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Conceptual Synthesis 2

**Learning from Knowledge
Management**

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Conceptual Synthesis 2: Learning from Knowledge Management

Introduction

A major concern for policy makers and managers is how to ensure that research evidence has greater impact on the policy making process, the organisation of service delivery and patterns of professional practice. Such research impact can take many forms and has various facets; for example it may focus on the utilisation of specific research findings or be concerned with the redesign of the policy process and service delivery practices so that they are routinely informed by best evidence. Reflecting this complexity, throughout this review we will use the term ‘research utilisation and evidence based policy and practice implementation’ (or RU/EBPP implementation for short) to refer to those diverse sets of activities which seek to enable more and better use of research findings.

This is the second of a series of reviews that aim to synthesise areas of conceptual knowledge that can contribute to a better understanding of these issues. The objectives of these syntheses are:

- To provide an overview of the literature in a given field, including the main ideas, models and debates;
- To tease-out the implications of these ideas, models and debates for the RU/EBPP implementation agenda;
- To consider whether the ideas from the field have already been applied to understanding RU/EBPP implementation issues and, if so, to assess the conclusions that have been drawn.

Using the literature in developing a conceptual synthesis

A common approach to literature search, review and reporting processes is being adopted for each of the conceptual syntheses (see Nutley et al., 2002a). Importantly, the intention of each conceptual synthesis is not to provide an exhaustive search and review of all the literature published in a field (in this case, knowledge management). Instead the aim is to identify the key ideas, models and debates, and review the significance of these for developing a better understanding of RU/EBPP implementation.

Staff at the British Library used the following strategy to conduct an initial literature search. The phrase ‘knowledge management’ was combined with each of the following terms: review*, overview*, literature and bibliography. These terms were then used to search a wide range of databases. Specific searches were undertaken of databases such as Web of Science, SIGLE, PAIS and Planex. In addition, DIALOG was used to search 517 databases and searches were also conducted of the monographs held by the British Library. From the listings returned by these searches, all review articles and overviews were selected by one of the authors (SN) and these were used to map the field and identify key studies and texts in the area (e.g. Nonaka and Takeuchi 1995). Searches then

used reference lists, following key authors, trace citations and personal contacts to identify further relevant studies.

Following from this, a search of RURU’s database (which contains over 700 papers on research utilisation) was undertaken to identify whether the ideas from the field had already been applied to understand RU/ EBPP implementation issues. Searches were conducted in the title, keyword and abstract fields of the database using search terms such as knowledge management, knowledge strategy, intellectual capital, knowledge systems, knowledge sharing and knowledge network. Titles and abstracts were reviewed for the 12 references so identified, full texts being obtained for all texts categorised as potentially useful by one of the reviewers.

Relevance of the literature on knowledge management

Since the mid-1990s there has been an explosion of interest in knowledge management. The reasons for this are manifold but appear to be rooted in the social, economic and technological changes impacting on organisations which highlighted the importance of knowledge in gaining competitive advantage (Davenport et al 1998). Because knowledge-based resources are usually difficult to imitate, the knowledge-based view of the firm posits that it is these assets that produce long-term sustainable advantage (Nonaka and Takeuchi 1995; Bontis 2000). These ideas have resulted in one definition of knowledge management as ‘the process of creating value from an organisation’s intangible assets’ (Liebowitz, 2000 p 5) or more specifically as processes for identifying and leveraging the collective knowledge in an organization to help the organization compete (von Krogh 1998).

The above definition illustrates that knowledge management is not a standalone concept, it is linked to ideas of organisational learning and also draws upon organisational change concepts. These linkages will be picked up in more detail in subsequent conceptual syntheses of the latter two areas. However, it is worth emphasising that although in theory the concepts of knowledge management and organisational learning are inter-linked, in practice the two fields have developed from different disciplines and relatively few articles have explored the links between them (Scarborough et al 1999), this is illustrated in Box 1. However, as the knowledge management field moves away from its information management roots towards more people-oriented concerns, the two fields increasingly overlap and some convergence can be identified.

Box 1: Main foci of the literatures on learning organisations and knowledge management

Learning organisations	Knowledge management
• Theory-driven	• Practice driven
• Broad focus	• Specific focus
• Organisation unit of analysis (and individual-organisation interactions)	• Specific project unit of analysis (and individual-project interaction)
• ‘Building’ metaphor	• ‘Mining’ metaphor

<ul style="list-style-type: none"> • Systems-based view of the firm 	<ul style="list-style-type: none"> • Resource-based view of the firm
<ul style="list-style-type: none"> • Emphasis on culture management and organisation design 	<ul style="list-style-type: none"> • Emphasis on information systems management and systems design
<ul style="list-style-type: none"> • Emphasis on maintaining and managing tacit knowledge embedded as organisation culture and values systems 	<ul style="list-style-type: none"> • Emphasis on changing tacit knowledge into explicit knowledge
<ul style="list-style-type: none"> • Strategic/ HR managers responsible for change 	<ul style="list-style-type: none"> • IS/IT managers and Chief Knowledge Officers responsible for change
<ul style="list-style-type: none"> • Main fields strategy, organisation theory, organisation design, human resource strategy, marketing, library studies 	<ul style="list-style-type: none"> • Main fields IS/IT strategy, business strategy, operations management, accounting, library studies.
<ul style="list-style-type: none"> • Mostly abstract/ global 	<ul style="list-style-type: none"> • Mostly concrete/ local
<ul style="list-style-type: none"> • Sensitive to context (multiple practice techniques) 	<ul style="list-style-type: none"> • Independent of context ('best practice' techniques)
<ul style="list-style-type: none"> • Planned culture change strategy 	<ul style="list-style-type: none"> • Planned IT change strategy
<ul style="list-style-type: none"> • Mostly intra-organisational knowledge emphasised 	<ul style="list-style-type: none"> • Intra- and inter- organisational knowledge emphasised
<ul style="list-style-type: none"> • Major investment in people and management development 	<ul style="list-style-type: none"> • Major investment in systems and user training
<ul style="list-style-type: none"> • Intangible gains 	<ul style="list-style-type: none"> • Tangible performance improvements
<ul style="list-style-type: none"> • Emphasis on 'internalisation' and 'socialisation' 	<ul style="list-style-type: none"> • Emphasis on 'externalisation' and 'combination' of knowledge
<ul style="list-style-type: none"> • Knowledge as cognition and action 	<ul style="list-style-type: none"> • Knowledge as cognition and raw material (resources).

Source: Scarborough et al 1999, Table 7, p 26

Despite the recency of much of the knowledge management literature, there is nothing new in the idea that knowledge is a valuable organisational asset (Martensson 2000). So, is knowledge management a new way of understanding key activities within organisations or is it just 'another re-labelling in the ceaseless flow of fashionable management concepts' (Martensson 2000 p 205)? This synthesis argues that there are important concepts, models and practices to be found in the knowledge management literature which have relevance for RU/ EBPP implementation, but that there is also a large measure of old wine in new bottles, speculation and plain hyperbole. Thus it is important to distinguish between conceptual descriptions, case-based analysis and ungrounded prescriptions when reviewing the literature in the field.

