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**CHAPTER 1**

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**The Rise of Knowledge Management:  
In Pursuit of Excellence**

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Necessity is the mother of all inventions  
— Proverb

*This chapter provides an overarching introduction to the field of knowledge management (KM). It examines the emerging context and rationale for KM, the implications and benefits of KM for organisations, and the current understanding of the KM concept itself. The aim is to provide a broad theoretical basis for exploring the role of technology in KM and to set the scene for the remaining chapters of the book.*

## 1.1 Introduction

The growing interest in knowledge management has been fuelled by a number of development trends: globalisation with the increasing intensity of competition; virtualisation or digitalisation enabled by advances in information and communication technology; and the transformation to knowledge based economy together with changing organisational structures, new worker profiles, preferences and predispositions (Raich 2000; Hall, 2003). This new emerging world is variously referred to as third wave, information age, knowledge-based or knowledge economy or society. Regardless of the terminology, these names, and others, refer to the transition that is taking place in the business environment.

As organisations move towards becoming more knowledge-based, their business success will increasingly depend on how successful knowledge workers are at developing and applying knowledge productively and efficiently. The ability to identify and leverage key knowledge plays a critical role in organisational survival and advancement. Consequently, the companies are facing the need to improve the management of their knowledge.

The knowledge economy demands that organisations integrate their activities, processes and systems in order to exploit their resources more efficiently and subsequently gain economies of scope and access to and from new markets (Burnes, 2000). Those organisations that are unable to change or choose not to adapt in a timely manner are likely to become vulnerable and unable to compete in the future.

The basic assumption of KM is that organisations that manage organisational and individual knowledge better will deal more successfully with the challenges of the new business environment. More specifically, knowledge management is considered to be central to achieving process and product improvement, executive decision making and organisational adaptation and renewal (Earl, 2001). The central task of those concerned with knowledge management is to determine ways to better cultivate, nurture and exploit knowledge at different levels and in different contexts.

However, while there is a widespread agreement of the importance of knowledge with respect to the struggle for economic success, there are

differences among researchers and practitioners alike in what constitutes useful knowledge and the ways in which it should be managed (Holsapple and Joshi, 1999). There are major disagreements as to whether it should be considered a technical issue, a human resources issue, a procedural issue or a part of strategic management (Handzic and Hasan, 2003). The variation between different schools of thoughts on knowledge management are an indication of the many problems faced. To gain a greater understanding of the KM phenomena, the following sections will examine major drivers, outcomes and models of KM, and introduce an integrated KM framework as a basis for understanding the role of technology in KM.

## **1.2 Drivers of KM**

We are currently experiencing a period of major change in the world economy. This is characterised by increased complexity, uncertainty and surprises. Some analysts think of it as a period of living in the centre of the “Bermuda Triangle” (Raich, 2000) where individuals and organisations have to deal with the increasing turbulence and speed of change. This change is brought about by the mega-trends of globalisation, digitalisation (or virtualisation) and transformation to a knowledge-based economy.

### **Knowledge Economy**

The transformation from the old economy to a new, knowledge-based economy, is driven largely by the recognition that knowledge rather than financial capital, land or labour is the major source of continued economic growth, value and improved standards of living. Figure 1.1 shows that while every economy relies on knowledge to some extent as its base, in the “knowledge economy” knowledge itself is for sale and ideas are the main output or product of the economic institutions.

