

Knowledge Management sans frontières

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Abstract

Knowledge management is a topic that crosses borders of various kinds, such as those between departments, between organisations or between countries. In this paper we will consider various issues relating to knowledge management, in the context where more than one department/organisation/country is involved. To do this, we place an emphasis on knowledge management as a process, rather than as an organisational system or, worse, as a piece of technology. This process involves trust, negotiation – and indeed some technological support. In this paper we wish to introduce the concept of ‘triangles of trust’, and to focus on where ‘the top meets the bottom’ in terms of knowledge management and organisational learning.

Partial examples will be offered in support of our views, but no full and complete examples – knowledge management simply is not well enough understood or documented for that yet. Our overall conclusion is that there is no one best way to “do” knowledge management, but there are principles that ought to be applied.

Key words: knowledge management, management learning, information technology, trust, mini-cases

Introduction

The title of this paper is intended to recall “Jeux Sans Frontières”, a TV show which has been running since the 1960s. It involves teams from towns representing different countries playing silly games, usually entailing the contestants getting very wet. Thus it demonstrates that people from different European countries do at least have something in common, even if it is a very low common denominator. Did those who devised the programme more than a generation ago ever imagine that they would see contestants from East European countries taking part? Whether they did or not, perhaps it seems strangely rewarding. Our title is intended to indicate that, yes, cross-border knowledge management (KM) may be done – and the results may be very fruitful, or very silly, or even both at once. Our intention here is to give some guidance that may increase the fruitfulness and at least warn of – and preferably avoid - the silliness.

In this paper, we first present some views of knowledge and knowledge management, arriving at the idea that knowledge management is a process. Next we present two mini-cases of knowledge management in organisations, to provide a context for the theoretical discussion that follows. This

discussion concentrates on looking particularly at three factors which can act as enablers (or, if done badly, barriers) to knowledge management in organisations. These are trust, organisational culture and the relationship between top down strategy and bottom up organisational learning (OL). We then describe two models, including the “Triangles of Trust” to help understand how these factors come into play within and between multiple organisations. The discussion goes on to consider the additional complexities of transnational issues. The role of middle management in the process of knowledge management is given special consideration.

We acknowledge that the illustrative mini-case examples we use are partial – there is virtually no detailed research on the cross-border aspects of knowledge management. Our conclusions are therefore tentative: plausible propositions rather than tested hypotheses. They may be seen to have the nature of a research agenda, but one that is focussed on action and practice.

Views of Knowledge Management

Our interest in this paper is in knowledge management in an organisational context. The most important foundation for this form of knowledge management is that the organisation develops the *will* to manage its knowledge, or perhaps we should say the knowledge of the people in it. Part of their need is to determine what constitutes relevant knowledge within that organisation. This is however, contingent: upon the industry, upon the organisation (and even its history), upon the people, upon the time, upon the competitive environment. There is no single answer, and so there is no single recipe for effective knowledge management.

However, before embarking on an exploration of how effective knowledge management might nevertheless be achieved, it is necessary to take one step further back, and address the question of “what is knowledge?” There is a very large literature on this topic, which we cannot review fully in the space available here. We concentrate therefore on two themes: the distinction between information and knowledge; and the nature of human knowledge.

Even within just the core computer science literature, the number of different definitions of information runs well into double figures¹. However, a widely held view is that there is some form of transformation hierarchy or progression, beginning with raw data, and taking in information and knowledge. Beyond this, depending upon the author, the progression may continue to include some or all of experience, intelligence, understanding and wisdom. This relationship is indicated in Figure 1.

The most common view begins with data consisting of (unprocessed) facts. Data is transformed into information by selecting and processing the data relevant to a specific issue; so information is data processed for a purpose; note that one person may not even perceive a piece of data as relevant, though it may be noted by another as an observation. Knowledge then consists of deeper structures and patterns that a person has recognised in information as potentially transferable to other issues – even ones that have not arisen yet.

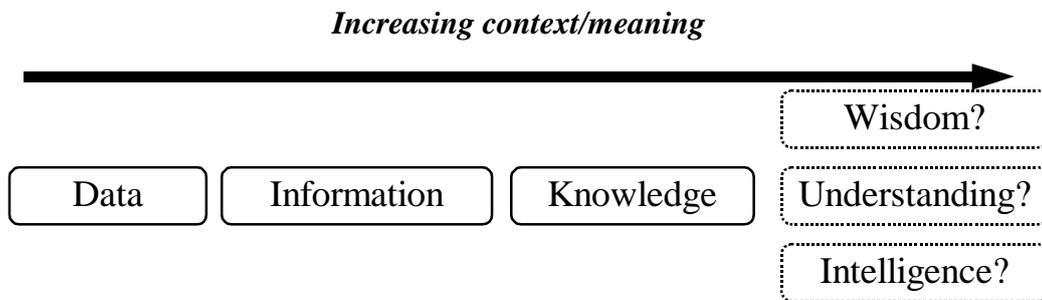


Figure 1: The relationship between data, information, knowledge and other terms

At this point, divergences occur. “Haeckel’s hierarchy” (see for example Haeckel and Nolan²) is an “information hierarchy” which progresses in the order: data – information – intelligence – knowledge - wisdom. Information is data with context, as above. Intelligence here has the same meaning as in the military area, that of making inferences from information, not in the sense of mental ability. Knowledge, for Haeckel, is subjective – ‘intelligence with certitude’. This is a similar definition to the one stated above. Wisdom is the synthesis of multiple areas of knowledge. Ackoff³, by contrast, takes a ‘question-answering’ standpoint. He concurs with the views that data are facts and observations, and that information is data in context, being the answers to description questions (“What?” “Where?” “How many?”). Knowledge, for Ackoff, is then information with meaning, but meaning with an application orientation; the answer to “How to?” questions. Understanding is knowledge with insight; explanations – answers to “Why?” questions.