If knowledge management is about creating value, what are the main activities or processes involved? A common view is that knowledge management can be defined broadly as 'any process or practice of creating, acquiring, capturing, sharing and using knowledge, wherever it resides, to enhance learning and performance in organisations' (Scarborough et al 1999). Much of the knowledge management literature focuses on the

private sector organisations but these basic processes are equally applicable in the public sector and more recently there has been a growing recognition of this (Bate and Robert 2002; Bell 2001; Fennessy 2001; Nicholas-O'Brien 2000)

Given the interests of the Research Unit for Research Utilisation (RURU), there are good reasons for choosing the literature on knowledge management for synthesis. These arise from the marked parallels between understanding the process of knowledge creation and use and similar concerns within RU/EBPP implementation. We cover these only briefly here, as we shall revisit them in more detail later in the paper when drawing the lessons from knowledge management for RU/EBPP implementation.

Given that knowledge management focuses on processes for creating, storing, transferring and applying knowledge, the parallels with RU/EBPP implementation, at least on the surface, are obvious. Much of RU/EBPP implementation is also concerned with the generation of knowledge (research-based knowledge), the communication of this knowledge, and the uptake, utilisation or changes in behaviour that result.

The paper proceeds by providing a brief overview of the literature on knowledge management. This is followed by an analytical review of that literature, which considers: the types of knowledge at issue, the forms of utilisation that are envisaged, how the process has been modelled, the 'ways of seeing' that underpin analyses within the field, and finally the lessons to emerge from the knowledge management literature. The final section of the paper draws out the implications of the knowledge management literature for RU/EBPP implementation, and considers to what extent these ideas have already been applied in the field.

Knowledge Management Research: a brief overview

There is a large and growing literature on knowledge management. Drucker is credited with being the first person to use the term knowledge worker back in the 1960s and Wiig is said to have coined the term 'knowledge management' in the mid-1980s (Liebowitz 1999). However, much of the knowledge management literature is more recent, with a great deal of it dating from the turn of the millennium.

Endeavour within the knowledge management field has been shaped by how people view the nature of knowledge and, in particular, whether knowledge is seen as an object or as a process. When knowledge is seen as an object (primarily explicit knowledge), knowledge management tends to focus on building and managing knowledge stocks. Resulting knowledge management strategies tend to be computer-centred; knowledge is carefully codified and stored in databases and then accessed and used by authorised personnel. Conversely, if knowledge is seen as a process of accessing and applying expertise (largely tacit knowledge) there is recognition that knowledge is closely tied to the person who develops it. Resulting strategies seek to develop enhanced opportunities for sharing knowledge, often through person-to-person contact. The role of information and communication technology is to help people communicate knowledge, not to store it (Hansen et al 1999). Early research within the field tended to focus on knowledge as an

object. More recently, an increased emphasis on the process of knowing has been noted (Blackler et al 1998)

Research within knowledge management has considered the following questions which are relevant to our own concerns about RU/ EBPP implementation:

1. Can we distinguish between different types of knowledge and what implications does this have for knowledge management strategies?
2. What are the key processes and approaches involved in creating and using knowledge in organisations? Can these be blended or do they contain largely irreconcilable tensions?
3. Is it possible to identify best practice(s) in knowledge management?
4. What do knowledge management practices imply for the design of key roles and responsibilities, such as knowledge managers and knowledge workers?
5. What are the main challenges for knowledge management, what are the barriers and enablers?

In this paper, particularly in the section on key findings, we outline what research in the knowledge management field has to say in relation to the above questions. Answers to many of the questions are still speculative; as a field of research, knowledge management is still in its infancy (Zack 1999). However, it is a growing field that addresses key questions about knowledge and knowledge work in modern day organisations. Nowhere are these questions more important than in the delivery of public services, where professional practice is becoming increasingly knowledge intensive.

Analysis of the KM literature

The intention is to provide an initial analysis of the KM literature before synthesising insights for the RU/EBPP implementation agenda. This section uses an adaptation of a framework that has been developed for mapping the broad field of RU/EBPP implementation (see Nutley et al., 2003). Readers may wish to refer to this paper for a fuller understanding of the ideas underpinning the framework for this conceptual synthesis. The same approach was adopted in the first conceptual synthesis (on the diffusion of innovation) and it will also be adopted in subsequent syntheses. In brief, the framework pays particular attention to the following issues:

- *Types of knowledge* – what types of knowledge is the field concerned with? What forms of explicit knowledge are considered to be important and what attention, if any, is paid to the role of tacit knowledge in understanding knowledge transfer and utilisation?
- *Types of utilisation* – what forms of knowledge utilisation are envisaged? Are we concerned primarily with direct and instrumental use (for example, adoption of new ways of doing things), or are we also concerned with less obvious shifts in basic attitudes and values? How far is utilisation conceived in terms of knowledge replication as opposed to reinvention?

- *Models of process* – how has the process of knowledge utilisation been modelled by key authors within the field? What are the key concepts employed, and how are their interrelationships portrayed?
- *Ways of seeing* – what intellectual traditions and schools of thought underpin the literature in the field? How do researchers and commentators in this area of enquiry tend to see the world? These concerns involve considerations of ontology, epistemology, theory and, most especially, methodology.
- *Key findings* – what are the key findings to emerge from empirical studies within the field? How do these findings provide either insight into knowledge utilisation and application processes or guidance on how such processes might be improved?

Each of these questions is addressed in turn below. In doing so we identify what has been gleaned across the diverse strands of KM research. While some of the parallels with the concerns of RU/EBPP implementation will be apparent as we go through, these insights are drawn out and explicated more fully in the final section of this review.

Types of knowledge

The knowledge management field is littered with knowledge taxonomies, which seek to build upon the well-known distinction between tacit and explicit knowledge (Polyani 1967). Some taxonomies identify many overlapping knowledge types, while others focus on the main forms in which knowledge is held (see Box 2). In terms of the latter, the three most common forms of knowledge are said to be:

- Embodied knowledge – what knowers intrinsically know;
- Represented knowledge – knowledge that is contained within documents, databases and records;
- Embedded knowledge – evidenced by processes, products, rules and procedures (Gamble and Blackwell 2001).

Box 2: Knowledge taxonomies

Taxonomy 1 (Alavi and Leidner 2001)	
<i>Knowledge Type</i>	<i>Description</i>
Tacit	Knowledge rooted in actions, experience, and in involvement in specific contexts
<ul style="list-style-type: none"> • Cognitive tacit • Technical tacit 	<ul style="list-style-type: none"> Mental models Know-how applicable to specific work
Explicit	Articulated, generalised knowledge
Individual	Created by and inherent in the individual
Social	Created by and inherent in collective actions of a group
Declarative	Know-about
Procedural	Know-how

Causal	Know-why
Conditional	Know-when
Relational	Know-with
Pragmatic	Useful knowledge for an organisation
Taxonomy 2 (Blackler 1995)	
<i>Knowledge Form</i>	<i>Description</i>
Embodied	Action knowledge, know-how
Embedded	Residing in systemic routines
Embrained	Dependent on conceptual skills and cognitive abilities
Encultured	Process of achieving shared understanding
Encoded	Information conveyed by signs and symbols

It is common to see definitions of knowledge that distinguish it from data, information and wisdom. These concepts are placed in a hierarchical relationship, where data and information are lower order concepts that feed into knowledge, and where wisdom is the routine application of knowledge (Gamble and Blackwell 2001).

