The last chapter of this volume, as is appropriate, brings together the previous chapters, summarising and integrating them before examining the challenges that face KM practice and research. Drawing on lessons articulated in this volume, and in reference to the Interim Australian Standard for KM (AS5037), the chapter will address the practical issues of why and how managers need to support knowledge enabling and mobilisation in their organisations. By identifying “proven” critical steps, key factors and possible alternative paths, the chapter will put, into the hands of managers, practical tools that can help them unleash the power of knowledge in their organisations. This chapter will also suggest a plausible research agenda for future investigation as it evolves into a mature dynamic discipline with sound methods and tools.
Introduction

The field of knowledge management is popular but relatively immature and prone to misconceptions and misappropriation. While the movement is currently fashionable, and therefore highly visible, there is a danger that the hype surrounding KM may kill off the field as a fad. As we see them, the major challenges for KM lie in:

- bridging the gap between theory and practice, and thereby providing well-established KM strategies, tools and procedures for managers, and

- achieving an objective picture of the field based on formal and sound research which integrates many of the diverse perspectives of researchers and practitioners described in the various chapters of this volume.

The former, practice-oriented challenge has been taken up by Standards Australia who has released an Interim Australian KM Standard as a “work in progress”, directed principally at managers and KM practitioners. The Interim Standard (AS5037) recognises the broad scope of KM with its strong link to culture from a workplace point of view and from a wider societal context. It promotes the view that managing knowledge is critical to success not only in workplace settings but also for many community groupings and for individual growth and learning. The committee chosen to establish the Standard followed an interesting path. Originally they intended that the standard, as an extension of the framework in the Standard's KM Handbook KM (HB275-2000), would be a definitive depiction of the KM area. Instead the Interim Standard (AS5037) is built around a specific model for understanding, developing and implementing knowledge management. As stated in the Preface:

“The Interim Standard is an informative document only. Due to the nature of knowledge management, the Committee considered that a prescriptive or normative standard is inappropriate.”
The objectives of the Interim Standard are to:

i. describe the key concepts of knowledge management,

ii. provide a model for exploring how different aspects of knowledge management can be used to help an organisation achieve its strategy; and

iii. reflect emerging practices in knowledge management

The model presented in the Interim Standard will be briefly explained later in this chapter.

Many of the authors contributing to this volume are actively engaged in the second, research-oriented challenge and some of their work has been referenced in the relevant chapters. It has become quite clear that KM is a very complex and multifaceted phenomenon. This realisation is well reflected in a variety of topics, methods and approaches represented in research and practice of the field.

**Achieving an objective picture of KM: Lessons learnt**

It has become clear that knowledge management is here to stay although its form, content and processes may vary. As discussed in chapter 2, its importance has been widely recognised, and it can be expected that, at some point of time, it will become an integral part of the basic fabric of every successful business. This is supported by a great deal of practical interest, as well as formal research in the area apparent from the incidents of panels, conferences and publications on the topic. Articles presented in this volume have dealt with some major KM issues. The following section will attempt to summarise what we have learnt from them so far.

**Knowledge Management Foundations**

The overview of existing conceptual developments in knowledge management presented in the volume suggests that the field is still evolving towards greater integration and more
holistic approaches (chapter 1). The most recent knowledge management literature suggests that we are entering the third generation of knowledge management. The new generation of thoughts is beginning to replace our current focus on tacit-explicit knowledge conversion (SECI model), and our earlier emphasis on efficient provision of knowledge (BPR initiatives). It also brings a new simplicity based on advances in understanding the nature of knowledge. In particular, the third age of knowledge management embraces the paradoxical nature of knowledge as both a thing and a flow, and looks for it in new and different ways. Most importantly, it recognises the need to manage not only the content, but also the narrative and the context of knowledge (Snowden, 2002).

**Content Management**

There are various taxonomies that classify knowledge content. Popular categorisations recognise object/flow, explicit/tacit, individual/collective or descriptive/procedural dichotomies. The most recent addition is Snowden’s (2002) classification of known, knowable, complex and chaos. One of the key propositions emerging out of the volume with respect to content management is that the known content is best managed by including evidence-based, proven best practices (chapter 8). Business processes can be used as a good source of the knowable (chapter 6). It is the domain of good practice where knowledge models can be developed given the resources, capability and time. Complex content can be best understood and managed in terms of patterns (chapter 7) where patterns are defined as emergent properties of the interaction of various agents. Chaos represents the realm of the completely unknown and uncharted. For managing chaos one requires creative and innovative ideas that would impose new order (chapter 3).

