■ *Case Study*

A Case Study of Strategy Innovation: Creating a Multi-perspective View of Organizational Knowledge

Jill Shepherd* and Gerry Johnson

Cranfield School of Management, UK

Using a case study, this paper takes the phenomenon of knowledge-based economies (Department of Trade and Industry, 1998) and the concept of knowledge as the basis of a dynamic theory of the firm (Spender, 1996), and integrates them to produce a view of strategy innovation. It does so by taking Nonaka's (1994) knowledge-based paradigm of organizations, in which the role of the manager involves more than just information processing and problem solving, and investigates in practice what this might entail in terms of knowledge management in a global, knowledge-driven industry. Copyright © 1999 John Wiley & Sons, Ltd and Cornwallis Emmanuel Ltd.

INTRODUCTION

The organization, studied over a period of two years, operates within the pharmaceutical/healthcare industry. This is arguably the most knowledge-intensive commercial arena currently in existence. It is also very typical of the knowledge era, in that not only is the volume of knowledge within it increasing exponentially, but also pharmaceutical managers are struggling with the challenge of how to turn this phenomenon to their own unique strategic advantage.

The reader will benefit from the paper by gaining an understanding not only of how managers attempt to manage knowledge by processing information imposed upon them by the environment and organization, but also of how organizational knowledge is created as organizations develop and enact strategy. The paper starts with a discussion of the concept of knowledge, in particular commenting on how knowledge within organizations takes on different dimensions and forms and what issues this

raises. Case study material is then used to illustrate how this multi-perspective view of knowledge can lead to strategy innovation. The creation of a dynamic, evolving organizational knowledge-base is described, as are the roles of senior management support and IT in enabling the strategic management of knowledge. In the discussion section the findings are extrapolated to determine how managers might view knowledge in different ways to produce the greatest overall strategic impact. Finally, conclusions are drawn around how organizations can develop their own way of managing knowledge in order to leverage strategic change in an innovative way.

STRATEGY INNOVATION AND THE ROLE OF KNOWLEDGE

Knowledge has become a commonly cited concept in the business world. Policy makers talk of knowledge-based economies, practitioners discuss the role of knowledge within information management and academics write about building a knowledge-based theory of the firm. As happens with most new ideas, the separate evolution of different perspectives has resulted in a lack of an integrated view of the role of knowledge within organizational life. The work most often cited in academia is that of Nonaka (1994), who declares that organizations wishing to become strategically innovative must move beyond the traditional model of

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Jill Shepherd is a Research Fellow of Organizational Knowledge and Strategic Management.

Gerry Johnson is a Professor of Strategic Management. Jointly, the authors share an interest in the micro aspects of strategy development.

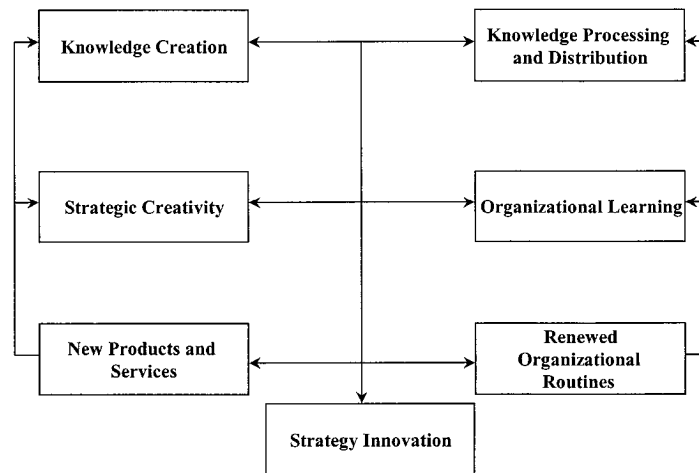*Correspondence to: Jill Shepherd, Cranfield School of Management, Cranfield MK43 0AL UK.