Knowledge has been proposed as a fourth factor of production to be added to land, labour and capital (Kluge et al 2001). Knowledge is thus defined as intellectual capital, which is said to have three elements (Seeman et al 2000):

- Human capital – the knowledge, skills and experiences possessed by individual employees;
- Structural capital – explicit, rule-based knowledge embedded in an organisation’s work processes and systems and in shared databases of best practices;
- Social capital – the ability of groups to collaborate together.

The range of taxonomies that can be found in the literature highlights the potential complexity of knowledge management, which needs to address the different ways of knowing present within any organisation. However, taxonomies have limited utility *per se* and there have been calls for the field to move away from a preoccupation with defining knowledge and treating it as an object (Gamble and Blackwell 2001). In response, a shift in thinking has been noted: a move away from treating knowledge as an object or commodity – something to be identified, catalogued and exchanged – towards the study of knowing as something that people do and hence as a process to be analysed (Blacker et al 1998; Heiseg and Vorbeck 2001). Indeed, the more critical literature on knowledge management has sought to challenge the reification of knowledge by highlighting how it is situated within social and politicised systems of meaning and generalisations (Swan and Scarborough 2001).

Types of utilisation

An important aspect of the knowledge-based theory of the firm is that competitive advantage resides in the application of knowledge rather than in the knowledge itself

(Bontis 2000; Grant 1996). In this sense, the ultimate aim of knowledge management is the direct and instrumental use of knowledge to improve organisational performance. Three primary mechanisms have been identified for applying knowledge in this way (Grant 1996):

- Directives – specific set of rules, standards, procedures and instructions developed through the conversion of specialists’ tacit knowledge so that it can be applied by non-specialists;
- Organisational routines – the development of task performance and coordination patterns, interaction protocols and process specifications that allow individuals to apply and integrate their specialised knowledge without the need to articulate and communicate what they know to others;
- Self-contained task teams – for situations in which task uncertainty and complexity prevent the specification of directives and organisational routines, teams of individuals with prerequisite knowledge and expertise are formed for problem solving.

In the first two cases the application of knowledge involves mechanisms to support the replication of specialist knowledge, while in the latter the process of applying knowledge is more akin to recreation and reinvention.

Despite the above observations, much of the knowledge management literature has little to say about how knowledge is utilised and applied. This, in part, reflects a technological preoccupation with the processes of knowledge codification, storage and dissemination, to the detriment of understanding the process of utilisation (Gallupe 2001). As a reaction to the limitations of this technological (‘hard’) approach, a good deal of the more recent literature has focused on ‘soft’ knowledge management – emphasising the importance of people rather than technology. Some of the latter literature is concerned with reward systems that encourage people to search for and apply existing knowledge (replication). However, much of the ‘soft’ literature eschews a linear view of knowledge management, where knowledge developed in one setting is disseminated to and replicated in another. Instead, the local utilisation of knowledge is inextricably linked to knowledge generation in that setting – a process of rediscovery (von Krogh et al 1998). Thus the type of utilisation envisaged is more a matter of reinvention rather than replication.

The knowledge management literature is preoccupied with the issue of using existing knowledge and generating new knowledge. The lack of knowledge use is seen as the core problem and hence the literature has far less to say about how to avoid the utilisation of outdated knowledge. This despite the fact that it has long been recognised that:

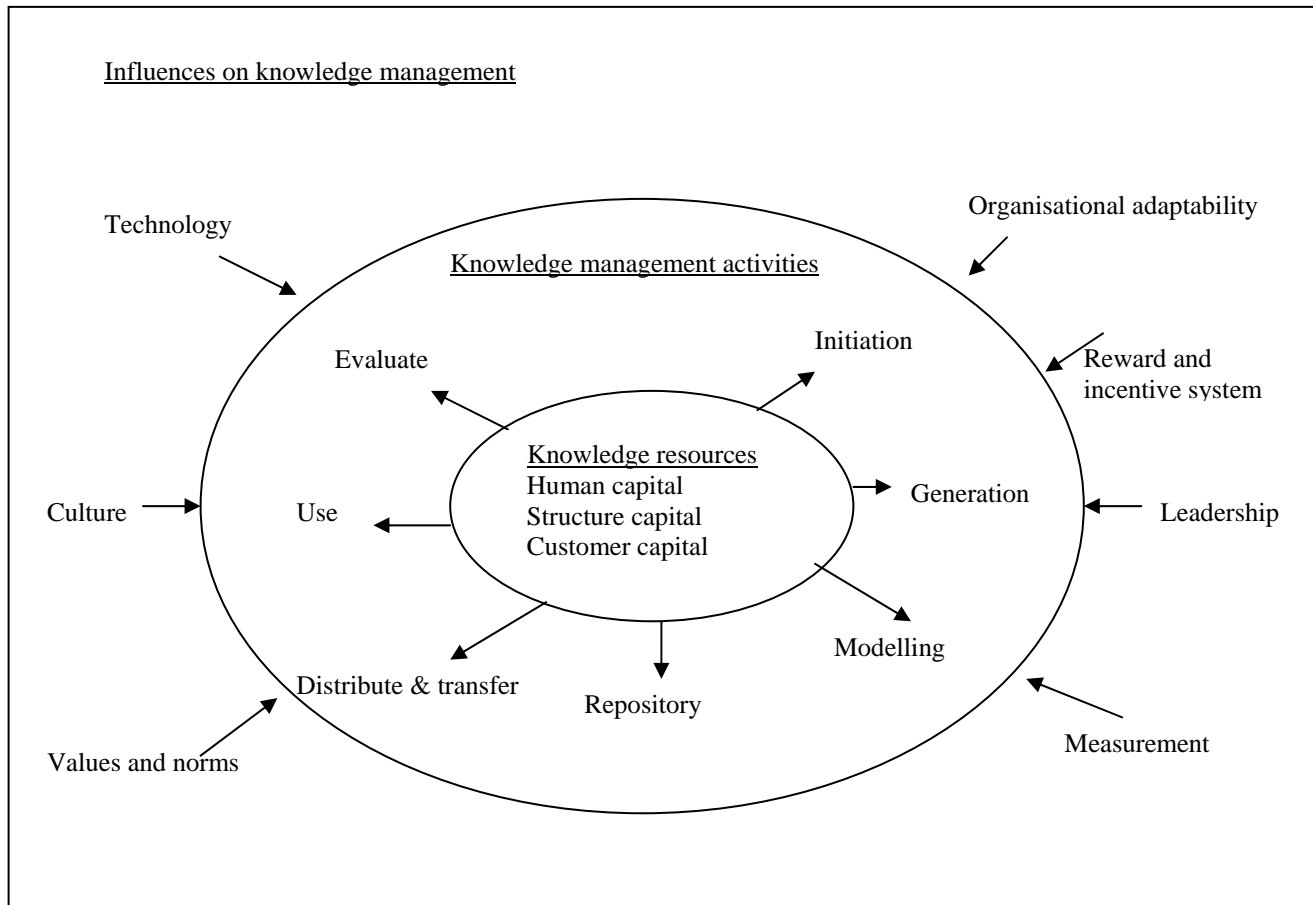
‘The greatest difficulty lies not in persuading people to accept new ideas, but in persuading them to abandon old ones’ (Maynard Keynes cited in Bukowitz and Williams 1999, p 321).

