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EDITED BY  
JOHN S. EDWARDS



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# The Essentials of Knowledge Management

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# 1

## Introduction: Setting the Scene

*John S. Edwards*

The activity that we now call knowledge management has been practised for thousands of years – probably ever since the first “organizers” in tribes or villages tried to think of ways to stop repeating the same mistakes. Coming up with new knowledge, sharing it with others, making sure it is retained for the future, refining it (learning from experience), understanding how to apply it and deciding when to discard it are all important parts of the human experience.

Nevertheless it was only in 1986 that the explicit attempt to direct and combine these activities was given the name knowledge management, by Karl Wiig. Most of the work on knowledge management in the generation or so since then has been set in an organizational context, and that is the emphasis we take in this book. It is nevertheless worth bearing in mind that many of the principles of knowledge management apply at levels all the way from the individual (personal knowledge management) to nations or even (say) science itself.

Knowledge management sits at the intersection of several disciplines, including organizational learning, computer science, human resource management, economics, psychology and strategic management. As a result, it is not very surprising that there is no single agreed view of what knowledge management is. Indeed, some would go so far as to say that managing knowledge is not possible, and that the best that can be achieved is managing human “knowers.” Perhaps the only aspects that everyone agrees on are that knowledge management is (at best) difficult, and that any knowledge management initiative in an organization has to be tailored to the particular context of that organization at that time.

Knowledge management as a field acquired the status of a management “fad” in the mid- to late-1990s, with an explosion in the number of books and articles published about it, and it is fair to say that it has both benefited and suffered from this status. Nevertheless, unlike some other management fads, it has demonstrated its staying power, and is widely practised and

studied worldwide today, even if not always under the precise name knowledge management.

The aim of this book is to review the field of knowledge management with an operational research/management science mindset, encompassing both “soft” and “hard” aspects. This implies a holistic approach that gives a broader perspective than one based on any single viewpoint such as that of computer science or organizational learning. The various chapters represent the best knowledge management articles published in the 21st century in the journals *Knowledge Management Research & Practice* and the *European Journal of Information Systems*. All have undergone a rigorous double-blind review process, and the contributing authors include Ikujiro Nonaka, perhaps the biggest name in the knowledge management field, as well as others with equal reputations in associated fields such as George Huber (decision support) and Richard Baskerville (information systems). The contributing authors are based in nine different countries on four continents, showing the global nature of knowledge management.

The chapters are organized by topic, rather than chronologically, running from the theoretical foundations of knowledge management through to some of the newest developments in technology. After the two Foundations chapters, theory and practice are closely intertwined in the subsequent sections, with six of the chapters featuring substantial case studies.

While the diversity of the field means that there are some differences in the standpoints taken in the various chapters, we have tried to choose the contributions so that there are no outright contradictions. This diversity also means that we do not recommend a particular sequence or sequences in which to read the chapters, since the needs of each individual reader will be different. However, if you are at all interested in the theory, then please do start with the Foundations chapters!

We now go on to introduce the contributions in each section in turn.

## Foundations

The most central concepts in the field, naturally, are knowledge, management and how they come together as knowledge management. We think that readers of this book are already likely to have some awareness of what management entails, whether theoretical or practical, so we do not specifically cover that here. Knowledge, however, is a different matter. Everyone has an everyday familiarity with the term, but relatively few people have thought rigorously about it, and such thinking is not easy. Knowledge itself, as befits something so fundamental to being human, has been discussed and debated for well over two thousand years without coming to a full understanding. Many of the basic ideas and questions go back to ancient Greek philosophers such as Aristotle, Plato and others (see Müller-Merbach, 2008, for a useful brief summary). On the other hand, recent research into

artificial intelligence has shed light on what we do (and do not) understand about human intelligence and knowledge. This has generated such a vast literature that consideration of knowledge here needs to be restricted to the context of knowledge management.

