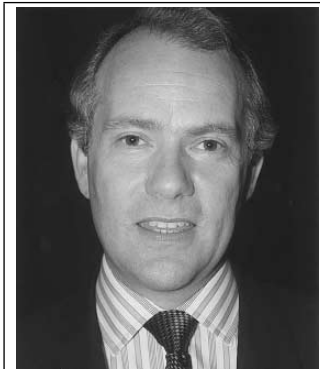# Building Knowledge Management into Strategy: Making Sense of a New Perspective

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Challenges of Knowledge Management

What has knowledge management achieved so far? A recent two-day conference of the Strategic Planning

*Edited by
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Strategy at the Leading Edge features short reports on conferences, new research and experiments by academics, organizations and consultancies for all those involved in strategy and strategic management. Contributions (two hard copies and a disk) should be sent to Martin Whitehill, City University Business School, Frobisher Crescent, Barbican Centre, London EC2Y 8HB E-mail: m.whitehill@city.ac.uk.

Knowledge management is rapidly becoming one of the next big trends. All the signs are apparent in the number of recent conferences, articles and books devoted to the topic. Even the comic strip Dilbert has taken notice and poked fun at it. Our experience of earlier management trends, including BPR, organizational learning and TQM, might cause sceptics to question: so what's new here? The experiences of knowledge management pioneers in North America and Europe show that real and significant results are possible. However, as with older methodologies, good planning and implementation are essential and success is not guaranteed.

This paper explores how managers might build knowledge management into the strategy process in their firms. Much has already been written about the philosophy and concepts of knowledge and intellectual capital. Less attention has been focused on how to combine a knowledge perspective with established strategy tools, or how to develop unique knowledge-based sources of sustainable competitive advantage. Gary Hamel and C.K. Prahalad have observed that managers typically spend too little time thinking seriously about strategy and the future. We need to ensure that in this limited time, the important dimension of knowledge doesn't get overlooked. © 1999 Elsevier Science Ltd. All rights reserved

Society in London provided an opportunity for reflection, learning and presentation of interesting cases. The following are some examples:

1. Unilever PLC has used knowledge to good effect in its Ragu sauces division. The company held a series of workshops around the world to map its knowledge of tomato sauce technology and factors contributing to the taste, texture and quality of the product. In this process, managers identified 50 areas of knowledge they didn't have. Knowledge networks or communities were set up to develop and share new insights. At Birds Eye frozen foods division, managers discovered they possessed an important area of knowledge not being fully exploited by customers: a world class expertise in nutrition. Unilever is also a company that has given a lot of attention to organizational learning and building knowledge capture into key processes.

2. The World Bank has adopted knowledge management as a central strategic thrust. The role of the bank is not limited to lending money but committed to transferring specialist expertise across national boundaries. An example was the rapid response to an urgent request by the Pakistani government for advice about premature road pavement failure. Officials were considering a new technology. Bank staff in field offices around the world were able to provide timely and appropriate advice within days. In the past this would have taken weeks or months. Such experiences are entered into a knowledge-base and communities of practice established. The Bank is making active use of help desks, groupware, surveys and web sites to provide technological support.

3. Enterprise Oil, one of the world's largest independent exploration companies, reported using knowledge communities to encourage dialogue between peers as well as faster problem-solving in an industry troubled by price erosion. These communities have used web sites to publicize tools, guidelines and case studies. Benefits identified so far have been the avoidance of costly duplication of effort and greater awareness of the need to capture knowledge for reuse.

4. A spokesman for IBM attributed that company's spectacular turnaround since the early 1990s to CEO Lou Gerstner's leadership and company efforts to exploit and develop knowledge in its businesses. This has been accompanied by a major cultural change and efforts to redirect the portfolio of competencies into services, consultancy and electronic commerce. A knowledge-driven culture is being created and focused on reengineering, procurement and intellectual capital management. Knowledge has been leveraged to integrate the procurement process, strengthen purchasing power and achieve $4.2 bn savings since 1995. Intellectual capital is being managed through 49 competency networks and the world's largest implementation of Notes and Web technologies. An Institute for Knowledge Management is being created to conduct research on knowledge strategy and related topics.

