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INTRODUCING KNOWLEDGE WORK: PROCESSES, PURPOSES AND CONTEXTS

Chapter Outline

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- >> What Is Knowledge?
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Learning Outcomes

At the end of this chapter you should be able to:

- ➔ Define core concepts – knowledge, organizational knowledge, knowledge work, Knowledge Management and innovation – as used in this book.
- ➔ Understand different perspectives on knowledge and the importance of these for approaches to managing knowledge work.
- ➔ Understand the nature and characteristics of knowledge work and the role of knowledge workers within organizations.
- ➔ Understand the history behind managing knowledge in organizations since the turn of the twentieth century.
- ➔ Understand the broad issues critical to the management of knowledge and knowledge workers, which will be explored in depth in the remainder of the book.

>> INTRODUCTION

Managing knowledge work and knowledge workers is arguably the single most important challenge being faced by all kinds of organizations. ‘Knowledge Management’, for example, has been heralded as essential to efforts to improve competitiveness and innovation. Even since writing the first edition of this book (published in 2002), a huge number of new tools and techniques, books, articles and ‘how-to’ guidelines have been produced in the name of Knowledge Management.

At the same time, many attempts to manage knowledge in organizations have failed to deliver promised improvements (Scarbrough and Swan, 2001). Some have focused too narrowly on generically applicable tools/methods to transfer information, without paying sufficient consideration to the social, organizational and cultural context needed to enable and support knowledge work. Others have forgotten what it is they are actually managing knowledge for – is the purpose to improve the efficiency of current activities, for example, or to do things differently and innovate? Yet others have faltered because they have emphasized particular processes (e.g. sharing knowledge between groups) and forgotten others (e.g. applying knowledge to new tasks). In this new book, then, a major feature is to stress all three of these dimensions of knowledge work: *enabling contexts, purposes and processes*. The need to align contexts, purposes and processes when managing knowledge work is a theme we shall revisit throughout the chapters that follow.

Many of the examples and case studies used throughout this book are drawn from our own research on innovation. This is because innovation is so central to knowledge work – many of the unique skills and experiences of knowledge workers would be largely wasted if they were not provided with the opportunity to put these skills to work in order to do things differently (hopefully better) and to innovate. Innovation also entails the application of knowledge to new tasks and situations in order to develop products, processes and services, and is a prime site for knowledge work.

We start by developing in this introductory chapter a rudimentary understanding of the core concepts we are going to be dealing with – knowledge, organizational knowledge, Knowledge Management and innovation. We are not going to engage deeply in philosophical debates about the precise nature of knowledge – this has been done much better elsewhere (Tsoukas, 2003; Tsoukas and Vladimirou, 2001). Rather, we outline some of the more well-known definitions and frameworks that have been developed in organizational theory and strategy, which help inform our understanding of what it is that firms are trying to do when they claim to be ‘managing knowledge’. We also look at how current approaches can be traced back to early ideas about managing work. Such a historically grounded account helps us to see how and why we have arrived at this point, what our possible futures may be and how we can avoid some of the mistakes of years past.

>> WHAT IS KNOWLEDGE?

Philosophers have wrestled over what knowledge is since the classical Greek period. Thus there is a whole branch of philosophy, ‘epistemology’ – from the Greek words *episteme* (knowledge) and *logos* (word/speech) – that deals with, and debates on, the nature, origin and scope of knowledge. These debates are many and varied but in studies of knowledge work in organizational settings two views stand out. These have been usefully summarized as the ‘epistemology of possession’ and ‘the epistemology of practice’ (Cook and Brown, 1999). In short, the epistemology of possession treats knowledge as something people *have* whereas the epistemology of practice treats knowledge as something people *do*.

The epistemology of possession view on knowledge emphasizes its cognitive aspects – knowledge is seen as a possession of the human mind and treated as a mental (or cognitive) capacity, or resource, that can be developed, applied and used to improve effectiveness in the workplace. Those adopting this view often describe knowledge as a kind of pyramid, or hierarchy, comprising data, information and knowledge and even wisdom (Ackoff, 1989) – see Figure 1.1. Data is described as a discrete physical entity, external to the individual, and having no intrinsic value of its own – the dots of ink on this page, for example. Information is data that is organized in some way such that it has a recognizable shape – the words and sentences on this page that are inscribed by data. Like data, information is also ‘out there’ – an objective property of the world, external to any particular individual, which can be searched, stored, sorted, transmitted, sent and received.

In contrast to data and information, knowledge is a different kind of thing altogether. Knowledge, according to the epistemology of possession, is seen as a personal property of the individual knower who is able to confer meaning on data and information by drawing from his or her own subjective experiences, perceptions and previous understandings. This is the sense in which knowledge

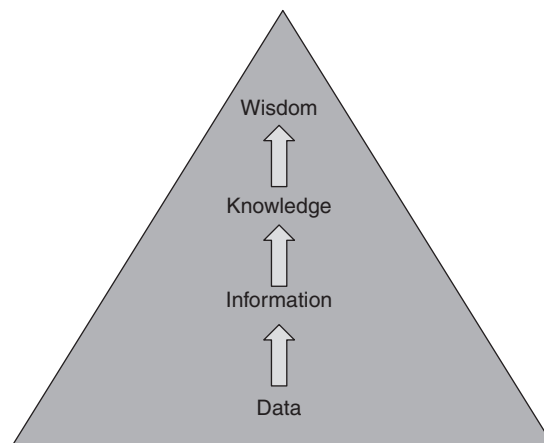


Figure 1.1 A knowledge ‘Hierarchy’ (e.g. Ackoff, 1989)

is ‘possessed’ by individuals. Being able to make sense of the words and sentences on this page is about knowledge. What an individual infers from information is related to their cognitive capacity and interpretive schema, or ‘frames of reference’, which they have acquired through life. It is reasonable, therefore, to suggest that different people, with different past experiences, may infer different things from the same information.

The ‘knowledge as possession’ view is implicit in much of what is written about managing knowledge work within contemporary organizations. For example, below we outline the very widely quoted work of Nonaka (1994), which talks about how ‘tacit knowledge’ (the knowledge that individuals have based on their personal experience that is hard to express or articulate) can be converted into explicit knowledge (knowledge that can be ‘spelled out’ or written down), which can then be communicated to others in the organization who will then also ‘know’ without having to have had the same experiences. So, according to this view, knowledge is something I possess and, like any of my possessions (say a football), I can then pass on this knowledge (or football) to others.

This ‘knowledge as possession’ view has, however, been roundly attacked by proponents of the ‘epistemology of practice’ (Brown and Duguid, 2001; Gherardi, 2001; Lave and Wenger, 1991; Nicolini, Gherardi and Yanow, 2003; Orlikowski, 2002). These writers start from the premise that ‘knowledge’ is constructed and negotiated through social interaction. Knowledge is, therefore, intrinsic to the localized social situations and practices (practices of saying things as well as doing things) that people actually perform, and not something that can stand outside those practices. Their studies show that social groups as diverse as construction engineers, photocopier technicians, radiologists, tailors, ship builders and alcoholics do not learn to do things by converting tacit knowledge into explicit knowledge which is transferred from one person to another but, rather, by sharing and creating all kinds of norms, stories, representations, tools and symbols which enable the experience of individuals to be related to the knowledge of the wider community. Knowledge is, in effect, ‘enacted’ through the practices of different groups and inextricably bound up with the way these groups work together and develop shared identities and shared beliefs. For example, chefs have access to recipes that hold explicit written information on what ingredients to use and how to put them together. However, as any good chef will tell you, they do not learn from this, as much as from the actual practice of being an apprentice with a Master Chef within a particular kitchen and social setting that reinforces certain kinds of norms, values and practices. It is this practice that allows them to interpret and apply the recipes effectively and innovatively.