For the Foundations section, our two chapters therefore cover firstly knowledge in the context of knowledge management and secondly the theoretical basis for the field of knowledge management.

Chapter 2, the knowledge Foundations, is by John Mingers, chosen both because it addresses knowledge specifically in the context of knowledge management, and because Mingers' own broad experience (being based in a business school with a CV including operational research, information systems, academia and practice) fits nicely with our underpinning philosophy in this book.

The particular motivation behind the chapter's original publication was that the issue of truth in people's conceptualizations of knowledge had been insufficiently covered in previous literature. As Mingers points out, many writers in the field implicitly or explicitly take the positivist stance that there is a single objective truth, on which basis a "piece" of knowledge can be said to be right or wrong, or perhaps still under evaluation. From a critical realist or an interpretivist stance however, the truth of something is a much more complex issue, and in addressing it, Mingers necessarily gives much consideration in his chapter to the issue of what it means to say "I know," offering examples of thirteen different senses of that verb. These range, for example, from direct perception ("I know it is raining") through to being acquainted with emotions ("I know how stressful an exam is"). The thirteen senses can be grouped into four categories: propositional (knowing that...), experiential (knowing...), performative (knowing how to...) and epistemological (knowing why...). These then correspond to four different conceptions of, and criteria for, "truth," which Mingers justifiably prefers to label as validity.

The issues Mingers raises provide the lead into Chapter 3, the knowledge management Foundations, by Richard Baskerville and Alina Dulipovici. This is, for obvious reasons, the longest in the book. It traces the roots of the subject of knowledge management in various related disciplines, and how concepts from those disciplines have come into knowledge management and been further developed there, in the form of a taxonomy. They point out that, in the research literature at least, 1995 can be regarded as a watershed for knowledge management, in that more publications on the topic appeared in the year 1996 alone than in all the years up to and including 1995.

The Baskerville and Dulipovici chapter is divided into three main sections, focussing in turn on the theories underpinning the rationale for knowledge management, the theories underlying the various knowledge management processes, and the theories supporting evaluation and measurement in

knowledge management. These theories come mainly from information economics and strategic management for the rationale; organizational culture, organizational behaviour, organizational structure and artificial intelligence for the processes; and quality management and organizational performance measurement for the evaluation aspects.

Work explicitly described as being within the knowledge management field has then produced further foundations in the form of new concepts such as the knowledge economy, knowledge alliances, knowledge culture (in an organization), the knowledge organization, knowledge infrastructure/architecture, and knowledge equity. Readers who already have a little knowledge about knowledge management may be especially interested in the connections between different theories shown in Table 3.6.

Armed with this taxonomy of the concepts supporting knowledge management, we go on to consider more specific aspects of the field. Generally the earlier chapters deal with the more strategic level, the longer term, and more “timeless” issues, while in later chapters we move towards more operational matters and future opportunities.

## Strategic Issues

Having explained what we believe people in the field are talking about, the next section concerns the strategic issues of managing knowledge. Our decision to start with considerations of strategy needs to be understood as being motivated by the breadth which that implies, not that knowledge management in an organization should be identified with a top-down approach. Far from it, in fact. As is clear from the chapter by Nonaka and Toyama, and as we have discussed ourselves elsewhere (Edwards and Kidd, 2003), all levels in the organization have a part to play, and knowledge management initiatives imposed top-down are unlikely to succeed.

Any thinking about managing knowledge must logically begin with knowledge creation, since without that there is nothing for any cycle of knowledge management to start from. Nonaka and his co-workers have concentrated their research for more than two decades on the theory and practice of knowledge creation, and the book by Nonaka and Takeuchi (1995) is regarded as one of the drivers for the explosion of interest in knowledge management already mentioned. Thus we open this section with a chapter by Ijuki Nonaka and Ryoko Toyama as Chapter 4.

The chapter takes the two fundamental aspects of the knowledge creation theory they have developed, the SECI model and the concept of *ba*, and extends them by incorporating dialectical thinking.