Figure 1   Evolving organizational knowledge

processing information to solve known problems to a model that, in addition, incorporates the creation and definition of problems. However, a disconnect has developed between the practitioner's view of knowledge management, which is very oriented towards the information processing power of information technology, and the more ambitious academic perspective, which considers a knowledge-based view of the firm as having the potential to explain strategic advantage. The authors propose that strategic advantage is not a function of the knowledge base of an organization encompassing information processing and knowledge creation, but the result of these interacting to produce an evolving knowledge base (Figure 1). Given the current gap between theory and practice in knowledge management, the emphasis of the paper is on the practical implications of the need to create knowledge, as well as how it needs to be managed to contribute to strategic advantage.

The knowledge-related issues facing practitioners are linked to information processing, knowledge creation and dynamic knowledge and are specifically:

● With so much information available to organizations from both within and outside the firm, how can knowledge be organized to ensure its strategic value is efficiently and effectively harnessed by the organization?
● If knowledge creation is something other than the processing of information and problem solving, what does it involve and how can it be promoted in organizations and by whom?
● Given that the organizational knowledge base changes so frequently, how can organizations manage the dynamic nature of knowledge?

These questions suggest that organizational knowledge has several dimensions worthy of managerial attention:

● A structural dimension—this covers issues involving how to collect, arrange and store organizational knowledge as well as how to make it easy to access and apply

● A temporal dimension—this covers the need to constantly update the knowledge base at the same time as capturing how it has changed in time, as well as the very important notion of incorporating knowledge yet to be created
● A learning dimension—this covers the need for the organization to constantly reflect on experience in order to update its working practices and principles
● A behavioural dimension—this covers the need to consider the power dimensions of knowledge as well as the change management implications of an evolving knowledge base.

From an academic perspective, Nonaka's (1994) knowledge paradigm and Spender's (1996) proposal for a knowledge-based dynamic theory of the firm suggest organizational knowledge exists in multi-forms. These are highly philosophical discussions that emphasize the dynamic nature of knowledge and discuss the role of the manager in transforming knowledge. Spender (1996) comments on the difficulties involved in operationalizing such a problematic concept of knowledge in a meaningful way but does state: 'Ultimately to know is to be able to take part in the process that makes that knowledge meaningful' (p. 59) and asks researchers to develop '. . . a tool to help managers discover their place in the firm as a dynamic knowledge-based activity system' (p. 45).

In the light of these views and given the practical problems faced by everyday managers in managing knowledge, the authors suggest that activities managers take part in which make knowledge meaningful include those that produce:

● Known knowledge, generated as the current environment is continually analysed in terms of its relevance to the organization, and which is subsequently embedded in organizational practice and principles
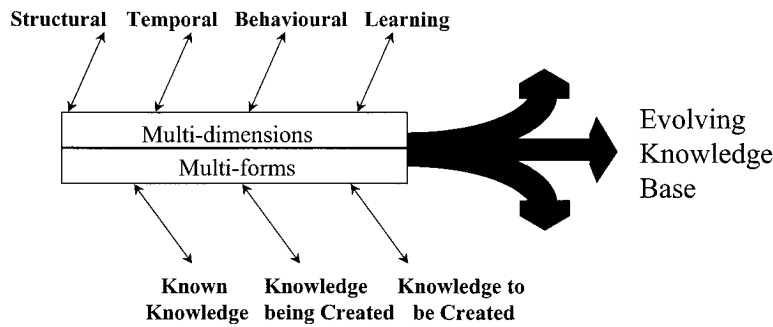
Figure 2   Multi-form and multi-dimensional knowledge

- Knowledge in the process of being created as organizational strategy is enacted and learning takes place
- Knowledge the organization considers worthy of creation, but has yet to create and is therefore encompassed in the strategic intent of the organization.

In line with the overall proposition of the paper, it is proposed that these forms need to interact dynamically, and to evolve constantly along the four dimensions stated previously for strategic performance to be enhanced. It is with these practical issues and dimensions, and theory advances and multi-forms in mind (Figure 2), that the case study is presented and discussed. The aim of the paper is to further our understanding of how to rise to the challenge of a knowledge-based view of the firm that is enhanced and enabled by information management; but that goes beyond this point to embrace the academic perspective that knowledge is much more than information processing and problem solving. It is hoped that this will encourage academics to consider the practicalities of defining and managing knowledge in knowledge-intense firms and practitioners to consider extending their definition of knowledge beyond the processing of information.