Tiwana (2001) identifies major characteristics of the new economy in terms of knowledge centricity, increasing returns, network effects,

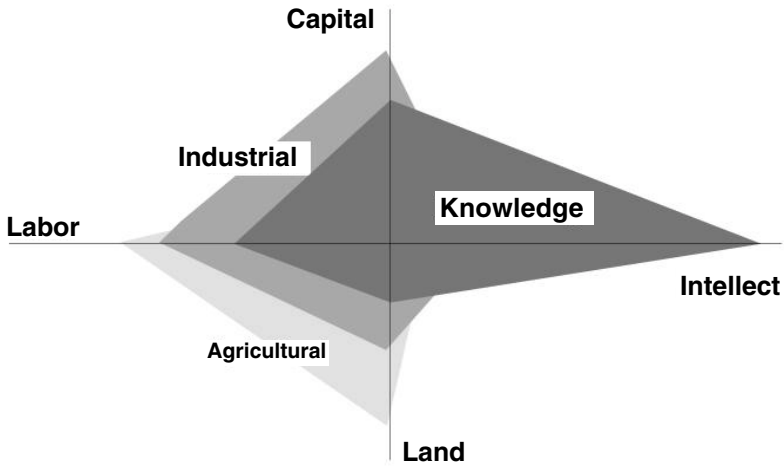


Figure 1.1 Shifting economy

accelerated clockspeed, transparency, customer loyalty, innovation, ad-hoc alliances, and products as experiences. He notes that knowledge centrality is typically demonstrated in the increasing dependence of services and non-physical as well as physical goods on knowledge for their production and distribution.

Tiwana further notes that knowledge-based offerings have increasing returns. Once the first unit is produced at a significant cost, additional units can be produced at a near-zero incremental cost (e.g., piece of software). Network effects are evidenced in the positive correlation between the market size and the value of the knowledge offering. Thus, companies trying to capture as much market as possible do so even at an initial loss (e.g., offering free software). Rapid and unpredictable changes dominate. To cope, business must have adequate organisational and technological mechanisms to support speedy adaptation and knowledge application. As businesses become increasingly networked with others (e.g., customers, partners) their knowledge becomes more transparent and potent. Firms are differentiated by differences in levels of assimilation and mobilisation of their knowledge.

Success in the new economy requires intimate knowledge of the company customer base. Such knowledge can help businesses provide

tailored products and services and thus attract and retain their customer's loyalty. Success often requires inventing new business processes, new industries and new customers rather than re-arranging old ones. With the rapidity of knowledge obsolesce, new knowledge must be integrated fast. This can be done through the formation of temporary collaborations between partners and members on an as-needed basis. Finally, in the knowledge economy, products and services are increasingly perceived as experiences. Accordingly, organisations act as knowledge integrators, finding out and offering customers individualised experiences they want and need.

### Knowledge Organisation

Economic progress throughout history has been driven by commerce and business organisations. These organisations have internal structures that mediate roles and relationships among people working towards some identifiable goal. Their existence is the result of a successful balance between the forces in their environment and their own creativity and adaptivity (Bennet and Bennet, 2003). Currently, at the forefront of organisational performance are the organisations which recognised that information, knowledge and their intelligent application are the essential factors of success in the new economy, and take advantage of information technology to achieve high level of efficiency and effectiveness. Various metaphors used to describe a knowledge organisation include: agile production system, living organism, complex adaptive system, self-organising system and virtual organisation.

The knowledge organisation can be best viewed as an intelligent complex adaptive system. It is complex because the system is composed of a large number of individual specialists called intelligent agents, who have multiple and complex relationships with the system and environment. It is adaptive because these intelligent agents direct and discipline their own performance through organised feedback from colleagues, customers and headquarters. It has been suggested in the literature (Bennet and Bennet, 2003) that a successful knowledge organisation exhibits the following characteristics: high performance, customer-driven, improvement-driven, high flexibility and adaptiveness,

high levels of expertise and knowledge, high rates of learning and innovation, innovative IT-enabled, self-directed and managed, proactive and futurist, valuing expertise and sharing knowledge.

One of the ways to achieve effective knowledge creation, transfer and utilisation within an organisation is through communities of practice (Wenger, 1998). This approach to organisational structuring advocates the formation of centres of expertise for each knowledge domain, discipline or subject matter speciality. The alternative approach suggests organising around projects and related activities. Information and communication technology can be the catalyst to form and sustain heterogeneous communities. With the support of the intranet or internet, these communities can include diverse people from different space and time zones of the globe (Hasan and Crawford, 2003).