The SECI model was in part inspired by the writings of Polanyi (1966) on tacit and explicit knowledge. Tacit knowledge is in the mind of the knower, and can never be entirely accessed; explicit knowledge can be shared in the form of documents, diagrams, computer routines and so

on. The SECI model (see Figure 4.1) conceives of knowledge creation as a process of four modes of conversion between tacit and explicit knowledge, encompassing Socialization (sharing and creating knowledge through direct experience), Externalization (articulating tacit knowledge through dialogue and reflection), Combination (systemizing and applying explicit knowledge and information) and Internalization (learning and acquiring new tacit knowledge in practice). Within an organization, this process spirals upwards from the individual to the group and eventually the whole organization.

The process needs a place in which to happen, and the term *ba* is used to describe it: a dynamic context in which knowledge is shared, created and utilized. Place is interpreted in the broadest possible sense here – the Japanese word *ba* has no exact English equivalent, and has been adopted widely in the knowledge management literature. *Ba* could be physical, virtual or even philosophical (see Figure 4.2 and Chapter 8 by Magnier-Watanabe et al).

Dialectical thinking, developing a single viewpoint from contradictory opinions, is then used to provide a yet broader view of the knowledge creation process than the SECI model and *ba* alone. This views a firm's strategy and organization as an ongoing dialectical process between the various agents that constitute the firm, rather than as a logical analysis. As Nonaka and Toyama put it themselves, "An organization is not an information-processing machine that is composed of small tasks to carry out a given task, but an organic configuration of *ba*" (p. 95).

After this overview from the school of one of the thought leaders in knowledge management, the section goes on to present contributions on four specific aspects of knowledge management strategy: bringing in knowledge from outside the organization; how knowledge might usefully be measured; the problems of discarding knowledge that is no longer relevant because the context has changed; and the challenges of balancing local and global knowledge that face multi-national organizations.

Bringing in knowledge from outside the organization is well-known to be challenging; the "not invented here" syndrome is familiar to everyone in management. The rigorous conceptualization of the issue is based on the notion of the absorptive capacity of the organization. This was originally proposed by Cohen and Levinthal (1990) as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (p. 128). In the subsequent 25 years, there has been extensive study of this from a theoretical point of view, especially in the organizational learning and knowledge management fields. However, it has proved hard to tie down the concept precisely enough to allow a reasonably accurate assessment of what an organization's current absorptive capacity is. A step forward was the identification by Zahra and George (2002) of four dimensions of absorptive capacity: acquisition, assimilation, transformation and exploitation. Chapter 5, by Jean-Pierre Noblet, Eric Simon and Robert

Parent, uses these four dimensions as a basis for operationalizing the concept of absorptive capacity from the point of view of dynamic capabilities, defined by Teece, Pisano and Shuen (1997) in terms of “the ability to integrate, build and reconfigure internal and external competencies to a changing environment” (p. 516).

Noblet et al. look for “variables” (by no means all quantitative), based on the four dimensions of Zahra and George, in an analysis of interviews carried out with CEOs of ten French companies, all of them innovative small- or medium-sized organizations. Their findings suggest that the three factors of greatest importance in the creation of new knowledge are: the creation of an environment conducive to effective interaction (in other words, a suitable *ba*); the presence of leaders with the skills necessary to ensure needed integration and direction in situations of creative chaos; and the capacity for ongoing self-challenge. The study validates the grid of 30 variables shown in Table 5.2 and thus provides a tool for organizations to use in future assessments of absorptive capacity.

Taking the theme of measurement further, this time concentrating on the quantitative, brings us to Chapter 6, by Ettore Bolisani and Alessandro Oltramari. This tackles the problem of, quite literally, accounting for knowledge. A generally accepted method of doing this would significantly ease the problem of judging the effect of knowledge management initiatives, or an absence of them, on the “bottom line” of an organization. This has been an active area of the literature since the inception of knowledge management, but remains controversial, with criticism of both the soundness and the usefulness of previous approaches.