Models of process

There are a wide variety of knowledge management models. These include Sveiby’s (2000) intangible asset monitor framework, Wiig’s four-step process and 16 building

blocks for knowledge management (1997), and Nonaka and Takeuchi's (1995) knowledge creation spiral. There have been attempts to combine these models to produce composite frameworks such as the one shown in Box 3. This seeks to model the process of knowledge management by highlighting three knowledge resources, seven main activities, and seven key influences on knowledge management. Such frameworks have, however, only been partially successful in reconciling the various approaches to knowledge management.

Box 3: A composite framework for knowledge management



Adapted from Lai and Chu (2002, p 30)

Most models are related generally to one of three key concerns (Scarborough et al 1999):

- How to value knowledge – this has been the concern of financial institutions (such as Skandia) and also features within the management accounting literature. Here the focus is on models and methods for quantifying and valuing an organisation's knowledge base (Bassi and van Buren 2000).
- How to exploit intellectual property – this has been a preoccupation of firms with a strong science and R&D base (such as Buckman Labs). Here the concern is with effective ways for tapping into the commercial value of an existing knowledge base (Quintas 2002).

- How to capture project-based learning – consultancy and professional firms, in particular, have focused on the need to capture learning from individual projects and make it available throughout the organisation (Bukowitz and Williams 1999).

It is the third of these concerns – the capture of project-based learning – that is of most relevance to this paper. Those readers interested in the valuation of knowledge would find Morey et al (2000) a useful starting point. Similarly, Liebowitz (2000) is a good initial source on the exploitation of intellectual property.

Models and techniques for the capture of project-based learning can be further subdivided into knowledge *push* and knowledge *pull* approaches. Knowledge push approaches (sometimes referred to as supply-driven) assume that the fundamental problem for knowledge management is the limited flow of knowledge and information within an organisation. They aim to increase that flow by capturing, codifying and transmitting knowledge. There is often a strong technology component to the models and techniques that are recommended, with information technologies enabling a vast increase in knowledge flow. Conversely, knowledge pull approaches (sometimes referred to as demand-driven) are concerned with the problems of engaging employees in the process of sharing and searching for knowledge. Consequently they focus on reward systems and other mechanisms to encourage employees to share, search for and apply knowledge. Knowledge pull approaches also recognise that if motivational measures are successful, employees need information technologies to be able to access the knowledge they now seek. Thus both knowledge push and knowledge pull approaches have a technological component, although the use of such technologies differs (see Box 4).

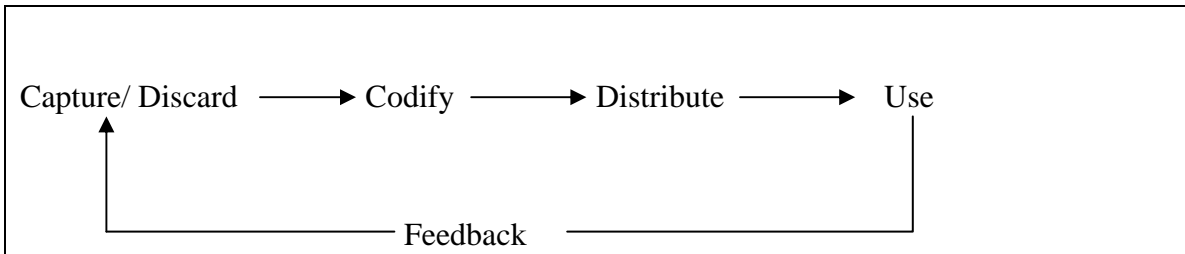
Box 4: Some difference between push and pull technologies

	Push	Pull
Objective	Information capture	Navigation
User	Passive	Active
Technology	Always active	Active only when used
Best for	Continuing knowledge needs Urgent or time-dependent information Creating awareness of what can be pulled (notification)	One-time knowledge needs Conducting research Detailed information
Main advantage	Brings important material to users' attention	Allows user to access information at point of need
Main disadvantage	Can overload users since they don't control it	Requires time on the part of the user (to both master the technology and to deploy it)
Examples	Search agents E-mail	Search engines Browsers Directories, frameworks

Source: Bukowitz and Williams (1999, p 54)

Knowledge push models and techniques have tended to dominate the literature. At their core they employ a fairly linear, life-cycle model for knowledge management where the process of capturing, codifying and using knowledge is refined over time with successive passes through each stage of the model (see Box 5). Much of the literature focuses on the way in which information technology provides the means of enhancing each stage of the life-cycle model (Box 6), particularly the creation of knowledge databases.

Box 5: A life cycle model for knowledge management



Source: Adapted from Gamble and Blackwell p 58

Box 6: Knowledge Management processes and the potential role of IT

Knowledge management processes	Knowledge creation	Knowledge storage/ retrieval	Knowledge transfer	Knowledge application
Supporting information technologies	Data mining Learning tools	Electronic bulletin boards Databases	Electronic bulletin boards Knowledge repositories Databases	Expert systems Workflow systems
IT enables	Combining new sources of knowledge Just-in-time learning	Support of individual and organisational memory Inter-group knowledge access	More extensive internal network More communication channels available Faster access to knowledge sources	Knowledge can be applied in many locations More rapid application of new knowledge through workflow automation
Platform technologies	Groupware and communication technologies Intranets			

Source Alavi and Leidner, Table 3 p 125

Initially, push approaches focused on the capture and codification of explicit knowledge. However, they have increasingly recognised the importance of tacit knowledge and the need to capture this. Recommendations to achieve this include the identification of experts and the use of methods such as interviewing, observation and simulation to enable the conversion of expertise into more codified forms of knowledge (Leibowitz 2000). Consideration of the different approaches and tools needed to capture and share different types of knowledge has led to the development of frameworks such as the one shown in Box 7. These suggest that different approaches and tools should be used depending on the type of knowledge and whether the purpose is to identify, organise, spread or incorporate knowledge.

Box 7: Range of tools used in knowledge management			
	Types of knowledge		
Purpose	Embodied	Represented	Embedded
Identify knowledge	<i>Observe</i> Knowledge surveys Workshops/ interviews Network analysis	<i>Gather</i> Business intelligence Text and data mining Intelligent agents	<i>Hypothesise</i> Market/ customer/ competitor analysis Modelling/ reasoning tools Reverse engineering
Organise knowledge	<i>Contextualise</i> Focus groups Expertise guides Knowledge co- ordinators	<i>Categorise</i> Knowledge taxonomies Libraries Data marts	<i>Map</i> Job/ workplace design Workflow analysis Performance measures
Spread knowledge	<i>Share</i> Mentoring/ coaching Communities of practice Conferencing tools/ groupware	Disseminate Broadcast tools/ Internet/ Intranet/ e- mail Distance learning Application systems	<i>Simulate</i> Scenario planning After-action reviews Training/ competency management
Incorporate knowledge	<i>Apply – Decide – Act</i>		

Source: Adapted from Gamble and Blackwell (2001, p 138)

Knowledge push approaches have received sustained criticism for being too preoccupied with codification (Birkinson 2001). Not only is it impossible to codify all knowledge but such an approach (even if it were possible) may generate its own problems. The

codification of all tacit knowledge would make the fluid, informal and intuitive practices, said to be essential in allowing the flexible firm to cope with uncertainty, more rigid (Scarborough et al 1999).