For our purposes in this paper, we adopt the data, information, and knowledge progression as described above. The most important aspect of this definition is that knowledge, at its core, resides in people, although they may not necessarily be able to explain it, or even conscious of it. As Polanyi⁴ said “We know more than we can say”.

Pursuing this issue of “unconscious” knowledge, the second theme is the relationship between human knowledge and activity. How is it possible to recognise knowledge in human activities? For example, is identifying knowledge with the ability to *teach* good enough as a definition, as the

philosopher Mittelstrass⁵ has said? For some organisations, in some circumstances, perhaps it would be. But in other circumstances, the ability to *do* is at least as important⁶. These two abilities do not necessarily go together. Many of us have met good “doers” who found it very difficult to impart their evident knowledge to others, whilst the old adage “those that can’t do, teach” may have at least a grain of truth in it. In other situations still, such as the aftermath of the Concorde disaster in the year 2000, the ability to use knowledge to *reflect* and *understand* is what is required, rather than either teaching or doing, at least in the short term.

Knowledge management as a process

Accepting the need for a contingent approach, it is extremely important to treat knowledge management as a process, rather than as an object or, worse, as a piece of technology. To explain what we mean by an object, consider the Vietnam War scenario. US trained army staff passing through debriefing at their West Point Academy could not understand how the Vietnamese managed their logistics in the jungle, because these staff initially denied the usefulness of bicycles, and so the debriefing became an object in itself. Although often repeated, the most important point about the technology is the advice of Davenport and Prusak⁷ that the technological factors should take third place to human and organisational ones. It bears repeating yet again precisely because, although often repeated, in our experience it still seems to be equally often ignored! Hendriks⁸ goes even further, identifying knowledge processes within an organisation as specifically needing a different consideration from the organisation’s other business processes, especially where IT support is concerned.

Mini-cases

In this section, we present two mini-cases that will be used as a basis for the later discussion. Broadly speaking, mini-case 1 is an example of successful knowledge management and mini-case 2 an example of unsuccessful knowledge management.

Mini case 1: DeliverThem

This case concerns a company that we will refer to as DeliverThem, for reasons of confidentiality: they are in the business of magazine distribution to the retail trade. It was originally set up as a joint venture by a group of magazine publishers, although it now has extended its scope to distribute for other independent publishers.

The knowledge management project in DeliverThem arose from an initial interest in making better use of financial information. Some of the objectives of the project were indeed information-based, such as improving the administrative effectiveness of the financial systems, but others

were clearly related to knowledge management. These could all be summed up under the heading of encouraging knowledge sharing, which was envisaged on three levels:

- Within the company's financial management processes
- Between different functions (e.g. with customer-facing staff in the sales teams)
- Beyond the company (e.g. with partner publishers)

Initially, the main aim of the project itself was to design a new financial system, but this evolved rapidly into designing a financial systems strategy, and then more slowly into providing a suitable knowledge management infrastructure for not just this project, but for further knowledge management projects. The need to adopt a staged approach to knowledge management was a key finding of the project, although the finding emerged well before the end, not just in the final report.

A key consequence was that the actual technology used for implementing the financial system was chosen for its scalability and additional functionality, and so was not that which would have been chosen for that system in isolation. DeliverThem's management were sufficiently convinced by the longer-term benefits of the staged approach that they chose this particular technology even though it was more costly, needed more resources, would take longer to implement and carried a greater risk than the "one off" option. It helped that a second knowledge management project, to develop a data warehouse, had already been identified before the final decision about the technology for the first project was taken.

Five critical success factors were identified for both the first project and for knowledge management within DeliverThem as a whole:

- develop a strong link to the business strategy
- appoint a knowledge champion
- promote a common knowledge sharing culture
- exploit collaborative knowledge with DeliverThem's partner publisher organisations
- provide a well-developed technology infrastructure (co-ordination to be the key)

The link to the business strategy was facilitated by a general recognition within DeliverThem of the importance of knowledge. Their latest business plan was called "Using knowledge to create value", and their mission statement read "Using our knowledge of the magazine sector to create value for our partners". The link between the third and fourth success factors is also important, especially in the context of the mission statement. Not only did a knowledge sharing culture need to be fostered within DeliverThem in order for effective knowledge management, but this also

needed to extend to their partner organisations. There was a particular concern in DeliverThem for their suppliers, because of the way in which the company had been established (originally, every supplier was also a joint owner), but there is no reason why this should not also include their direct customers (the retailers).