**Narrative Management**

The nature of knowledge content is key to understanding the narrative management. The choice of the most suitable narrative (process, strategy or activity) to deliver knowledge content is
highly contingent upon the nature of that content. Cataloguing and describing legitimate best practices is the best way of conveying what is known. Case studies have been suggested as a highly useful and relevant means of knowledge transfer when a complicated situation or process is being explained (Remenyi et al., 2002). Hence, the abundance of cases present in this volume. As a general rule, the less abstract and the more illustrative the description of complexity, the greater the audience’s understanding. With respect to knowable, organisations usually need to study past events and business processes to learn which components of various complicated systems and their relationships are important, and use what they discover to create predictive and prescriptive models for future (chapter 6).

While the issues of conveyance surrounding complicated, but known and knowable content, are reasonably well understood, this is not true for the domains of complex and chaos. Most humans make decisions on the basis of perceived patterns, so perceiving and making sense of patterns is the key for managing complexity (chapter 4). Visualisation appears to be a useful vehicle to explore emerging patterns (chapter 7). However, in the realm of chaos, the only way to learn is to create, to break down old patterns and form new ones. The creative stimulus of chaos can, through brainstorming, for example, produce new capabilities in the ecology (chapter 3).

**Context Management**

Our research in knowledge management departs from the earlier held universalistic perspective by confirming that the effectiveness of a knowledge narrative (process, strategy or activity) depends on the knowledge context. A number of researchers before us have addressed the question of fundamental conditions for knowledge development (Nonaka and Konno, 1998; Becerra-Fernandez and Sabherwal, 2001). The latest position is that a bureaucratic context is good as a training environment, communities of practice encourage knowledge exchange through socialisation, informal contexts
Continuing the Knowledge Management Journey

use stories and symbols to provide shared understanding, while innovative contexts require action and risk taking to impose order on chaos (Snowden, 2002).

This volume has identified two broad groups of socio-technological factors that act as major knowledge catalysts that enable or facilitate knowledge processes and thus contribute to knowledge output. The primary role of interventions with respect to organisational structure, culture and leadership, is seen in creating an organisational environment conducive to knowledge development (chapter 9).

Technological solutions are perceived as an important facilitating tool for knowledge sharing, representation and transformation, as well as improving people’s ability to acquire knowledge (chapter 10). The socio-technical knowledge management approach presented in chapter 9 and the communities of practice described in chapter 5 can help people find the nature of various phenomena of interest and discover their inter-relationships. The KM systems (summarised in chapter 10) shows that there are a variety of tools that support different forms of knowledge creation in organisations.

**Knowledge Management Impact**

One of the most important lessons learnt is that KM produces the true added value only when knowledge is applied to marketable products and services. According to Goethe “Knowledge is no good if you don’t apply it”. Such applications can take many different forms. Articles in this volume illustrated some innovative arenas where such knowledge application can take place (chapter 12, 13 and 14), and how its impact can be evaluated and measured (chapter 11).

In summary, what we have learnt and presented here can provide a valuable source of ideas for practical knowledge management, and directions for developing a future research agenda. In most applied, technology-related disciplines, there is debate as to which comes first, research or practice. Does
research inform practice or does practice drive research, resulting in general theories and frameworks?

In KM, the case can be made for both sides of the debate. It has emerged in a era when there is increased complexity and risk in organisations corresponding to increased rates of change due to environmental, social and economic pressures, the globalising effects of technology, new structures and relationships both within and between organisations. KM stimulates a re-evaluation of the way things are done and is appropriate for all types of organisations from nations to small business, for public and private companies, for government and non-government service agencies, for traditional business and not-for-profit organisations.

These two aspects, practice and research, will be addressed respectively in the next sections three and four of the chapter, with an understanding that each drives, and learns from, the other.

**Practical Guidelines for KM Initiatives**

There are organisations and consultants who have been practicing KM for some time, have identified KM solutions that work for them. Some are providing case studies to be analysed by researchers while others are keeping them as their own intellectual property to commercialise. There are many managers who can see that KM is important but who are perplexed by the bewildering array of available KM solutions. They see KM as controversial, hard to pin down and meaning different things to different people. These managers are seeking guidance on KM issues and answers to questions of when, where, how and why to become involved in KM initiatives. The output of KM research should be providing some of these answers, so could practice and also standardising bodies, as shown in the three following models. These could then be amalgamated into methodologies as will be outlined in the concluding part of this section of the chapter.
Based on their observations from practice, Von Krogh et al. (2000) developed a sequential evolutionary model (Figure 16.1) of company development in KM, that includes 3 steps. In step 1 most companies try to locate and capture valuable company knowledge. Then, in step 2, they try to make use of what they have easily accessible and find new uses for existing knowledge. Finally, in step 3, they realise that the knowledge they have is not sufficient for creating a knowledge-based business and focus on enabling of new knowledge creation for innovation.