BACKGROUND TO THE CHANGE PROGRAMME WITHIN HEALTHCARE CO.

HealthCare Co., now a global company, started trading over 100 years ago as a family firm. Known for its highly successful products, it grew in parallel with the industry and thrived in the 1980s as new products fuelled a particularly strong period of growth. With heightened levels of ambition it chose to undergo both downsizing and horizontal integration, merging with two other firms in a move designed to follow globalization trends.

Aware both of the commercial need for new products to be global successes as well as the dangers of a reduction in innovative spirit in times of mergers and downsizing (Dougherty and Brown, 1995), consultants were employed to work in partnership with the company. A cross-functional project team, an organizational structure new to the firm, was set up within which the management consult-

ants operated to devise new ways of working to ensure the most rapid commercialization of the company's top priority product. Supporting senior management structures for the project team were also set up, in the form of sponsor teams either side of the Atlantic to counsel the project team members, and a global steering committee to which strategic decisions had to be referred. For two years consultants worked with the organization, in particular the project team, to transform their ways of working. Initial emphasis was on improving operational excellence whereas, after a year, the focus changed to the company's strategic processes within new product development, through the intervention of a re-mobilized consultancy team.

The change programme took place over two years. Consequentially, it is impossible to report in detail all of the change initiatives. Instead, mini-cases are provided which illustrate the move from the traditional, routinized approach to new product development to a more flexible, creative and adaptive approach of strategic creativity and organizational learning through knowledge management. The examples were selected on the basis that they most accurately reflect and illustrate the need to appreciate the role of different forms and dimensions of knowledge as well as the importance of facing the practicalities of defining and managing knowledge in global, knowledge-intense firms.

Although far from conclusive and comprehensive, this single case study does provide indications of the directions advances in strategy innovation might take. In particular, the development of knowledge into a concept which allows it to take on multi-forms and dynamic dimensions which go beyond, but include information technology, is suggested. In addition, the contemporary nature of the empirical data presented in this paper contributes to the topical debate of how the idea of knowledge should be usefully considered by those operating within the field of management today.

CASE STUDY

The case study material was collected from the electronic learning database of the consultancy firm involved in the project, and included the following source documents:

- Client and consultant project milestones and commentary
- Client working documents
- Client learning documents
- Consultant project presentations to the client
- Consultant monthly client progress reports
- Individual consultant learning notes
- Consultant team group learning exercises.

The data was extracted from the database after the client work had been terminated. The complete consultancy team reviewed the database, confidential client material was removed, the database locked and placed on the consultancy firm's global knowledge network. Each mini-case is presented in the following manner:

Mini-case section	Source material
1. An account of the relevant events throughout the two-year project	Milestone information and client documents
2. Commentary on the evolving role of knowledge within these events	Learning notes, exercises and progress reports
3. The relationship of that interpretation to the multi-perspective view organizational knowledge	Not applicable

MINI-CASE A—CREATING A KNOWLEDGE-BASE

For sound ethical reasons the pharmaceutical industry is obliged to comply with regulations that dictate the way in which the safety and efficacy of new products is proven. This, however, has led to viewing new product development as solving the problem of obtaining regulatory approval, rather than defining the problems which will ensure the drug is of benefit to society and then solving these newly created problems in a way considered ethical by society. Arguably, this level of institutionalization often fails to 'kill' weak drug candidates early enough in the product pipeline, or to ensure strong candidates realize their full commercial potential, as too little effort is consumed managing the uncertainty of renewing the organizational knowledge base. The focus of this mini-case is on the strategy development processes involved in creating and defining the objectives of the tests in humans required by regulatory authorities before approval to market can be applied for. In particular, attention is paid to how the strategy development processes within HealthCare Co. were altered by viewing them through a knowledge-creation lens and how this helped in dealing with the inherent uncertainty of strategy innovation.