Knowledge pull approaches, attempt to respond to some of the limitations of knowledge push approaches. They emphasise the importance of developing an organisational culture that both values knowledge and recognises the importance of knowledge sharing within the organisation. This has led some devotees to claim that knowledge management is 'mostly culture and people with technology thrown in' (Liebowitz 2000: 42). The emphasis is still on the importance of making knowledge accessible, thus the need to develop methods for uncovering tacit knowledge, those 'rules of thumb' that underpin practice heuristics.

Modelling the interplay between tacit and codified knowledge is fundamental to both knowledge push and knowledge pull approaches. In discussing this interplay, much of the literature draws upon the work of Nonaka and Takeuchi (1995), who argue that organisational knowledge is created by human interaction among individuals who have different types of knowledge (tacit and explicit). Such interactions, they suggest, produce four modes of knowledge conversion:

- Socialisation – where individual tacit knowledge is converted to group tacit knowledge to produce sympathetic knowledge;
- Externalisation – where tacit knowledge is converted to explicit knowledge to produce conceptual knowledge;
- Internalisation – where explicit knowledge is converted to tacit knowledge to produce operational knowledge;
- Combination – where separate explicit knowledge is combined to produce systemic knowledge.

The interaction between tacit and explicit knowledge is shaped by shifts between different modes of knowledge conversion, which are in turn induced by several triggers:

- Socialisation starts with building a field of interaction;
- Externalisation is triggered by 'meaningful dialogue' or 'collective reflection';
- Internalisation is triggered by 'learning-by-doing'.
- Combination is triggered by networking;

Organisational knowledge creation is thus seen as a continuous and dynamic interaction between tacit and explicit knowledge, which Nonaka and Takeuchi describe as a knowledge spiral.

The above references to 'meaningful dialogue' and 'collective reflection' are a far cry from knowledge management models based on the management of corporate digital information. They represent a shift in emphasis to a model of knowledge management that is concerned with the sensitive management of social relations (Swan and Scarborough 2001), where knowledge is intrinsically linked to the social and learning processes within an organisation (McAdam and Reid 2001). The key to understanding

such processes, it is argued, is the concept of ‘community of practice’ (Bate and Robert 2002).

The term ‘community of practice’ was first coined by Wenger and Lave in 1991 (Bate and Robert 2002). Communities of practice are defined as ‘collections of individuals bound by informal relationships who share a similar work role in a common context’ (Gamble and Blackwell 2001, p 80). More specifically they are characterised as communities where:

‘people share their experiences and knowledge in free-flowing creative ways so as to foster new approaches to problem solving and improvement, help drive strategy, transfer best practice, develop professional skills and help companies recruit and retain staff’ (Bate and Robert 2002, p 652).

In much of the knowledge management literature, communities of practice are presented as yet another tool that companies can use to foster social capital (the ability of individuals and groups to collaborate together), which in turn contributes to the development of intellectual capital (Gamble and Blackwell 2001). Communities of practice thus need to be identified and enabled to work more effectively so that knowledge generation and transfer can be optimised. Within the prescriptive literature, recommendations for fostering communities of practice typically involve the measures set out in Box 8.

Box 8: Fostering communities of practice

- Identify communities of practice
- Provide opportunities to meet face to face
- Provide tools that enable communities of practice to identify new members and main contact with existing members
- Identify key experts within communities of practice
- Measure results

Source: Prusak and Lesser 1999, cited in Gamble and Blackwell (2001)

The concept of communities of practice is also associated with approaches to organisational knowledge that emphasise its socially constructed nature (Newell et al 2001). Thus communities of practice are central to understanding the ways in which practitioners engage in a process of constructing meaning:

‘By changing our perspective to one in which knowledge is socially constructed, we move our focus from exploring an individual’s knowledge as an asset to be potentially transferred, to exploring collective knowledge, which is situated and context-specific. In a community of practice, knowledge is constructed as individuals share ideas through collaborative mechanisms such as narration and joint work. Within such communities shared means for interpreting complex activity are thus constructed, often out of conflicting and confusing data. It is this process of constructing meaning that provides organisational members with

identity and cohesion.’ (Newell et al 2001, quoted in Bate and Robert 2002, p 654).

This conceptualisation presents a very different approach to the problem of understanding organisational knowledge, one that is highly sceptical about the possibility of ‘managing’ knowledge (Swan and Scarborough 2001) – an issue we explore further in the next section.

Ways of seeing

The knowledge management literature draws upon a wide range of disciplines and schools of thought, each with its own concerns. For example, intellectual capital is conceptualised differently by numerous disciplines:

‘Accountants are interested in how to measure it on the balance sheet, information technologists want to codify it on systems, sociologists want to balance power with it, psychologists want to develop minds because of it, human resource managers want to calculate an ROI on it, and training and development officers want to make sure they can build it.’ (Bontis 2000, p 376).

Despite this diversity, certain disciplines have dominated in making contributions to the knowledge management literature:

- *Information science/information technology.* A literature review by Scarborough et al (1999) found that 70% of the 184 articles they identified on knowledge management in 1998 appeared in the IS/IT literatures. This perspective has been particularly important in the development of knowledge push approaches to knowledge management.
- *Business strategy.* Knowledge management came to the fore due to the growing emphasis within the business strategy literature on the importance of knowledge as part of a resource-based view of the firm. This perspective thus focuses on how intellectual capital can be enhanced and exploited.
- *Cognitive science.* This disciplinary base has been influential in shaping thinking about different forms of knowledge and how knowledge is transformed from one form to another.
- *Human resource management.* An HR understanding underpins much of the thinking within knowledge pull approaches to knowledge management.
- *Organisational behaviour and change management.* As emphasis shifts towards implementing knowledge and managing changes within organisations, so to does the extent to which the knowledge management literature draws upon thinking from the OB/organisational change literature.
- *Social anthropology.* As interest has grown in mapping social relations and communities of practice, anthropologists have increasingly taken to conducting ethnographic studies of organisations to identify informal networks and ‘thought communities’ (Lesser et al 2000; Bate and Robert 2001).

Much of the literature on knowledge management since the mid-1990s appears to have been based on the view of knowledge as an economic resource (Swan and Scarborough

2001). Thus the concern of the greater part of the knowledge management literature is not on whether knowledge and knowledge work can or should be managed, but how this is best achieved. The view has been that if knowledge is the problem then management is the answer (Fuller 2001)

As we have seen, knowledge push and knowledge pull approaches adopt different ways of thinking about knowledge but both tend to be rooted in a cognitive epistemology (Venzin et al 1998). This views knowledge as a fixed and represented entity, which is developed through the assimilation and dissemination of incoming information. The resulting key task for knowledge management is to raise the representational capacity of the organisation – transforming tacit knowledge to explicit knowledge.