While information technology is not necessary to create a knowledge organisation, the use of advanced technologies can transform the way the whole business works. The concept of “cybercorp” has been heralded as the new business revolution (Martin, 1996). It is envisaged as a totally virtual organisation based on the capabilities of the modern communication, i.e., the internet and the mobile phone. Typically, a virtual organisation consists of three fundamental parts: knowledge professionals and workers who possess core competencies; relationships and networks of people including partners, suppliers and customers grouped around a common brand; and a culture based on co-operation and collaboration and sitting in the centre of global networks linked electronically (Raich, 2000).

A knowledge organisation must of necessity become a learning organisation, so that the entire firm will learn while it works and be able to adapt quickly to market changes and other environmental perturbations. It has been suggested that the building blocks of a learning organisation are systematic problem solving, experimentation, learning from past experience, learning from others and transferring knowledge (Garvin, 1998). The way to build it is to first foster the environment that is conducive to learning, then open up boundaries to stimulate the informal exchange of ideas and finally create formal learning forums and programmes with explicit learning goals tailored to business needs.

Learning organisations have also been described as places “where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together” (Senge, 1990). To achieve these ends these organisations use systems thinking, personal mastery, mental models, shared vision and team learning. Furthermore, knowledge creating companies are characterised as places where “inventing new knowledge is not a specialised activity, but the way of behaving, indeed a way of being, in which everyone is a knowledge worker”. The way to achieve this is to use metaphors, encourage dialogue, and make tacit ideas explicit.

### Knowledge Work and Workers

In knowledge based organisations, the largest part of their workforce is engaged in knowledge work (Schultze, 2003). The following paragraphs summarises different perspectives on this new phenomenon. The economic perspective emphasises how knowledge work differs from other types of work in the nature of knowledge possessed and produced by workers. Knowledge work assumes the possession of mostly abstract, theoretical and esoteric knowledge gained through formal education. It also suggests that workers have to produce new knowledge rather than just manipulate existing knowledge. The labour process perspective concerns itself with the formation and composition of a new class of white-collar workers between the proletariat and bourgeoisie who perform managerial, professional and clerical tasks. Their work is characterised by scientific base, formal education, autonomy, ethical rules, culture, client orientation, social sanction and authorisation.

The work practice perspective focuses on the work that workers do and classifies it into knowledge production and knowledge reproduction. Re-production includes transfer and application. Specific processes and practices that form part of knowledge work include generating new knowledge, interpreting and representing it, as well as expressing, monitoring, translating and networking. For example, software engineering qualifies as knowledge work based on the presence of

creativity and problem-solving aspects of the work; co-location which allows work remote from the employing firm; and “gold collar” conditions of employment, including exceptional remuneration and benefits packages (Edwards, 2003).

Given that all work requires the application of knowledge, the emergence of knowledge work as a separate category of work has been criticised. However, it does offer a possibility of categorising groups of workers by highlighting their similarities and differences. Generally speaking, a knowledge worker is any worker who performs knowledge work (as described in the previous section) in every element of the economy. It covers various managerial, professional and clerical occupations. Examples of occupations that qualify as knowledge workers include executives, legislators, engineers, scientists, administrators and counselors. According to Australian statistics (ABS, 2003) there has been a significant increase in the percentage of knowledge workers in the country’s labour force over the last couple of years, this being consistent with the country’s transition to a knowledge economy.

Of particular interest for KM is a special category of knowledge workers, KM professionals, who make knowledge management in an organisation work. KM professionals are a new phenomenon and there is still no clear picture about what roles they should play in an organisation and what competencies and skills they need to have to play these roles. Currently there is a wide range of KM related job titles and roles found in organisations. Examples include titles such as Chief Knowledge Officer (CKO), Knowledge Asset Manager, Knowledge Officer, Web Master, etc.