By taking these criticisms on board we can begin to see that the often used saying that knowledge is a person’s ‘justified true belief’ – which dates back to Plato and underpins theories such as Nonaka’s – is actually quite problematic (Gourlay, 2006). This is because there are likely to be many possible ‘truths’ and, so, ‘truth’ (or what counts as truth) results as much from the negotiations amongst social actors (and the tools at their disposal) as it does from any personally held justifications. What finally comes to be accepted as ‘true’ is often

driven by those who happen to hold positions of power or authority and whose justifications carry more weight (such as the Master Chef). In Western medicine, for example, clinicians' claims about what treatments work, backed by scientific data, usually override competing knowledge claims coming from less powerful groups about alternative therapies. Yet, this was not the case centuries ago and is still not the case in some other societal contexts (Abbott, 1988). Furthermore, if the 'truthfulness' of something can only be judged in relation to personal belief (Nonaka, 1994), then someone could be provided with full justification for something and still choose not to believe it. Hence we can see that knowledge – or claims to knowledge – are social as well as individual and depend heavily on the organizational and cultural context in which such claims are made.

Some proponents of this alternative 'knowledge as practice' view prefer to use the term 'knowing' rather than knowledge, precisely to underline this interweaving of what people know with what they do and who and where they are. The term 'knowing' (as a verb rather than a noun) draws our attention to the active, processual and social nature of knowledge (Suchman, 1987). This social and context-dependent nature of knowledge (sometimes described as 'socially situated') needs to be addressed when attempting to manage knowledge within organizations – a theme that will be revisited throughout this book.

Cook and Brown (1999) have attempted, somewhat controversially, to reconcile these different epistemologies of possession and practice, by arguing that it is possible to see processes of knowing and forms of knowledge as equally important and complementary:

Individuals and groups clearly make use of knowledge, both explicit and tacit, in what they do; but not everything they know how to do, we argue, is explicable solely in terms of the knowledge they possess. We believe that individual and group action requires us to speak about both knowledge used in action and knowing as part of the action.

(p. 382)

Moreover, they are inextricably linked, with knowledge being seen by Cook and Brown as a tool for knowing:

Organizations are better understood... if knowledge and knowing are seen as mutually enabling (not competing). We hold that knowledge is a tool for knowing, that knowing is an aspect of our interaction with the social and physical world, and the interplay of knowledge and knowing can generate new knowledge and new ways of knowing.

(p. 381)

Working definition of knowledge

The definitional issues will probably never be resolved – indeed, some would argue that if 'knowledge' is naturally contested then why should they be? However, it is useful for us to be clear about our own working definitions (or knowledge claims) when we talk about managing knowledge work. Drawing from the discussion above, then, we define *knowledge* simply as 'the ability to discriminate within and across contexts' (Swan, 2008). Studying 'knowledge'

means looking at the varied ways in which actors in particular social situations understand and make sense of where they are and what they are doing. This working definition borrows from Tsoukas and Vladimirou (2001), who theorize knowledge as ‘the individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory or both’ (p. 979). Our working definition is broad enough to encompass the individual cognitive aspects of knowledge as well as its social nature. It also suggests that it is important for us to consider the roles of material artefacts in managing knowledge work – technologies, tools, computers, physical spaces, clocks, schedules and the like – because the ability to discriminate is mediated by them (Barley, 1986; Black, Carlile and Repenning, 2004; Orlikowski, 2007; Orlikowski and Yates, 2002; Schultze and Orlikowski, 2004). For example, knowledge of what is useful, or not, in cooking is mediated by the experiences you have, the tools you are using and the people and cultures that you interact with.

Following along this vein, *organizational knowledge* can be understood as ‘a learned set of norms, shared understandings and practices that integrates actors and artefacts to produce valued outcomes within a specific social and organizational context’ (Scarborough, 2008b). Studying ‘organizational knowledge’ is about understanding the means by which groups of actors develop more or less shared beliefs, behaviours and routines that help shape the organization’s capabilities. Organizational knowledge can be reflected in what people say, in what they do, or in the technologies, routines and systems that they use. For example, Hewlett Packard’s organizational knowledge is reflected through stated corporate objectives, such as ‘everyone has something to contribute: It’s not about title, level or tenure’ (assuming this is believed!), their relatively flat organizational structure and their employment selection systems and routines that favour diversity in staff.

These debates about the nature of knowledge are not purely academic. The point is that our underlying assumptions about what knowledge is, and whether it is something people have (possess) or do (practice), have a profound influence on the tactics, strategies and analytical tools that we use when attempting to more effectively manage knowledge work. The term ‘*Knowledge Management*’ is one that has come to be used to refer to explicit strategies, tools and practices applied by management that seek to make knowledge a resource for the organization. As a field of study Knowledge Management is concerned with the development of concepts that illuminate or enhance the application of these practices. If your assumptions are that knowledge is possessed, then the major challenge of Knowledge Management is to free knowledge from the individual and make it widely available as an organizational resource, for example, by capturing it in an IT system or by writing it down in guidelines and recipes. If your assumption, on the other hand, is that knowledge is about what people do (and say) then the challenge of Knowledge Management is to provide an enabling context that allows people to do (and say) things differently and, hopefully, better. Therefore, it is important when considering major tools, theories and frameworks for managing knowledge work to be aware also of the assumptions that drive them and the practical issues they lead us to focus on. We turn to this next when we look at three different perspectives on knowledge – structural perspectives, which

essentially adopt a knowledge as possession epistemology, and then process and practice perspectives, which adopt a knowledge as practice epistemology.

>> STRUCTURAL PERSPECTIVES AND TYPES OF KNOWLEDGE

Structural perspectives on knowledge draw largely from the epistemology of possession and focus on identifying different types, or forms, of knowledge that people have. Citing Polanyi's (1962) earlier work on 'personal knowledge', two forms or types of knowledge – tacit and explicit – are often distinguished. Tacit knowledge is associated with the skills or know-how that people develop through their own experience in specific contexts (e.g. *knowing how* to ride a bicycle) and has an essentially personal quality that makes it hard to formalize or communicate. In contrast, explicit knowledge is that which has been 'spelled out' or codified, making it more communicable across contexts (e.g. *knowing what* components a bicycle needs to have to make it work and how they should be put together).

An important aspect of tacit knowledge is that we know more than we can articulate or attend to at any point in time. Hence tacit knowledge is often referred to as 'know-how' – it resides in our heads and in practical skills and actions. For example, many of us 'know' how to swim. However, explaining this to someone is extremely difficult. Indeed, if a novice tried to follow our verbal instructions they would probably drown! In fact, the individual's experience of learning to swim for themselves and what the water feels like, coupled with help and instruction, is what leads to the accumulation of tacit knowledge.

However, if everything had to be learned from first-hand experience then learning in organizations would be severely limited. Explicit knowledge, on the other hand, can be readily codified, articulated and communicated to others and is, therefore, seen by some as more useful for organizational learning (Teece, Pisano and Shuen, 1997; Zollo and Winter, 2002). The way to create knowledge in organizations, then, according to the structural perspectives is to identify important tacit knowledge, make it explicit, and convert it back again into the tacit knowledge of others elsewhere in the organization so that it can be applied (Nonaka, 1994).

Frameworks for understanding knowledge types

Structural perspectives are useful in providing frameworks that help us to understand further what kinds of knowledge can be involved in knowledge work. Next we outline three models developed by organization theorists that are particularly helpful in this regard. Of course there are many others we could have looked at but the different principles captured in those selected underpin many of the approaches to managing knowledge work that we see today.

