



A tenth anniversary assessment of Davenport and Prusak (1998/2000) *Working Knowledge*: Practitioner approaches to knowledge in organisations

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Abstract

Davenport and Prusak's *Working Knowledge* is aimed at practitioners. The tenth anniversary of the paperback edition of Davenport and Prusak's *Working Knowledge* is evaluated using two approaches. First, a practitioner view of knowledge management (KM) is examined from two lenses: the authors' definition of knowledge and their view of knowledge processes for knowledge sharing or hoarding. The second approach considers their advice to ensure that knowledge is neither mismanaged nor unmanaged in organisations (p. xxi). Davenport and Prusak's advice takes three forms. First, they provide a rationale for knowledge sharing based around its value when lost. Second, they provide advice on the processes that facilitate knowledge sharing. Third, they reinforce the continuing importance of organisational values. At a time when the cost pressures facing contemporary businesses reduce funds available for technological codification of knowledge and knowledge-supporting activities, *Working Knowledge* reminds us that knowledge involves individuals making judgements and providing insights. However, the continuing lack of a clear definition of knowledge makes for difficulties in gaining acceptance for KM and knowledge practices.

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Introduction to *Working Knowledge*

It has been 10 years since the release of the paperback edition of Davenport and Prusak's *Working Knowledge*. Its authors (Davenport & Prusak) set out the place of knowledge in relation to both the increasing numbers of employees and managers with responsibilities that depend on using knowledge and the increasing role of technology in business. The popularity of the first edition (1998) resulted in a paperback (2000) with a new preface reflecting on its status and the challenges facing businesses that had committed to Knowledge Management (KM) (references in this paper are to the paperback edition). *Working Knowledge* is widely regarded as a major resource for knowledge projects having been translated into 12 languages and has sold over 150,000 copies (Prusak, 2011).

Working Knowledge (hereafter WK) is notable for its double-immediacy view of KM. Double-immediacy refers to the preference that practitioners have for knowledge that will produce quick results, and giving their

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attention to their local environment to source the knowledge that they seek. Hitherto, proximity and convenience had been overlooked as profound influences on knowledge sharing. Before Davenport and Prusak's book (published by the prestigious trade publisher Harvard Business Press), KM had three streams of development. In the first stream were the precursors with economic and social foci and the business scholars: Machlup (1962) identified the 'knowledge economy', and Bell (1967, 1973) provided sociologies of the future predicting an economy that was information-led and service-oriented. In the second stream were academics: theories of knowledge transmission (e.g., Boisot, 1995) or knowledge creation (e.g., Nonaka & Takeuchi, 1995) were proposed. KM also drew upon knowledge-informed views of business cycles (e.g., Schumpeter, 1942/1975) and innovation (Allen, 1977). Finally, some writers on general management had been early advocates of the importance of knowledge (e.g., Drucker, 1993), recognising the productivity of knowledge workers. Nevertheless, knowledge received scant attention as it competed with quality management and business reengineering, as evidenced by Drucker's reiterating his emergence of the knowledge worker view in his later publications over many years (e.g., Drucker, 1995, 2004). Drucker placed great emphasis on managers having an understanding of their objectives, markets and channels, and profit as an unreliable measure of success (partly because it could be easily manipulated and partly because other factors determined the continuity of the organisation). For an introduction see Drucker (1967). There is an extended discussion in Drucker (1973/1993). Like *Working Knowledge*, Drucker's books are wholly aimed at practitioners. In parallel, the combination of knowledge and strategy was developed by Grant (1996), moving KM into the fields of leadership and strategic planning. This contributed to the benefits of knowledge gaining attention among senior managers. A preliminary mapping of knowledge-related publications by Easterby-Smith & Lyles (2003, pp. 5, 8, 11) identified connections with 'organisation knowing' (e.g., Blackler, 1995; Cook & Brown, 1999) and confirmed the prevalence of specialist areas and the newness of the field bearing in mind that their main focus was organisational learning, and KM was a secondary consideration. Since then, knowledge in organisations has been absorbed into existing functional responsibilities, including human resources, and accounting (for intellectual capital) so there is potentially a new audience for *WK*.

Method

In this 10-year evaluation of *WK*, two approaches are followed. First, the account given by Davenport and Prusak (hereafter *D&P*) is assessed in terms of its value to practitioners, the audience for the book. The criteria are based on what *D&P* regard as the central issues of KM as evidenced by the structure and content of *WK*. Second, the account of knowledge sharing and hoarding proposed in *WK* is subject to a critical evaluation.

WK is based on research from 39 organisations as well as some other companies used for illustration. Table 1 lists all the companies discussed by *D&P* and identifies the key knowledge example or insight that they suggest should influence other companies (and presumably the readers of *WK*). The key example or insight is selected on the basis of its discussion in *WK*.

In total, the same 71 companies feature in both the 1998 and 2000 editions of *WK*. The reissue of *WK* retained the same text as the original as *D&P* saw no 'pressing need to revise the text', apart from the comments in the preface to the paperback edition (Prusak, 2012). Given the preface to the paperback edition claims that KM has 'widespread legitimacy' (p. vii) and that management needs to 'change the core of the business' (p. ix) using the guidelines already provided in *WK*, their views can be taken as fair account of their (then) current position and direction. For the purposes of this evaluation, the contemporary practitioner literature will be referenced since *WK* was entirely aimed at practitioners. In the main, the practitioner literature describes how organisations discover and manage what the employees know (e.g., Leonard-Barton, 1995; Dixon, 2000). The early attempts to value knowledge (e.g., with an intellectual capital view of knowledge such as Edvinsson & Malone, 1997) are of little concern to *D&P* as they value knowledge in terms of actual not potential use or return.

Table 1 contains two striking features. It shows that the companies vary widely in the conception of knowledge, from trade secrets (e.g., Zildjian Cymbal) to expertise (e.g., American Express), taking varying forms, such as stories (e.g., Verifone). It also shows a range of processes and commitment. These ranged from a project basis (e.g., Hoechst-Celanese) to a broad operational application (e.g., Sharp) with some harnessing of technology (e.g., Raychem). Table 1 also shows the fate of the companies mentioned, with 1 ceasing business, 11 acquired, 3 mergers, 6 evolving into new organisations and 49 continuing to operate. While no definitive conclusion can be drawn from these numbers, it suggests that there is no immunity from the business life cycle, even for knowledge-aware companies.