Figure 16.1 Evolution Model from Van Krogh et al. (2000)
A Cylcical Model of KM Development

In contrast, Arthur Andersen’s (1999) proposed a more parallel and cyclical development approach (Figure 16.2). Their model of KM implementation includes 7 stages: awareness, strategy, design, prototype-pilot, implement, evaluate-maintain. Awareness involves educating clients about KM, assessing current KM, identifying KM problems and getting commitment from key decision makers; Strategy is concerned with implementation plan including identifying communities of practice, their knowledge needs and developing value proposition. Design involves development of knowledge blueprint and supporting environment and infrastructure. Prototype-pilot step tests KM solutions before they are implemented throughout the organisation. In the final evaluate-maintain step KM solutions are assessed, and renewed in a repeated cycle.

The Arthur Andersen Approach

Figure 16.2 KM Methodology from AA (1999)
The Australian Interim Standard Model

As mentioned in the introduction to this chapter, the Australian Interim KM Standard (AS5037) is built around a specific model for knowledge management. This KM model is based on the principle that effective and relevant knowledge management must be aligned with the overall organisational strategy. The model incorporates five components:

- Strategy
- Organisational Capability and Culture
- Drivers
- Elements
- Enablers

The model is depicted graphically in Figure 16.3 and the explanation for this model is given in the Interim Standard as follows:

“The organisation’s capability and culture form the core of the model, given direction by the overall business strategy. An organisation’s strategy is usually articulated as goals or drivers (that which drives the organisation). Knowledge management must be aligned with organisational strategy, serve one or more drivers and contribute to the realisation of the organisation’s outcomes.”

Effective knowledge management must balance the four elements – people, process, technology and content – and again fit with organisational capability and culture. Therefore, the balance of the elements will depend on the particular organisation or group, which is the focus of a particular initiative. Finally, knowledge management is implemented through the selection of particular enablers. Enablers range from recognised disciplines that complement knowledge management, such as records management or quality management, to specific practices such as mentoring or tools such as electronic collaboration software.”
Figure 16.3 The Australian Interim Standard Model (AS 503)
The standard also suggests that the following are three key phases in developing and implementing knowledge management:

- Understanding the context for knowledge management
- Conducting a knowledge gap analysis
- Facilitating knowledge in action

However it is recognised that the phases do not form a linear process and that, while the phases do build on each other, they can be used flexibly or iteratively. The order and depth of each phase will depend on the nature and aims of the particular knowledge management initiative.

**Towards a KM Methodology.**

Some important messages from these different models are

i. that there is no “one size fits all” approach to KM,

ii. that while some KM initiatives may be a clearly defined project, other may be loosely connects set of activities aimed at changing the organisational culture and

iii. that KM is not an end in itself but rather a means for organisational improvement, growth and learning.

The success of any KM initiative is therefore determined by its impact on the organisation and a critical starting point for successful KM initiative is a clear knowledge management vision which is aligned with the overall business strategy represent. Together with an appropriate understanding of KM this will serve as a basis for designing and applying the most appropriate KM interventions that will achieve the right balance between developing new knowledge and utilising existing knowledge, to ensure the organisation’s long-term competitiveness and success. The following sections provide a set of recommended phases of a flexible integrated methodology for KM initiatives.
First Things First: Building KM Awareness

There is worldwide recognition of the importance of knowledge management with respect to the struggle for economic success in the new age economy. According to de Hoog et al (1999), the main benefit of the explosion in the interest in KM is the reinstating of knowledge as one of the most important production factors in advanced economies. Knowledge management is seen as central to process and product innovation and improvement, to executive decision making and to organisational adaptation and renewal.

However the popular and academic literature on knowledge management presents a confusing and incoherent picture of this new field of research and practice. Knowledge management concepts are often defined and understood vaguely, partially or narrowly. They also have different meanings and importance for different people. The danger is that the term KM may be misused to cover everything that goes on in organisations, as reinventions of previous management fads, or restricted to marketing hype associated with repackaged ICT applications.

The results of a recent Australian study (see chapter 15) are encouraging. They reveal a relatively similar and good understanding of the KM concept among Australian senior executives. The majority of 85% respondents defined knowledge management as being a business focussed approach comprising the collection of processes that govern the creation, dissemination and utilisation of knowledge to fulfil organisational objectives; 7% saw it as being about documents and databases; 6% as technological concept; and the remaining 2% as no visible process.