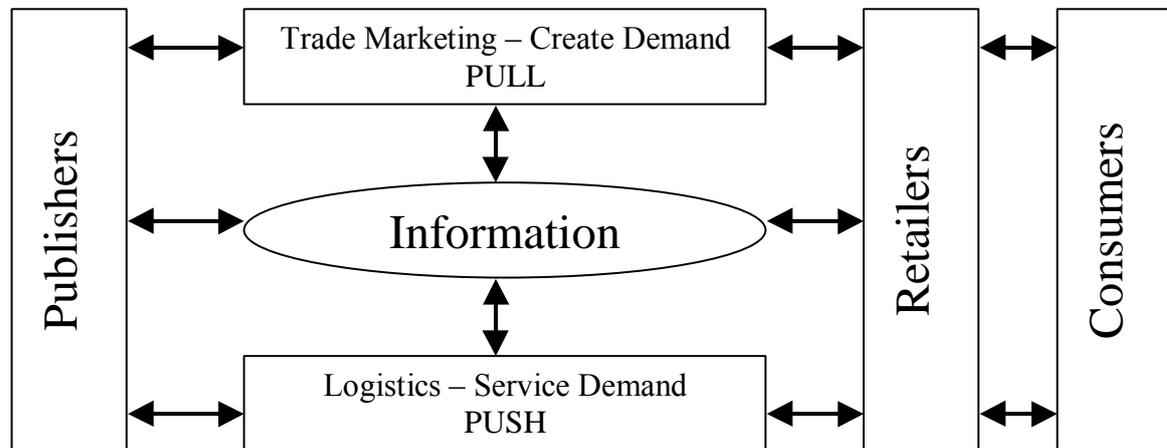


Figure 2: DeliverThem’s business vision

Indeed, DeliverThem’s overall vision was to change the business model of the supply chain in the UK (and later European) magazine industry, linking publishers and retailers by a marketing and distribution company (themselves) rather than passing the magazines through a traditional wholesaler (see Figure 2).

Mini case 2: MakeIt

MakeIt is a heavy manufacturing organisation, whose identity again needs to be disguised for reasons of confidentiality. We joined the case with a strategic initiative relating to knowledge management already in progress. The stated strategic aim was for MakeIt to be a learning organisation, but there were problems actually achieving this in practice. Sharing knowledge was a problem at all levels: between the different manufacturing plants within the UK, and even between different production shifts within the same plant. In one plant, for example, while one shift team had developed a clearly superior operating practice, the other two shifts on the same process refused to adopt it – a clear instance of the “not invented here” syndrome.

This issue was not initially perceived as relevant to knowledge management by MakeIt’s management, because knowledge management as a strategic issue within MakeIt was seen by the top managers as concerned solely with information systems. Thus knowledge management would

be achieved by the installation of appropriate information technology, and organisationally the initiative ‘belonged’ to the information systems function. Not surprisingly, the eventual use of the installed IT (in this case, groupware) was poor. Only one project team within MakeIt really made effective use of the system, and nearly all of its members belonged to the IT department.

Interestingly, at the time of our study, MakeIt’s UK operation had recently been merged with a similar company in the Netherlands. This appeared to be giving rise to another instance of the “not invented here” syndrome at a higher level (between the UK and the Netherlands, rather than between shift teams). There was also a simultaneous fear that perhaps ‘the grass was greener on the other side’, with staff saying, “We think their system is probably better than ours, but we don’t want to use it.” It emerged in subsequent discussions that both the UK and Dutch parts of MakeIt had actually taken a very similar approach to knowledge management at the strategic level before their merger, even using virtually the same groupware technology. Moreover, they had encountered very similar problems with it.

Returning to the problem of transferring knowledge between those working different shifts on the same process, one barrier was that personnel from the different shifts rarely met. In MakeIt’s case each shift also had its own operational management. The firm’s middle management tended to work “normal office hours”, and so had very little involvement with the other shift teams. The official channels for communicating to and from the non-day shifts were therefore the only ones that could be used – and the people involved hardly ever met informally either. Only when a conscious effort was made to exchange management personnel between shifts did matters begin to improve. However, the potential benefit of similar exchanges between Dutch and UK personnel did not appear to have been appreciated.

Knowledge management enablers and barriers

There are many enablers and barriers to knowledge management as a process. Several are common to all types of project; the lack of clearly agreed goals, for example, or an inadequate budget, will surely detract from a knowledge management project’s effectiveness. Here we concentrate on factors that are specific to knowledge management and relevant to the “frontières” in our title. We will discuss three inter-related factors. If done well, they will be enablers; if done badly barriers. The three factors are:

- trust;
- organisational culture(s);
- the relationship between top down strategy and bottom up organisational learning

We need to develop the theory relating to each factor somewhat before reviewing the lessons from the mini-cases.

Trust

Trust between individuals

The presence or absence of trust will be crucial to any attempts at knowledge management. The development of trust between individuals is fundamental to our very existence, not just to knowledge management. However, it is a complex process, fraught with the possibility of error, and has several dimensions. An extensive literature on trust has emerged, especially since the late 1970s. Works on trust that are commonly cited in the knowledge management literature include those of Mayer et al⁹ and Fukuyama¹⁰; a suitable review is given by Kramer¹¹. A complete discussion of the various theories is beyond our scope here, although we will draw out some of the most pertinent themes.

Trust between individuals appears to have at least two dimensions: cognitive, and affective/motivational, although researchers disagree both about the relative importance of these two, and whether ethics/morality is part of one or both of these two dimensions, or a third dimension in itself. The cognitive dimension involves elements that are described as calculative or strategic – “thinking trust” (“what can I get out of this relationship?”). This basis leads to a view of trust as rational choice, as described by economists such as Williamson¹². The relational model of trust⁹ acknowledges that there is a cognitive component to trust, but also a social one (“feeling” trust); this begins to link the individual to the group, as we will discuss later. For example, normative trust may be based on the idea that all work together for a common good. Hardin¹³ also argues that trust does not depend simply on individuals’ contemplation of their own interests, but also a sophisticated understanding of the interests of the other party (“knowing the other’s mental models, how best can I proceed?”). He calls this “encapsulated trust” because the trust of the other party then encapsulates the interests of the first party. It is clear that in some circumstances, but by no means always, thinking trust may develop into encapsulated trust, and thence into feeling trust.