Assessment of the value of 'Working Knowledge' to practitioners

WK provided practitioners (defined as both managers and knowledge workers) with a handbook delineating a range of actions that establish the value of knowledge to organisations in three ways. First, they describe how knowledge is different to information and data. Ultimately, knowledge is seen as a distinct property of individuals (knowing) that can be overlooked when downsizing (pp. 43–44) or not made available after a takeover (p. 55). Second, they identified three generic processes associated with using knowledge: knowledge generation, capture and codification. Third, they suggest nine knowledge heuristics to guide KM endeavours. Each descriptor

Table 1 Knowledge example or insight provided in *Working Knowledge* (1998/2000)

Company discussed in WK ^a	Status of company in 2011 ^b	Key knowledge example or insight from WK ^c
1 American Express	Operating	Example of a stable expert system
2 Andersen Consulting ^a	Evolved into Accenture	Establish competency groups
3 Apple	Operating	Put knowledge gained into products
4 AT&T	Operating	Knowledge transfer inhibited by a conqueror culture
5 Boeing ^a	Operating	Manage configuration knowledge
6 Booz Allen Hamilton	Operating as two companies	Knowledge transfer through mentoring
7 British Petroleum ^a	Operating	Make knowledge accessible; create a sense of crisis
8 Buckman Laboratories ^a	Operating	Position of Director of knowledge transfer
9 Chaparral Steel ^a	Acquired by Gerdau Ameristeel	Flat organisation structure; learning culture
10 Chemical Bank ^a	Evolved into J P Morgan Chase	Phone directory on what employees did
11 Chevron	Operating	Knowledge management best practice
12 Chrysler ^a	Operating	Codify process knowledge
13 Citicorp	Operating	Knowledge management best practice
14 Coca-Cola ^a	Operating	Trade secret of the formula
15 Coopers & Lybrand	Merged with Price Waterhouse	Vice President role for learning
16 CSIRO ^a	Operating	Knowledge/research relationship with industry
17 Dai-ichi Pharmaceuticals ^a	Merged with Sankyo	Discussion opportunities
18 Digital Equipment	Acquired by Compaq and then HP	CEO narrow vision of the business and strategy
19 Dow Chemical ^a	Operating	Chief Knowledge Officer of intellectual capital management
20 EDS	Acquired by Hewlett-Packard	Chief Knowledge Officer role
21 EL Products	Acquired by Grimes	Takeover does not necessarily transfer knowledge
22 Ernst & Young ^a	Operating	Establish competency groups
23 Ford ^a	Operating	Bringing external knowledge into the organisation
24 General Electric	Operating	Learning centre established for knowledge
25 General Motors ^a	Operating after Chapter 11 bankruptcy	Linking knowledge and decisions
26 Hewlett-Packard (HP) ^a	Operating	Use of electronic communication
27 Hoechst-Celanese ^a	Evolved into Celanese listed in Germany	Informal discussion leads to formal projects; create a sense of crisis
28 Hoffman-LaRoche ^a	Operating	Consolidate and make knowledge accessible (relevance is more important than completeness); knowledge/research relationship with industry; ego inhibits knowledge sharing
29 Hughes Space and Communications ^a	Acquired by Boeing	Consolidate and make knowledge accessible
30 IBM ^a	Operating	Use of technology for knowledge growth; establish competency groups; knowledge transfer inhibited by a conqueror culture
31 IDEO ^a	Operating	Culture of questioning what is not known
32 International Harvester	Acquired by J I Case	Had 'forgotten' how to build a truck factory completed 20 years earlier
33 Javelin Development Corp	Acquired by Oracle	Knowledge market inefficiencies
34 Matsushita	Operating	Understand what has to be done well
35 McDonalds Universities	Operating	Establish competency groups
36 McDonnell Douglas Corp. ^a	Merged with Boeing	Difficulty of change when successful; create an artificial sense of crisis
37 McKinsey & Company ^a	Operating	Make knowledge accessible
38 Merck	Operating	Dedicate distinct resources to generate knowledge
39 Microsoft ^a	Operating	Use of technology for knowledge growth
40 Mobil Oil ^a	Operating	Expertise under politics influence codification and coordination
41 Monsanto ^a	Operating	Common definitions for codification and consolidation
42 National Semiconductor ^a	Operating	Knowledge sharing with one and many software tools
43 NationsBank	Evolved into Bank America	Project to consolidate knowledge
44 NEC	Operating	Faster model changes; mobilising knowledge produces better results than robots
45 Nissan	Operating	Combining different ideas, skills and values creates innovation
46 NYNEX ^a	Evolved into Verizon	Knowledge brokering
47 Owens-Corning ^a	Operating	Librarians create navigation tools
48 Polaroid	Ceased	Founder dominates the firm's knowledge market
49 Raychem	Operating	Database of employees willing to share information

Table 1 (continued)

	Company discussed in WK ^a	Status of company in 2011 ^b	Key knowledge example or insight from WK ^c
50	Sandia National Laboratories ^a	Evolved into Martin Marietta now Lockheed Martin	Knowledge conservation programme
51	Sears	Operating	Ignore Wal-Mart retailing changes until forced by declining sales
52	Sematech ^a	Operating as an association of member companies	Structures to support knowledge transfer
53	Senco Products ^a	Operating	Understand failures of knowledge in decisions
54	Sequent Computer ^a	Acquired by IBM	CKO role in capturing and leveraging knowledge
55	Sharp	Operating	Research knowledge routinely transferred to business units
56	Silicon Graphics	Operating	Created internal knowledge repository
57	Skandia ^a	Operating	Measure the economic value of knowledge
58	Standard Life	Operating	Uses sources of competitor knowledge
59	Sun Microsystems	Acquired by Oracle	Created internal knowledge repository
60	Teltech ^a	Operating	External expert systems
61	Texas Instruments ^a	Operating	Re-use of knowledge
62	3M ^a	Operating	Encouraged private research
63	Time Life ^a	Evolved into Time-Warner	Quality and depth of information
64	U.S. Army ^a	Operating	After action reviews
65	Verifone	Acquired by Hewlett-Packard	Circulate stories of excellence in action
66	Wal-Mart	Operating	Orchestrating core competencies
67	Wang Laboratories	Acquired by Getronics of the Netherlands after bankruptcy	Failed to adapt
68	World Bank	Operating	Dispense knowledge as well as money to improve developing countries
69	Xerox PARC	Operating	Failure to capitalise on innovative use of knowledge; establish competency groups
70	Young & Rubicam ^a	Operating	Managing knowledge is the responsibility of all knowledge workers
71	Zildjian Cymbal Company	Operating	Trade secret formula for metal composition

^aIndicates that the company is 1 of the 39 companies identified by *D&P* in their acknowledgements (p. xxiv). However, the original research programme comprised 'about 25 client companies' (p. xxi). Some companies wished to remain anonymous and, from the discussion, it appears that all the organisations had a significant budget for knowledge management initiatives.