An alternative epistemology – one that emphasises the subjective, local and emergent nature of knowledge – is also found within the more critical knowledge management literature. It argues that knowledge cannot be separated from action, and hence it seeks to break down the Cartesian separation between knowing subject and knowable object that has underpinned much of the knowledge management literature (Swan and Scarborough 2001). Knowledge is thus ‘situated action’ (Tsoukas and Vladimirou 2001) which occurs within local networks and communities of practice. There are questions about where there is a role for knowledge ‘management’ within such an epistemology: in this view, it might be seen as, at best, about facilitating and developing communities of practice (Bate and Robert 2002). Tsoukas and Vladimirou (2001) argue that the effectiveness of knowledge management involves making this activity a reflective practice. Thus knowledge management is seen as:

‘the dynamic process of turning an unreflective practice into a reflective one by elucidating the rules guiding the activities of the practice, by helping give a particular shape to collective understandings, and by facilitating the emergence of heuristic knowledge’. (Swan and Scarborough 2001, p 918).

Key findings from KM research

Research in the knowledge management field is still in its infancy and good empirical evidence to support the claims that are made is often lacking (Zack 1999). Many of the books on knowledge management have been described as ‘little more than extended sales pitches for the authors’ consulting practices’ (Empson 1999 p 67). There is, however, a growing body of empirical work, albeit much of it descriptive, most of which uses case studies as well as conceptual arguments to support the points which are made (Gallupe 2001).

There is some evaluative work, which seeks to measure the success or otherwise of knowledge management strategies (e.g. Kluge et al 2001). Most of this work is based on cross-sectional analysis. Published financial and other data is used to assess organisational performance, surveys are used to identify the knowledge management practices used by the same organisations, and correlation analysis is used to assess whether high performing organisations use different knowledge management approaches to those who perform less well.

Other evaluative research is focused on the development of metrics for measuring knowledge stocks and the value produced or created by these stocks (Bassi and van Buren 2000). The aim is to be able to compare measurements before and after an intervention in order to assess its effectiveness. A section of the literature argues strongly that the development of such metrics is crucial:

‘Without metrics, knowledge cannot be produced....Without measures, we turn knowledge management into a metaphysical exercise with little actionable value to anyone’ (Swanstrom 2000, p 313).

Others doubt the value of measurement or are sceptical about the value of generic measurement models:

‘It is certainly possible to identify metrics ... The best known of these was developed by financial services group Skandia, but there are some doubts as to whether it provides a generally portable model’ (Gamble and Blackwell 2001, p 203).

Some of the evaluative research has adopted an action research approach (Fennessy 2001). Within this research the evaluative component tends to rely on participants’ views of whether knowledge management has improved as a result of the changes that were introduced. Our review came across only one study that adopted a controlled experimental research design for assessing the effectiveness of a knowledge management system (Davenport and Glaser 2002). In this example, effectiveness was measured in terms of changes in organisational performance (number of medical errors).

Most of the empirical studies focus on the private sector. There is almost no mention of the public sector in much of the literature (Bate and Robert 2002), although there is a small but significant literature on the development of knowledge management systems in health care organisations (e.g. Bate and Robert 2002; Davenport and Glaser 2002; Fennessy 2001).

To draw out the main findings to date from this research and to summarise the key messages in the paper so far, we return to the five questions outlined in our initial overview of knowledge management research.

1. Can we distinguish between different types of knowledge and what implications does this have for knowledge management strategies? It is possible to identify different types of knowledge and various knowledge management tools and practices have been associated with these (as shown, for example, in Box 7). However, the main message to emerge from the literature is that the key to knowledge management does not reside in segregating management practices according to knowledge type but in managing the relationship and interplay between knowledge types, particularly the continuous interplay between explicit and tacit knowledge.

2. What are the key processes and approaches involved in creating and using knowledge in organisations? Can these be blended or do they contain largely irreconcilable

tensions? We have already distinguished between knowledge push and knowledge pull approaches, between codification and collaboration models, and between managing knowledge as an object and managing knowledge as a process. The fourfold framework outlined in Box 9 provides a further set of distinctions. It highlights on one axis the relative emphasis placed on the organisation as opposed to the individual and on the other whether knowledge management is imposed or seeks to empower. The four resulting approaches to knowledge management are described as:

- Prescribed – a formal approach to knowledge and knowledge management at the organisational level, where technology is likely to be employed to capture, store and protect knowledge
- Compliance – where individuals are required to engage in knowledge activities through contract and regulation
- Adaptive – which engages with the informal knowledge within the social fabric of the organisation through communities of practice and the self-management of teams
 - Self-determination – which encourages individuals to take responsibility for their contribution to learning through both knowledge creation and knowledge sharing (Armistead and Meakin 2002, p 52).

Box 9: A fourfold framework of knowledge management

	Imposed	Empowered
Organisation	Prescribed	Adaptive
Individual	Compliance	Self-determination

Source: Armistead and Meakin 2002, p 51

As might be anticipated much of the literature argues that what is required is a judicious blend of all of these approaches (e.g. Hildebrand 1999). However, the evidence to support this as a strategy, or to suggest what sort of blend should be employed, is rather sketchy and based largely on anecdote. In fact, survey evidence tends to suggest that, in practice, organisations find it difficult to blend different approaches (Kluge et al 2001). Research that mapped the knowledge management approaches of seven organisations onto the four-fold framework (shown in Box 9) found that organisations tend to use more than one approach but that prescribed and compliance approaches seem to be dominant (Armistead and Meakins 2002). The conclusions drawn from that research were that the reason why it does not seem possible to have an overall strategy that balances each of the four approaches is that there are key trade-offs between:

- An imposed or an empowered approach;
- Focusing on the individual or the organisation;
- A concern with explicit or tacit knowledge;
- Technological or people solutions.

Such conclusions are echoed by Hansen et al (1999) who reviewed the knowledge management practices of consulting firms and found that they adopted either a codification approach (the construction of databases) or a personalisation approach (enabling person-to-person contact). While it may be tempting to go for a blend of these

two approaches, the authors argue that it is necessary to make a choice. They claim that it is only possible for the approaches to coexist in a corporation where business units operate like stand-alone companies. Furthermore, they argue that the choice between these two strategies is far from arbitrary – it depends on a number of factors:

- The extent of provision of standardised services and products: the more standardised, the more appropriate is a codification strategy; the more that services and products are bespoke the more that personalisation may be effective.
- The extent to which services and products are mature or innovative: for more mature service lines codification may be possible, whereas innovative services may need a personalisation approach.
- The extent to which an organisation relies on explicit or tacit knowledge to solve problems: the more that explicit knowledge is used, the more appropriate is codification; tacit knowledge is better communicated interpersonally.

The implications of this are that organisations might need to develop a variety of approaches depending on the nature of the knowledge that they wish to manage and the nature of the services or products to which that knowledge relates. Such contingent strategies may be difficult indeed to realise.

3. Is it possible to identify best practice(s) in knowledge management? The literature is full of recommendations about how to improve knowledge management but many of these recommendations are at best speculative. The practices most frequently mentioned in the knowledge management literature tend to be technology focused:

- The design and maintenance of knowledge databases to capture formal knowledge within the organisation;
- The creation of corporate ‘yellow pages’ to provide the means of identifying and contacting existing experts in the organisation who have worked on similar projects;
- The establishment of electronic discussion forums and chat rooms to provide a virtual environment within which people can meet and exchange information and knowledge.

Some other practices, which do not necessarily have a technological component, also feature strongly in the literature. Key amongst these are:

- Recognising and rewarding people for sharing and using knowledge;
- Working to identify and document good or even best practices within the organisations;
- Company conferences to enable people to meet face-to-face to exchange information and knowledge.