Knowledge sharing, even without any kind of formal system, inevitably raises issues of trust. Thus the first “frontière” to bridge is between individuals. In terms of knowledge management, we have only five senses {of seeing, touching, smelling, hearing and tasting} at least according to Western science. We use them to create models of our environment, our world, as we perceive it to be. Moreover, we use these models, sometimes unconsciously, to make predictions and to ‘sense’ our future. This is the subjective element of knowledge as in the “Haeckel hierarchy”. If

the model yields good results we are happy, but if the results are in conflict with our belief we may be more or less disturbed and have recourse to rebuilding our models. Festinger and Carlsmith¹⁴ gave us the concept of ‘cognitive dissonance’ to explain our unease at finding our mental predictions at odds with our sensual perception - either because our model is wrong, or because we have a poor perception of reality - as in a distorting ‘hall of mirrors’.

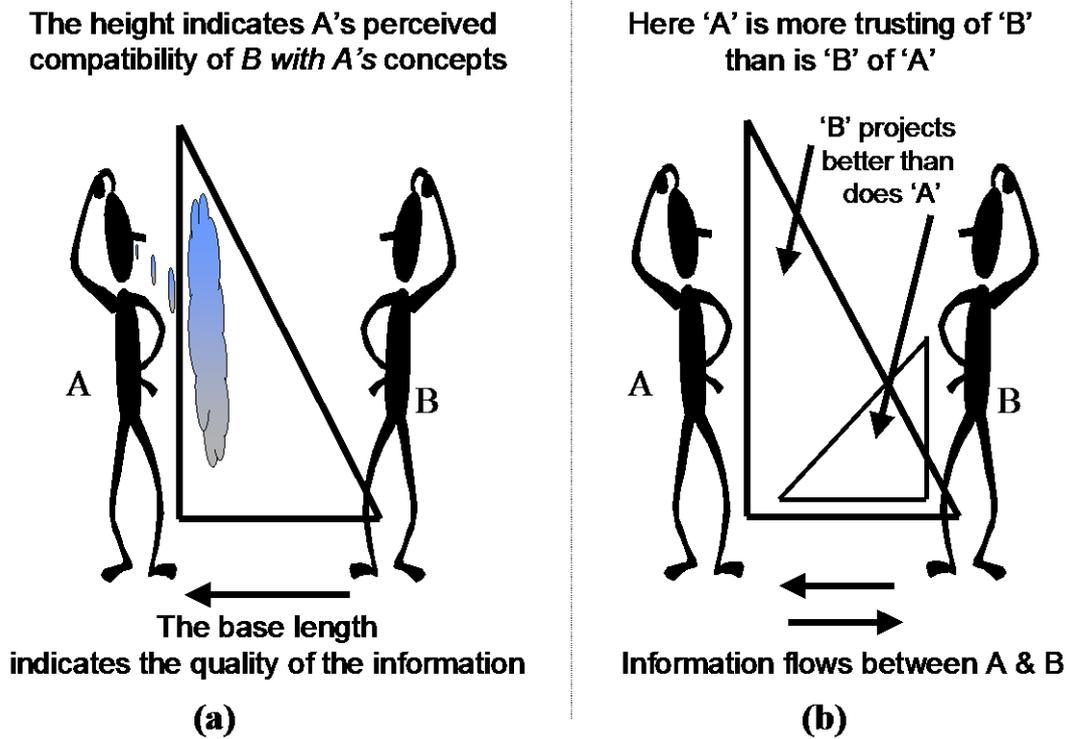


Figure 3: A visualisation of the development of Trust between individuals

As part of knowledge management, individuals have to exchange information and models somehow. Figures 3(a) and 3(b) show the beginnings of this process. Here we introduce the concept of “triangles of trust” to illustrate the issues involved. The two axes of the triangle represent different concepts: the length of the base indicates the quality of the information, while the height represents the perceived compatibility of the “other” with the perceiving person’s own concepts. When considering the two individuals in Figure 3(a), the strength of the trust between them is represented by the triangle’s area: a large triangle represents a high degree of trust, a small triangle a low degree. Note that there is a process element here, too; the *building* of trust, consistent with our view of knowledge management as a process.

Here, if A and B use the same (or similar enough) models of the world, when information flows from B to A it is indeed knowledge transferred to A through the automatic operation of their joint mental-processing model. But if they do not share the same models (views) then information

flowing from B to A may lose its context and thus only be perceived as data by A. At a basic level, the transfer B to A is simply data, but this needs to become information before A may even have the opportunity to develop calculative trust. Hence the horizontal axis of the triangles is information, not just data. A foundation of good information is necessary to build trust, but also it is necessary for the people concerned to have a sufficient degree of model compatibility to move to a higher level of trust.

The initiation of this process is seen in Heise's Affect Control Theory¹⁵. Heise identifies three stages: (i) individuals create events to confirm the sentiments that they have about themselves and others in the current situation; (ii) if these events do not work to maintain sentiments then individuals re-identify themselves and others; (iii) in the process of building events to confirm sentiments, individuals perform the social roles that manipulate society - the principle of 'affective rationality'. We would say the individuals set out to test the other by building and exchanging models; though Heise suggests that we rarely become involved in cost-benefit analyses while engaging in this behaviour - our actions emerge from our hearts. That is why these kinds of behaviour can be predicted from affect control theory – thus our actions are 'affectively derived'. Even if an observer may predict our actions, Heise concludes that we often unfold our rational actions intuitively, rather than by analysis.

In situations where there are improbable-looking triangles, we may have situations where trust may be misguided:

a) If there is a lot of information passed from B to A, yet the height of the triangle remains shallow.

This implies that even though B is at pains to relate to A, maybe even stating "trust me", we suggest that that A should not trust B. A does not understand "where B is coming from".

b) If the height of the triangle is tall, but with little information passed from B to A, and A believes B.

Here we have a situation of 'a divine belief in B' on the part of A – relational trust with little cognitive basis. This may prove to be a little foolish.