Section 1:   An account of the relevant events

- Development of a milestone plan, by a project team of five centrally based staff supported by colleagues across the world, based on the activities needed to obtain marketing authorization
- Decision making falls on the critical path for 6 months as managers struggle both to interpret the results of some of the tests and to decide on the future development path
- A risk management framework, differentiating between technical, operational, strategic and environmental risks, is devised and used to identify the risks involved in continuing to develop the product in more or less strategically innovative ways
- A new milestone plan developed on the basis of the levels of knowledge needed to be reached to successfully commercialize the product
- A risk of not reaching milestones managed by associating the knowledge milestones with the risk management framework on an ongoing basis
- Project activities restart after a further month
- Achievement of subsequent milestones subjected to a peer review process, involving both internal and external experts, tasked with verifying whether the level of knowledge needed to proceed to the next milestone has indeed been achieved
- Decision making becomes more streamlined without decisions falling on the critical path.

Section 2:   Commentary on the evolving role of knowledge
Mini-case A supports the notion that organizations are moving towards a knowledge paradigm by placing more emphasis on the process of knowledge creation than in the past. In this case the effect of the change was a project, less constrained by operational effectiveness and institutionalized capabilities, and more strategically innovative. The development of the original activity-based milestone plan suffered from the phenomenon of core rigidities (Leonard-Barton, 1992). The newly formed team, unused to working cross-functionally, struggled to behave in a 'creatively destructive' manner (Schumpeter, 1942), limiting their thinking to the known organizational routines. This included conducting a 'Phase 1' safety trial with healthy volunteers, as was considered routine practice, without questioning whether this was needed. In fact given the diagnostic purpose of the product, rather than the therapeutic nature of a drug, arguably it did not pose a threat to patients and could therefore have been immediately tested for safety and efficacy in patients, rather than healthy volunteers. If this argument had been put forward to and accepted by the regulatory authorities, several months of valuable critical path development time would have been saved. Another example involved the knowledge-based view allowing the team to approach the US regulatory body in a very novel and fruitful way,

in terms of both strategic creativity and organizational learning.

The development of the risk management framework enabled the team to build a shared understanding of the risks involved. This allowed them to differentiate between operational and strategic risks. In particular, they realized the former were very much in their control, could be isolated and dealt with through improvements in routine organizational processes while, more powerfully, enabling them to identify the strategic risks and convert them into strategic choices. Furthermore, in separating out the on-going prospect of technical failure (failure of the product due to its already established technical performance criteria) from all other risks it was appreciated that this ultimately could only be managed at a portfolio level. The team, as a whole, began to understand the strategic freedom they had and how the environment could be managed in their favour to test and develop the relevant market niches through the creation of new knowledge.

As a result the strategic choices were communicated in the form of knowledge milestones. Milestones such as 'end of clinical trial X' were converted into 'when commercially viable dosing procedure has been proven'. Once the wording of the milestone encapsulated the uniqueness of the external opportunity and internal competencies, defining exactly what was meant by 'commercially viable' became the focus of attention and creativity. Thus the team moved away from the institutionalized way of monitoring product development by ticking-off activities which, quite incidentally, may or may not have achieved substantial strategic value, to a situation in which the strategic innovativeness of what was trying to be achieved was debated and stretched. In Nonaka's (1994) terms, the team moved from viewing the problem as needing to conduct their activities in a way compliant with regulatory standards to creating problems in the form of defining what needed to be known about this new product. The risk of not achieving this new level of knowledge about the product was then defined in terms of all the categories of risk and communicated across the organization along with operational action plans. This proved to have many advantages:

● The product being developed in more innovative settings of potentially greater commercial worth.
● Increased levels of shared understanding of the purpose of activities which led to the discarding of some activities of low strategic worth.
● Decision making being taken off the critical path, decreasing the time to market.
● A greater emphasis placed on managing the risks of product development and decreasing the chances of failure.
● The facilitation of the communication process between the project team and the global steering committee allowing the latter to challenge the team more and to be more aware of the contribution the product in

development was likely to make to the organization as a whole.

Top management support was seen as critical in enabling the transformation of the project team towards knowledge creation. Converting top management to more strategically innovative milestones was challenging, as they sometimes found it easier to follow the institutionalized routines and practices than the new processes that challenged them. Obtaining external support and sponsorship was often critical in changing top management opinion. On some occasions meetings between top management and the project team became very protracted, as a lot of new information 'needed' to be presented to justify the project team's position. On a few occasions project team staff were prepared to take the initiative themselves. Conversations within the project team were more lively and involved greater debate about what was known, why it could be said that it was known and what impact that had on how innovative the strategy was.