^bStatus is categorised as one of Operating, Ceased, Evolved, Acquired or Merged.

^cSpecific examples or insights are found in more than one company.

is used to assess the claims made in *WK*. In addition, a general problem is considered below, namely, that if knowledge is different to information and data then its close association with the technology undermines 'knowledge as resource', the conception proposed by Grant (1996) and Choo (1998) because technology tends to reduce knowledge to information and data.

Descriptors of knowledge (knowing)

D&P describe knowledge using three properties. First, they claim that knowledge is a refinement of data and information and possesses an experiential factor (p. 7). Data is regarded as the element of a transaction that can be captured and extracted (p. 2). Information is the use of data for a purpose that allows meaning to be understood (p. 3). This implies that it is always the recipient not the provider who determines meaning. However, the methods suggested by *D&P* (facilitating contacts, and allowing individuals opportunities to communicate) overlook the central issue, namely, whether sharing or hoarding of knowledge will actually take place. *D&P* also fail to make

clear how activities labelled KM go beyond exchanging data or information.

The second aspect of knowledge is that it can be difficult to isolate. In adopting this view, *D&P* support the argument proposed by Polanyi (1966/1983) that individuals possess knowledge that is not entirely apprehended by them because explicit knowledge and tacit knowledge is intermingled. This presents a problem that *D&P* do not entirely satisfactorily resolve although they consistently distinguish between the two classes of knowledge. Supporting Polanyi's view requires them to locate knowledge in the individual as part of cognition. *D&P* then rely on the conversion model provided by Nonaka & Takeuchi (1995) to give certainty that the tacit knowledge can be made explicit. *D&P* cite the example from Nonaka & Takeuchi (1995) of the bread-making machine at Panasonic that required the combination of expert knowledge (computer control, induction heating and rotating motors) from three different business units (pp. 60–61). Again, this may be only exchanging data and information since Polanyi (1966/1983) claims that tacit knowledge is only made explicit infrequently and in

fragments. *D&P* often alternate between the explicit form of knowledge, meaning it has been shared, so it can be used, and knowledge as a power to organise, filter and judge (p. 12).

The third property is its active use outside the individual to the benefit of the organisation in terms of the judgement, expertise, innovation or creativity (p. xix) that occurs within and between individuals (p. 6). *D&P* recognise that the receiver may understand a completely different message to that which was intended by the sender (p. 3) but suggest that the choice of appropriate methods will overcome this problem. The methods they instance are essentially putting searchers for knowledge in touch with people who have made claims to possess the category or class of knowledge sought and leaving it up to them to communicate. This is a practical approach and is far superior to the wholesale codification of knowledge approach that prevailed at the time *WK* was written. But it is an uncertain approach, depending on numerous factors for successful knowledge transfer. In fact, it really is the default knowledge sharing policy of those organisations that leave employees to work out how to use the available systems and technologies. To overcome miscommunication, *D&P* rely on two solutions. The need for redundancy (Shannon, 1948) but measuring content is replaced with the 'impact on judgement and behaviour of the recipient' (p. 3) and is achieved through overlapping expertise (Nonaka & Takeuchi (1995, p. 81).

An assessment of the *D&P* view of knowledge is difficult because they do not make clear whether knowledge for them is any one of the properties or the sum of the properties and thus a problem arises when only one or two are present. Moreover, under the descriptions given, it is possible for a communication to be knowledge to one person and data to another as is clear from Plato's (2007) allegory of the cave. That is, data or information can become knowledge where there are limitations as to what is made available and the sources are restricted. In part, this arises from their uncritical use of Nonaka & Takeuchi (1995) depicting tacit and explicit knowledge as readily separable. *D&P* eventually concede that knowledge is in some way refined data or information as part of a utility view based on individual knowledge being evaluated in terms of the decisions or actions associated with it (p. 6). While *D&P* avoid a wholly performance-based evaluation, which is due to their observation that there is too much short-term concern for profit, their definition is not entirely satisfactory for three reasons. The first is that some employees are adept at manufacturing opportunities to publicly release their knowledge or pass-off as theirs knowledge provided to them by other employees. Second, a just-in-time view of knowledge is implied in which knowledge does not require a gestation period in which to develop nor is it awaiting circumstances in which it can be uniquely applied. Just-in-time knowledge implies that many organisational resources are consumed

unproductively until a future event endows them with value. For example, designing and fitting the quadruple flying systems gave the Boeing 747 its envied safety record (Sutter, 2006). Third, *knowledge* altruists may reconsider their commitment in the face of poor understanding of the difference between knowledge and information. This is reinforced by *D&P* commenting that it is common that many managers do not distinguish between knowledge and information (p. 6) and instead suggest the focus should be on its components, that is, 'experience, truth, judgement and rules of thumb' (p. 7). For much of *WK*, it is the characteristics of knowledge that dominate the discussion rather than what is known by specific individuals (knowers). A simple distinction following Locke (1689/1975, pp. 525, 529, 538–539, 545–546) that knowledge is the combination of contextual information, values and insights used to evaluate new experiences and information by perceiving connections and distinctions or inconsistencies would be useful for practitioners. Knowledge may also be enhanced by integrating two or more complementary disciplines as it fosters critical thinking (Winter *et al*, 1981).

