Complex dynamics: Literature, science, and postdisciplinarity. *Poetics Today, 12,* 337-346.

Mars, G. (1982). *Cheats at work.* London: George Allen and Unwin.

Mattera, P. (1985). *Off the books: The rise of the underground economy.* London: Pluto Press.

McAdam, R., Mason, B., & McCrory, J. (2007). Exploring the dichotomies within the tacit knowledge literature: Towards a process of tacit knowing in organizations. *Journal of Knowledge Management, 11*(2), 43-59.

McDermott, R. (1999). Why information technology inspired but cannot deliver knowledge management. *California Management Review, 41*(4), 103-117.

McHoul, A., & Grace, W. (1993). *A Foucault primer: Discourse, power and the subject.* Melbourne: Melbourne University Press.

McPhee, R. D., Corman, S. R., & Dooley, K. (2002). Organizational knowledge expression and management. *Management Communication Quarterly, 16,* 274-281.

Mead, G. H. (1934). *Mind, self, and society*. Chicago: Chicago University Press.

Meehan, J. (1999). Knowledge Management: A case of Quelling the Rebellion? Critical Management Studies Conference. Retrieved March 25, 2008, from http://www.mngt.waikato.ac.nz/ejrot/cmsconference/1999/documents/Information%20Knowledge/gilson.pdf

Metaxiotis, K., Ergazakis, K., & Psarras, J. (2005). Exploring the world of knowledge management: Agreements and disagreements in the academic/practitioner community. *Journal of Knowledge Management, 9*(2), 6-18.

Miller, R. (2005). Creating boundary objects to aid knowledge transfer. *Knowledge Management Review, 8*(2), 12-15.

Mingers, J. (2008). Management knowledge and knowledge management: Realism and forms of truth. *Knowledge Management Research & Practice, 6*(1), 62-76.

Mitchell, R., & Nicholas, S. (2006). Knowledge creation in groups: The value of cognitive diversity, transactive memory and open-mindedness norms. *The Electronic Journal of Knowledge Management, 4*(1), 67-74.

Morgan, G. (1986). *Images of organization.* Newbury Park, CA: Sage.

Morgan, G. D., Kobus, K., Gerlach, K. K., Neighbors, C., Lerman, C., Abrams, D. B., & Rimer, B. K. (2003). Facilitating transdisciplinary research: The experience of transdisciplinary tobacco use research centers. *Nicotine & Tobacco Research, 5,* S11-S19.

Murphy, P., & Pauleen, D. (2007). Managing paradox in a world of knowledge. *Management Decision, 45,* 1008-1022.

Murray, A. (2010, February). Report from the trenches: Progress & challenges. *KM World, 19*(2), 18.

Murray, S. R., & Peyrefitte, J. (2007). Knowledge type and communication media choice in the knowledge transfer process. *Journal of Managerial Issues, 19,* 111-133.

Nie, K., Ma, T., & Nakamorie, Y. (2009). An approach to understanding emerging research fields – the case of knowledge management. *Systems Research and Behavioral Science, 26,* 629-643.

Nonaka, I., & Konno, N. (1998). The concept of "Ba": Building a foundation for knowledge creation. *California Management Review, 40*(3), 40-54.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation.* New York: Oxford University Press.

Nowotny, H., Scott, P., & Gibbons, M. (2001). *Re-thinking science: Knowledge and the public in age of uncertainty.* Oxford: Polity Press.

Oram, R. (22 February, 2009). This is no ordinary recession. *Sunday Star Times,* D2.

Orlikowski, W. J. (2002). Knowing in practice: Enacting a collective capability in distributed organizing. *Organization Science, 13,* 249-273.

Owen, H. (2009). Opening space for emerging order. Retrieved 30 October, 2009, from http://www.openspaceworld.com/brief_history.htm

Pain, E. (2003). Multidisciplinary research: Today's hottest buzzword? Retrieved 18 March, 2008, from http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2100/multidisciplinary_research_today_s_hottest_buzzword/

Parent, R., Roy, M., & St-Jacques, D. (2007). A systems-based dynamic knowledge transfer capacity model. *Journal of Knowledge Management, 11*(6), 81-93.

Pauleen, D. J., & Harmer, B. (2008, December 15). Business Insight (A Special Report): Leadership --- away from the desk...always: A new breed of workers -- independent, autonomous, out of the office -- requires a new breed of manager. *Wall Street Journal* (Eastern Edition), p. R.8.

Payne, S. L. (1999). Interdisciplinarity: Potentials and challenges. *Systemic Practice and Action Research, 12,* 173-182.