Naturally there are many variations on this theme, and we must accept that trust is multi-dimensional, even when focused on one issue. Note that our children often say, at length, "I did not do it, I was not there!" yet we find our triangles of trust still tall: we love our kids, despite their information flows.

The process aspect should be stressed again. These “triangles of trust” are not permanent: they are snapshots of the situation at a particular point in time. They can and will change over the course of a relationship, especially in the early, relationship-building stages.

In the MakeIt mini-case, one barrier to knowledge management was that very little information was flowing between the people on the two shifts; thus the baselines of the “triangles of trust” were very small – perhaps vanishingly so – and the workforce were unwilling to use this almost non-existent foundation as the basis for a change in the way they worked.

Trust between organisations

The phrase “trust between organisations” is really a misnomer. Organisations do not trust; trust is something that only the people in the organisations can do. Here it is sufficient to say that the build-up of trust between organisations is founded upon the inter-personal bonding via trust developed between the individuals in the different organisations (or indeed between different units within a single organisation). Through these processes the organisation elaborates rules “of how we do it round here”, so we loosely say “the organisation learns”. The organisations go on to develop cultures or strategies that encourage [or discourage] trust. These are both formal and informal. March and Olson¹⁶ discuss how rule-based trust within organisations is founded on socialisation and shared understanding.

In Figure 4, the “triangles of trust” model is extended to show the trust across this larger “frontière” between organisations. Initially only two individuals in different firms exchange their mental models; but this goes further, to involve whole networks of individuals in both organisations. However, the process is more complex than simply the perception of the trustworthiness of individuals in the other party. It is also necessary to perceive and understand the organisational systems in which the others work, and these two processes feed upon each other. The more we understand the rules of the other’s organisation, the better we understand our human partners. Between organisations the respective As and Bs must understand (i) how each A person (or B person) relates to peers in the hierarchy of the other’s firm, and (ii) how each partner pair $A \Leftrightarrow B$ relates to their particular partner’s organisational culture, which is often unlike their own operation (see the next sub-section).

In DeliverThem, there were many large “triangles of trust”. Exchanging information was part of normal business operations at all levels. Not only was this being improved further as part of the new information system development, but knowledge sharing was also an active part of the agenda (thus helping to increase the height of the triangles as well as the base).

By contrast, most of the triangles in MakeIt were very small indeed. The crucial point is that interpersonal perceptions were being formed on the basis of very little information (a short base); for example, both UK and Dutch workers appeared to perceive the other country as being better at knowledge management than it really was. Thus there was no real foundation on which to decide, in the cognitive sense, whether to trust the “other” or not.

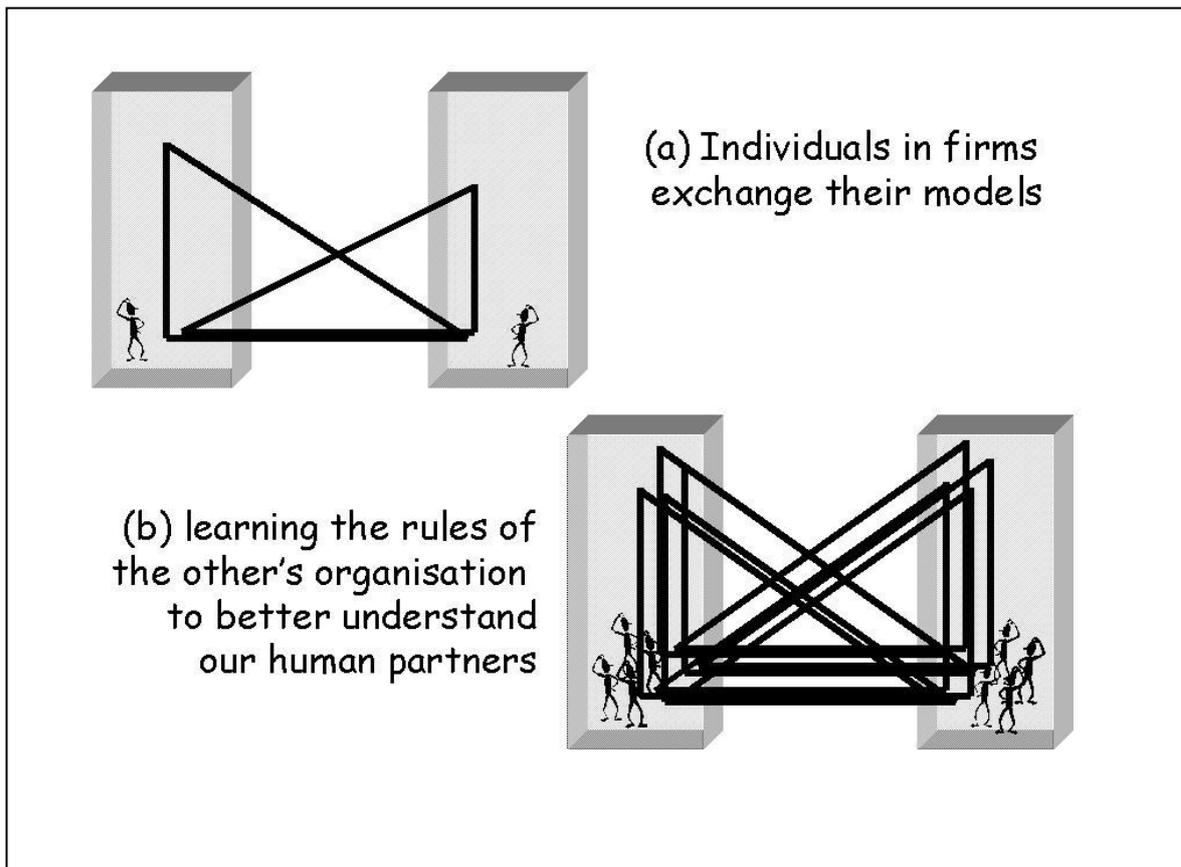


Figure 4: The development of organisational trust

Organisational culture

Organisational culture affects knowledge management in two ways:

- The culture in an organisation may either enable knowledge management by making it easier, or act as a barrier to it
- The presence of a difference in natural culture may make it harder to share knowledge between organisations, or units

A key element in most knowledge management projects is the sharing of knowledge. Thus, one of the vital elements of an organisational culture to enable knowledge management is that it

encourages knowledge sharing. As we have already said, this must also include some element of trust. Clearly culture and trust cannot be completely separated. Fine and Holyfield¹⁷, for example, have discussed the relevance of cultural elements in trust.