Processes for knowledge use

If knowledge itself is difficult to pinpoint then processes associated with it are also imperfect. *WK* identifies three processes for managing knowledge (generation, codification and transfer), in which an organisation must excel (p. 51) if it is to be successful. Given that *D&P* are strongly influenced by Nonaka & Takeuchi (1995), these can be seen as drawing on their knowledge-creation processes of internalisation, externalisation and socialisation, respectively. Internalisation allows tacit knowledge to be made explicit although *D&P* regard the generation of knowledge as acquisition (p. 53), establishing dedicated resources (p. 58), the fusion of skills, ideas and values (p. 60), adapting resources or fostering absorptive capacity (p. 65), and relying on the efforts of networks or communities (p. 65). In this respect, *D&P* offer an account that goes beyond processes to recognise that context, and availability of space and time are catalysts for knowledge. Perhaps, more importantly, *D&P* consider the precursors of the processes, namely, a nurturing environment and measurement in terms of knowledge generated (p. 67) subsequently addressed by Nonaka & Konno (1998, p. 41) using the concepts of *ba* and *basho* to concentrate resources so each of the knowledge conversion actions (p. 43, Figure 1) may comprise spirals but together also form a spiral, assuming that repeating or refining knowledge transfer improves transmission. It is not clear who makes the greater effort, the sender or the recipient in this model, a point that *D&P* consider important for managing knowledge (p. 28). However, Nonaka & Konno (1998, p. 54) ultimately recognise that a place for knowledge (*ba*) is established under the auspices of top management with a special role for knowledge activists.

The codification and transfer processes of knowledge are less reliant on Nonaka as they are concerned with leveraging its value. The problem of codification and coordination of knowledge is partitioned into two functions and the problem of retaining the essential characteristics that allow it to retain its character and value over time (p. 87). The process of discovering who knows what (being a precursor to a knowledge directory) is seen as a legitimate form of codification (p. 72). A 'yellow pages' directory describing employee functions and expertise is seen as a knowledge tool, while the organisation chart or telephone directory are seen as data (p. 72). Like Nonaka, *D&P* overlook some challenges to conversion such as the subjective conception of knowledge, the effect of hindsight and the lack of any controls to demonstrate that the combination and internalisation modes operate as described (Essers & Schreinemakers, 1997; Goulay, 2006). These are similar criticisms to those of Bereiter (2002, pp. 175–179) who claimed that Nonaka's model lacks an explanation of how innovations are produced. *WK* offers four principles for codification (goal, availability, appropriateness and medium, p. 69) but puzzlingly flag as the major challenge 'developing technologies' when earlier in the chapter they emphasised the 'value of narrative' (p. 81).

Knowledge transfer presents a unique problem for *D&P* as what amounts to best practice does not guarantee successful transfer (pp. 101, 104). It is clear that these constitute necessary but not sufficient grounds for transfer (defined as transmission and absorption, p. 101). The end chapter proposal to 'shift ... from documents to discussions' (p. 106) dwells on making opportunities rather than allowing the individual knowers to manage the process. They comment somewhat lightheartedly that hiring smart people is half the problem but this excludes those organisations who have to select from the available workforce and who sincerely want to become knowledge intensive. In any case, *D&P* observe that it is rational behaviour to seek knowledge from nearby colleagues (p. 88) rather than expend the effort to find the person with the deepest knowledge. So difficulties with knowledge transfer should be expected to be one of the day-to-day problems management has to contend with and in which they will have varying degrees of success.

When *D&P* differentiate between expert knowledge, which is contextual, and expert knowledge, which changes very little, they are really taking the point of view of the provider and undermine their own claim to the importance of using it. According to *D&P*, actual knowledge (whether tacit or explicit) is capable of removal from the individual without much loss and thus whether it is actually knowledge. *D&P* persist with a 'process perspective', despite their own contradictory evidence that managers did not find it useful (p. 157). However, the value of *WK* is that, in their examples from businesses and individuals responsible for the knowledge function, *D&P* often provide alternatives to their own

argument. In one comment *D&P* suggest that the importance of knowledge is the criterion used for acting on it, while the type of knowledge governs what should be done with it (pp. 36, 70). Another is from Hoffman-LaRoche who found that 'relevance is far more important than completeness' (p. 69). These appear to be descriptions of the subset of processes that release knowledge, through fostering trust and establishing a common ground (p. 97). Consequently, their advice to managers is to blend knowledge into work processes, redesigning and fine tuning them to 'better channel the flow of knowledge' (p. xi). When *D&P* concede that this is yet to be explored it is also clear they do not mean by using the internet technology or business process reengineering options they have already discussed. Instead, the answer they provide is to build linkages between KM and knowledge processes for the import and export of knowledge and for how the knowledge should be used and how the knowledge should affect the outcome (p. xi). This is a refreshing alternative to the wholesale codification that has been one product of KM or the attempt to isolate intellectual capital, which can have the counteracting effect of stifling knowledge flows.

Heuristics for knowledge

WK mainly provides heuristics obtained from anecdotal evidence from apparently successful approaches adopted by leading companies in KM. In all, *D&P* offer nine heuristics, which roughly correspond to the chapter structure in *WK*. Table 2 below summarises each heuristic by chapter and the key elements offered by *D&P* to support their heuristic.

It is clear from Table 2 that *WK* offers a corporate view of KM. The most notable characteristics of the examples used are the attempt to provide insights. *D&P* explain these are 'best practices, new ideas, creative synergies and breakthrough processes that information cannot supply, regardless of how well it is managed' (p. xxi) and will come from knowledge that already exists within the organisation but 'was not accessible or available when required' (p. xxi). The heuristics use the goal of utility to the organisation to guide successful knowledge transfer and are essentially advice to secure knowledge from individuals. Having in their preface pointed out that the challenge of KM lies beyond 'awareness' and 'broad acceptance' (p. vii), *D&P* portray KM as a chess game where the company is pursuing strategies to get employees to unburden their knowledge and the employees are coming to the realisation that the less personal knowledge they possess the less reason the company has to retain them.