Nonaka's framework (1994)

Nonaka's now well-cited 'SECI' model (see Figure 1.2) sees knowledge creation as a spiraling process of interactions between knowledge types (explicit and tacit). He identified four distinct knowledge conversion processes through which

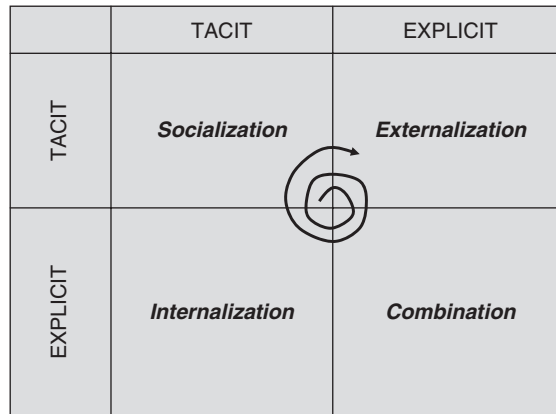


Figure 1.2 The SECI model (after Nonaka, 1994)

knowledge creation could take place: socialization (tacit/tacit); externalization (tacit/explicit); combination (explicit/explicit) and internalization (explicit/tacit). Because Nonaka believes that individual cognition plays an essential part in knowledge creation, he suggests that organizational knowledge creation stems from the individual. If we take the socialization process, for example, this rests on individuals interacting with others and reflecting on their own and others' experiences. This emphasis on knowledge existing only at the individual level is a fundamental difference between Nonaka's framework and the other frameworks discussed later.

This is not to suggest, however, that organizations and their managers do not have a role to play in knowledge creation. Nonaka also stressed that managers need to provide the necessary enabling context for individuals to share and create knowledge. In his more recent elaborations of the SECI model, then, Nonaka developed the notion of 'ba' – a concept originally developed by Japanese philosopher Kitaro Nishida, meaning 'a context which harbours meaning' (Nonaka and Konno, 1998). According to Nonaka and Konno (1998), 'ba' (roughly translated in English as 'place') is 'a shared space for emerging relationships. This space can be physical (e.g. office, dispersed business space), virtual (e.g. e-mail, teleconference), mental (e.g. shared experience, ideas, ideals), or any combination of them' (p. 40). Relating back to the distinction between knowledge and information discussed earlier, knowledge is seen as embedded in 'ba' where it is acquired through individuals' experiences and reflections. Information is knowledge that is separated from ba and so able to be communicated independently – 'Information resides in media and networks. It is tangible. In contrast knowledge resides in "ba". It is intangible' (p. 40). Nonaka and Konno identified, in turn, four kinds of 'ba' that map onto the four kinds of knowledge conversion processes:

- Originating ‘ba’ – the place where individuals develop empathy, share feelings, emotions, experiences and mental models. This is essential to socialization. It relies on face-to-face contact and is where knowledge creation is seen as starting. An example is an informal exchange around a shared problem or issue.
- Interacting ‘ba’ – a more consciously constructed place where peers get together to engage in dialogue, challenge ideas and reflect on their own ideas in the light of others’ idea. This is essential to externalization. An example is assembling a project team and plan to resolve an issue.
- Cyber ‘ba’ – the virtual place where new knowledge can be combined with existing information and made available throughout the organization. This is enabled by information communication technology (ICT) and is essential to combination. An example is adding project findings to an Internet database.
- Exercising ‘ba’ – the place where formal explicit knowledge can be applied through on the job training and active participation. This is essential to internalization. An example is developing training or ‘peer assist’ schemes to put results into practice.

The SECI model of Nonaka and his colleagues is not without critics. Not least, and despite the notion of ‘ba’, it presents an overly individualized view of knowledge and is a bit ‘slippery’ in how it treats knowledge. For example, on the one hand, knowledge separated from ‘ba’ is not knowledge but information. At the same time, the model continues to classify knowledge as either tacit or explicit, leaving open the question of what explicit knowledge actually is. The SECI model also significantly downplays the differences of interests, power and political dynamics that knowledge creation processes in organizational contexts inevitably encounter. Instead the ‘knowledge spiral’ – the movement of knowledge from being the possession of an individual to becoming an organizational resource – is depicted as rather smooth, linear, uncontested and unproblematic. These criticisms aside, the model has been very influential and has played an important part in channeling attention, not just to the cognitive, information processing aspects of knowledge creation in organizations, but also to the importance of values and the enabling context in which such values are shared, acquired and played out.

Spender’s framework (1996, 1998)

Spender’s framework, pictured in Figure 1.3, differs from Nonaka’s because it is built on the principle that, in order to understand where organizational knowledge comes from, we need to be concerned with not only types of knowledge (i.e. epistemology), but also where it resides (i.e. ontology). So, as well as incorporating tacit and explicit knowledge, his framework also makes a distinction between individual and social (or collective) knowledge. Combining concerns about what knowledge is (i.e. tacit or explicit) and where it resides (individual or social) means that the four, rather than two, different types of knowledge can be identified: (i) individual/explicit (conscious); (ii) individual/implicit (automatic); (iii) social/explicit (objectified) and (iv) social/implicit (collective).

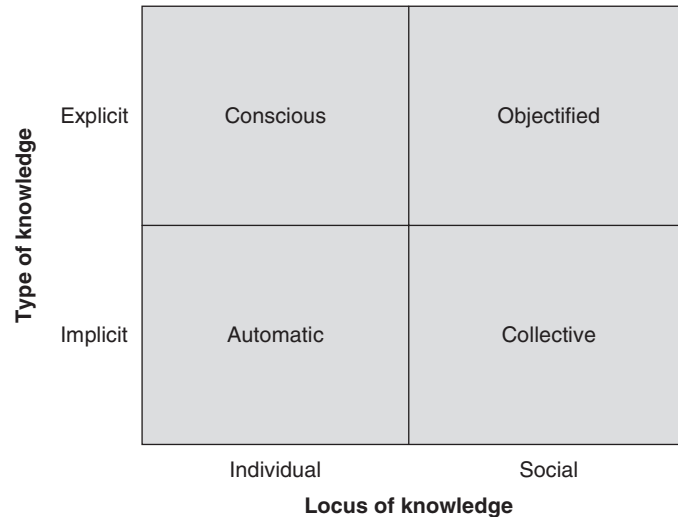


Figure 1.3 Forms of knowledge – Spender’s framework

Spender’s framework makes a very important additional point, which is that forms of social knowledge can exist beyond the individual. Hence it is possible to make a ‘contrast between the explicit knowledge that individuals feel they possess and the collective knowledge on which this explicit knowledge actually stands, and the interaction of the two’ (Spender, 1998, p. 238). For example, the culture of an organization is a form of social knowledge that survives beyond the contribution of particular individuals. Spender also saw the creation of organizational knowledge as resulting from interactions between all four types of knowledge. What this framework does not highlight, however, which the SECI model makes explicit, are the processes that allow different types of knowledge to be created in the first place.

Thinking strategically, Spender argues that collective (social/implicit) knowledge is actually the most valuable to organizations because this is a type of knowledge that other firms find difficult to understand and imitate. As we shall see in Chapter 2, if a firm can develop a culture (collective knowledge) that supports knowledge creation then this can be very hard to imitate, even if individuals leave and try to replicate this new culture elsewhere. This idea very much supports the view, still held strongly today, that a firm’s ‘core competencies’ are a crucial strategic resource.