In order to avoid any danger of misconception and misunderstanding, our recommendation for the first step in successful KM journey in your organisation is:
This volume may be helpful in this regard and has been written to further develop a common understanding of the KM phenomena, including basic concepts, models and theoretical foundations, as well as empirical confirmation of these. Three different, but equally valid, approaches to concept development are applied in this volume. In Chapter 1 a top-down approach to KM concept development is used to search for an integrated framework of KM. In other chapters bottom-up approaches are represented by case studies in specific environments, and tool-centred approaches describe applications of specific KM tools. This breadth of coverage overcomes any shortcomings of each of the individual approaches (eg. lack of empirical evidence for the top-down integrated frameworks, the local context of case studies, and the specificity of tool-centred solutions). A balanced, integrated approach will also cater for the context of KM practice as is dealt with in the following section.

**Motives for KM Initiatives: KM in context.**

There may be many different motives for starting knowledge management initiatives in organisations. Based on Von Krogh's (2000) observations companies can be grouped into 3 broad categories: risk minimisers, efficiency seekers and innovators. The main difference between these three groups is in their focus on existing or new knowledge and on knowledge processes or content. In general, risk minimisers tend to implement KM initiatives around capturing and locating valuable company knowledge, efficiency-seekers tend to make maximum use of the existing knowledge through transferring and sharing practices, while innovators focus on new knowledge and processes necessary for enabling creativity for successful innovations.

The Australian survey (chapter 15) suggests that the Australian market seems to be less concerned with product
development and innovation than with responding to market needs more efficiently and more effectively than their competitors. Survival, success, efficiency and effectiveness were equally cited by the respondents. Increasing profit, product development and market activities were of less importance to respondents.

A list of challenges may include: limited access to outside knowledge, poor link with customers, vendors and alliances, poor understanding of changing business and industry dynamics, stagnating skills, inefficient development of new products and services, little organisational knowledge, breakthrough ideas not leveraged, available information is not used smartly (AA, 1999). Our strong recommendation is:

Step 2: Determine your organisation’s position, and consider carefully what is important and why, before undertaking any KM initiatives. At the same time determine the intended outcomes of your KM initiative, how will be monitored, and how you will verify that it has been worthwhile.

Chapter 2 of this volume examines a variety of different motives that may trigger readers’ own ideas and help them identify challenges they may wish to address through KM initiatives. Chapter 11 investigates what might constitute an appropriate set of methods or techniques for measuring aspects of KM practice and process.

**Knowledge Assets and Resources: the knowledge audit**

Every organisation houses valuable intellectual material. According to Sveiby (1997) it can been found in people, structures and processes and in customer relationships. Scandia Insurance is one of the leading companies in the world in Intellectual Capital accounts. Scandia’s Intellectual Capital consists of human capital (personal values, competencies, potential relationships, attitudes) and structural capital, which
includes customer capital (base, relationships, potential) and organisational capital (processes, culture, innovation assets). Scandia believes that their Intellectual Capital is at least as important as their financial capital in providing sustainable earnings.

Scandia measures human capital by using indices such as an empowerment index (motivation, support, awareness and competence), training expenses per employee, employee turnover, average years of service, education levels. Scandia’s structural capital is measured primarily in terms of its IT capacity and processing time. Scandia’s core business measures consist of a set of indicators including financial (return-based efficiency and effectiveness metrics), customer (satisfaction and unit growth), process (efficiency and outputs/savings per employee), development (return business and future growth) and human (employee loyalty, skills and competencies). All metrics are tied to the company’s strategic goals of generating value in financial and prudential services.

The advice given by Von Krogh et al. (2000) is to allocate substantial time to think carefully through the types of knowledge that you have in your business and where it resides. It is of outmost importance for designing the appropriate KM interventions to determine if the critical knowledge is tightly connected to the skills of people and deeply rooted in their years of experience, or if is kept in instructions, procedures, documents and databases. Otherwise, it is not possible to create the right ‘ba’.

From the point of view of the knowledge management cycle (De Hoog, 2000), taking an inventory of knowledge, with an analysis of its effectiveness towards organisational performance are prescribed steps before defining and planning necessary improvements. From our point of view, evaluating weak and strong points of knowledge issues in the organisational context in an overt fashion is a necessary step in successful KM implementation journey: Accordingly, our recommendation is:
Step 3: Take a stock of existing knowledge and where it resides, evaluate it to determine remaining gaps and changing needs using well-defined measurement system.

Knowledge, useful to your organisation, can reside in a variety of places, in people, in database systems, in documents, or on the Intranet to name a few, but is not always recognisable, available and applicable where it is needed. Frameworks, such as the ones presented in Chapter 9, are often useful tools for undertaking a knowledge audit in a systematic way.