Many of the heuristics are therefore directed to employees as individuals. This is appropriate where a single employee possesses all the up-to-date knowledge but is atypical in organisations where knowledge is possessed by more than one employee (e.g., through having formerly performed those duties) or where the knowledge is made available to employees (in the

Table 2 Summary of the heuristics by chapter with the key elements of each heuristic

Chapter		Heuristic	Key elements supporting the heuristic
#	Title		
1	What do we refer to when we talk about knowledge?	Make clear where knowledge, and not data or information, was utilised	- Knowledge as insights, judgements and understanding - Knowledge as refinement of data and information possessing an experiential factor
2	The promise and challenge of knowledge markets	Recognise where knowledge markets exist in the organisation	- Roles include 'seeker', 'buyer' and 'broker' - Marketplaces include face-to-face and technology-mediated - Signals include position title, status, reputation, informal networks and communities of practice - Value is determined by both buyer and seller using repute, reciprocity, altruism, trust (based on social exchange theory)
3	Knowledge generation	Foster knowledge generation	- Pathologies include monopolies, artificial scarcity and trade barriers - Acquisition, rental and dedicated resources, and networks are avenues - Copying, fusion and adaptation are methods
4	Knowledge codification and coordination	Selectively codify the bounded, unambiguous and rule-based knowledge and coordinate unstructured knowledge	- Types of knowledge (articulatable, teachable, observable, documentable, rich, complex) - Mapping and modelling knowledge - Capturing tacit knowledge - Embedding knowledge in systems
5	Knowledge transfer	Enable knowledge transfer, resulting in absorption and use so that it thrives beyond where it was developed	- Knowledge transfer is accomplished through a variety of strategies including: - Formal strategies, which include partnership, mentoring and apprenticeship - Informal strategies, which include gossip - Random strategies, which include, for example, water cooler meetings - Structured activities, which include, for example, knowledge fairs, open forums, technology infrastructure
6	Knowledge roles and skills	Identify knowledge roles and skills	- Knowledge specialists - Workers with knowledge - Managers of knowledge projects - Chief Knowledge Officers and equivalents - Expert systems and artificial intelligence
7	Technologies for knowledge management	Carefully utilise technology	- Case-based reasoning - Broad knowledge repositories using a thesaurus to index and search - Knowledge domains and knowledge sharing within communities - Real-time (short- and long-term) knowledge systems
8	Knowledge management projects in practice	Better manage knowledge projects	- Use many types of repositories (external knowledge, structured knowledge and informal knowledge) - Undertake many types of projects (expert, internal records, new knowledge, lessons learnt, high-level processes, evaluation and compensation systems to change behaviour) - Attempt projects with multiple characteristics of types listed above - Measure success in several dimensions (e.g., resources, knowledge value, spread beyond participants, comfort using knowledge, financial return) - Senior management support with clarity of vision - Knowledge oriented culture - Infrastructure with multiple channels
9	The pragmatics of knowledge management	Leverage existing approaches and avoid common pitfalls	- Start with high-value knowledge on multiple fronts leveraging existing approaches that involve decision making - Avoid leading with technology, quality, best practices or organisational learning - Get help when encountering difficulties

manner of F. W. Taylor job design specification). It may also be the case that the career trajectory and personal qualities of a single employee allow them to integrate knowledge. Potentially, this makes them a knowledge broker, but not the kind that *D&P* envisage (pp. 29, 168) because the essential criterion for *D&P* is their active connection between those who need knowledge and those who possess it (p. 29). Nevertheless, there is often a fundamental divide between individual needs and group needs and their uses of knowledge. It is not simply a matter of extending the heuristics to a work group employing tactics such as creating communities of practice. A catalyst triggers sharing of knowledge and this occurs in a social situation in which trust is only one factor. Readers of *WK* may want to consider what heuristics would need to change to consider the place of individual knowledge in a downsized workforce and what additional heuristics would be appropriate to develop a knowledge culture (p. xii), recognise the social context of knowledge and whether this would affect the advice *D&P* would offer to managers.

Advice to practitioner managers

The anecdotes in *D&P* of companies that have dismissed employees for short-term gain and then incur additional costs to re-obtain knowledge are a powerful reminder that these costs of losing knowledge can be easily calculated. Despite seeing knowledge hoarding as understandable, *D&P* come out on the side of the company, advocating processes for eliminating hoarding, such as trust building and a leadership culture from the top that demonstrates these knowledge-sharing values. *D&P* suggest that knowledge sharing ultimately benefits employees through the continuity of the organisation and this may be more effective than conformance to corporate values or policies for sharing knowledge. So *D&P* provide three sets of advice to managers. First, they provide advice to help practitioners understand the rationale for sharing knowledge. Second, they offer advice concerning the business processes to facilitate knowledge sharing. Third, they highlight the influence of organisation values (equated to culture and politics) although the influence of status and reputation is only briefly acknowledged (pp. 100–101).

Advice to help practitioners understand the rationale for sharing knowledge

WK opens by suggesting that when organisations downsized they found that some of the retrenched managers performed coordination functions of knowledge synthesis (p. xix), which were not part of their official job descriptions, a point made earlier by Nonaka & Takeuchi (1995). In other words, KM improves performance, productivity and innovation by adding value to information in ways which organisations find difficult to understand. *D&P* explain this with the respected theory of social exchange (p. 26). It accounts for employees focusing on immediate consequences, including loss of

power and the prospect of satisfying future needs. However, *D&P* overlook a number of promising alternatives expounded around the same time, which may resolve some of the difficulties knowledge initiatives may face. The most notable is the three-dimensional information space (Boisot, 1995) of abstraction of information (abstract–concrete), codification (codified–uncodified) and diffusion (undiffused–diffused). In these three dimensions, dynamic flows are plotted in a diffusion curve. Boisot (2000, p. 13) explicitly uses Shannon's (1948) work on entropy and conceptualises data as a property of things, information as relationship between things and agents and knowledge as a property of agents that orients actions through creating expectations. So, for Boisot (2000, pp. 11, 13, 20), an agent is a source of knowledge and knowledge is a disposition that is useful over time reducing entropy, that is, disorder. Somewhat disappointingly, this later iteration considers knowledge as an asset and thus potential intellectual capital, which can become part of the business accounts, which *D&P* rejected (p. 172) in favour of it being an indicator of success (p. 151).