5. BP has used virtual teamwork for over four years as a means of achieving a step change in performance. The term ''performance and learning'' was used rather than knowledge management. The objective was to tap rare and scarce resources within the company, which was described as possessing a ''federal'' culture. Extensive use was made of video conferencing technology to communicate and problem solve at a distance using a corporate intranet. An example of successful knowledge-sharing around the globe was BP Japan's adoption of self-service stations. Lessons of how to educate consumers were transferred from Europe and other continents and posted on the intranet. Another interesting example was the successful bid to supply energy to a brewery in Tanzania where expert advice and a blueprint for the proposal was obtained from BP Aberdeen's experience in a similar situation with a Scottish brewery. A site on the intranet has been set up with video clips and a library to educate employees and managers about BP's policies on human rights.

The majority of the ten organizational case studies presented at the Strategic Planning Society conference reported implementing some form of intranet, knowledge network or community of practice. These delivered the greatest value when supporting a clear business challenge or problem, and where speed of knowledge transfer, team-working over large distances and cultural change were key objectives.

It seems that knowledge management is maturing from a novelty to a strategic approach being implemented by many of the most successful corporations and international organizations. Further evidence for this is the widespread diffusion and use of management tools closely related to knowledge management, such as benchmarking and the balanced scorecard. Major international management consultancies also increasingly emphasize development of their own intellectual capital for application in their clients' businesses. McKinsey claims to devote ten percent of revenues to knowledge creation and distribution.

Roots of Knowledge Management

Numerous books, articles and special editions of journals have already been devoted to explaining

concepts of knowledge and its management in organizations. It is not necessary to dwell on these, except to iterate that the key components of successful knowledge management are strategy, culture, technology, organization and people. Many speakers at the Strategic Planning conference noted that the key success factor is people rather than technology.

Knowledge management has very diverse practical and academic roots. The closely-allied field of organizational learning popularized by Peter Senge in 'The Fifth Discipline' (1990) dates back to works by Argyris and Schon in the late 1970s. Innovation is another contributing thread with a huge number of writings devoted to R&D, new products and processes. Strategies have recently emphasized the "resource-based view of the firm" which notes that a firm's internal capabilities, strengths and weaknesses are critical in rapidly changing conditions typical of the 90s (Wernerfelt, 1985; Grant, 1991). Hamel and Prahalad's notion of core competencies are essentially knowledge-based sources of competitive advantage.

Other roots of knowledge management can be located in BPR, IT management and strategic control literatures. The Balanced Scorecard popularized by Kaplan and Norton can be viewed as a tool for knowledge management. Nonaka and Takeuchi's (1995) descriptions of tacit knowledge development in Japanese companies like Honda and Matsushita bring us into the realm of international management and cultural differences.

The practical origins of knowledge management are not hard to identify. The BPR trend of the early 1990s has led to widespread adoption of new systems, notably enterprise (ERP) software by (e.g.) SAP, PeopleSoft, Baan and Oracle. Experience has shown that the success of these extremely costly reengineering projects is related to organizational and cultural issues, often knowledge-related. The Y2K software bug can be viewed as a challenge for knowledge management. There are many new 'smart' products on the market which incorporate new technologies. Not least in significance is the growth of the internet and corporate intranets as platforms for information and knowledge dissemination.

There are important macroeconomic reasons for interest in knowledge-based strategies. Governments of all persuasions are concerned with promoting economic growth, especially in the high-tech and service sectors. Knowledge is a driver for important national industry 'clusters' e.g. consumer electronics in Japan, computers and telecommunications in California's Silicon Valley and financial services in the City of London. Encouragement of innovation in knowledge-intensive firms, dissemination of 'best practices' and investments in education have become hot political issues.

Knowledge management has an attraction for many stakeholders because it is timely and a means of redressing the excesses of earlier approaches such as BPR and downsizing. It is a broad enough umbrella to cover many critical issues and trends. Some features of knowledge management emphasized by its advocates are:

- holism and humanism: the priority is to make better use of human potential rather than to downsize it;
- a concern with growth and new possibilities by developing new knowledge;
- support to creative management practices which result in new competencies;
- making good use of important technological developments such as networks;
- political and social support because knowledge drives economic growth.