Section 3:   The multi-perspective view of organizational knowledge
The generation of a knowledge-based milestone plan had the advantage of expanding the shared knowledge framework of the team, making their efforts more strategically oriented. This was achieved by allowing knowledge to take on a perspective involving the creation of new knowledge rather than solely analysing known information; and trying to interpret the analysis in the light of opportunities and internal competencies. This allowed the team to move from a design format based on today's knowledge to one which encompassed designing the future. At the same time, in questioning the basis of their strategy, the team became more aware that other influences were affecting the product strategy development process, such as their perspective of which development options were risky and why. This, in turn, introduced new notions of knowledge, what different levels of management knew, how learning and experience had altered their knowledge base, how the culture of the organization altered, what they felt they knew and how their own cognitive structures of what they planned to do were affected by functional bias. In effect the transformation involved challenging the notion that the team knew its environment, both internal and external, by questioning on what basis it really knew something.

The need to create new knowledge when attempting to be strategically innovative clearly involved taking into consideration the different forms of knowledge. In particular, it required the recognition that the creation of new knowledge involved uncertainty that needed to be managed and the responsibility for this to be shared among the project team and with senior management to generate a much broader knowledge base containing more than relevant information.

MINI-CASE B—ALLOWING THE KNOWLEDGE-BASE TO EVOLVE

In evolving to a product development process based on knowledge creation, the need to monitor changes in the organization's knowledge stock on an ongoing basis became evident. The old institutionalized routine required a single strategy document to be presented to senior management at the start of the development process. Yet with the environmental and organizational conditions and context changing to quickly this practice was inadequate. The project team struggled to interpret and organize the operationalization of strategy, and received very little support from senior management in their role as challengers of the strategic content of the new product development process and balancers of the new product portfolio. An accessible and structured system was therefore needed which could accommodate evolving organizational knowledge.

Section 1: An account of the relevant events

- Completion of a draft strategy document at the start of the project by a team of three staff from the Strategy Department working independently of the project team
- Integration of the leader of this team into the project team
- The failure of several attempts to update the strategy document and the decision to embark on a different approach as follows
- Assessment of whether the strategic choices were supported by objective data or subjective belief
- Building of knowledge hierarchies, which included both objective environmental data and tested and updated organizational routines and subjective beliefs about what was thought strategically worth while and possible, in support of each knowledge milestone
- Continual updating of the knowledge hierarchies supporting the knowledge milestones either in terms of objective environmental data, new organizational routines devised through learning exercises, or knowledge created by the achievement of milestones
- Continual assessment of whether the updating process required the knowledge milestones to be changed and/or whether they had been achieved.

Section 2: Commentary on the evolving role of knowledge

The initial 'draft' and 'final' approach to product strategy documentation proved to be a way of ensuring that much time was spent focusing on the institutionalized routine of presenting a final version to the management and then living with the consequences. This restricted the strategic creativity of the team by:

- Placing an emphasis on minimizing risk at the expense of analysing it and managing it
- A lack of organization of data and information to support the decisions made

- A lack of challenge by top management
- A lack of understanding across the project team of what they were trying to achieve with the product.

Furthermore, the strategic flexibility of the team's thinking was also reduced by this approach to product strategy documentation and led to:

- Delays while relatively uninformed discussions took place
- An uninformed team, given the lack of a procedure to update the knowledge stock on an ongoing basis
- A feeling of frustration within the team that their emotional commitment to the project could not be backed by their involvement in strategy development.

In mini-case B, the strategy moved from being encapsulated in a static document into an emerging knowledge base. Whereas in the past, the strategy documentation once signed off by management was shelved and rarely referred to or updated, the new system was much more dynamic. At any point in time what was known about the project was held within an evolving knowledge base of active inter-related project documents. This allowed the project team to check on an ongoing basis whether new knowledge levels had been achieved in the light of the most updated environmental and organizational context and conditions, rather than referring to an often outdated single document written before anything was known about the product.