According to *D&P*, organisations need to better manage their value-added information (p. xxi), that is knowledge. Effective use of knowledge requires understanding of the mechanisms of exchange and there is utility in the concept of the 'knowledge market' suggested by *D&P*. Not only does it consider buyers, sellers and brokers but it makes clear that knowledge has a present or future value and that it takes the form of 'insights, judgements and understanding' (p. 28). *D&P* propose that particular employees and managers should not be characterised as either knowledge sharers or knowledge hoarders; it is realistic for employees or managers to act in a self-interested way whenever faced with an opportunity to share or withhold knowledge. Their earlier reliance on trust, generated through interaction, to establish relationships with potential for the future, does not become more tempered later in the book (p. 99).

D&P missed an opportunity to use the organisation's market for knowledge to account for breakdowns and failures in knowledge sharing. For example, greater direct interaction (or proximity) is double edged: it may 'establish a foundation of mutual respect' (p. 100) or it may confirm the wisdom of knowledge hoarding (p. 29). Moreover, the knowledge market should have led them to the realisation that there are outright exceptions and outcomes that were delicately balanced. Any particular action is therefore not necessarily consistent with an earlier instance of knowledge sharing or hoarding. Consistent with Nonaka & Takeuchi (1995), *D&P* appear to see that making knowledge available eventually leads back to codification even if the preliminaries were tacit and social (p. 99). Their economic view – utility – with payment in terms of reciprocity, repute or altruism (p. 31) provides brokers, buyers and sellers with reasons for both sharing and hoarding knowledge and thus each occasion will be separately evaluated. There is no easy solution that ensures knowledge sharing and overcomes the

tendency to hoard knowledge. *WK* fails to make this clear, partly through its detailed attention to the processes of KM (which comprise Chapters 3, 4 and 5).

Advice concerning the business processes that facilitate the sharing of knowledge

While *D&P* make the KM processes clear, the motivators for sharing knowledge are opaque. Grounding policies in a programme or a benchmark for a specific industry does not release knowledge. Of course, depending on the self-interest of the manager, some measures will always be reported that support or deny the existence of knowledge sharing consistent with the intended outcome. *D&P* anticipate this by suggesting that any knowledge-sharing policy should be considered carefully before being enunciated (p. 164) and equally carefully evaluated after implementation (p. 48). Many of the barriers are organisationally specific. A major problem *D&P* identified was knowledge silos where knowledge was held in one part of the organisation primarily as a result of that business function being its collection point. Investigation of the root causes for this was not provided. One reason, suggested by *D&P* (p. 93), is that the knowledge was never shared because there was no slack time allowed for sharing knowledge. Technology vendors have used analytics software to share knowledge that would otherwise not be available with limited success since, as *D&P* show, when knowledge is power there is a shift in what is valued (reports can be regarded as data). They remind the readers who are in senior management that until knowledge is part of the everyday language of the business it will continue to be down played (pp. 108, 156). This approach is supported by three kinds of examples or insights. First, there are examples that relate to the successful adoption of a KM programme and these tend to be tips or traps that can apply to an industry. For example, knowledge-intensive industries, such as consulting, use mentoring (e.g., Booz-Allen). Second, there are the examples that apply to retaining knowledge about processes or operations that may potentially be re-used in the future. For example, International Harvester had forgotten how it built one of its popular trucks. Third, non-formal knowledge markets can play a dominant role. For example, Dai-Ichi has talk rooms where researchers are expected to discuss their work without an agenda (p. 46).

In many ways, this is the most interesting part of *WK* because *D&P* suggest that the first task of the knowledge-aware organisation is to become aware of its knowledge markets and how they operate. Since these are not necessarily apparent to management in terms of organisational functions or channels of communication, *WK* provides little specific advice for senior managers over and above the examples, apart from the need to change 'many core aspects of the business'. However, they warn that 'KM projects ... are by definition peripheral to the rest of the business' (p. ix) and there will be numerous challenges to 'integrate it with familiar aspects of the

business: strategy, process, culture, behaviour' (p. ix). It is a moot question whether such integration will displace the knowledge focus and result in cost reduction dominating as was apparent with BP before the Gulf of Mexico oil disaster.

Advice concerning the influence of organisation values (equated to culture and politics)

Organisational values are seen by *D&P* as affecting the feasibility and failure of knowledge transfer and hoarding. They show three aspects of them. Some organisation values are directly associated with the leader. For example, An Wang CEO of Wang Computers (p. 50), Edwin Land at Polaroid (p. 50) and Ken Olsen CEO of Digital Equipment (p. 50) all misguided strategy through tight control over knowledge about the future direction of their companies. These leadership defects are seen as permeating down through the business and creating a culture where knowledge is neither mobilised nor generated by the individuals whether at operational levels or with research responsibilities. This may result in individuals secretly pursuing innovation that is later embraced either by senior management when they recognise the value of an idea they had dismissed (e.g., Abrahamson, 1991) or by management at the organisation that subsequently hires the employee.

Some organisation values ignore extant knowledge by failing to recognise innovation for what it is. *D&P* instance the value of the graphical interface developed by Xerox PARC which was recognised by Steve Jobs from Apple, who then used it in his next generation of Apple devices. *D&P* overlook the fact that knowledge was openly shared to all visitors by Xerox PARC (p. 59) and that commercial success is not assured by either having a technically superior product or an early market presence. They also overlook the use of patents and litigation between competitors. The recent history in pharmaceuticals, optometry and software show knowledge being mobilised as a competitive weapon, as evidenced by these industries' use of litigation against competitors, adopting an intellectual capital view (i.e., registering all possible intangible knowledge in terms of patents and copyright as soon as practicable (Edvinsson & Malone, 1997)).

While an organisation may be culturally receptive to purchasing new knowledge, making use of it can be problematic. *D&P* cite the example of the IBM purchase of Lotus Development Corp for its Lotus Notes knowledge-sharing product (p. 81), which was followed by the destruction of value by IBM when it did not improve its market position. Similarly, Grimes' acquisition of EL Products (p. 55) was intended to acquire knowledge of processes but the post-acquisition operations did not accrue the knowledge. The cultural approach proposed by *D&P* is somewhat mechanistic. The organisation, often in the shape of the Chief Knowledge Officer (CKO), is seen as unfettering knowledge to the benefit of the business. The subsequent demise of CKOs suggests that they

were unable to generate progressive earnings or savings perhaps because they could not penetrate organisational silos and overcome the rational hoarding by individuals. The ever-increasing popularity of outsourcing partly accounts for this owing to the likelihood that the external organisation will try to maintain its knowledge boundary while providing the data required to the contract administrator who is likely to be a non-expert. *D&P* do not discuss outsourcing to reduce costs where employees can be replaced by members of an existing organisation contracted to provide services or where a subset of the existing employees are offered a position with the organisation taking over providing the services. However, *D&P* acknowledge the politics of knowledge transfer as they confirm that knowledge matters, but can be distorted by power and influence (pp. 73, 79–80), later recognised by Cross & Prusak (2003) in terms of social relationships.