Building Knowledge into Strategy Development

There exists a wide variety of strategy tools including mission statements, competitive intelligence, environmental scanning, technology assessment, portfolio matrices, SWOT, core competencies, the value chain, scenario analysis and stakeholder mapping. In recent years books by Mintzberg (1998), Whittington (1993) and others have raised awareness of different 'schools' of strategy formation, such as the 'design' school, competence-based competition, hypercompetition, emergent strategy, complexity and evolutionary approaches. These tools and schools of strategy can be enriched by a knowledge dimension. Examples follow of how this can be done. Managers concerned with strategy are encouraged to be creative in adapting tools to their own purposes.

Many organizations develop *vision or mission statements* as a means of communicating identity and exerting broad guidelines for strategic decision-making and control. A well-crafted mission delineates the directions an organization wants to pursue or avoid. A meaningful focus on knowledge can be introduced into such a statement. Unilever emphasizes the transfer of new knowledge for the benefit of society and especially the emerging economies, i.e: "developing and transferring global knowledge to local people everywhere." KPMG developed a new mission statement a couple of years ago with knowledge a central focus.

Missions and visions cascade down to *objectives and targets* which may be part of a *balanced scorecard*. Kaplan and Norton (1996) argue that the Balanced Scorecard is a tool for organizational learning and improvement, as well as a performance measurement system. The four perspectives of a Balanced Scorecard are financial, customer, internal business process, growth and learning. The last perspective

typically includes strategic objectives for training and development, technology and teamwork. The internal business process perspective might include objectives for innovation and business process improvement. Knowledge-related objectives can easily be suggested for these perspectives. Chemical Bank's Scorecard mentions knowledge of the product/service portfolio and financial markets as elements of customer, learning and growth objectives (Kaplan, 1996). Mobil Oil's Scorecard includes core competencies and skills (Kaplan, 1997).

Competitive intelligence, industry analysis and environmental scanning are used to assess threats and opportunities in the external environment. A *knowledge map* about key competitors, substitute technologies, potential entrants, customers and suppliers can be developed. This map might include pointers to sources of knowledge, a 'yellow pages' of experts on the corporate intranet, typically one of the first applications of knowledge management technology. Companies which have successfully implemented yellow pages include Ernst & Young and Arthur Andersen. Some observers have also suggested using intelligent software agents over the internet to collect up-to-date competitive and scientific information.

A knowledge map can be an invaluable component of a *SWOT analysis* for uncovering the strengths and weaknesses of corporate knowledge. In looking for new opportunities the firm could focus on knowledge creation with customers and other stakeholders. Developing strategies for operational excellence typically requires benchmarking and quality review of existing processes as part of the SWOT. Process mapping is usually an essential first step. This may be enriched by mapping important related knowledge sources at the same time as mapping the work activities. This might prevent some of the disasters of reengineering projects in which important organizational memory and competencies get lost.

Knowledge maps can be constructed to summarize the important forms of knowledge for the parts of a business. For example: the ''know-how'' of innovation and process capabilities, the ''know-what'' of professional expertise, the ''know-why'' of business dynamics and ''know-who'' of important personal, political and social relationships.

When a knowledge map is used in some way for systematic comparison or evaluation this may lead to a *knowledge audit*. For example, financial institutions or others concerned with risk management or uncovering unusual exposures might map knowledge available against the 'hotspots'. The failure of Barings Bank in Singapore has been attributed to failure to identify and rectify such knowledge deficiencies (Marshall, Prusak and Shpilberg, 1996). An entrepreneurial or growing firm might map knowledge needs against knowledge supply as part of

developing a human resource strategy. Microsoft takes a lot of care to match bright people to their business strategy. A knowledge audit can also be used in conjunction with implementation of a balanced scorecard to ensure that strategic objectives and organizational capabilities are potentially in alignment.

Other tools of strategic analysis which can be adapted for knowledge management are the *product lifecycle and business portfolio matrices* such as the famed ''Boston Box''.