Blackler’s framework (1995)

Blackler’s framework (depicted in Figure 1.4) was built from a review of existing studies of organizational knowledge at the time. It identifies knowledge types – embrained, embodied, encultured, embedded and encoded:

| | | |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emphasis on collective endeavour | <p>Knowledge-Routinized Organisations: <i>Knowledge embedded in technologies, rules and procedures.</i></p> <p>Hierarchical division of labour and control. Low skill requirements.</p> <p><i>Example: 'Machine Bureaucracy' such as a McDonalds.</i></p> | <p>Communication-Intensive Organisations: <i>Encultured knowledge and collective understanding.</i></p> <p>Communication and collaboration the key processes. Empowerment through integration.</p> <p><i>Example: 'Adhocracy' such as a large management consultancy</i></p> |
| | <p>Expert-Dependent Organisations: <i>Embodied competencies of key members.</i></p> <p>Performance of individual specialist experts is crucial. Status and power from professional reputation & qualifications.</p> <p><i>Example: 'Professional Bureaucracy' such as a hospital.</i></p> | <p>Symbolic-Analyst-Dependent Organisations: <i>Embrained skills of key members.</i></p> <p>Entrepreneurial problem solving. Status and power from creative achievements.</p> <p><i>Example: 'Knowledge-intensive-firm' such as a science-based, high tech firm.</i></p> |
| Emphasis on contributions of individuals | Focus on familiar problems | Focus on novel problems |

Figure I.4 Organizations and types of knowledge (after Blackler, 1995)

Embrained knowledge is knowledge that is dependent on conceptual skills and cognitive abilities. Embodied knowledge is action oriented and is only partly explicit. Encultured knowledge refers to the process of achieving shared understanding, through the development of an organizational culture. Embedded knowledge is knowledge that resides in systemic routines. It can be analyzed by considering the relationships between technologies, roles, procedures and emergent routines. Finally, encoded knowledge is information conveyed by signs and symbols either in manual or electronically transmitted form.

(Blackler, 1995, pp. 1024–1025)

Blackler’s framework, like Spender’s, suggests that different types of knowledge exist at either the individual (embodied and embrained knowledge) or at the collective level (encultured and embedded). However, each of these knowledge types can be more or less explicit, so giving rise to the fifth kind of knowledge, encoded knowledge. For example, in an organization like McDonalds, culture (encultured knowledge) may be articulated in the form of formal statements and symbols (e.g. the Big ‘M’ that indicates the McDonalds brand around the world) or may be tacitly known by everyone in the firm and reflected in their behaviours.

What Blackler tried to illustrate, which distinguishes this framework from the others considered above, is that different types of knowledge dominate in different types of organizations. For example, he suggested that a bureaucratic organization making highly standardized products, like McDonalds, will rely predominantly on knowledge embedded in organizational routines and rules. More dynamic and

innovative firms, like Hewlett Packard, will rely on either encultured knowledge, if they are communication-intensive, or embrained knowledge, if they are mostly dependent on the knowledge and expertise of the individual's employed. The latter scenario is typical in 'knowledge-intensive firms' which are described in Chapter 2. Blackler's framework is therefore a useful starting point when considering the problems of managing knowledge because it relates the major *purpose* of the firm (e.g. whether they are trying to produce innovative or standardized products and services) to the type of knowledge that dominates and, therefore, to the *processes* and *enabling context* that need to be in place to manage knowledge. The case studies presented in the following chapters in this book will illustrate this important idea.

Critique of structural perspectives

The frameworks outlined above assume, in the main, a 'knowledge as possession' view (Cook and Brown, 1999) and because of this have been challenged for failing to take sufficient account of the more subjective, highly equivocal and dynamic nature of knowledge (Bijker et al., 1987; Weick, 1990). Other critics of structural approaches claim that the separation between tacit and explicit knowledge has been overstated and is not, in fact, a very accurate reflection of Polanyi's original idea (Gourlay, 2006). Indeed Polanyi argued that all knowledge has an indispensable personal component but that, depending on the circumstances, we are only aware of certain aspects at particular points in time. Explicit knowledge, then, is merely that which we are aware of at any given moment, in much the same way as shining a spotlight highlights particular features of a landscape at that point in time. These explicit features are always connected, though, to the things that lie behind in the dark and that can come into view at any moment as the spotlight, and our focus, shifts. Taking this view we can see, in fact, that tacit and explicit knowledge are mutually 'constituted' (Boisot, 1995; Gourlay, 2006; Tsoukas, 1996). In other words they define each other. By attending to something, and making it explicit, we automatically push other things into the background, or into tacitness, so to speak. Gourlay (2006) points out, then, that tacit knowledge may be better considered as a continuum where the degree of 'tacitness' and 'explicitness' is a function of the extent to which knowledge is communicated.

If we consider the example of riding a bicycle, we can see that it may be useful for the novice to be told to hold lightly onto the handlebars. This brings knowledge about how to hold the handlebars into focus, making it explicit. But, at the same time, it pushes other knowledge (e.g. on how to balance weight onto the pedals) further into the background. This is not a trivial point when it comes to managing knowledge because it means that *any* explicit, codified knowledge will *always* be incomplete or partial. It is only by combining this explicit knowledge with tacit 'know-how' developed through experience (e.g. about balance and hand-eye coordination) that tasks can be accomplished.

By focusing on what knowledge is, structural approaches also tend to adopt what has been termed an 'entitative' view of knowledge (Hosking and Morley, 1991). Hence knowledge is seen as 'thing-like' – an object or resource that can

be moved around much like other resources such as money. Like other resources the aim is to accumulate it and move it around for the good of the organization. In short, more knowledge equals more profit. However, there is no particular reason, *a priori*, why benefit should automatically follow from having more and more knowledge. As seen with the widespread diffusion of e-mail, it is quite conceivable that information overload might result and/or that existing, embedded knowledge might constrain attempts to do new things. Thus knowledge, unlike money, is not valuable in and of itself, but only where it is applied to specific tasks (McDermott, 1999).

Another criticism of this approach is that it assumes a so-called ‘functionalist’ view of organizations (Burrell and Morgan, 1979). In other words an organization is depicted as a collection of interdependent parts (e.g. machines and people) that work in harmony towards a common, agreed upon, goal – (e.g. organizational survival and profit). However, this assumes that common goals actually exist in organizations and, therefore, does not address important issues of power and conflict in organizations and in society at large (Foucault, 1980). For example, encouraging individual employees to surrender their knowledge for the benefit of ‘the organization’ may actually benefit shareholders or senior managers but can, equally, be for the individuals themselves. This is one reason why individuals may choose to ‘hoard’ rather than share knowledge. Moreover, it is quite conceivable that those in power could use knowledge to further their own interests rather than the interests of the collective organization.

As well as theoretical objections, there are some very practical issues when it comes to using structural approaches to manage knowledge work. For one thing, understanding types of knowledge (e.g. tacit/explicit) and where it resides (e.g. individual/collective) does not actually tell us much about where it comes from or how to *use* it – knowing, in this sense of the word, does not equal doing (Pfeffer and Sutton, 2000). Furthermore, there is now good evidence that Knowledge Management initiatives based solely on this kind of thinking often fail (Walsham, 2002). For example, in an empirical study of an initiative to encourage knowledge transfer in a world-wide bank, Newell et al. (2001) found that the introduction of a Knowledge Management System – a global intranet – designed to capture and share tacit knowledge across the organization had the opposite effect to that intended by senior management. These problems will be discussed further in Chapters 3 and 7.

These points of critique have led people to develop more sophisticated ‘contingency’ frameworks that show us how strategies for managing knowledge can be linked to specific aspects of the organizational tasks at hand. For example, Hansen (1999) studied innovation in a large electronics company and concluded that strong social relationships with a few people were beneficial for tasks that required the transfer of complex, highly tacit knowledge, whereas weak relationships with many people were more effective where the knowledge involved was less complex and more explicit. This approach is promising as it takes into account *purpose* – that is what knowledge is to be used for. However it still,

fundamentally, sees knowledge as a thing or commodity that is valuable for its own sake and tells us relatively little about the processes involved in creating and using knowledge across contexts.