According to the Australian Interim KM Standard (AS5037) this phase involves studying two related aspects: the current knowledge environment and what is desired or required. Both current knowledge and information holdings and the enablers that can support or hinder knowledge management initiatives should be examined. Supporting systems or elements that can affect knowledge management initiatives should also be investigated. An initiative can build on and integrate existing practices such as training, communications, records and information management. The aim of this phase is to measure the gap between the current situation and a desired situation as:

- what knowledge the organisation currently has
- what it is using,
- what knowledge it wants and
- what knowledge enablers are in place.

It should be noted that the concept of measuring knowledge, of at least knowledge assets and needs, is quite distinct from the process of measuring or evaluating in some way the outcomes of knowledge management initiatives (mentioned in section 4.4.2). It is generally agreed that it is not possible or desirable to measure knowledge management directly as it is never an end in itself. Rather the success of KM initiatives should be measured according to their impact on the performance of the organisation, although a clear relationship between a particular
KM activity and a specific aspect of organisational performance is often hard to determine.

**KM Solutions**

There are major differences among KM professionals in what constitutes useful knowledge and the ways in which it should be managed. A recent review (Baxter and Chua 1999) reveals that western theorists show central preoccupation with codified repositories and information processing as enablers of ‘explicit’ objective and systematic knowledge. Eastern theorists, on the other hand, focus more on ‘tacit’ knowledge that people derive from their experiences and through sharing.

Hansen et al. (1999) divided strategies for knowledge management into:

i. **Codification** - to systematise and store information that represents the knowledge of the company, and make this available for the people in the company, and

ii. **Personalisation** - to support the flow of information in a company by storing information about knowledge sources, like a “yellow pages” of who knows about what in a company. Hansen et al. argue that companies should focus on just one of these strategies.

We should add here that any one strategy may not fit all types of knowledge. In designing KM solutions, companies need to think carefully why they are needed. According to Von Krogh et al. (2000) risk-minimisers tend to use datawarehouses, yellow pages, expert systems and similar KM technologies for locating and capturing existing knowledge. Efficiency-seekers tend to use Internet, Intranet, groupware and work-group technologies to support transferring and sharing of best practices and experiences. Innovators tend to create an overall socio-technological context to enable new knowledge creation.

Technical solutions can help in structuring information and effectively retrieving documents. They may also help in connecting people and removing the geographic and time
barriers. However, technologies should not drive out the process of human interaction and relationship building.

McKinsey & Company is a global business consulting firm with 82 offices in 43 countries. The company has over 25 years of service in Greater China. Its reputation comes from a few basic ideals: the clients’ interest come first, be discreet, be honest, do not overextend yourself. McKinsey’s internal structure is supported by a collaborative culture reinforced by the fact that staff share part of the entire firm’s profit irrespective of what country they are employed in. The company is owned by partners which creates strong relationships and keeps the competence from leaving the firm. There is also emphasis on cultural socialisation. Partners are encouraged to move between client companies thereby sharing knowledge through personal relationships. Several policies are aimed at increasing competence of the firm and enabling knowledge flow from more to less senior people. The company recruits the top graduates, assigns them to teams with seniors and puts them through an up-or-out initiation. The company encourages knowledge flows by developing individual concepts, transferring tacit concepts and models that can be used by other staff, and sharing information on all projects. In terms of external structure the firm focuses on nurturing close relations with selected high image clients. The company also nurtures close relationships with universities because they recruit talent from them (Handzic, 2002).

We argue that all sources and forms of knowledge have to come into play to maximise business specific working knowledge. Therefore our recommendation for the next step in the KM journey is:

Step 4: Implement KM solutions that combine those processes, cultures and technologies that have the best potential to enhance knowledge and add value to your firm.
From the survey of selected practices presented in this volume, one may conclude that knowledge management represents one of the most significant management movements in the knowledge economy. If planned and implemented carefully in alignment with organisational objectives and core competencies, it may enable the release of the organisational knowledge resources that would bring the ultimate business success in the new economy.

**Themes, topics and methods for KM Research**

A recent literature review of knowledge, and knowledge management, indicates that these topics are popular in organisational theory, strategic management as well as information systems literature (Alavi and Leidner, 2001). The Australian Interim Standard (AS5037) identifies that a primary characteristic of knowledge management is its integration of other disciplines including:

- human resource management,
- communications,
- philosophy,
- business management,
- change management,
- information management
- information technology, and
- sociology.

Given this multidisciplinary basis of KM it is not surprising therefore that there are a variety of themes, and classification of topics and methods, proposed for KM research. Some of these will be discussed here.

**A socio-technical view**

The STAR group, specialising in socio-technical activity research in KM, recently identified the following four broad themes for KM
research in a nomination to the Federal government’s program “Developing National Research Priorities”:

- Knowledge Management at the corporate level to enable businesses to capitalise on their knowledge, learn, grow and innovate.