It also allowed management to trace the logic of the evolving strategy as the new product was developed and new findings about its capability and the reaction of external stakeholders to this capability were unearthed. This engaged management in a more constructive challenge of product strategy. Functional managers previously disenfranchised from the project team attended appropriate project team meetings.

Section 3: The multi-perspective view of organizational knowledge

The move to a looser, but more utilized, emerging product system, in which knowledge about the product could by dynamically organized in all forms and supported in all dimensions, appeared to enable the organization to be more flexible and creative in its strategic thinking. The system did not, however, make the strategy process unplanned and emergent. Instead it encouraged all known information about a strategic choice to be exposed in a logical and rational way, juxtaposed against the creative knowledge goals. This allowed the multi-forms of knowledge to exist in harmony, with one enabling the other, and allowed the evolution of the knowledge base to occur in an organized and transparent fashion.

This mini-case emphasizes the structural and temporal dimension of the practicalities of handling knowledge. It shows how more sophisticated concepts of knowledge, that go beyond information, can still be managed in practice but

highlights that emphasis must be placed on allowing knowledge to take on different forms in an agreed and structured way.

MINI-CASE C—USING IT TO ENABLE THE EVOLUTION OF THE KNOWLEDGE BASE

As the product development process evolved from being an institutionalized list of activities to being based on dynamic knowledge, the IT department began to analyse how they might support this transformation in approach. They were installing a document management system used by much of the industry to collect the data needed to put forward a marketing authorization request to the authorities in an electronic format and saw the potential to expand its use.

Section 1:   An account of the relevant events

● New document management system installed
● Purpose of system defined as repository for reports destined to be formally submitted to the FDA as part of the request for regulatory approval
● System chosen as repository for organizational new product development learning database
● Complete knowledge hierarchy for a product designed and system reconfigurations to fit these needs established
● Plan drawn up for access to system to be granted to periphery of organization (i.e. affiliate companies as well as headquarters)
● Processes designed for capture and use of relevant knowledge relating to the product.

Section 2:   Commentary on the evolving role of knowledge
The initial use of the document management system followed normal organizational routines and industry standards. However, the project team became frustrated at having to use a separate location for storing other project documents. This was first articulated in the case of the learning documents produced by the team to aid the transfer of new working practices within the team and to other product development teams. Once this body of knowledge had also been placed on the system it became increasingly obvious there was likely to be value in organizing all of the project-related knowledge within this supporting infrastructure. This initiative created one repository for all project-related knowledge. More importantly, functionality designed into the system was used to create and manage the project-related knowledge more dynamically. Every structure within the system, such as competitive intelligence, could potentially be accessed remotely by staff, including those operating within the periphery of the organization, and updated as necessary. Pre-defined document and milestone owners in headquarters could then be automatically alerted of the change, allowing them to alter higher-level structures if deemed necessary.

Equally, senior managers dealing with portfolio issues could access the system at its highest level to monitor changes in levels of project-related knowledge, as well review the changing risk profiles of reaching the next knowledge milestone. Scanning functionality, designed initially into the system to enter data from clinical trials arriving from hospitals, could also be used to incorporate any relevant external documentation being used as supporting data in the development of the knowledge milestones and product strategy. Audit trail functionality needed for regulatory purposes could be used to trace the emergent documents and processes, providing a source of data for the learning manager to convert into knowledge the experience of conducting the project.

Section 3:   The multi-perspective view of organizational knowledge
Although by the end of the consulting project the reconfiguration of the system to the above requirements had not been completed, it was apparent from the rate of uptake of the changes achieved that the idea to transform the document management system into an evolving knowledge base was well received. The use of IT had the effect of bringing together the changes in the notion of knowledge within the organization. Although these changes would have been possible without the system, it was considered to have facilitated the transformation greatly in terms of access, user-friendliness and transparency. Without the system much more time would have been spent collecting, analysing and storing information and much less on challenging the knowledge base and allowing it to evolve. Information technology can therefore do much more than information management. Well-designed systems containing knowledge as well as information allow the two to interact and be exchanged. It can therefore be proposed that where IT systems are doing little to help managers accrue organizational advantage it is because either the system contains nothing more than information or that it is designed to contain unique organizational knowledge but the system is not practical enough for it to be harnessed or managers are unaware of the potential it holds for knowledge management.