Critical business knowledge seems to follow a path over time in which at the beginning there may be considerable uncertainties, accompanied by increasing returns to scale and at maturity an apparently unassailable source of competitive advantage—as in Microsoft's Windows software development capabilities. Eventually the value of specific knowledge may depreciate through growth of substitute capabilities and successful imitation. For example, Windows is threatened by Sun's Java language platform as a substitute technology.

Just as business may be classified as ''wildcats,'' ''rising stars,'' ''cash cows'' or ''dogs'' in the old Boston Box (BCG Matrix), so may knowledge be viewed as developing through the stages of a portfolio. *Core competencies* can be classified using the Boston Box terms as they mature through their lifecycles. Firms could regularly assess the balance of their competency portfolios as part of a resource-based approach to strategic planning.

A portfolio model which could be particularly helpful for strategic thinking can be constructed around the dimensions of knowledge content and awareness. A much-repeated truism is that there are four important types of business knowledge:

1. what we know we know
2. what we know we don't know
3. what we don't know we know
4. what we don't know we don't know.

Figure 1 shows the areas of concern these frequently apply to in practice. Many knowledge management programmes are presently concerned with processes for sharing and distributing existing knowledge, i.e.: ''what we know we know''. This might include sharing best practices across internal boundaries. Rank Xerox is reported to have saved £200 m by such means.

Increasingly systems such as intranets and knowledge networks are also being designed for intelligence-gathering and market research purposes, or ''what we know we don't know''. Perhaps somewhat by accident, overlooked or forgotten knowledge may be rediscovered and used, i.e.: ''what we don't know we know''.

1. What We Know We Know	2. What We Know We Don't Know
Emphasis: knowledge sharing, access and inventory. *Tools:* e.g. benchmarking, communities of practice.	*Emphasis:* knowledge seeking and creation. *Tools:* e.g. R&D, market research, competitive intelligence.
3. What We Don't Know We Know	4. What We Don't Know We Don't Know
Emphasis: uncovering hidden or tacit knowledge. *Tools:* e.g. knowledge maps, audits, training, networks.	*Emphasis:* discovering key risks, exposures and opportunities. *Tools:* e.g. creative tension, audits, dilemmas, complexity science.

Knowledge Awareness (vertical axis label)

Knowledge Content (horizontal axis label)

FIGURE 1. A knowledge portfolio.

From a strategy perspective perhaps the type of knowledge that poses the greatest threats and opportunities is type 4: ''what we don't know we don't know''. This might include the emergence of unsuspected new technologies, substitute products and new competitors. In the terms of complexity theory this is where the ''butterfly effect'' may most often be found—where small and apparently insignificant events lead to momentous impacts. Firms like Miramax or Starbucks that have mastered 'Competing on the Edge' (Eisenhardt and Brown, 1998) or managing through dilemmas (Hampden-Turner, 1990) may be best equipped to cut through a veil of ignorance or tunnel vision, and apply creative management approaches.

All these forms of knowledge could be considered part of a portfolio, and just as with a business portfolio, firms should consider managing and exploiting each knowledge type in different ways. Knowledge which at first falls into type 4 ''what we don't know we don't know'' may be transformed into type 3 ''what we know we don't know'' and then into type 1 ''what we know we know''. The organizational context appropriate to dealing with type 4 knowledge may involve tension and types of culture and controls inappropriate for type 1 knowledge management.

These examples of introducing a knowledge dimension into typical strategy tools indicate the possibilities for imaginative managers and planners. Other techniques which clearly could benefit from a knowledge dimension are the value chain, scenario planning and options analysis.

A Knowledge Framework for Competitive Advantage

Building a knowledge dimension into the use of strategy tools is a first step towards developing and implementing a knowledge-based strategy. The critical question is how to create unique knowledge-driven sources of competitive advantage that provide superior value to customers and which are hard for competitors to copy and duplicate.

A fundamental paradox of attempting to create knowledge-driven sources of advantage is that we want to make knowledge transfer fluid and effective within the organization but we also want to prevent loss of such knowledge to the competition. Since we are in an environment when organizational boundaries are becoming ever more permeable through employee attrition, rapid information flow, networks and benchmarking—how can such advantages be sustainable?