Penman, R. (2000). *Reconstructing communicating: Looking to a future.* Mhawah, NJ: Lawrence Erlbaum.

Perez-Soltero, A., Barcelo-Valenzuela, M., Sanchez-Schmitz, G., Martin-Rubio, F., & Palma-Mendez, J. T. (2006). Knowledge audit methodology with emphasis on core processes. Retrieved 4 April, 2007, from http://www.iseing.org/emcis/EMCIS2006/Proceedings/Contributions/C20/CRC/EMCIS%20KAMCP%20Final.pdf

Pocock, N. (2008, October). *Challenging the disciplinary assumptions of academia.* Paper presented at the 12th Annual Waikato Management School Student Research Conference.

Polanyi, M. (1967). *The tacit dimension.* New York: Doubleday.

Ponzi, L. J. (2002). The intellectual structure and interdisciplinary breadth of knowledge management: A bibliometric study of its early stage of development. *Scientometrics, 55,* 259-272.

Ponzi, L., & Koenig, M. (2002). Knowledge management: Another management fad? *Information Research, 8* (1), paper no. 145. Retrieved March 28, 2007, from http://InformationR.net/ir/8-1/paper145.html

Pray, L. (January, 2002). Interdisciplinarity in science and engineering: Academic in transition. *Science Career Magazine.* Retrieved March 18, 2008, from http://sciencecareers.sciencemag.org/career_magazine/career_magazine/previous_issues/(year)/2002/(month)/01/(day)/17?action=prev

Probst, G., Raub, S., & Romhardt, K. (1998). Wissen managen – Wie unternehmen ihre wertvollste resource optimal nutzen, 2. Auflage, FAZ Frankfurt, Gabler Verlag: Wiesbanden.

Prusak, L. (2001). Where did knowledge management come from? *IBM Systems Journal, 40,* 1002-1007.

Quintas, P., Lefrere, P., & Jones, G. (1997). Knowledge management: A strategic agenda. *Long Range Planning, 30,* 385–391.

Reddy, M. J. (1979). The conduit metaphor: A case of frame conflict in our language about language. In A. Ortony (Ed.). *Metaphor and thought* (pp. 284-297). Cambridge: Cambridge University Press.

Restak, R. (2006). *The naked brain: How the emerging neurosociety is changing how we live, work, and love.* Harmony Books: New York.

Richardson, K. A. (2008). Managing complex organizations: Complexity thinking and the science and art of management. *E:CO, 10*(2), 13-26.

Russell, A. W., Wickson, F., & Carew, A. L. (2008). Transdisciplinarity: Context, contradictions and capacity. *Futures, 40,* 460-472.

Saarinen, E. (2008). Philosophy for managers: Reflections of a practitioner. In R. P. Hämäläinen & E. Saarinen (Eds.), *Systems intelligence: A new lens on human engagement and action* (pp. 1-27). Espoo, Finland: Helsinki University of Technology, Systems Analysis Laboratory.

Sayer, A. (2001). For postdisciplinary studies: Sociology and the curse of disciplinary parochialism/imperialism. In J. Eldridge, J. MacInnes, S. Scott, C. Warhurst, & A. Witz (Eds.), *For sociology: Legacies and prospects* (pp. 83-91). Durham, England: The Sociology Press.

Scarborough, H., Robertson, M., & Swan, J. (2005). Professional media and management fashion: The case of knowledge management. *Scandinavian Journal of Management, 21*(9), 197-208.

Scheeres, H. (2006). Knowledge on the line. Retrieved 5 March, 2008, from www.literacy.lancaster.ac.uk/what/Hermine-Scheeres.paper.doc

Scheeres, H. (2003). Learning to talk: From manual work to discourse work as self-regulating practice. *Journal of Workplace Learning, 15,* 332-337.

Schmidt, T. (2010). Absorptive capacity – one size fits all? A firm-level analysis of absorptive capacity for different kinds of knowledge. *Managerial and Decision Economics, 31,* 1-18.

Schneider, U. (2006). The other side of the distinction: The management of ignorance. In B. Renzl, K. Matzle, & H. Hinterhuber (Eds.), *The future of knowledge management* (pp. 99-111). New York: Palgrave MacMillan.

Senge, P. M. (1992). *The fifth discipline: The art and practice of the learning organization.* Sydney, Australia: Random House.

Senge, P., Smith, B., Kruschwitz, N., Laur, J., & Schley, S. (2008). *The necessary revolution; How individuals and organizations are working together to create a sustainable world.* New York: Doubleday.