DISCUSSION

In this company, considered typical of the healthcare/pharmaceutical industry, the organization can be said to have moved very tangibly towards organizing work around a knowledge paradigm. In doing so the concept of organizational knowledge expanded greatly. The creation of knowledge was seen, at least by some managers, as the driving force behind strategy innovation and not just a matter of electronically collating and distributing data within institutionalized routines. The notion of knowledge moved from information processing and problem solving to
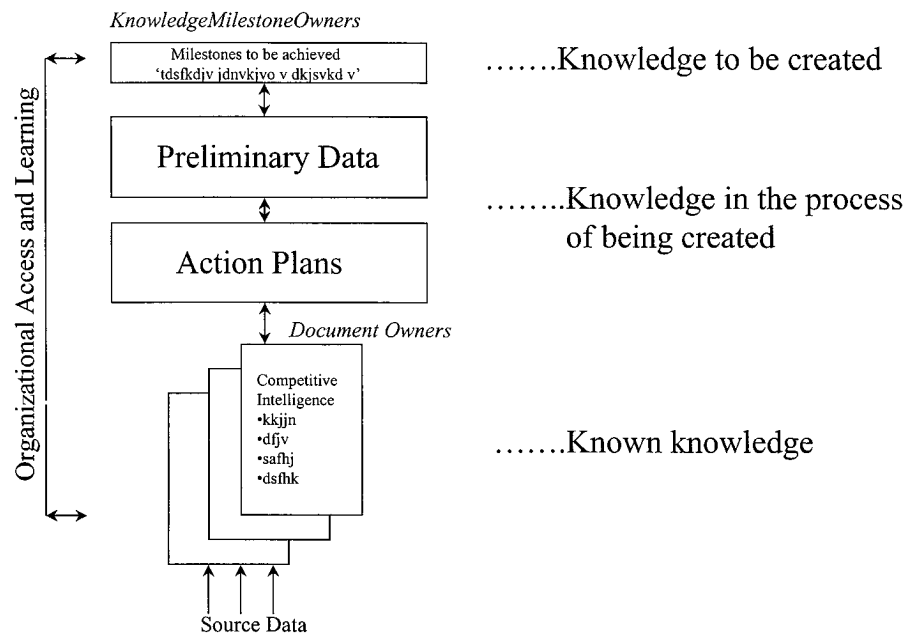
Figure 3   The structure and dynamics of an evolving knowledge-base

problem creation and knowledge creation. This was achieved by being very practical in the sense of ensuring that multiple forms of knowledge could be managed within a multi-dimensional evolving, user-friendly system.

The transformation from information processing to knowledge creation was supported by allowing the content of the strategy to be structured in a dynamic, 'upside-down' fashion as shown in Figure 3. No longer did interested parties have to wade through pages of out-dated script before finding the strategic choices that had been made and wondering just how and why these had been arrived at, or how close the project team were to achieving milestones. They could 'double-click' on the milestone and find the supporting evidence and status. If they were interested in knowing more about any particular piece of evidence they could 'double-click' again and find the source data. If anything changed at any point in the knowledge structure, the data could be changed and the owner of the area could evaluate whether this had any impact on the remainder of the hierarchy. Critically, the nature of the knowledge milestone or any other knowledge milestones and whether to update and/or re-evaluate source data were constantly under scrutiny. Within this knowledge base different forms of knowledge were allowed to co-exist: known factual knowledge encompassing analysed source data in the form, for example, of competitor intelligence, market facts and figures, current purchasing dynamics and latest trends in technology development were constantly updated. Knowledge in the process of being created was stored at the next level, examples include preliminary results from tests, projections of future market scenarios and forecasted purchasing patterns. Lastly, strategic choices were stored, in this case in the form of unachieved knowledge-based milestones,

and therefore existed as the knowledge the organization wished to create.