>> PROCESS AND PRACTICE PERSPECTIVES: KNOWLEDGE AND KNOWING

The failure of many initiatives that have attempted to ‘capture’ and ‘transfer’ individuals’ knowledge have helped fuel shifts towards accounts that take as their focus the development of *processes* and *enabling contexts* capable of supporting knowledge work. This shift can be seen in organization theories which focus on ‘knowing’ as a social and organizational activity, in contrast to ‘knowledge’, as a thing or object. Process, and more recently practice, perspectives draw, then, from an epistemology of practice (outlined above – Cook and Brown, 1999).

Our working definition of knowledge – as the ability to discriminate within and across contexts – is based on this processual perspective in that it avoids notions of ‘truth’ and defines knowledge in dynamic terms as a practice of making distinctions (Tsoukas and Vladimirou, 2001). Process approaches to managing knowledge work draw from theoretical traditions of ‘social constructivism’, seeing knowledge, or knowing, as a process of ‘sensemaking’, whereby actors interacting within particular social contexts come to negotiate understandings of the world (Berger and Luckman, 1967; Weick, 2001). Knowledge is, therefore:

- equivocal (subject to different meanings and interpretations);
- dynamic (accepted meanings can change as actors and contexts change) and;
- context-dependent (difficult, if not impossible, to separate from the context in which it is produced).

While structural approaches see a direct relationship between increased knowledge, knowledge transfer and organizational performance (Amidon, 1998), process approaches view this relationship as socially and politically mediated. Whether or not knowledge (or knowing) leads to improvement depends, then, on how tasks, actors and contexts come together (Clark and Staunton, 1989). For example, Clark (2003) describes how the US game of American Football originated from knowledge of the game of rugby in the United Kingdom. However, it was not simply a case of capturing knowledge about rugby and transferring this to the United States. His historical analysis showed how key stakeholders (including players, sports promoters and the media) reinterpreted the British rules of the game and created ‘pivotal modifications’ that allowed it to be adapted to the particular context in the United States at the time. Hence, in order to generate advertising revenue through media breaks, they introduced shorter ‘periods’ (instead of halves) and ‘time-outs’.

This example shows how the particular interests and interpretations of actors within and across different social and institutional contexts come to bear in reproducing and legitimating particular forms of knowledge and innovation. The process approach also highlights the central role of social networks in translating (not just transferring) knowledge across groups and contexts.

Knowing is not a static embedded capability or stable disposition of actors, but rather an ongoing social accomplishment, constituted and reconstituted as actors engage the world in practice.

(Orlikowski, 2002, p. 249)

Managing knowledge work, then, is less about converting, capturing and transferring different forms of knowledge and more about building an *enabling context* that connects different social groups and interests, identities and perspectives to accomplish specific tasks or *purposes* (Boland and Tenkasi, 1995). Management initiatives aimed at building so-called ‘communities of practice’ (Thompson, 2005; Wenger and Snyder, 2000) or social networks (Cross and Sproull, 2004) reflect such a view. These will be explored in Chapter 8.

Practice perspectives

In the last decade there has been a surge of interest in ‘practice perspectives’ as a way of studying and analysing social and organizational life (Schatzki et al., 2001). In terms of managing knowledge work, however, practice perspectives have had less attention. Even advocates of the so-called ‘communities of practice’ approach (see Chapter 8) to managing knowledge within firms have emphasized the importance of communities and networks for improving knowledge flows but have left ‘practice’ relatively untouched (Beth, 2003).

Practice and process perspectives have more in common than not – both see knowing as a social activity and address *process, context and purpose*, for example. However, practice perspectives emphasize in particular the links between knowledge and action, or practice. In short, knowledge is inextricably linked to practice – it flows where practice is shared (e.g. within specialist or functional groups) and sticks where practice is not shared (e.g. across functional departments). It is useful for us to look at practice perspectives more closely because they help us to pay attention to aspects of managing knowledge work that have not been so commonly addressed to date.

Many different kinds of theorists have influenced practice perspectives, including social philosophers (e.g. Dreyfuss, 1991; Wittgenstein, 1958), social theorists (e.g. Bourdieu, 1990), cultural theorists (e.g. Lyotard, 1988) and ethnomethodologists (e.g. Garfinkel, 1967). It is impossible to do them justice here. Definitions of ‘practice’ include ‘action informed by meaning drawn from a particular group context’ (Cook and Brown, 1999) and ‘socially recognized forms of activity, done on the basis of what members learn from others, and capable of being done well or badly, correctly or incorrectly’ (Barnes, 2001, p. 19). However, we

can identify some general insights that practice perspectives offer over and above process perspectives to our understanding of knowledge work.

First, practice perspectives remind us that knowledge is ‘sticky’ – it sticks to practice and is therefore difficult to share where peoples’ practices are also not shared. This helps to explain why sharing knowledge across specialist functions or disciplines within an organization, or from one organization to another, is so difficult – even where people appreciate others’ ideas, they may not be able to apply them because it would be too difficult to change their current practices. This means that knowledge is not uniformly good but is actually quite paradoxical in relation to organizational performance. On the one hand, division of labour results in different groups performing different practices which means that valuable specialized knowledge can develop. On the other hand, the ‘knowledge boundaries’ created by specialization pose barriers to knowledge sharing across different groups of practitioners (Brown and Duguid, 2001; Carlile, 2004; Scarbrough et al., 2004). As Carlile (2002) puts it:

the irony is that these knowledge boundaries are not only a critical challenge, but also a perceptual necessity because much of what organizations produce has a foundation in the specialization of different kinds of knowledge.

(Carlile, 2002, p. 442)

Second, when we perform practice we use many kinds of material and physical objects, not just words and thoughts. Material objects are not just tools that people use to achieve ends, however, they also set limits around what practices are actually possible. For example, Orlikowski (2007) describes an online business meeting where laptop computers, Internet connections, phone lines, cables, connectors, pens, mute buttons on telephones – in her terms, the ‘stuff’ of everyday life – serve to ‘scaffold’ the social activity of the people involved. She uses the metaphor of ‘scaffolds’ to highlight the ways in which temporary material arrangements help constitute particular kinds of social activity *in real time*. Practice perspectives on knowledge work draw attention, then, to the ‘materiality’ of social activity (Orlikowski, 2007; Schatzki, 2001). In other words they focus on the ways that all human activities, including knowledge work, are interwoven with non-human, material artefacts, objects and physical arrangements. While there is considerable debate around exactly *how* this interweaving takes place (the importance of human versus non-human agency, being a particular bone of contention – Latour, 1988), practice perspectives agree that the social world is ‘a field of embodied, materially interwoven practices centrally organized around shared practical understandings’ (Schatzki, 2001, p. 3).

This has important implications for managing knowledge work. On the one hand, it means that the ability (or lack thereof) to transform knowledge and innovate depends, at least to some extent, on what Schatzki (2001) describes as the ‘solidifying inertia’ of material layouts (p. 3). Bicycles rely fundamentally on the wheel and are still very much the same today as they were centuries ago, for example. On the other hand, material objects (mobile technologies, drawings, prototypes and so on) can also act as critical tools for Knowledge Management.

An important point, however, is that this is not a one-way relationship – the design of material objects (e.g. the layout of the meeting room) influence human activity but also result from it. This is an issue we will return to in Chapter 3.