Shanker, S. G., & King, B. J. (2002). The emergence of a new paradigm in ape language research. *Behavioral and Brain Sciences, 25,* 605-620.

Sharma, N. (2005). The origin of the "data information knowledge wisdom" hierarchy. Retrieved March 27, 2007, from http://www-personal.si.umich.edu/~nsharma/dikw_origin.htm

Shimazu, H., & Koike, S. (2007). KM2.0: Business knowledge sharing in the web 2.0 age. *NEC Technical Journal, 2,* 50-54.

Siemens, G. (2004). Connectivism: A learning theory for the digital age. Retrieved 10 April, 2009, from http://www.elearnspace.org/Articles/connectivism.htm

Simpson, P. (2006). Organizing in the mist: A case study of leadership and complexity. *Leadership & Organization Development Journal, 28,* 465-482.

Simpson, P., & Burnard, H. (2000). Leaders achieving focus in the place of not knowing. *Leadership & Organization Development Journal, 21*(5), 235-242.

Sims, R. (2008). 43 knowledge management definitions – and counting… Retrieved February 18, 2009, from http://blog.simslearningconnections.com/?p=279.

Sinclair, N. (2007). The KM phoenix. *VINE: The Journal of Information and Knowledge Management Systems, 37,* 255-261.

Smithson, M. (1989). *Ignorance and uncertainty: Emerging paradigms*. New York: Springer-Verlag.

Snider, K. F., & Nissen, M. E. (2003). Beyond the body of knowledge: A knowledge-flow approach to project management theory and practice. *Project Management Journal, 34*(2), 4-12.

Snowden, D. (2002). Complex acts of knowing: Paradox and descriptive self-awareness. *Journal of Knowledge Management, 6*(2), 100-111.

Snowden, D. (2003). Managing for serendipity or why we should lay of "best practice" in KM. Retrieved 29 October, 2009, from http://www.cognitive-edge.com/ceresources/articles/39_Managing_for_Serendipity_final.pdf

Snowden, D. (2005). The ASHEN model: An enabler of action. Retrieved 12 February, 2007, from http://www.cognitive-edge.com/ceresources/articles/7_Organic_KM_1_of_3_ASHEN.pdf

Snowden, D. (2009). Defining KM. Retrieved 29 October, 2009, from http://www.cognitive-edge.com/blogs/dave/2009/09/defining_km.php

Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal, 17*(S2), 45-62.

Stacey, R. D. (1996). *Complexity and creativity in organizations.* San Francisco: Berrett-Koehler.

Stacey, R. D. (2000). *Strategic management and organisational dynamics: The challenge of complexity.* Harlow, England: Financial Times/Prentice Hall.

Stacey, R. D. (2001). *Complex responsive processes in organizations.* London: Routledge.

Stacey, R. (2003). Learning as an activity of interdependent people. *The Learning Organization, 10,* 325-331.

Stacey, R. (2007). The challenge of human interdependence: Consequences for thinking about the day to day practice of management in organizations. *European Business Review, 19,* 292-302.

Standen, P., McKenna, R., & Williams, M. (1998). Using the ignorance paradigm to teach lifelong learning skills. In B. Black. & N. Stanley (Eds.), *Teaching and learning in changing times* (pp. 313-317). Proceedings of the 7th Annual Teaching Learning Forum, The University of Western Australia, February 1998. Perth: UWA. Retrieved 12 March, 2008, from http://lsn.curtin.edu.au/tlf/tlf1998/standen.html

Stankosky, M. (Ed.). (2005). *Creating the discipline of knowledge management: The latest in university research.* Burlington, MA: Elsevier Butterworth Heinemann.

Star, S., & Griesemer, J. (1989). Institutional ecology, "translations" and boundary objects: Amateurs and professionals in Berkley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science, 19,* 387-420.

Stewart, T. A. (1995). Mapping corporate brainpower. *Fortune, 132*(9), 209-12.

Stocking, S. H., & Holstein, L. W. (1993). Constructing and reconstructing scientific ignorance: Ignorance claims in science and journalism. *Knowledge: Creation, Diffusion, Utilization, 15,* 186-210.

Stokols, D. (2006). Toward a science of transdisciplinary action research. *American Journal of Community Psychology, 38,* 63-77.

Stowell, F. (2007). The knowledge age or the age of ignorance and the decline of freedom? *Systemic Practice and Action Research, 20,* 413-427.

Styhre, A. (2003). *Understanding knowledge management: Critical and postmodern perspectives.* Copenhagen: Copenhagen Business School Press.

Suchman, A. L. (2006). A new theoretical foundation for relationship-centered care: Complex responsive processes of relating. *Journal of General Internal Medicine, 6,* S40–45.