The effectiveness of rewards and incentive systems to encourage the sharing and use of knowledge has been questioned in an empirical study of barriers to the transfer of best practice within the firm (Szulanski 2003). This study was based on a statistical analysis of data collected from 122 transfers of 38 practices in 8 companies. It found that motivating employee to adopt best practices from elsewhere in the firm may help initiate knowledge transfer but that a highly motivated knowledge “recipient” can also

complicate the process of implementation. The main barriers to knowledge transfer identified by the study are:

- Causal ambiguity about the knowledge to be transferred - that is, the precise reasons for the success or failure of a practice cannot be determined;
- Lack of absorptive capacity of the knowledge recipient – that is, little prior knowledge which is related to the practice to be transferred;
- An arduous relationship between the knowledge source and the recipient – that is, lack of ease of communication, which is exasperated if the source and the recipient work in very different domains with different frames of reference and with no previous history of collaboration.

In recent years there have been a number of surveys aimed at identifying best practices in knowledge management (Hildebrand 1999, Heisig et al 2001, Kluge et al 2001). The survey by Kluge et al (2001) is probably the most systematic of these. It involved 40 leading companies in Europe, US and Japan. It was based on a prior literature review that identified a basic set of 139 knowledge management techniques. At least eight people in each company were asked about their use of these techniques. The financial and process performance of each company was also analysed and correlation techniques were used to see if certain types of knowledge management were associated with superior performance. This analysis focused on the top 15 and bottom 15 performers and it found that these two groups did indeed use different knowledge management techniques. One of these differences related to the extent to which companies used knowledge pull (encouraging employees to seek knowledge) as opposed to knowledge push strategies (trying to ensure that knowledge is pushed to the right place at the right time). The survey found a profusion of push approaches but also found that the top performing companies were using more knowledge pull techniques. These included setting ambitious targets that could not be reached single-handedly and the use of incentives associated with being seen to be drawing on external knowledge.

A danger of using surveys to search for best practice in knowledge management is that the approach assumes that successful knowledge management practices can be separated out from the context within which they work. Other studies conclude that success is far more contingent than this (Armistead and Meakins 2002, Hansen et al 1999). Nevertheless, there is a strong movement in both the US and Europe to benchmark best practice in knowledge management (Mertins et al 2001).

4. What do knowledge management practices imply for the design of key roles and responsibilities? There is debate within the literature about the importance or otherwise of creating new knowledge management roles, such as: chief knowledge officer, knowledge manager and knowledge worker. Some commentators (such as Bukowitz and Williams 1999; Fennessy 2001) argue that such roles are important in both co-ordinating knowledge management efforts and in ensuring that operational staff do not become overwhelmed by the demands of knowledge management systems. Bukowitz and Williams (1999) identify three main knowledge management roles: knowledge co-ordinator, knowledge manager and knowledge steward. Knowledge co-ordinators have high administration responsibilities but low content expertise while, at the other end of

the continuum, knowledge stewards have low administrative responsibilities but high content expertise. The key role for other commentators is the knowledge intermediary (probably formerly known as an information officer) who works with operational staff to capture local knowledge and access external knowledge, thereby limiting the demands placed on operational staff (Fennessy 2001). Yet other commentators argue against the whole idea of specialist posts, suggesting instead that all employees are knowledge workers and need to be considered as self-standing chief knowledge officers in their own right (e.g. Kluge et al 2001). In this latter scenario, the role of senior and middle managers is to lead by example.

The empirical evidence brought to bear to support any of the above conclusions is at best descriptive and often largely anecdotal. For example, advocacy of specialist posts seems to relate less to any empirical evidence than to consideration of the push/pull debate: whether the overall approach to knowledge management is hierarchical and based on knowledge push (emphasising the importance of specialist posts) or whether the approach is more collaborative and network based (in which case specialist posts have less of a role). Regardless of such arguments it appears as if specialist roles are becoming a more frequent feature of the organisational landscape (Allee 2000).

5. What are the main challenges for knowledge management, what are the barriers and enablers? Lists of challenges, barriers and enablers abound within the knowledge management literature. Many of these suggest that the main challenges are culture and people related, regardless of whether the knowledge management approach is based on 'push' or 'pull', or whether it emphasises codification or collaboration (Liebowitz 2000). The critical literature is, however, quick to point out that focusing on cultural factors runs the danger of ignoring the way in which knowledge work and knowledge management is intimately bound up with social and *politicised* systems of meaning (Swan and Scarborough 2001).

One strand of literature argues that the main challenge relates to doing rather than knowing (Pfeffer and Sutton 2000). The assertion is that employees and managers in organisations know much about how to improve organisational performance, yet they work in ways that they know will undermine performance. Based on multiple case study analysis, Pfeffer and Sutton argue that the knowing-doing gap is not a problem of individual psychology but is due more to organisational practices. Worryingly, they argue that typical knowledge management practices make the knowing-doing gap worse because they:

- Emphasise technology and the transfer of codified knowledge;
- Treat knowledge as a tangible thing – some thing that can be separated from the use of that thing;
- Do not recognise that formal systems cannot easily store or transfer tacit knowledge;
- Make people who do not understand the actual work being documented responsible for transferring and implementing knowledge;
- Focus on specific knowledge practices and ignore the importance of overall philosophy.

Pfeffer and Sutton (2000) go on to argue that addressing the knowing-doing gap requires action to overcome the following main barriers:

- Talk as a substitute for actions;
- Memory as a substitute for thinking – doing what has always been done without reflecting;
- Fear which prevents people from acting on knowledge;
- Measurement which often obstructs good judgement;
- Internal competition, which turns friends into enemies.

These present a tall order for any organisation intent on improving its management of knowledge so that what employees and managers know is translated into action.

Implications and applications of ideas from knowledge management

There are clear parallels between knowledge management and RU/ EBPP implementation. So much so that the latter has been referred to as a form of knowledge management: ‘providing information to support evidence based practice is an example of knowledge management’ (Fennessy 2001, p 4). This review endorses such a view, highlighting many implications from the knowledge management literature to better inform strategies aimed at increasing research uptake and impact.

Many of the activities within RU/ EBPP are based on a knowledge push model, for example, dissemination efforts, creation of on-line databases of studies, and the synthesis of explicit knowledge in the form of systematic reviews. Where service delivery is concerned with standardised and mature services or products, which rely on the successful application of explicit knowledge, knowledge push and codification approaches may work well (for example, the decision support system reported by Davenport and Glaser (2002)). However, the knowledge management literature increasingly points to the limitations of such an approach, with its reliance on linear models of knowledge generation, validation and use, and argues instead for the need to devote more attention towards developing knowledge pull. Thus, the creation of databases, research syntheses and prescriptions for practice may be necessary but is probably not sufficient for effective knowledge sharing and use.

A focus on knowledge pull shifts attention away from the knowledge itself and towards the recipients and intended users of that knowledge. Thus there is increasing interest being shown in collaborative approaches to knowledge management, based on the argument that networks are superior to hierarchies in enabling knowledge generation, validation and transfer. Such an approach emphasises the importance of identifying existing communities of practice, supporting and building upon these networks, and encouraging the development of reflective practice. The relevance of these ideas for RU/ EBPP is now receiving attention. For example, the paper by Bate and Robert (2002) uses the knowledge management literature on communities of practice to critique the current approach to developing and managing collaboratives in the NHS. It recommends that in future the emphasis in collaboratives should shift from:

- Information to knowledge;
- Knowledge application to knowledge generation;
- Explicit evidence to tacit experience;
- Contrived network to community of practice.