Third, practice perspectives remind us that knowledge work actually takes place in a broader ‘field of practices’ (Schatzki, 2001). For example, the practices of medical professionals are part of the broader field of scientific practice. This includes ‘epistemic practices’ (or ‘knowledge cultures’) that govern how knowledge is created and legitimated – in science via the rules of scientific method, for example (Knorr-Cetina, 1999). Therefore, to manage knowledge work, we also need to be sensitive to the broader institutional contexts and interconnected sets of practices in which that knowledge work is located. The notion of ‘the field of interconnected practices’ reminds us that change in one area of practice potentially disrupts a wide range of other practices. It is for this reason that creating and using knowledge in interdisciplinary settings can be so challenging. As Drexler noted at the first conference on nanotechnology (in 1989), ‘unfortunately, interdisciplinary subjects have a way of escaping from any discipline whatever’ (Drexler, 1989).

Fourth, practice perspectives emphasize not just the socially situated nature of knowledge, but also the *investment* of knowledge in peoples’ practice (Carlile, 2002). In other words, practices often take considerable time and effort to establish and, once established, can be reinforced by a whole range of other, interconnected practices. For this reason they are difficult to change, even where there is good evidence to do so. For example, new integrated IT systems are notoriously difficult to introduce into organizations because people find it very difficult to change from their current ‘legacy’ systems. Moreover, even if one group is willing to change, they may face challenges in introducing the system because other groups can not (or will not). As we shall see in Chapter 7, this applies equally when introducing Knowledge Management systems.

>> PERSPECTIVES COMPARED

Table 1.1 provides a summary of the distinctions between structural, process and practice perspectives on knowledge and managing knowledge work. In the chapters that follow we want to understand knowledge *work* – that is, where people work with knowledge in order to accomplish things – not knowledge for its own sake. Because of this, we draw more heavily from the process and practice perspectives as these: (a) take closer account of the core aspects of knowledge work – *knowledge processes, purposes and enabling contexts*; and (b) balance attention to the social *and* the material/technological aspects of knowledge work.

Having identified core concepts and approaches to knowledge work, in the next section we look at historical approaches to managing knowledge in organizations. This historical overview, albeit brief, is important in understanding why knowledge work is so important today and why formal Knowledge Management programmes sometimes repeat the mistakes of the past.

Table 1.1 Perspectives on knowledge work compared

| | Epistemology of Possession | | | Epistemology of Practice | | |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--|--|
| | Structural | Process | Practice | | | |
| View of social life | Individuals navigate in an objective external world through cognitive processes | Individual & collective interpretations embedded in social interactions, roles & structures | Materially interwoven (human & non-human) practices centrally organized around shared practical understandings | | | |
| View of Knowledge | Knowledge as a cognitive entity – a resource to be accumulated, captured, transferred | Knowing as a social & organizational activity – socially constructed through interactions in particular contexts | Knowing as practice – constituted by and constituting fields of interconnected practices | | | |
| Major locus of knowledge | Embrained and embodied in the skills and heads of individuals or organizations | Embedded & encultured in social context | Embedded, embodied and invested in practice | | | |
| Link between knowledge and organizational performance | Knowledge directly related to, and functional (good) for performance | Relationship between knowledge and performance socially & politically mediated: reflecting interests of powerful groups | Relationship between knowledge and performance mediated through practice: Knowledge paradoxical for performance – sticks at practice boundaries | | | |
| Major focus for managing knowledge work | Transfer/convert knowledge from one type (e.g. tacit to explicit) or location (individual, organizational) to another | Share, translate & legitimate knowledge amongst interacting groups | Transform knowledge through overlapping practices | | | |
| Major tasks of Knowledge Management | Capturing/transferring knowledge, e.g. using IT | Translating knowledge across social groups, e.g. by building social networks & trust | Transforming practice and transverting boundaries of practice, e.g. using objects and creating communities of practice | | | |

>> SCIENTIFIC MANAGEMENT AS KNOWLEDGE MANAGEMENT

The importance of managing knowledge to improve the production process is not new. As long ago as 1890 Alfred Marshall suggested that knowledge was the most powerful engine of production. However, it was not really until the advent of Scientific Management at the beginning of the twentieth century that firms

began to actively explore how to manage knowledge in work settings. Frederick Winslow Taylor developed the principles of Scientific Management in 1911. This new (at the time) approach to the organization of work – in particular, manual work – had a very profound effect on management, many features of which have endured to the present day.

Scientific Management emerged in the United States during the industrial revolution at a time where there were major advances in technology and mass production was on the increase. Managers of ever larger organizations were grappling, then, with the problems of controlling ever increasing volumes of work. Moreover, this was being carried out by a largely untrained workforce made up of immigrants from Europe or native American workers who had come from the agricultural regions of the United States. These workers were generally unskilled in factory work, many had little understanding of the English language and the majority had little or no experience of working in a factory environment.

Frederick Taylor began to develop the principles of Scientific Management based on his experiences at the Midvale Steel Company, where his career took him from machine shop labourer, through foreman to chief engineer. Having been involved with several wrangles with shop floor workers during his time as a foreman, Taylor believed that the prevalent system of production at that time – craft production – was highly inefficient. This was because it was largely left to the groups of ‘craft workers’ themselves to plan and carry out work tasks as they saw fit using loosely defined ‘rules of thumb’ acquired through years of experience. Hence, the knowledge concerning the way work was to be carried out resided, in effect, within ‘the head and the hands’ of the workers. This, Taylor believed, left organizations vulnerable to a lack of discipline and ‘systematic soldiering’ – the deliberate slow pacing of work and restriction of output – because it was not in workers’ interests to produce any more than they absolutely had to.

To overcome these problems, Taylor believed that work processes should be organized differently, being divided up into a series of simple sub-tasks which could be standardized and tightly prescribed. Workers could then be selected ‘scientifically’ (Taylor, 1911) according to the task(s) they were to perform. Workers would no longer be responsible for planning the organization of work; instead they would only be required to carry out these simple, standardized sub-tasks in an efficient manner.

Taylor also argued that it should be the task of managers to observe work processes and determine the most efficient way to organize and schedule them – effectively acting as engineers. The Business Process Reengineering efforts of today are to some extent reminiscent of this approach. Hence, whilst with the craft system the knowledge required to carry out work had resided in the ‘head and the hands’ of the workers, with the new system of Scientific Management engineer-managers would extract and capture this knowledge by systematic observation. They would then use these observations to redesign the work process that workers would then follow. In short, managers would be the heads, and workers the hands, of the organization. To use today’s terms, we can see, then, that these managers were in fact attempting to manage knowledge.

After leaving Midvale, and carving out a career as an independent consultant, Taylor carried out some of his first systematic studies around 1898 at the Bethlehem Steel Corporation in the United States, with impressive increases in productivity. His most famous study (a story that he rewrote several times, each time with more impressive results) was of a Dutch pig iron handler called Schmidt. At the start of his studies, 75 men were loading an average of 12.5 tons per man per day. Schmidt followed Taylor's simple but detailed instructions regarding when to load the pig iron and walk and when to sit and rest, with no interaction with other workers. By following these instructions specifically, Schmidt increased his output to 47.5 tons per day. He was able to maintain this output for three years of studies and received a 60 per cent increase in wages compared to his peers (Taylor, 1911).

Following the impressive results at the Bethlehem Corporation, other firms were keen to apply Scientific Management principles. However, the improvements in productivity were accompanied by widespread hostile reactions from workers because the work was inherently boring and left workers little or no latitude to apply their knowledge and skills. In addition, in many firms management chose to introduce the principles rather selectively to reduce the number of workers required and, because the skills required were now simpler, cut rather than increase wages. This often led to strikes such that the Federation of Labor came to vehemently oppose Scientific Management. In 1911 a House of Representatives Committee was set up to investigate Taylor's methods, concluding that Scientific Management did provide useful techniques for the management and organization of work. However, because of continued hostility and significant concerns about the potential for industrial unrest in arms factories in wartime, congress banned the adoption of the approach in the defense industry.