Looking at the mini-cases, DeliverThem had a specific objective to encourage knowledge sharing, and succeeded. DeliverThem possessed two advantages. The first was its cultural homogeneity: all its major operations are within one country (there is a separate import/export business for the independent publishers). The second is that the company was originally set up by its partner publishers, not only inducing further cultural similarity but also encouraging a “collaboration culture”. This is not to claim that the culture in DeliverThem is the same as in the partner publishers, or indeed that the cultures of the three founding partner publishers are themselves exactly the same. Anecdotal observation is that the natural cultures of two of the partners are in fact very similar, but the third is somewhat different. Nevertheless, the benefits are clear.

In MakeIt, perhaps the key cultural issue was that of the industry, not the country. There seemed very little difference between the UK and Dutch organisational cultures. Both featured a high level of suspicion internally, resulting at least in part from past histories of layoffs and poor industrial relations. This is not a good foundation for knowledge sharing, even when the cultures of the two partners are very similar. In terms of “triangles of trust”, most of the triangles in MakeIt were very small indeed, as we have said. Thus the workers did not engage in organisational learning, either in the UK, or in the Netherlands operation, or between the two. Furthermore, the headcount reductions both before and after the merger did not foster either an organisational learning or knowledge sharing culture; nor importantly, a community that was ‘trusting’, at least between workforce and management. There seemed to be relational trust between the two workforces, possibly reinforced by a shared mistrust of management!

Even without the historical issues present in MakeIt, knowledge sharing at the workforce level is one of the most difficult aspects of knowledge management. Snowden¹⁸ has explained well the problems encountered here; too often the structure intended to achieve a knowledge sharing culture is one of conscription, when by definition knowledge sharing can only work effectively with volunteers.

This may prove to be easier in some industries, or even some departments, than in others. In the MakeIt case, we hypothesised that the industry culture was more significant than the two national cultures principally involved – as was found by Collinson¹⁹, also in the steel industry sector. Many global organisations with core competences in engineering and technology have found it easiest to develop successful knowledge management programmes for engineering and technical

domains. David²⁰ describes such a situation in three organisations in the petro-chemical industry: Shell, BP (as it then was) and the Australian-based BHP. A further, extreme example of the latter was when BP Amoco (as it now is) took over the American oil firm Atlantic Richfield (ARCO). Even though many of the staff were going to be made redundant, the employees in ARCO's technology centre put in a great deal of effort to make the material they had accumulated over decades available in a comprehensible form to the new company²¹. This is a classic example of a willingness to share knowledge, even when there was absolutely no incentive to do so. The existence of such a knowledge sharing culture was clearly related to the fact that ARCO had had a knowledge management programme in place for some years before the take-over. Snowden is surely correct that it would be impossible to conscript such a degree of co-operation.

Where there are major cultural differences between the two sides of a “frontière”, then again it may well be that what flows is no longer information, but merely data. For example, one party may be trying to communicate something vital about which caste they belong to, while the other does not know what a caste is. And in general the development of mutual trust (between organizations and/or between individuals), which may be called back in later times, is the normal expectation of Asian managers. The using and developing of [long term] personal connections stand in contrast to Western planning inclinations and their short-term result orientation with respect to goals. The decision making process of Asian firms, as *nemawashi* in Japan, *noonchi* in Korea, *musjawara* in Malaysia, or *tonguo houmen* in China is particularly opaque to Westerners, and may lead – in Western eyes – to a belief in the Asian's biased and non-comprehensible decisions. See Richter, Kidd and Li²² for a discussion of this point.

Where the top meets the bottom

A further issue in knowledge management in organisations is how to match the [necessarily] top-down strategic direction of knowledge management with the bottom-up organisational learning that is essential in order to achieve anything concrete. The relationship between knowledge management and organisational learning is key, as illustrated in Figure 5.

It is clear from the emphasis in the literature on the corporate or company level^{6, 7} that knowledge management must be strategic and therefore aligned more with top-down views and approaches. Without a strategic focus, the best that could be achieved would be isolated islands of knowledge. Organisational learning, by contrast, must be organic, and bottom-up. As Peter Senge said²³ “Ultimately, you know that learning is occurring when human beings are able to do something they couldn't before”. Thus knowledge management must enable organisational learning, in terms of “permitting” and “facilitating” it, but it is only through organisational learning that knowledge

management can be implemented, to make it a day-to-day reality in the organisation. Extending across many units, for example in a supply chain, the strategic will “to work together and share knowledge” must exist at the top, but the challenge is to make it work throughout the bottom echelons.