Bolisani and Oltramari first present a critical review of the methods of knowledge accounting already proposed in the literature, and their limitations. They then go on to set out their own method. This is based on treating knowledge as an object, representing a change in perspective from the previous two chapters, both of which focussed mainly on the knowers rather than the knowledge, thus taking a viewpoint of “knowledge as process,” although both did also include some elements of “knowledge as object.” Treating knowledge as an object enables knowledge accounting to use a stock-and-flow approach, analogous to that used in traditional accounting. This in turn makes possible the use of charts and metrics analogous to those of traditional accounting.

The notion of knowledge stocks is straightforward, even if the extent to which tacit knowledge might be included in them is not. However, knowledge flows offer more variation. The knowledge might, for example, flow as part of the transfer of a physical object, either in the physical object, or as an associated interaction; or it might flow as an object in itself, such as provision of training, consultancy or information. Bolisani and Oltramari give simple examples of knowledge accounting, using a knowledge balance sheet, in two situations: knowledge sharing, where both parties in a

transaction have access to the same knowledge object, which becomes part of the knowledge stock of both; and knowledge delivery, where one party creates a knowledge object to become part of the other party's knowledge stock.

The fourth chapter in this section, Chapter 7, is by Juan Cegarra-Navarro, Anthony Wensley and María Teresa Sánchez Polo, concerning the topic of forgetting knowledge, or unlearning, as they call it. This is a vital aspect of knowledge management, since much knowledge potentially has a limited lifespan. Thus unlearning/forgetting is relevant to all organizational situations except the implementation of a completely new system or operation, yet except for the literature on change management, it is often neglected.

The sector that Cegarra-Navarro et al. deal with is that of healthcare. As they explain, "Many researchers who have investigated healthcare organizations have indicated that healthcare professionals are likely to be burdened with outdated knowledge" (p. 153).

Offering healthcare in the patient's own home which would previously have only been available in a hospital is a direction in which many health providers are moving, especially public healthcare providers. The particular situation under consideration in this chapter is that of the acute care services delivered by HHUs (Hospital-in-the-Home Units) in Spain.

The change in context which this represents from in-hospital provision is clear. Cegarra-Navarro et al. argue that this means working with new knowledge, new practices and new technology, resulting in a need for adaptation of existing knowledge and therefore full or partial unlearning. They identify three types of intentional unlearning activity in the home healthcare environment, which they name as awareness, relinquishing and relearning.

They then go on to develop a framework for assessing the unlearning context, consisting of three components: the perceptual lens(es) through which individuals view situations; the changing of individual habits and assumptions; and the consolidation of emergent understandings into existing knowledge and knowledge structures. They also identify the key enablers for success in each of these three components, and finally apply the framework to the HHU initiative.

The section concludes with Chapter 8, by Rémy Magnier-Watanabe, Caroline Benton and Dai Senoo. Magnier-Watanabe et al. examine knowledge creation, and knowledge management processes more broadly, in an organization in the pharmaceutical sector. Their study covers its Japanese headquarters and its three largest subsidiaries, in the USA, France and China. The aspects they consider follow the theoretical constructs from the Nonaka school of thought about knowledge management, which we have already mentioned in introducing the chapter by Nonaka and Toyama, including the SECI model, leadership, culture and *ba*. Data were collected by a questionnaire survey which obtained more than 2600 responses in total. Regression models were then constructed for each of the four countries,

with the five organizational factors – *ba*, leadership, organizational culture, organizational control, and work styles – as independent variables, and the four SECI knowledge conversion modes as dependent variables.