Other research, on two multi-agency communities of practice, found that personal knowledge and experiences are the main influences on collective decision making, even when relevant research evidence is brought to the attention of participants (Gabbay et al 2003). This suggests that communities of practice do not offer a panacea for the development of RU/ EBPP; they do not, necessarily increase the pull for research-based knowledge or its use. There is, therefore, a need to develop a clearer understanding of the processes of collective sense making, in order to understand how to encourage the more systematic use of relevant knowledge in collective decision making. Furthermore, if, as initial research seems to suggest, it is important to focus attention on naturally occurring communities of practice rather than contrived networks, the identification of these may not be at all straightforward.

One of the major unresolved issues for knowledge management has important implications for RU/ EBPP. That central issue is: *can different approaches be blended and if so what should that blend be?* It is tempting to argue that RU/EBPP should use a judicious mix of push and pull approaches, of approaches that support codification where possible and collaboration as both a means and as an end in itself. However, there is enough doubt shed on this as a strategy by the knowledge management literature to suggest that caution is appropriate. At the very least a contingent approach will be needed, with strategies varying in emphasis as a function of both knowledge type and service context. This is therefore an area where more research is required, research that looks at a broad range of organisations, including public service delivery organisations.

At a more conceptual level, the knowledge management literature, and particularly the work by Nonaka and Takeuchi (1995) can help us understand the different knowledge conversion/combination challenges facing RU/ EBPP:

- *Converting formal knowledge to tacit knowledge* in the process of application – a process that Nonaka and Takeuchi described as ‘internalisation’, and one that they argue is triggered by ‘learning-by –doing’. This seems to be particularly important as part of the translation of research knowledge into new individual practice routines.
- *Converting tacit knowledge to formal knowledge* in the process of knowledge generation and application – a process that Nonaka and Takeuchi describe as ‘externalisation’ triggered by dialogue and collective reflection. This is particularly important as part of the research process itself. In addition, as there are formal knowledge gaps (particularly in relation to how new knowledge fits with the local context) it is important to supplement formal knowledge with local, often tacit understandings. These local understandings may then themselves be converted to explicit knowledge as part of the process of tapping into them.
- *Converting individual tacit knowledge to group tacit knowledge* in the process of knowledge sharing – what Nonaka and Takeuchi refer to as socialisation triggered

- by building a field of interaction (for example, enabling the development of a community of practice).
- *Combining separate explicit knowledge in the process of new knowledge creation* – Nonaka and Takeuchi refer to this as ‘combination’ and argue that it is triggered by networking. The implications of this for the research review process are important. It suggests that reviews (including systematic reviews) should be undertaken as part of a network activity rather than in isolation by a few solitary experts.

The potential application of knowledge management ideas to RU/EBPP is therefore wide-ranging at both conceptual and practical levels. Certainly the language of knowledge management has been appropriated by EBPP advocates: many government departments and public bodies are now developing knowledge management strategies (e.g. the Cabinet Office, the Home Office and the Social Care Institute for Excellence). There is a danger however that, in their ‘first flush’, these knowledge management strategies will focus on knowledge push approaches because knowledge push is relatively easy (Kluge et al 2001).

Research studies that have considered the application of knowledge management ideas to RU/EBPP implementation are much thinner on the ground than might be expected from the conceptual developments and rhetoric outlined above (although no doubt more studies are in the pipeline). While there have been empirical papers, particularly in health care, knowledge management as a means of RU/EBPP implementation has, ironically, not yet itself developed a substantial and robust empirical base. Studies have however looked at the application of knowledge push technology, including several that have examined the application of expert and decision support systems. While early application of expert systems experienced some problems, recent evidence (e.g. Davenport and Glaser 2002) is more encouraging. Davenport and Glaser argue that it is possible to ‘bake knowledge’ into the work processes of ‘high-end professionals’ like physicians. They argue that you need the right information and good IT people, an organisational culture of measurement, and that you need to leave the final decision to the experts (it must always be possible to over-ride the system). The conclusion from their study is that such systems are best suited to fields with low levels of ambiguity, a well-established external knowledge base, and a relatively low number of possible choices facing decision makers.

Other research work has explored the relevance of communities of practice (Bate and Robert 2002; Gabbay et al 2003) and the role of intermediaries as knowledge workers (Fennessy 2001) for understanding EBP (all of these studies were again developed in the health care arena, although Gabbay et al consider the health and social services interface). While there are other studies outwith the healthcare field that have looked at communities of practice (e.g. Bell 2001 on the proceeds of crime community), these have tended not to relate the concept to understanding RU/EBP implementation.

This incongruence – between the obvious applicability of many of the ideas in knowledge management to RU/EBP implementation, and the apparent dearth of empirical work in

the area – creates some clear research opportunities. Alavi and Leidner (2001) have developed a clear research agenda for knowledge management (aiming to understand processes of knowledge creation, storage and retrieval, transfer, and application - see Box 10). While many of these concerns are clearly germane to the RU/EBP implementation agenda, their focus on mainstream knowledge management rather neglects a view that takes as its starting point the socially construction of meaning. Thus any research programme aimed at underpinning RU/EBP implementation would need to explore these ideas also.

Box 10: A research agenda for knowledge management

Research questions concerning knowledge creation: what conditions facilitate knowledge creation in organisations?

- a) Do certain organisational cultures foster knowledge creation?
- b) Can IT enhance knowledge creation?
- c) How is knowledge originating from outside a unit evaluated for internal use?
- d) Does the lack of a shared context inhibit the adoption of knowledge originating from outside a unit?

Research questions concerning knowledge storage and retrieval: what incentives are effective in encouraging knowledge contribution and sharing in organisations?

- a) How much context needs to be included in knowledge storage to ensure effective interpretation and application?
- b) Is stored knowledge accessed and applied by individuals who do not know the originator of the knowledge?
- c) What retrieval mechanisms are most effective in enabling knowledge retrieval?

Research questions concerning knowledge transfer: how can knowledge be effectively transferred among organisational units?

- a) To what degree does the application of IT to knowledge transfer increase the transfer of knowledge among individuals within a group and between groups?
- b) What organisational and technical strategies are effective in facilitating knowledge transfer?
- c) What social, cultural, or technical attributes of organisational settings encourage knowledge transfer by balancing push and pull approaches?
- d) Does the application of IT to knowledge transfer inadvertently discourage external searches for knowledge?

Research questions concerning knowledge application: how can an organisation encourage application of knowledge that is made available?

What factors contribute to the knowing-doing gap in organisations and how can these be reduced or eliminated?

What organisational practices can help bridge the knowledge application gap?

Source: Alavi and Leidner (2001)

In conclusion then, while there remains much to do in terms of rooting the ideas of knowledge management and their application to RU/EBP implementation in a solid empirical body of evidence, the review of progress to date suggests that this would indeed be a worthwhile enterprise. The concepts and insights from knowledge management provide useful building blocks for further unpacking of the dynamics of evidence use in day-to-day service delivery.

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