WK shows the positive side of organisation values and identifies leadership and the prevailing behaviours in encouraging knowledge sharing. Nevertheless, the connection between culture and knowledge may not necessarily lead to changes in behaviour. A 'wait and see' attitude by employees is pragmatic, particularly if knowledge sharing is an element of a KM programme that they know is subject to funding review.

Discussion

WK takes a practical view of knowledge, providing heuristics for the market for knowledge in organisations, but these depend on what constitutes knowledge. *WK* opens by differentiating between data, information and knowledge but treats them as a continuum (p. 7). This suggests an oscillation between absolute and relative definitions. The absolute view relies on separate categories for each data (discrete facts and opinions), information (data endowed with relevance and purpose) and knowledge (experience, values, contextual information and expert insight). The relative view depends on the value of the message to the recipient (p. 3). This dual approach has two major difficulties. The first is the many knowledge dichotomies that exist. They include the distinction between tacit and explicit knowledge (Polanyi, 1966/1983), the difference between know-how, often called procedural knowledge, and know-what, often called descriptive knowledge (Ryle, 1949), the difference between codified knowledge available to the organisation and the knowing possessed by individuals (Hansen *et al.*, 1999), and *a priori* knowledge, obtained without needing to observe the world, and *a posteriori* knowledge empirically obtained (Kant, 1996). These are simple dichotomies and although they suggest difficulties with characterising knowledge they are unsophisticated compared with the conceptions of knowledge available from philosophers (Müller-Merbach, 2008). The second difficulty is the intrusion of the recipient of the message in applying the definition: so for some people a specific message would be data, for others it would be

information and for yet others it would be knowledge. This not only introduces an interpretivist view but historicism (Popper, 1957). Thus the same message can be regarded in any of three ways, depending on the recipient. An alternative is to concede that knowledge is multi-faceted.

If knowledge is considered as an omnibus term that is providing many things at once, it becomes possible to accept competing views of knowledge. Two views of knowledge support this approach. Aristotle in book 6 of *Nicomachean Ethics* (2011, pp. 115–134) enumerates five types of *hexis* (or durable dispositions), which a person possesses to disclose truth: (1) *Episteme*, concerned with codified rules with universal validity; (2) *Techne*, or any capability that can be explained; (3) *Phronesis*, or making social judgements against a criteria; (4) *Metis*, or savvy understanding; and (5) *Nous*, or the capacity developed with experience to evaluate sources of knowledge and assumptions. These five aspects of knowledge suggest that there are several forms of knowledge and that it is pointless to use a single word in English for knowledge, and significantly weaken the meaning of KM. The Grecian view also works against a relative view of knowledge as it implies that *phronesis* may be information. The Popperian view of knowledge considers that theories compete as knowledge and that knowledge about knowledge is the growth of knowledge (Popper, 1972/1979). The advantage of regarding knowledge as an omnibus term is that it buffers attempts to reduce it to a knowing individual (e.g., Blackler, 1995) while allowing it to be mediated and contested.

A second advantage from retaining the term knowledge is a broader acceptance of sources of knowledge. It permits interpretations of information, beliefs about cause–effect relationships and know-how that is held outside individuals, that is at the level of the organisation. This organisational knowledge may be part of sense-making (Weick, 1995; Dervin, 1998) or the product of the experience of many people. Knowledge is a hybrid in that it can refer to an object (e.g., particular expertise) or to a mental capability (e.g., a capacity for judgement) or an outcome (e.g., better decisions). Doing this would make clear that knowledge is valued (p. 10) by provider and recipient for many different reasons. It would have the by-product advantage of making the acquisition of knowledge by the organisation realistically problematic. For example, the knowledge market proposed by *D&P* becomes a source of both helpful and unhelpful knowledge in focusing on both routine and novel problems. Practitioners are influenced by many factors, some personal to them, in their decision to share or hoard knowledge. So flows of knowledge from individuals depend on three broad factors: individual preferences, the social situation and organisational factors. *WK* does not suggest how these are understood by the organisation or even how the organisation can diagnose which factor is playing a dominant role in any instance. By concentrating on making knowledge productive, *D&P*

give organisations targets for increasing the value of the knowledge available to them without necessarily suggesting any limits to the knowledge available or any points where it could become unproductive to produce and transfer knowledge. However, they make clear from their studies that there is a considerable potential for improved use of available knowledge.

WK recognises the organisational problem of immediate vs deferred use of knowledge. Its answer is to move people responsible for knowledge generation and acquisition to distinct departments (p. 58), to make the achievement of new knowledge more visible, and allocate responsibility for its distribution to departments and people who can best put it to use. *D&P* accept that the short-term need for revenue/profitability can deplete knowledge-generating resources and inhibit thinking about how to do things. In this respect, *WK* was correct to suggest that attention to intellectual capital such as patents (p. 85) overlooks the potential improvements in internal processes. Kodak provides a contemporary example of this failure. At the organisational level, traditional communication vehicles (with or without technology), such as meetings and forums, lack involvement with the processes to which the knowledge can be readily applied (p. 157). *WK* offers two solutions: re-creation of historical situations through stories and problem-solving activities. While these can be expected to have immediate outcomes, they overlook the painstaking ways in which individuals have built their knowledge and the tacit nature of any judgements that they pass on the problem. In any case, the range of stories and political use of stories (spin) makes them more problematic (Oliver & Snowden, 2005). A Grecian view of knowledge would help organisations refocus their expenditure on the codified information that matters and make time for employees to spend more time communicating. *D&P* only provided one solution to the deferred value of knowledge, that of codification (pp. 68–87), which retains a dependence on knowledge brokers (pp. 30–31) and market-places (pp. 46–47). In concluding their chapter on codification, *D&P* acknowledge that codified knowledge becomes standardised and inflexible. Although they suggest unstructured repositories, they also recognise that this does not make for usable and useful knowledge. This appears to leave them with strategies of mentoring and apprenticeship for spreading knowledge (p. 81). Here *D&P* do not seem to realise they have resolved the deferred knowledge problem through tacit knowledge, which is remoulded for the circumstances.