From this variety three distinct categories can be recognised: *knowledge manager*, *knowledge engineer* and *knowledge scientist* (Weidner, 2003). The knowledge manager is expected to be primarily concerned with the knowledge needs of the enterprise. The knowledge engineers, with various specialisations, are perceived as advisors on what can be done given the current “state of the art”. Knowledge scientists are seen as showing them what is possible if they were willing to try. A snapshot of actual CKOs portrays them as highly educated and experienced individuals, generally satisfied with their position, freedom and latitude it affords (McKeen

and Staples, 2003). At present, their primary goal is to raise awareness of KM, and they have little direct authority and effect changes through persuasion, negotiation and communication.

### 1.3 Outcomes of KM

The importance of KM for organisational performance has been widely recognised and acknowledged in the management literature. In general, KM is assumed to create value for organisations from applying their accumulated knowledge to their products and services outputs. These ensure organisational survival or advancement. KM can impact organisational performance in a number of different ways, these can be grouped into three broad categories: *risk minimisation*, *efficiency improvement* and *innovation* (Von Krogh et al., 2000).

#### Risk Minimisation

Risk minimisation is closely linked to identifying and holding onto the core competencies that the company has. In most organisations, people have been recognised as key holders of valuable knowledge. KM can minimise the risk of losing valuable knowledge by identifying, locating and capturing what is known by individuals and groups of organisational employees that is of critical importance for organisational survival. Frank (2002) offers five tips to reduce knowledge loss: do not let people leave, mentor and coach, share best practices, share lessons learned and document. Indeed, documented project management knowledge, expertise and skills accumulated in the construction industry were found to benefit both employees and the public at large (Land et al., 2002). At another level, society's knowledge records are preserving the cultural capital of nations (Handzic, 2003).

KM can also impact people's learning, adaptability and job satisfaction (Becerra-Fernandez et al., 2004). For example, KM can facilitate employees' creativity and group effectiveness through informal and formal socialisation (Handzic and Chaimungkalanont, 2003). Socialisation forms

a vital component of Nonaka's (1998) knowledge creation model. It enables tacit knowledge to be transferred between individuals through shared experience, space and time. Examples include spending time, working together or informal social meetings. More importantly, socialisation drives the creation and growth of personal tacit knowledge bases. By seeing other people's perspective and ideas, a new interpretation of what one knows is created.

### Efficiency and Effectiveness Improvement

In today's complex economy, businesses are constantly confronted with the need to operate more efficiently in order to stay competitive and satisfy increasing market demands. Organisations are under increasing pressure from customers to deliver solutions and services faster and cheaper. KM can improve organisational efficiency by transferring experiences and best practices throughout the organisation in order to avoid unnecessary duplication and to reduce cost. Technology is often an important part of achieving efficiency improvements. For example, a best practice replication program at Ford (Rollo and Clarke, 2001) achieved process improvements in plants around the globe, and nine-figure cost savings from a simple intranet-based KM system for knowledge sharing.

KM can also help organisations become more effective by helping them select and perform the most appropriate processes and make the best possible decisions. KM can help organisations to avoid repeating past mistakes, foresee potential problems and reduce the need to modify plans (Becerra-Fernandez, 2004). For example, The Australian Government responded to increasing community expectations of better social services and access to empowering information sources by integrating historically separate health, housing and community services via a virtual corporate environment (Rollo and Clarke, 2001). The outcome is that various community and service providers have been given equitable and wide-spread access to expert knowledge and can directly contact the right people for service delivery.

## Process and Product Innovation

There is a growing belief that knowledge can do more than improve efficiency and effectiveness. KM can impact process innovations, value-added products and knowledge-based products (Becerra-Fernandez, 2004). Innovation of products, processes and structures have been assessed as a critical component in the success of new-age firms. The new products and services resulting from the interaction of knowledge and technology bring profound changes in the way businesses operate and compete in the new economy.