- Knowledge Management at the national level to enable diverse communities to communicate and capitalise on their collective knowledge.

- Facilitating multidisciplinary approaches to research, which will, lead rather than lag, technological innovation.

- Supporting the nation and its people with cradle to grave knowledge in context, and enculturating the acceptance and practice of life-long learning.

This group is funded by the federal government for a project entitled “Systems to support Knowledge Creation in Learning Organisations”. This project is an example of a socio-technical approach to KM which emphasise the integration between people and IT systems. It is investigating the capacity of IT to support knowledge creation for innovation in modern organisations. Prototypes of flexible computer-based systems are being iteratively developed and evaluated for their support of knowledge workers in three different industries. The study aims to determine how the systems can contribute to organisational learning, performance, and responsiveness to change. The outcomes will inform the designers of such systems and show Australian organisations how to gain competitive advantage by expanding their capacity to learn.

The group is also conducting research into multifaceted approaches to building the capacity for innovation through online communities of learning. Information and communication technologies can be integrated into social systems to support communities of learning, leading to innovation in areas of need. This project uses developmental research methods to investigate multifaceted, experiential, team-
based approaches to learning in online communities. It builds on the results of two pilot studies, where a flexible multifaceted approach, integrating face-to-face and online activities, was implemented for experiential learning, in professional education.

A Process Orientated Research Agenda

A list of process orientated KM themes of interest to Information Systems researchers is as follows: (Handzic and Jamieson, 2001)

- knowledge capture and storage
- knowledge discovery,
- knowledge sharing, and
- creativity and learning.

The following sections describe specific research issues and directions with respect to each individual theme.

Knowledge capture and storage

It is argued that the availability of environment-specific and organisation-specific knowledge as well as a variety of cause-effect relationships can play an important role in improving decision-making. The value of such knowledge may be seen primarily in its ability to explain past and anticipate future changes in the behaviour of the variable of interest, thus enabling the decision maker to deal more competently with his or her decision task. This is a convincing argument for suggesting that the availability of increased amounts of valid ‘explicit’ knowledge in codified organisational databases should increase an employee’s working knowledge base and consequently improve individual task performance. However, processing of increased amounts of task data is a cognitive task that induces higher demands on the mental resources of the person and increases the complexity of the problem. This in turn may affect the nature of knowledge acquisition, utilisation and performance. Some past empirical research casts serious doubts
in people’s ability to effectively turn data into knowledge (Handzic, 1997).

With modern technology generating a growing abundance of knowledge artifacts (e.g., Internet), it is of particular interest to examine whether, and how, their availability in computerised repositories may affect individual employees’ working knowledge, and what impact this may have on the quality of their subsequent performance. More specifically, research may look at alternative ways of representing knowledge in repositories to enhance its absorption by the user. It also may explore the issues of data quality, amount and diversity.

In summary, research is needed to address the following questions regarding knowledge capture and storage:

Question 1:
(i) What conditions are effective in encouraging knowledge contributions to knowledge stores?
(ii) What knowledge and context should be included in repositories?
(iii) How is stored knowledge utilised?

Knowledge discovery

In order to effectively manage their business, companies need to consider many avenues for accumulating knowledge about their customers, partners and competitors. The growing number of electronic transactions among organisations and their customers generate large volumes of electronic data that are becoming an increasingly important new source of organisational knowledge. Vast amounts of data accumulated in organisational databases may contain potentially valuable new knowledge. One of the main knowledge management issues is the discovery of knowledge that is implicit in the electronic transactions and utilisation of the extracted knowledge to support business tasks.
Knowledge discovery has been described as the nontrivial process of identifying, valid, novel, potentially useful and ultimately understandable patterns in data (Fayyad et al., 1996). Two main goals of knowledge discovery include: description and prediction. Description is concerned with identifying patterns for the purpose of presenting them to user in a form understandable by humans. In prediction oriented datamining, the patterns are being discovered for the purpose of predicting future values of some variables. If the discovered knowledge is going to be used for judgement and decision-making, the comprehensibility of the extracted pattern is considered to be crucial.

There are four major categories of KD approaches: classification, association, sequence and cluster (Marakas, 1999). Classification is intended to discover the rule that defines whether an item or event belongs to a particular class or set. Association analysis searches for a rule that correlates one set of events or items with another set of events or items. Sequence method is used to relate events in time. Through this analysis various hidden trends can be discovered that are often predictive of future trends. Clustering method groups a set of objects together by virtue of their similarity or proximity to each other. Some of the current research efforts in these areas include the use of intelligent agents and application of competitive intelligence (Bainning and Bui, 2000). An example would be the use of knowledge discovery for fraud auditing of electronic commerce systems (Lek et al, 2001).