Magnier-Watanabe et al. find that there are considerable differences between the four countries. One of them reflects their different “histories” of knowledge management: the Japanese headquarters began major knowledge management initiatives in 1998 at a time when the international subsidiaries had only recently been established. As a result, the four SECI modes are much better balanced in Japan than elsewhere, reflecting the effect of continued knowledge management training. A lack of knowledge management training leads to low levels of externalization and combination, the more important conversion modes at the organizational level. The level of knowledge management training does not, however, explain the differences between the most influential factors in the regression analysis, which were formal *ba* in the subsidiaries in the USA and China, clear objectives in the subsidiary in France, and a self-directed vision in the Japanese headquarters. Magnier-Watanabe et al. are careful not to claim that these correspond to general national differences, only that they apply to the organization under study. Nevertheless, both their method and their results will be of considerable interest to those concerned about national differences in knowledge management processes, as well as those more generally concerned with knowledge creation.

## Understanding Knowledge Transfer/Sharing

Knowledge sharing remains one of the most researched topics in knowledge management (Ribière and Walter, 2013), but as with the concept of knowledge, a full understanding still eludes us. The two chapters on knowledge sharing/transfer that we include are by George Huber and Jialin Yi, and both are concerned with effectively linking the intention of a knowledge management initiative at the strategic level to its implementation at the operational level.

A major theme of Huber’s writings (e.g. Huber, 2004) is that people too often assume that the future will be like the past, and as a result what they learn from history and experience is not always appropriate. Chapter 9 by Huber included here looks at how to motivate people to participate in an organization’s knowledge management system, especially one in which a knowledge repository (for storing explicit knowledge) makes up a substantial component. He points out that many studies reported in the literature are single cases, making it difficult to tell, for example, what management practices have what effects under what conditions, or what interactions, especially interference, there might be between different practices.

Huber is very much concerned with the balance that needs to be struck in managing knowledge between the human and organizational issues, and

the technological ones. This is related to the views of “knowledge as process” and “knowledge as object” mentioned earlier, and Huber’s concern is a reflection of the way that many early knowledge management initiatives were strongly technology-driven. He looks particularly at the motivational issues both in the initial adoption of knowledge management systems and in their continuing use. He raises a set of eight questions, intended not only as a research agenda for academics, but also for practitioners, “to provoke thinking and debate about what their organization ought to be doing to facilitate transfer of knowledge” (p. 210). The eight questions cover: motivation to contribute to and make use of the systems, both extrinsic (reward) and intrinsic (social-psychological); making the systems more effective, especially when users have varying backgrounds; and linking the different approaches to motivation to effectiveness in system construction and use, particularly when more than one approach is used simultaneously. Although originally published in 2001, most of the issues that he identifies are still live ones today.

Jialin Yi offers a very specific step forward in Chapter 10, by developing and validating a scale for measuring knowledge sharing behaviour (KSB). This is a crucial element in understanding the success (or otherwise) of a knowledge management system, and so is very much in tune with Huber’s philosophy that better understanding is needed. Yi set herself the task of developing a new measure of KSB with desirable psychometric properties – a well-developed KSB scale with a sufficient level of reliability and validity. She begins by discussing the various dimensions that might be seen as forming part of KSB, where she points out that previously there had been no clearly agreed definition of the concept, as with many other concepts in knowledge management. A definition was therefore essential, and she proposed:

Knowledge sharing behavior is a set of individual behaviors involving sharing one’s work-related knowledge and expertise with other members within one’s organization, which can contribute to the ultimate effectiveness of the organization. (p. 218)

From this foundation, she goes on to develop a scale with four dimensions and 28 items, being careful to distinguish it from the somewhat related (and relatively well-researched) concept of organizational citizenship behaviour (see for example Organ, 1988).

The four dimensions relate to Written Contributions, Organizational Communications, Personal Interactions, and Communities of Practice, respectively. Yi goes on to validate the scale in two stages, the first using expert judgement, and the second involving a survey of employees of a high-technology company in the USA. She thus achieves her goal of constructing a validated KSB scale for others to use.