Typically, innovative organisations focus on both new knowledge and on knowledge processes. They constantly engage and motivate people, creating the overall enabling context for knowledge creation. These organisations take a strategic view of knowledge, formulate knowledge visions, tear down knowledge barriers, develop new corporate values and trust, catalyse and coordinate knowledge creation, manage various contexts involved, develop conversational culture and globalise local knowledge (Nanaka and Nishiguchi, 2001).

The unifying thread among various theoretical views is the perception that innovation is the key driver of an organisation's long-term economic success. According to Von Krogh (2000) the greatest challenge for organisations is to move in knowledge-enabling direction by consciously and deliberately addressing knowledge management. Pfizer is one good example of such an organisation (Rollo and Clarke, 2001). This company uses KM primarily to beat the industry average. Its main approach to management of the research process involves the "mining" of scientific publications to make its researchers aware of the progress and projects of others. This approach has resulted in the discovery of the well-known Viagra drug.

### 1.4 KM Frameworks

There have been a number of recent efforts at developing KM frameworks to better understand KM phenomena. In order to make sense of the

variety of existing KM frameworks, some form of categorisation or grouping is needed. One way to group them is into partial and integrated models or ontologies.

### Partial KM Frameworks

Partial KM frameworks encompass a broad range of issues, methods and theories that differ in scope and focus. Some are knowledge oriented, like the intellectual capital models of McAdam and McCreedy (1999) and the economic school in Earl's (2001) taxonomy. The list of types and perspectives elaborated in Alavi and Leidner's (2001) review also fits this category. Knowledge-orientated models are well known in the business environment. The HR literature relies heavily on this grouping of KM models and frameworks, as does the Accounting discipline's work on intangible assets. From this perspective, KM focuses on hiring, retaining, training of personnel, i.e., "intellectual assets", and organisational knowledge is often defined as the sum of the knowledge of its personnel. However, in the broader view of KM this is just one aspect that would be included in an integrated approach.

Other models, like Nonaka's (1998) knowledge spiral and Earl's (2001) behavioural school are process orientated. Process orientated frameworks are perhaps the most frequently quoted and used category in the knowledge management literature. The knowledge creation spiral of Nonaka views organisational knowledge creation as a process involving a continual interplay between explicit and tacit dimensions of knowledge. Four levels of carriers of knowledge in the organisation area are assumed, namely individual, group, organisational and inter-organisational. The spiral model describes a dynamic process in which explicit and tacit knowledge are exchanged and transformed through four modes: socialisation, combination, externalisation and internalisation.

Several frameworks emphasise the dependence of knowledge on socio-technological influences. Nonaka and Konno's (1998) model of 'ba' suggests four types of ba (originating, interacting, cyber and exercising) that act as promoters of knowledge processes (socialising, externalising, combining, and internalising) respectively. Earl's (2001) technocratic

school that supports and structures IS work in KM also belongs to this category. Much KM work within the field of Information Systems, makes the distinction between knowledge as an object that can be stored in a computerised system, and knowledge embedded in people. This group of models or frameworks address issues of complexity and change in areas of organisational culture and learning, change and risk management and the support of communities of practice. Frameworks in this KM grouping also emphasise the dependence of knowledge on context.

### Integrated KM Frameworks

There have been a number of attempts to bring together this diversity of partial approaches and propose more comprehensive and integrated frameworks in order to provide holistic views and common ground for KM research, and improved methods for KM practice (for review see Handzic and Hasan, 2003). Among some of the most recent developments is Handzic's (2003) integrated KM framework. The KM framework presented in Figure 1.2 is an extended version of the original model. It illustrates various components involved in the conduct of knowledge management and their relationships. This framework is used as a basis