So to return to the initial managerial issues proposed and the structural, temporal, learning and behavioural dimensions of knowledge mentioned at the beginning of the paper:

● With so much information available to organizations, from both within and outside the firm, how can it be organized to ensure its strategic value is efficiently and effectively harnessed? IT can be successfully used to create a structure and system that facilitates knowledge creation. This is done by differentiating between current knowledge and knowledge thought worthy of creation or in the process of being created while relating those different forms of knowledge to strategy innovation. In temporal terms it means creating a system which allows the organizational knowledge base to evolve on a continual basis and the impact of those changes to be continually assessed. In learning terms it means constantly recording changes, spending time reviewing these content changes and the processes aligned to them and ensuring there is room on the system to share learning across the organization. In behavioural terms it means creating an internal climate which sponsors the IT infrastructure investment, the level of knowledge transparency and organization, and uses both to productively challenge levels of strategy innovation.

● If knowledge creation is something other than the processing of information and problem solving, what is it, how can it be promoted in organizations and by whom? Knowledge creation in structural terms means structuring current knowledge as much as possible to

allow more time and space to explore new beliefs about what might be strategically feasible. In time this evolves into a knowledge framework which can be shared and articulated to the extent it can be communicated in the form of manageable ways of dealing with the uncertainty of creating new knowledge. Behaviourally, such a view requires ensuring teams discuss the goals of knowledge creation in detail. Of equal worth is the challenging by top management of the assumptions underlying the choices being made. This intervention leads to the questioning of how risks are being managed and how they might be managed better. This is of value to the project team but also aids senior management in the process of balancing risks within the portfolio of projects across the organization. It also involves accepting that people are likely to be different in the degree to which are excited by uncertainty and allocating them accordingly to different projects.

● Given that the organizational knowledge base changes so frequently, how can organizations manage the dynamic nature of knowledge? Structurally this involves making the system as simple as possible. Temporally it means creating infinite time in which there are no versions just a number of changes made on an ongoing basis. From a learning standpoint this means monitoring and leveraging this constant renewal of the organizational knowledge stock across the whole organization. Behaviourally it involves making people proud of contributing to that process and leveraging it to increase the strategic value of their efforts.

Nonaka's knowledge paradigm of organizations promotes the knowledge creation aspects of innovation as well as accepting the need for organizations to develop the capability to process information imposed upon it by the environment. In this organization we have seen how these two can interact to enable each other by organising multi-forms of knowledge. This dynamism allows the structure and organization to evolve over time while promoting the behaviours among middle and senior managers needed to support this form of knowledge management and creating processes by which learning becomes an everyday part of organizational life.

CONCLUSIONS

On the basis of the empirical evidence presented in this paper, the value of a multi-perspective view of knowledge appears to be the way it can integrate many aspects of organizational life to the process of strategy innovation. The authors claim this is because a shared, dynamic, evolving framework of multi-dimensional and multi-form

knowledge allows managers to avoid institutional inertia and organizational routines constrained by core rigidities (Leonard-Barton,1992). In its place a culture of knowledgeable learning and strategic flexibility is promoted and created, in the form of the freedom to resourcefully create new knowledge. By doing so the seeds of innovation can not only be sown but also propagated, allowing the organization to produce a variety of strategic thought in a self-sustaining and unique manner.

This case study has also revealed the practical side of developing a dynamic knowledge base that harbours multi-dimensional and multi-form knowledge. The supporting roles of both senior management and IT have been illustrated. The need also to translate the concept of different perspectives of knowledge into forms and dimensions that are clearly relevant to strategy development processes has been revealed.

It is hoped this has stimulated the reader to consider how knowledge management might be taken beyond the efficient and effective organizing and processing of information in his or her organization as well as how evolving organizational knowledge relates to strategy innovation. Exactly what form this review needs to take or exactly how best to achieve a multi-perspective view of knowledge within different organizations will be a function of the unique opportunities and competencies the organization harbours. This paper shows that managers operating within knowledge-based economies subject to accelerating change will benefit from critiquing and extending their notion of knowledge. The empirical evidence has shown this can be done in practice in the context of the latest advances in the development of a knowledge-based theory of the firm, to produce sustainable organizational advantage though strategy innovation.

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