Despite moving from knowledge held by the individual to knowledge in the organisation, *D&P* often return to the former. This raises the question as to whether knowledge is uniquely and exclusively held by individuals or is available more widely (e.g., to small groups). If knowledge is held uniquely and exclusively by individuals then individual incentives make sense; if knowledge is shared and available within groups then it raises a new question on what kind of incentives ought to

be offered to groups or whether culture is sufficient. The discussion of culture and the power of the leader as CEO in setting organisational values or the CKO in setting knowledge-sharing values therefore reduce knowledge sharing to its formal processes. Other parts of *WK* emphasise the informal and unfettered aspects of knowledge sharing that can occur irrespective of the politics of the organisation. At the level of the organisation, it is possible to escape the minutiae of what and whether individuals have learnt and be concerned with broadly what knowledge is of value to the organisation (p. 174) in terms of its improving processes, satisfying customers and understanding competitor activity. The advice from *D&P* is that knowledge requires multifaceted programs, which take longer and have less obvious results than a single focus initiative (p. 165) but result in changes to valuing knowledge sharing and behaviour. These changes would involve overcoming the friction or supplying a motivating force (p. 97). This is not necessarily a matter of considering what employees may gain or lose by doing so (p. 26). *D&P* should have given more attention to Polanyi's (1966/1983) recognition that some knowledge is shared almost inadvertently when a topic triggers recall of tacit knowledge. This would have led them to consider the advantage of reviewing systems and procedures rather than attempting specification and codification. While *D&P* equate knowledge to a valuable possession, they often describe it solely as an individual return rather than as activities and initiatives that increase knowledge.

Conclusion

Despite this extensive critique, *WK* remains relevant 10 years after publication in terms of its recognition of the double immediacy of knowledge, its sound theoretical rationale for knowledge sharing and its description of knowledge. *WK* retains its place in serious management literature. It is superior to the popularisers (e.g., Leonard-Barton, 1995; Edvinsson & Malone, 1997; Brown & Duigid, 2000; Dixon, 2000), who failed to provide managers with clear conceptual tools and a clear social theory underpinning their examples. In recent years, knowledge has been sidelined by the cost pressures on organisations at a time when the limits to further cost reduction are being encountered. Knowledge losses from outsourcing are still not apparent partly because consultants place negligible value on most individuals' knowledge and partly because value chain analyses overlook the knowledge component of activities. When such value linkages are recognised formally, outsourced functions may be brought in-house as shared services. The message from *WK* that knowledge is the one thing that organisations under-utilise and contributes to competitive advantage remains relevant even after 10 years.

WK remains unique for emphasising the local nature of knowledge at a time when the effects of the internet were becoming apparent. Its attention to local culture and context as the places for discovering and developing knowledge in individuals reminds practitioners that for

much of the time the operation of knowledge markets is local. While *D&P* endorse initially offering rewards for sharing knowledge, they predict that they are not viable in the long term. This suggests that creating communication events or forums is likely to have limited success since they can be insufficient to build trust despite face-to-face interaction. For practitioners seeking clear-cut knowledge support activities to undertake, *D&P* show that knowledge is only shared when the parties themselves have what they consider to be an appropriate price but also an appropriate context. With the benefit of a 10-year perspective, it is clear that *WK* does not deal with the increasing workload pressures on employees, the use of job performance indicators and reduced free time, all of which limit the freedom of employees and managers to be selective with their knowledge.

WK provides practitioners with a proven social theory, that of social exchange, to understand knowledge sharing. Although it comprises four influences, reciprocity (p. 32), repute (p. 32), altruism (p. 33) and trust (p. 34), only trust is thoroughly explored (pp. 97, 154). Although *WK* only touches on organisation-level knowledge sharing, it does offer clear warnings about the dangers of over-reliance on technology (pp. 123, 128, 142, 201) and the well-known criticism that knowledge is not a 'thing' (p. 53). For organisations seeking to understand their informal lines of reporting and communication, *WK* will be of considerable assistance by reminding managers and employees that knowledge-sharing markets may also have a group as well as an individual dimension. *WK* ought to have gone further by clarifying within the organisation what role is played by formally established committees, communities and informal coalitions. Their observation that interaction (or face time) is essential for people to know what kinds of use can be made of the knowledge that they possess is somewhat muted by not extending their discussion of politics (later addressed by Cross & Prusak, 2003) and considering the strategic use of knowledge by individuals at times when it brings them the best advantage. Ten years on, it is clear that there is a much greater need to understand the politics of sharing knowledge and the politics of decision making including the role of knowledge in the escalation

of commitment. In part, this can arise from knowledge being used to guide covert actions and in part from knowledge being used to form temporary alliances or coalitions. It is also possible for knowledge to be used by autocratic senior managers to enhance their power.

One disappointment is that *WK* reinforces the priority that practitioners mostly have an expectation for immediate results with knowledge. While this is understandable as a justification for the use of scarce organisational resources, it overlooks the evolving nature of knowledge. *D&P* appear to see this issue as one of either research for patents or the use of groups and communities to incubate knowledge until it is wanted. Organisations tend to fund projects for defined outcomes rather than groups, overlooking that every local environment in the organisation contains people with unique knowledge, capable of improving its performance at different times depending on circumstances. The hijacking of KM by software vendors and professionals offering consulting products had erroneously suggested that knowledge is a commodity and this has had a residual effect. This has left practitioners with an unresolved difficulty in distinguishing between data, information and knowledge. The disbanding of KM functions and their allocation to support functions opens up a new audience for *WK*. If *D&P* had rejected the hierarchy view of data-information-knowledge (Cleveland, 1982; Ackoff, 1989) and elaborated their view that knowledge is insights, judgements and understanding (p. 28) practitioners would have had a simple yardstick to reduce confusion and be more likely to accept a more fluid view of knowledge.

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