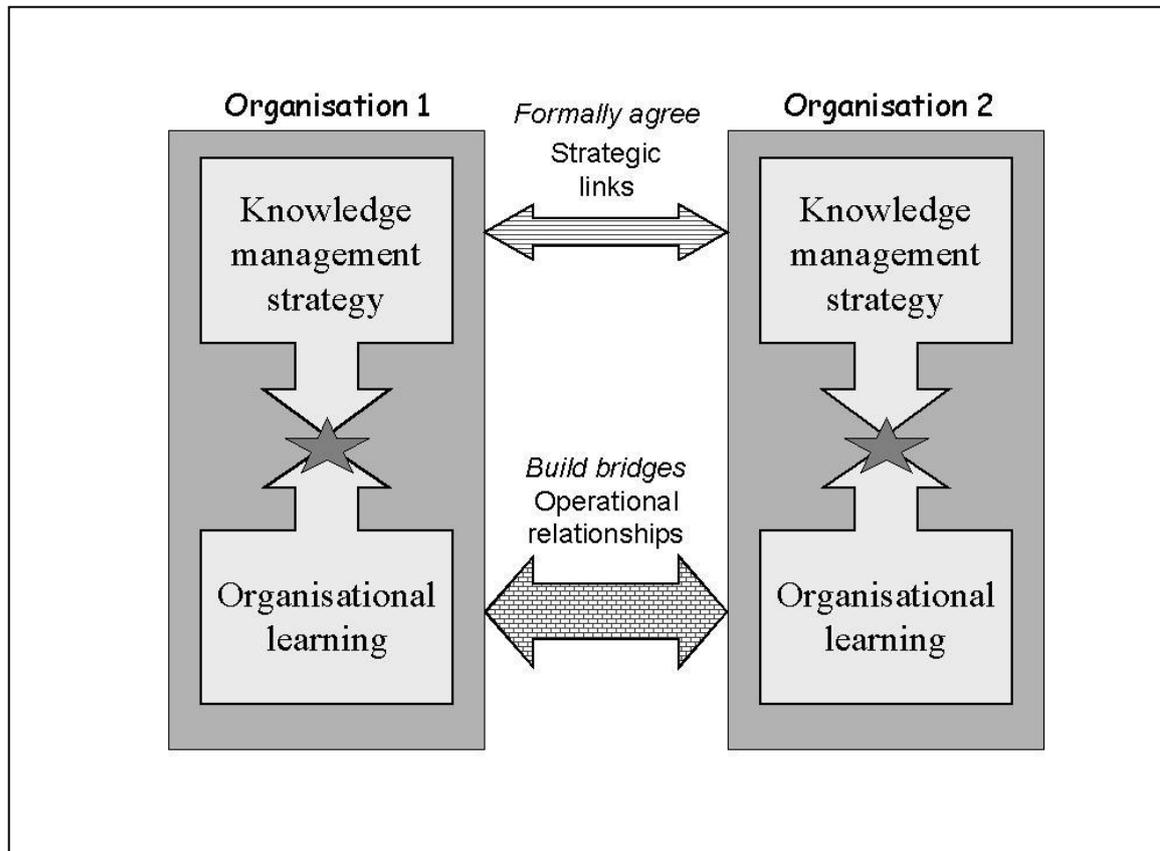


Figure 5: Knowledge management and organisational learning relationships within and between two organisations or units

A crucial aspect of knowledge management and learning in DeliverThem was bridging the gap between the statements in the vision and the business plan and the reality of knowledge management in the organisation – linking “top down” and “bottom up” approaches. Both the management and the employees realised the amount of work involved in this, and showed themselves willing to undertake it. For example, the information systems implementation plan was modified as a result of the organisational learning that was taking place.

By contrast, in MakeIt, some large triangles of trust must have existed, but only at the “top”. The respective CEOs must have learnt adequately about the other company before the merger, engaging in the processes of ‘due diligence’ and therefore (perhaps) developing shared values – an appropriately large triangle of trust. But while this was going on, and after the merger, the

workforce continued in their original ways, unaffected by any knowledge management initiatives (understood by the CEOs to be needed).

Middle up down?

As suggested by Nonaka and Takeuchi⁶, the effective meeting of the two programmes/agendas - top-down knowledge management and bottom-up organisational learning - relies very much on middle management having the time and space to think, to make connections, and thus to help develop the knowledge of the organisation. We have seen that the absence of this was a decisive element in MakeIt's lower-level difficulties in knowledge transfer. Even when the importance of some exchange of management personnel was realised, it was still only carried out to a limited extent.

It can be problematic for modern-day Western firms to find the capacity to allow this time and space for thinking. Those that have followed the trends of the 1990s, flattening their structures and removing their middle management, may have found themselves optimised for what they were doing when the downsizing project was carried out, but are now finding themselves without the organisational slack to make further progress^{24, 25}.

Strategy for the use of IT in knowledge management

IT can also serve either as an enabler or a barrier to knowledge management, especially with regard to issues of connecting people at different levels, or in different units. Kidd and Yau²⁶ reported that Japanese manufacturing firms operating in the UK used operating and control software that was either written in the UK or heavily modified in the UK to take into account circumstances that were local, and unlike those in Japan; few used software that was predominantly of Japanese origin. Indeed, several of the larger UK-based Japanese firms also operated across the European continent, and each country's operating software mapped the respective local processes.

Kidd and Yau noted that it was a tradition in Japanese companies, in Japan, to employ many people whose task it was to take data from outpost firms, "massage" it (thus transforming it to local information), and to re-present this to senior managers (as company-wide knowledge transfer through the use of shared models). In following this process the middle managers would naturally discuss their findings with their fellows and thus, as Nonaka and Takeuchi⁶ might say "engage in the development and exchange of models and concepts". Therefore they would be embedding individual items of information into broader company-wide models.