Some important research questions concerning knowledge discovery are:

**Question 2:**

(i) What conditions are effective in encouraging knowledge discovery?
(ii) What retrieval mechanisms are most effective in enabling knowledge discovery?
Knowledge sharing

Western theorists generally view organisations as information processing machines. They show central preoccupation with hard and quantifiable 'explicit' knowledge embedded in organisational repositories as the only useful kind of knowledge (Baxter and Chua, 1999; Nonaka, 1998). Eastern theorists, on the other hand, focus more on 'tacit' knowledge that people derive from their own experience and through sharing (Nonaka and Takeuchi, 1995; Nonaka, 1998). The notable success of Japanese companies suggests that any company that wants to compete on knowledge should learn from their examples, and master techniques for creating and sharing tacit knowledge. Given that between 40% (AAOTE, 1998) and 90% (Hewson, 1999) of the needed knowledge in organisations is tacit, it is not surprising that there is currently a sense of urgency felt among knowledge management researchers to better understand how to tap the wealth of knowledge in people's heads.

Some authors suggest that new knowledge always begins with the individual, and that making personal knowledge available to others is the central activity of the knowledge-creating company (Nonaka and Takeuchi, 1995). The spiral knowledge model assumes that the process of sharing will result in the organisational amplification and exponential growth of working knowledge. Others propose that in order to build a knowledge organisation the first step should be to foster the environment conducive to individual learning, that is allow experimentation to gain experience, and second, to open up boundaries and stimulate exchange of ideas (Garvin, 1998). However, given the current infancy of the knowledge management research, there is little empirical evidence regarding the ways in which tacit knowledge is actually acquired and shared, and the impact it has on performance.
Future research may look at some of these questions:

**Question 3**
(i) How can knowledge be effectively shared amongst individuals or groups?
(ii) What organisational and technical strategies are effective in facilitating knowledge sharing?
(iii) What social, cultural or technical attributes of organisational settings encourage knowledge sharing?

**Creativity and learning**

Innovation is at the heart of the new economy. There is a widespread recognition in the knowledge management literature of the critical importance of creativity and innovation for organisational success in the changing environment (Drucker, 1985). However, while change is inevitable, our adaptive response may be a choice between development and decay. The evolutionary principle proposes that those who are innovative survive, while those who do not become extinct. It is therefore not surprising that surveys show that creativity and innovation are among the top priorities for senior executives in industry (BW, 1998).

Businesses’ need for innovation requires an appropriate response from education and training. Great ideas need creative thinking. Some theorists believe that creativity is reserved for the gifted. Others (including us) see creativity as a skill that can be learned (Ford, 1996). Therefore, future research may address the issue, by exploring theories, practices and technological solutions that may stimulate creative and innovative thinking.

New ways of conducting business also requires people with multi-disciplinary knowledge and skills. Education needs to develop new curricula and find more effective ways to transfer expert professional knowledge to junior sales and marketing professionals. Future research may look at new instructional
techniques and advanced technologies to support accelerated and more effective learning. Specific topics may include for example collaborative learning, multimedia systems, and mentoring and coaching schemes.

We argue that the main research questions concerning creativity and learning are:

**Question 4:**
(i) What conditions foster new knowledge creation?
(ii) What cultures and technologies are enablers and facilitators of knowledge creation processes?
(iii) How is new knowledge evaluated and adopted?

Chapters in this volume deal with other more specialised topics, which are part of the KM spectrum. Some of these are:

- Creative Idea Generation,
- A Sense-Making Theory of Knowledge in Organisations
- Knowledge and Business Process Models
- Knowledge Visualisation
- Knowledge Utilisation within Communities
- Cultural Factors in Organisational Learning
- Information Systems for Supporting Knowledge Work,
- Measuring the Benefits from Knowledge Management,
- Creating Value by Managing Knowledge,

**Research as KM**

The academic research process is itself one of KM where researchers engage in activities of seeking, using, creating and sharing knowledge. Therefore, not only should KM researchers approach KM as a topic of research, they should also adopt good
Continuing the Knowledge Management Journey

KM methods to improve their outcomes and set an example through their own practices. Some reasons why good KM practice should be applied to research as well as practice are:

- Knowledge is multidisciplinary; therefore effective management of knowledge mobilisation needs to be multidisciplinary.
- Research has become stove piped, even though there is now a frequently acknowledged blurring of borders between disciplines, and multidisciplinary approaches have been producing richer research outcomes.
- Electronic sources of information have circumvented the previous filtering and verification process performed by formal publishing requirements, so new forms of evaluating and verifying electronic information need to be perfected.
- There is a need for more Meta-knowledge, i.e. knowledge about knowledge
- Currently, there appears to be a lack of valuing knowledge acquisition and cultivating new knowledge, entrepreneurial activity and innovation in institutional and business settings.
- Social innovation lags behind technological innovation
- Although not always recognised, success in business and science depends heavily on social skills, which need to be developed for commercialisation of research findings.
- There is a need to seriously review the current emphases on competition and credentialing and the current demarcation of skills to create a more cooperative, sharing environment for learning.