Despite this knock-back, Henry Ford applied and further developed Scientific Management principles for the production of cars. At the turn of the century, highly skilled craftsmen had been employed to build cars using handcrafted parts manufactured on general-purpose machines. However, with the introduction of Scientific Management and rationalization at the Ford automotive plant, single-purpose machines were introduced on which anyone could be easily trained to produce standardized parts. The knowledge and many of the skills required to build a car had in effect been *embodied* in the machine. However, workers still controlled the *speed* of production. It was not until Ford developed the concept of the assembly line, still used today – where the car moved past the men, instead of men moving past the car – that Ford was able to achieve what he considered to be total control of the production process.

Importantly, Taylor and Ford both had very instrumental views of human nature, believing that workers were purely rational, economic beings motivated solely by monetary incentives. They therefore believed that management-labour relations could actually be improved because workers would have the opportunity to earn more (but not too much more) money in return for gains in efficiency. However, these beliefs were fundamentally mistaken and as worker fatigue and boredom set in, absenteeism rose significantly and the quality of

the work decreased. Later, the ‘Human Relations’ school, led by the pioneering work of Elton Mayo at the Hawthorne plant of the Western Electric Company, led to the development of different approaches to the organization of work based on group work and group responsibility for work tasks. This demonstrated that workers have social, not just monetary, needs and are also motivated by intangible rewards such as job satisfaction and recognition of a job well-done.

It would be a mistake to think that we have witnessed the end of Scientific Management. The underlying principles are still applied across sectors today, especially, where efficiency, standardization and cost minimization are the main drivers of competition. Take, for example, the rise of fast food chains like McDonalds or the ever increasing number of call centres outsourced to low-wage countries. Many of the problems around quality of products or, increasingly, services are now addressed technologically, with mechanisms for surveillance and quality control being built into the core technologies used by workers (Sewell and Wilkinson, 1992). For example, call centres across a range of sectors now use sophisticated information technology to monitor the number of calls taken by workers and the quality of the interaction between client and worker. Essentially the idea with these systems is still to take knowledge, and all the uncertainty that this creates, out of the work (and workers) and place this in the hands of management and the technologies that they choose to use.

>> MANAGING KNOWLEDGE IN THE ‘INFORMATION AGE’

Whilst this earlier work alerts us to the fact that managing knowledge has long been seen as important in organizations, the so-called ‘Knowledge Era’ or ‘Information Age’ has seen major advances in this idea. This can be traced to wider debates about the organization of work and the sources of wealth creation in contemporary society. A whole ‘new’ language has arisen around concerns that it is knowledge, and not other resources such as labour or capital, that is the main source of competitive advantage across sectors. This language is now used widely in management and in politics and includes such terms as: the learning organization, Knowledge Management, strategic management of core competencies, the knowledge-based view of the firm, knowledge-based systems, knowledge-intensive firms, intellectual and social capital, knowledge capital, talent management and so forth.

The fashionable labels come and go and, as predicted in the previous edition of this book, ‘Knowledge Management’ has largely lost its ground as ‘flavour of the month’ (Scarborough and Swan, 2001). The emergence and demise of these management fads, however, is itself continued testimony to the phenomena which they address – that is, the growing knowledge-intensity of business, the impact of discourse on patterns and styles of management, the seemingly endless importance of information and communication technology (ICT) on work and work relationships, and the importance of change and innovation for organizations facing increasingly turbulent environments. These factors are not the product of fashion but of history – a convergent set of forces which have unleashed fundamental patterns of change on advanced industrial economies.

These forces have been examined in a number of different studies of industrial, occupational and organizational change in more recent decades. In 1969, Drucker emphasized that knowledge had become the crucial resource of the economy. Daniel Bell, in 1973, also described the potential for the development of a post-industrial society dominated by knowledge workers operating in knowledge-intensive firms. This would be a society organized around knowledge for the purpose of economic development, social control and institutional innovation and change. Other work in the 80s and 90s (e.g. Castells, 1996; Drucker, 1988; Gibbons et al., 1994) indicated the extent of such changes in advanced economies since the days when Scientific Management principles were first introduced. Such studies have outlined important characteristic features of the current era. These include the following:

- (i) The extent to which knowledge has been ‘globalized’, or freed up from material, physical and geographic constraints.
- (ii) The economic value of intangibles, such as new ideas, software, services and network relationships.
- (iii) The convergence of computing power and communications technology, with a new generation of web-based technologies having major impacts on the structuring of work and occupations.
- (iv) The importance of knowledge as a primary means of production, acting upon itself in ‘an accelerating spiral of innovation and change’ (Castells, 1996).
- (v) An emphasis on normative, or cultural, rather than hierarchical forms of control so that knowledge workers effectively manage and discipline themselves (and each other).
- (vi) Fundamental changes in the ways knowledge itself is produced – no longer just in ‘ivory tower’ academic organizations or R&D departments (Mode 1) but *as it is applied* in new contexts (Mode 2) (Gibbons et al., 1994; Nowotny et al., 2003). The different dimensions of these modes of knowledge production are summarized in Table 1.2.

Table 1.2 Mode 1 and Mode 2 knowledge production

| Mode 1 knowledge production | Mode 2 knowledge production |
|-----------------------------------------------------------|----------------------------------------------|
| Problems defined by academic and professional communities | Knowledge produced in context of application |
| Disciplinary knowledge | Transdisciplinary knowledge |
| Homogeneity | Heterogeneity |
| Hierarchical and stable organizations | Heterarchical and transient organizations |
| Quality control by the ‘invisible college’ | Socially accountable and reflexive |

Source: Adapted from Nowotny et al. (2001).

Taking a more critical approach, it is important that we continue to ask questions about the extent to which these changes have been as widespread, or as inherently positive, as predicted by the likes of Drucker or Gibbons et al. As we have seen, in some types of work – call centres being an example – there is little evidence of workers being freed from hierarchy or being actively engaged in using their own knowledge as a means of production. New web-based and increasingly mobile technologies also, clearly, create their own problems. On the one hand, they can decentralize work and free people and activities from the constraints of physical location or even identity. At the same time, however, they can depersonalize the experience of work, generating problems of social isolation, or can intensify it by shifting home–work life balance. They can also increase opportunities for more subtle forms of surveillance and control.

Positive or negative, however, the changes heralded by the ‘Information Age’ are undoubtedly having a visible impact on the way organizations are being structured. Many have indeed shifted away from the traditional command and control structures of Taylor’s time (the classic bureaucracy) towards flatter, decentralized structures and more flexible, open-ended, fluid and networked arrangements (see Chapter 3). If we look at high-technology sectors such as the biopharmaceutical industry, for example, we see this characterized by loose constellations of firms, alliances and mergers, outsourcing and partnering arrangements, licensing deals and so forth. The rise of networked organizations (sometimes referred to as polycentric organizations), virtual modes of organizing, and more open-ended, collaborative forms of innovation and product development (Chesbrough, 2004) illustrate further the extent to which organizational structures have evolved in pace with changes in technology that break down traditional boundaries of time and space.

These changes in structure have, however, generated new problems for managing knowledge in the current era that are equally, if not more, significant than those experienced in Taylor’s time. For example, when outsourcing is introduced, or mergers take place, the implications in terms of ‘losing’ valuable knowledge are often not recognized until it is too late. More open-ended, collaborative arrangements for organizing work and product development also generate significant challenges in terms of who owns intellectual property (Chesbrough, 2003a, b). And, when businesses are restructured around virtual teams and networks, and stretched across time and space, they also inevitably lose opportunities for casual sharing of knowledge and learning invited by physical proximity. As Prusak put it (1997):

If the water cooler was a font of useful knowledge in the traditional firm, what constitutes a virtual one.