However, Kidd and Yau also noted that many of the Japanese firms were using or considering the use of Enterprise Resource Planning (ERP) software from suppliers such as SAP, Baan, and Peoplesoft. These systems were to be installed in such a way as to make the firms' databases coherent, so the Japanese firms would be able to assess and compare their data right across the European operations, on a common base. However, although these systems would yield instant data aggregation into information, they would also lose the human touch – that essential creative process that develops new ideas through sharing information and models; new knowledge. In the automatic computer-based process, the base of a triangle of trust might be long, but the height could be negligible.

Whatever the actual software used, the form of its implementation is also important in terms of knowledge management. The DeliverThem example demonstrates the virtues of a staged approach to implementing the technology – not treating the first project in isolation, but also not trying to introduce all the technology in one go, before DeliverThem had had the chance to learn what was actually needed. By contrast, MakeIt's approach was to install the technology and hope that it would be used; for the most part, it was not used.

Globalisation

We mentioned in the case of the joint alliance of MakeIt that their CEOs would have entered a phase of knowledge acquisition through their process of due diligence. We expect that most firms find it prudent to undertake this process when forming alliances or even when entering a contractual arrangement. In the early days of industrialisation there was time to get to know one's partners, but now there is little time for this process: many CEOs wish to create an alliance to hit their perceived market fast.

Ultimately in this global scene we are focusing on the ability of individuals from different countries (having different beliefs and training) to trust each other, and to understand they have to share their knowledge with all others in the alliance or supply chain. For knowledge managers in multi-national enterprises there are big issues in developing trust across [possibly] short-lived alliances amongst outsourced firms, while developing and maintaining knowledge across many major sectors of their own firm's core competencies. The desirability of knowledge sharing internally is not generally perceived as problematic. Few organisations would have any qualms about embarking on a strategy of knowledge sharing, but sharing knowledge more widely *within* an organisation almost certainly increases the likelihood of it being "shared" unintentionally *outside* the organisation. This is not usually desirable, as the firm loses its intellectual capital.

Highly complex, multi-tiered supply systems are not uncommon – for instance in the automotive sector where many suppliers support the ‘big few’ – GM, Ford, Toyota, and so on. Here the final assembly of the vehicle is dependent on hundreds of suppliers working in concert, often to a just-in-time (JIT) regime activated by integrated IT and communications systems²⁷. Clearly information has to be shared to enable contracts to be fulfilled. Each supplier will contract to the next higher level to provide some item to a given standard and will find it helpful if their own lower tier suppliers also deliver to a contractual standard. To engage fully in this process it would be really useful if every level in the supply chain could exchange their organisational learning. But, if inter-organisation information sharing is used within a competitive environment it is possible that information will be ‘harvested’ and then guarded to prevent access by others – otherwise data, information and even knowledge may skip intermediaries who may be cut out through disintermediation in their chain. In this more restrictive information-sharing mode, it is most likely that only the immediate partners, up and down stream, will be able to engage in organisational learning. Thus we accept there is a limit to the organisational depth or geographic reach of the KM-OL programme. When either there is rapid change, or when much is at stake, individuals become less trusting: they will cast aside altruistic exchanges in favour of their personal interests - notwithstanding any financial or motivational pressure brought upon them by their senior managers to “volunteer” their knowledge.

Conclusions

Our overall conclusions are necessarily tentative. There are many “frontières” that need to be bridged in knowledge management; between individuals, between organisational units, between organisations, between nations and between cultures. There may also be slightly different kinds of “frontière”, such as between an information systems department and the rest of the organisation. Awareness of these boundaries is perhaps the key step on the road to overcoming them. It is clear that people are needed to act as boundary spanners. But while they must be volunteers, it is not necessarily the case that all those who volunteer should be chosen, at least in the first wave. Both enthusiasm *and* skills are needed to succeed in such an endeavour.

Cultural literacy is also a crucial input: again boundary spanners and bridge builders are needed. It is not enough to be willing to share information, as this merely guarantees that the relevant triangles of trust have a long baseline. In order to build trust effectively, there must be some deep ability to share information, knowledge and thus models of the world to come to an understanding of the other person’s culture, and indeed the limitations of one’s own. This will serve to increase the (potential) height of the trust triangles and develop the effectiveness of joint organisations^{28, 29}.

Table 1 summarises the lessons indicated by the two mini-cases, DeliverThem and MakeIt. We are aware of the dangers of generalising from a small sample, and also that the information provided by these two examples is only partial. Even so, the table illustrates outcomes (if not extremes) that we must be aware of in carrying out KM-OL.

Factor	DeliverThem	MakeIt
Trust between individuals	Satisfactory	Poor – lack of information transfer.
Trust between organisations	Good. Emphasis on collaboration.	Good at high level. Lack of information transfer at low level.
Organisational culture(s)	Internally: homogeneous, knowledge sharing encouraged. Externally, partnership view even though cultures different.	Internally: suspicion. Externally: two partners very similar.
Top down meets bottom up	Very good.	Poor. “Us and them” from the bottom. Little understanding from the top..
Strategy for managing technology	Staged approach, carefully thought out.	IT-driven.

Table 1: Lessons from the two mini-cases

It is also evident that there is, nevertheless, no one best way to “do” knowledge management. However, we suggest at least tentatively that there are principles that ought to be applied, as follows.

From the top down, CEOs and other senior managers need to:

- Make the strategy for knowledge management clear (and remember that any information technology used is only a small part of this strategy)
- Generate an atmosphere for organisational learning
- (Re-)create organisational slack

Correspondingly, from the bottom up, the staff need to:

- Learn to trust each other (wherever the “other” may be)
- Voluntarily exchange knowledge

- (Perhaps) agree to staff exchanges between units or partners in an alliance

IT can help to communicate, store, retrieve and find information, but few knowledge management initiatives will stand or fall solely on the IT element of the project. However, there does appear to be some indication that staged approaches to IT support and knowledge management may be the most effective.

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