**Research methods**

There is a widespread recognition in the KM community of the importance of suitable research methods for the discipline. Despite this, the question of which research methods are most
appropriate for knowledge management research still remains unanswered. This is because KM draws upon diverse research fields and disciplines that encompass different research traditions. There is also a lot of tension and misunderstanding between proponents of different paradigms.

Literature considers three broad research paradigms: positivist, interpretivist and critical. Each of these paradigms reflects a basic set of philosophical beliefs about the nature of the world and provides guidelines and principles concerning the way research is conducted (Cavana et al., 2001). Thus, positivist research uses deductive reasoning, beginning with a theoretical position and moving towards concrete empirical evidence, to identify a set of universal laws. Interpretivist research assumes that the reality is socially constructed, and is interested in understanding people’s perceptions. Critical research is action oriented towards change, and interested in empowering people to create a better world for themselves.

It is argued here that the use of a diverse set of research methods within knowledge management is a strength of the discipline. Different research methods may complement each other and focus on different aspects of a research problem, leading to a richer understanding of the research domain. Mingers (2001) calls this methodological pluralism. Research methods should be selected within a research program based on their suitability for answering particular research questions. For example, the choice of a laboratory experiment may be justified in terms of its superiority over other methods for hypothesis testing and determining causal relationships among factors of interest. The interpretivist research approach is of value for better understanding of some interpretation on the part of the researcher and their findings from rich and usually qualitative data. A constructive type of research, such as prototyping and systems development is of particular concern for the knowledge management systems design theory.

Through rigorous multi-method research such as that described above, both objectivity and generality in KM can be achieved. In particular, objectivity can be accomplished through
Continuing the Knowledge Management Journey

a range of controlled studies, which can reliably establish what works, and what doesn’t, and under what circumstances. Once a substantial collection of such studies have been accumulated, general concepts can be identified leading to integrated frameworks and models that can then be tested leading to proven practical applications.

Conclusions

From what we have learnt so far, Knowledge Management is too important a field of endeavour to be left to mature on its own. The chapters of this volume are an indication of concerted and rigorous efforts by researchers and practitioners that are currently driving the development of the field in Australia.

As recognised business assets, knowledge content, narrative and context all need to be carefully managed in order to preserve or create value for an organisation. For maximum effectiveness, KM initiatives also need to be integrated into the strategic management of an organisation. This can be achieved by building KM awareness, determining its intended outcomes, auditing and measuring knowledge assets and resources, and finally by implementing those KM solutions that have the best potential to enhance knowledge and add value to the organisation.

When knowledge is viewed as an essential component of innovation and learning, fertile environments need to be created and nurtured in which people can grow both as individuals and as communities of practice. In businesses, government and less formal or profit-oriented organisations, this can only be done though pioneering approaches and techniques that involve cultural, social and technical considerations.

This volume addresses the relationship between research and practice in KM where it should be remembered that the principal motive for KM research is to reliably inform KM practice. What has been described in this concluding chapter is a rigorous multi-method approach to KM practice, based on the research of the contributors to this volume, involving knowledge processes
in a socio-technical context. We believe that such an approach can help achieve objectivity and generality and alleviate the scepticism surrounding the practical value of academic research. Some readers of this volume may be inspired to undertake KM research on one of the topics described above. Alternatively they may find that they can apply some of the approaches, methods and processes described in practice.

If we are indeed, as Snowden (2002) suggests, entering the third generation of knowledge management, it is appropriate to look back at what we have learnt so far and to look forward to where we might go. This chapter firstly summarises some key propositions articulated earlier in this volume. Then, it addresses the practical issues of why and how managers need to support knowledge enabling in their organisations. By identifying “proven” critical steps, key factors and possible alternative paths, the chapter puts, into the hands of managers, practical tools that can help them unleash the power of knowledge in their organisations. Finally, recognising that “we are the result of what we have been doing in the past, but our future will be the result of what we are doing right now”, the chapter suggests a plausible research agenda for immediate investigation.

References

AA (1999) Conference presentation


HB275-2000 Knowledge Management: A framework for succeeding in the knowledge era, Standards Australia.


...