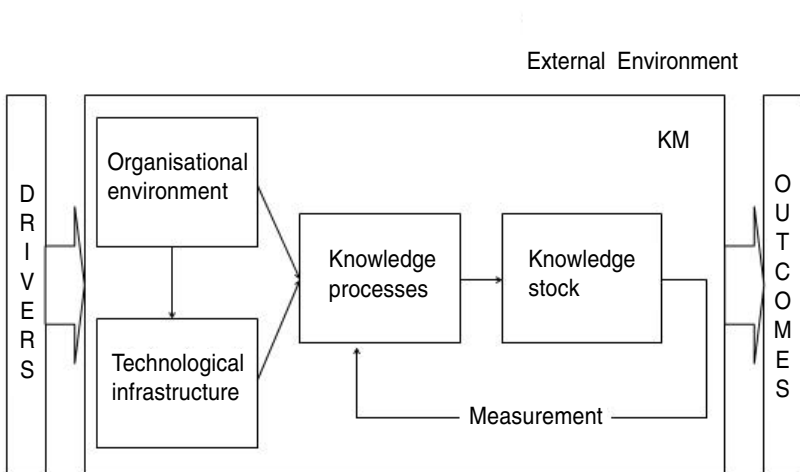


Figure 1.2 Extended framework of KM

for examining the role of technology in KM in the later chapters of this book.

The core KM model suggests two types of organisational factors: *organisational environment* (e.g., leadership, culture, structure, etc.) and *technological infrastructure* (e.g., information and telecommunication technologies) as major enablers that facilitate *knowledge processes* (e.g., creation, transfer, utilisation) and foster the development of *knowledge stocks* (e.g., explicit and tacit, know what and how). The model also suggests that organisational environment governs the choice and implementation of the technological infrastructure that supports knowledge processes. Finally, the core model incorporates a feedback loop to suggest the need for continuous knowledge *measurement* and potential adjustment of strategies over time. The extended KM model includes two additional components: *KM drivers* and *outcomes*. This model suggests that various *KM drivers* (e.g., changes in external environment) trigger *KM initiatives* (i.e., specific configurations of knowledge processes and enablers that act upon knowledge stocks) that, in turn, lead to various *KM outcomes* (e.g., improved performance, innovation).

In essence, the Handzic framework synthesises human and object perspectives of knowledge by adopting a two-dimensional model of organisational knowledge, with explicit and tacit know-what and know-how dimensions. This model adapts and extends the original work by Polanyi (1966) and Nonaka (1998). The integrated framework further considers knowledge management as a complex multidimensional concept that includes three essential and inter-related components: knowledge stocks, processes and enablers. In this way, it provides a missing link between different partial perspectives discussed earlier in the chapter. Furthermore, it recognises knowledge management as both a social and technological phenomenon, a view strongly emphasised in the opinions of KM academics and practitioners in a recent survey (Edwards et al., 2003). Finally, it suggests the evolutionary and context dependent nature of KM. This is consistent with the view that the main objective of KM is to help the organisation realise the best value from its knowledge assets (Bollinger and Smith, 2001).

## 1.5 Conclusions

This chapter examines the main drivers, outcomes and conceptualisations of KM in order to set the scene and provide theoretical foundation for exploring the role of technology in KM. The chapter recognises that KM is fuelled by the changing nature of the business environment. The emerging environment is identified as global, directly based on the production, distribution and use of knowledge in the development and distribution of products and services, and heavily reliant on information and communication technology.

This chapter also recognises that KM contributes to organisational performance in many ways. It impacts people, processes, products and structures in attempting to minimise risk, improve efficiency and effectiveness, and create innovative processes or products. In this way, KM provides sustainable competitive advantages that ensure the organisation's survival or advancement.

Finally, this chapter promotes the view of KM as a dynamic phenomenon with an emphasis on knowledge processes in expanding cycles of knowledge growth. KM is considered as a socio-technical undertaking enabled and facilitated by a variety of social, organisational and technical factors. which must be considered in any KM initiative. Finally, KM is recognised as being severely dependent on context so that there is no 'one size fits all' solution.

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