(p. xiii)

Indeed, it has been suggested that in fact one of the reasons that Knowledge Management initiatives became so popular in the late 1990s was because they offered an antidote to some of the profound organizational problems posed by these changes of organization in the ‘Information Age’. The emphasis in

Knowledge Management was, at least initially, on identifying, extracting and capturing the, often tacit, 'knowledge assets' of the firm so that they could be both fully exploited and fully protected as a source of competitive advantage. For example, Dow Chemical, which earns a high income through technology licensing, replaced a data archive described as 'a disorganized mess of intellectual capital' with a widely accessible database to keep track of their many patents.

The use and limitations of Knowledge Management systems, introduced to exploit the company's intellectual or knowledge assets, are explored in detail in Chapter 7. From this historical overview we can see that in some respects 'Knowledge Management' is actually pretty similar to Scientific Management, in so far as both aim to capture the knowledge that resided in 'the heads and the hands' of the workers. However, the task of extracting and capturing the knowledge of work processes 'held' in the heads of workers has become far more complex as traditional forms of work have gradually been replaced by what we now refer to as knowledge work.

>> WHAT IS KNOWLEDGE WORK?

If we look back at the definition of knowledge above we can see that all work, even Schmidt's pig iron handling, requires the application and use of some knowledge. You could argue, then, that all work is knowledge work. However, as we shall see in Chapter 2, using the term in such a broad-brush way is not very helpful when thinking about managing knowledge work.

The term 'knowledge work', as used here, refers more particularly to organizational activities and occupations that are 'characterized by an emphasis on theoretical knowledge, creativity and use of analytical and social skills' (Frenkel et al., 1995, p. 773). 'Knowledge work' in these terms encompasses both what is traditionally referred to as professional work (e.g. accountancy, scientific and legal work) and more contemporary types of work (e.g. consultancy, software development, advertising and public relations). In these kinds of work, knowledge acts as the main input into the work, the major way of achieving the work and the major output. This kind of work, and the organizations that focus on it, are explored in more depth in Chapter 2. Suffice to say here, it is with this kind of work that we are most concerned in our book.

The term 'knowledge worker' encompasses, then, both professionals and those with other discipline-based knowledge or more esoteric expertise and skills – for example advertising, media, consultancy – whose major work tasks involve the creation of new knowledge or the application of existing knowledge in new ways. Knowledge workers typically have high levels of education and specialist skills combined with the ability to apply these skills in practice to identify and solve problems. What is significant about these types of knowledge workers is that, unlike the kinds of shop floor workers Taylor was dealing with, or the call centre workers discussed above, knowledge workers are the organization's primary means of production. If we take the view, also, that specialist knowledge is deeply embedded in practice (the epistemology of practice view), this means that knowledge work does not lend

itself particularly well to knowledge capture or standardization. Therefore those engaged in these types of work need to be left to make their own decisions about what and how to do their work.

>> CONCLUSIONS

In this chapter we have focused on introducing and providing terms and providing a historical overview of how and why knowledge work has become so important for organizations in the twenty-first century. In this we have seen how process and practice perspectives have become more prominent over recent years, in part due to the limitations and critique of purely structural approaches and knowledge typologies. Table 1.3 summarizes some of the major concepts introduced in this chapter:

We can conclude from this that managing knowledge work in the twenty-first century is less about direct control and capture of knowledge in machines or systems – as in the days of Taylor and Ford – and more about providing an enabling context that supports the processes and practices of applying knowledge for specific tasks and purposes. Knowledge workers resist the command

Table 1.3 Core concepts

| Concept | Working Definition | Field of study |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge | The ability to discriminate within and across contexts | Concerned with the ways in which actors in particular social situations understand and make sense of where they are and what they are doing |
| Organizational knowledge | A learned set of norms, shared understandings and practices that integrates actors and artefacts to produce valued outcomes within a specific social and organizational context | Concerned with the means by which actors develop beliefs, behaviours and routines that shape the organization's capabilities |
| Knowledge Management | Explicit strategies, tools and practices applied by management that seek to make knowledge a resource for the organization | Concerned with the development of concepts that illuminate or enhance the application of these practices |
| Knowledge Work | Organizational activities and occupations that are 'characterized by an emphasis on theoretical knowledge, creativity and use of analytical and social skills' | Concerned with the analysis of organizational conditions, or enabling contexts, that allow such work |
| Knowledge Worker | Professionals and others with disciplined-based knowledge or more esoteric expertise and skills whose major work tasks involve creating new knowledge or applying existing knowledge in new ways | Concerned with the ways in which knowledge workers are organized, motivated and managed |
| Innovation | The application of knowledge to new tasks and situations | Concerned with the ways in which new products, processes and services are developed and delivered |

and control structure of Taylorist times and demand a new form of management and organization more reminiscent of the orchestra than the traditional manufacturing firm. Like musicians, knowledge workers seek outlets for their creative abilities and become absorbed in interesting challenges and the stimulation of working with other specialists. This poses new challenges for management in knowledge-based organizations that we shall consider through the course of this book, which are to:

- Develop *enabling contexts* – including organizational cultures, structures, opportunities for collaborative forms of work and coordination, reward and recognition systems and career opportunities – that support knowledge work.
- Understand *knowledge processes* – that is the processes and practices through which knowledge is shared, integrated, translated and transformed (but also hoarded, constrained and protected).
- Deploy knowledge for specific *purposes* – that is to accomplish specific tasks as set by particular interest groups (and not assuming that knowledge is necessarily good, or good for its own sake)
- Align *context, knowledge processes and purpose* in the management of knowledge work.

Throughout the following chapters our emphasis is on combining theories with practical examples and case studies – many of which are drawn from our own research – that enable us to better understand knowledge work and its management through aligning processes, purposes and enabling contexts. In the next chapter, however, we focus on the management of knowledge-based or ‘knowledge-intensive firms’, as they tend to be referred to in the literature as these pose distinctive challenges for managing knowledge work. Using the case of ‘ScienceCo’, we explore in particular the structural and cultural contexts that support and enable knowledge work.

Summary of key learning points

- >> Knowledge is highly contextual thus distinguishing it from information or data.
- >> Two major ways of understanding knowledge underpin approaches to managing knowledge work: the epistemology of possession and the epistemology of practice.
- >> The epistemology of possession treats knowledge as something people have and tries to identify types and forms of knowledge – knowledge creation is seen as involving the conversion of one type of knowledge to another.
- >> The epistemology of practice treats knowledge (or knowing) as something that people do and tries to understand processes by which people and organizations come to know and apply this knowing in practice – knowledge creation is seen as an ability, rooted in action and social practice.

- >> Structural approaches to managing knowledge assume an epistemology of possession, while process and practice approaches assume an epistemology of practice.
- >> The principles of Scientific Management can be seen as an early attempt to manage knowledge. They are still applied today in many sectors.
- >> An industrial shift to the 'Information Age' or 'Knowledge Era' has witnessed new forms of knowledge production and a growing awareness of knowledge work as a major source of wealth creation across organizations and nations.
- >> 'Knowledge Management' became popular on the back of this shift as a means of coping with growing uncertainties of knowledge work in the twenty-first century. Approaches that aim to extract and harness the knowledge of the individual worker are actually quite reminiscent of Scientific Management.
- >> The management of knowledge workers is of strategic importance, in particular, to firms that compete on the basis of innovation.