Sveiby, K. (2001). What is knowledge management? Retrieved February 10, 2009, from http://www.sveiby.com/articles/KnowledgeManagement.html

Sykes, C. & Springall, L. (2 November, 2009). The soul of a business. Retrieved 2 November, 2009, from http://www.stuff.co.nz/business/industries/3021745/the-soul-of-a-business

Teece, D. J. (1998). Capturing value from knowledge assets. *California Management Review, 40*(3), 55-76.

Thompson, H. (1997). Ignorance and ideological hegemony: A critique of neoclassical economics. *Journal of Interdisciplinary Economics, 8,* 291-305.

Thompson, M. P. A., & Walsham, G. (2004). Placing knowledge management in context. *Journal of Management Studies, 41,* 725-747.

Tourangeau, R., & Sternberg, R. (1982). Understanding and appreciating metaphors. *Cognition, 11,* 203-244.

Townley, B. (1993). Foucault, power/knowledge, and its relevance for human resource management. *Academy of Management Review, 18,* 518-545.

Tsoukas, H. (2000). On organizational knowledge and its management: an ethnographic investigation. In J. T. Koski & S. Marttila (Eds.), *Conference on knowledge and innovation* (pp. 12-30). Helsinki: Helsinki School of Economics and Business Administration.

Tsoukas, H. (2003). Do we really understand tacit knowledge? In M. Easterby-Smith & M. A. Lyles (Eds.), *Handbook of organizational learning and knowledge* (pp. 410-427). Oxford: Blackwell.

Vreeken, A. (2005). The history of information: Lessons for information management. *Sprouts: Working Papers on Information Systems, 5*(2). Retrieved 4 April, 2009, from http://sprouts.aisnet.org/84/1/2005-19.pdf

Walsham, G. (2002). What can knowledge management systems deliver? *Management Communication Quarterly, 16,* 267-273.

Walsham, G. (2005). Knowledge management systems: Representation and communication in context. *Systems, Signs & Actions, 1,* 6-18.

Walton, D. (2005). Pragmatic and idealized models of knowledge and ignorance. *American Philosophical Quarterly, 42,* 59-69.

Weick, K. (1989). Theory construction as disciplined imagination. *Academy of Management Review, 14,* 516-528.

Weinberger, D. (2007). The real difference between the two 2.0s. *KM World, 16*(2), 18-20.

Wenger, E. (2008). Communities of practice: A brief introduction. Retrieved 20 October, 2008, from http://www.ewenger.com/theory/index.htm

Wheatley, M. J. (1999). *Leadership and the new science: Discovering order in a chaotic world.* San Francisco: Berrett-Koehler.

Wickson, F., Carew, A. L., & Russell, A. W. (2006). Transdisciplinary research: Characteristics, quandaries and quality. *Futures, 38,* 1046-1059.

Wierzbicki, A. P. (2007). Modelling as a way of organising knowledge. *European Journal of Operational Research, 176,* 610-635.

Wiig, K. M. (2000). Knowledge management: An emerging discipline rooted in a long history. In D. Chauvel & C. Despres (Eds.), *Knowledge horizons: The present and the promise of knowledge management* (pp. 3-26). Woburn, MA: Butterworth-Heinemann.

Williams, R. (1983). *Keywords: A vocabulary of culture and society*. London: Flamingo.

Wilson, G., & Herndl, C. (2007). Boundary objects as rhetorical exigence: Knowledge mapping and interdisciplinary cooperation at the Los Alamos National Laboratory. *Journal of Business and Technical Communication, 21,* 129-154.

Wilson, T. D. (2002). *The nonsense of 'knowledge management'*. Retrieved 28 May, 2007, from http://information.net/ir/8-1/paper144.html

Winter, S. G. (1993). *The nature of the firm.* Oxford University Press: Oxford, UK.

Wong, K. Y., & Aspinwall, E. (2004). Characterizing knowledge management in the small business environment. *Journal of Knowledge Management, 8*(3), 44-61.

Yuthas, K., Dillard, J. F., & Rogers, R. K. (2004). Beyond agency and structure: Triple-loop learning. *Journal of Business Ethics, 51,* 229-243.

Zhu, Z. (2007). Complexity science, systems thinking and pragmatic sensibility. *Systems Research and Behavioral Science, 24,* 445-464.

Zorn, T. E., & Taylor, J. R. (2004). Knowledge management and/as organizational communication. In D. Tourish & O. Hargie (Eds.), *Key issues in organizational communication* (pp. 96-112). London: Routledge.