One answer which has been suggested is to create deep pools of knowledge throughout the organization and a rapid rate of filling those pools with new knowledge. Even as diminution of advantage occurs through imitation or skill loss, the organization is able to maintain a higher level in the pool than the competition,

and hence a dynamic competitive advantage. This notion may be built upon a number of assumptions which do not apply to all firms, i.e., that there is an almost unlimited appetite for new knowledge-intensive products in the firm's industry and that markets are growing not shrinking. These conditions do not presently prevail for many utilities or the oil industry, and may only be true for industries such as communications, media or software. Even in the high-tech industries there is some evidence that consumers are becoming tired of constant time-consuming software and hardware upgrades.

Other resolutions of the knowledge paradox are to focus upon those areas which resource-based strategy theory suggests are sustainable sources of advantage, i.e., culture, brands, management of people, relationships, strategic assets (e.g. patents, licenses) and integration of numerous complex skills (Kay, 1993; Barney, 1996).

Speakers at the Strategic Planning Society conference addressed these topics. For example, cultural change was an intense preoccupation of IBM and BP. It is notable that both companies now are delivering improved results. An issue raised on several occasions at the conference was how to evaluate and reward people in line with a knowledge strategy. Individual barriers to knowledge-sharing need to be overcome. In the future, we are likely to see ever more imaginative schemes for acknowledging and rewarding knowledge creation, sharing and use by employees. Several consulting firms reported using knowledge as a basis for staff evaluation. American Management Systems (AMS) requires staff to contribute knowledge as a condition of membership in important internal networks. AMS also awards prizes for the most frequently reused knowledge assets.

DERA (Defence Evaluation and Research Agency) provided an example of a U.K. organization which has used a knowledge management approach to articulate and exploit its relationships, strategic assets and ''brand'' to commercialize and sell its expertise in defense, electronics, materials, human, biological and chemical sciences.

The popularity of creating knowledge networks and communities of practice alluded to earlier can be explained as a search for competitive advantage, not just through communication, but also through cultural change, motivation of people and development of unique and complex relationships. One consulting firm envisioned a situation in which employees might stay loyal because they would not wish to leave the internal communities and networks to which they had become bonded.

Resource-based concepts suggest that technology per se cannot provide competitive advantage if it can be easily bought or copied. This may explain why many conference speakers emphasized that tech-nology is less important than the people factor. It was also notable that some of the greater successes with technology appeared to be in situations where geographical distance was a major barrier to communications (e.g. BP) or the organization itself was strongly mission-driven (World Bank).

Recommendations for Knowledge Managers

The tree of knowledge management has indeed grown from many roots. It seems likely to mature and rapidly become a forest of new products, services, technologies and systems in coming years.

The key areas of success to date reported by speakers at the Strategic Planning Society conference are cultural change, communication, problem-solving, cost reduction and business turnaround. In the future knowledge management may also be instrumental in creating or supporting completely new and creative business models, especially in combination with electronic commerce and the World-Wide Web. There are already examples of ''mass customization'' being applied to services such as credit cards, business-to-business marketing and travel.

Many of the old rules of competitive advantage are breaking down as clever and aggressive new firms find ways of circumventing or tunneling through barriers to entry or of rapidly creating entirely new brands such as Amazon.com, Excite and Yahoo. The insights provided by the resource-based school of strategy and knowledge management, as discussed in this article, are helpful in these circumstances.

There are clearly many issues of concern for strategists and knowledge managers. The new knowledge manager should be very careful to gauge corporate commitment and the culture. A distillation of recommendations made by numerous conference speakers is the following:

1. Preparation is everything! Combine thoughtful analysis with careful consideration of practical issues.
2. Avoid philosophizing and academic abstractions.
3. Avoid developing an integrated knowledge architecture at first attempt.
4. Look for better ways of doing things the organization is already doing.
5. Build knowledge networks and communities of practice around important problem areas.
6. Integrate knowledge management with the firm's strategy.
7. Seek the full support of top management and the board.
8. Align evaluation and incentive systems with knowledge sharing.

9. Know your firm's dominant political culture and adapt your approach accordingly.

10. Apply knowledge to knowledge management: benchmark and learn from the best practitioners.

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