

# Competing on Knowledge

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## Introduction

Most executives and managers today embrace the notion of knowledge as a strategic asset. They are implementing a variety of knowledge management programs to explicitly and proactively harness and exploit the intellectual resources of their organizations. However, despite the potential strategic advantage from developing and applying knowledge, most knowledge management projects today are not explicitly aligned with competitive strategy. Several recent knowledge management surveys and research projects confirm the findings of my own research and consulting experiences with over 25 companies. In not one case was business strategy or firm value the primary motivator of the project or measure of its success. Despite their nod to strategy, organizations most frequently conceive of knowledge management as an operational issue addressed by information technology. Online repositories represent the primary approach to managing and sharing what is often called explicit or codified knowledge; an online repository of best practices created by most consulting firms is a good example.

Organizations are beginning to recognize that explicit knowledge is merely the tip of the intellectual iceberg. The vast majority of knowledge in organizations is tacit, hard-to-articulate, and held in peoples' heads. It is created and shared via direct person-to-person interaction, story-telling, and shared experience. While explicit knowledge is more easily managed and shared, tacit knowledge potentially has more strategic value, being derived from particular circumstances and events and thus unique and hard to imitate. Many firms are following the framework developed by Professor Ikujiro Nonaka within which tacit knowledge is made explicit so that it may be shared with others in the organization who then internalize it as tacit knowledge by reusing it in a new context. This interplay between tacit and explicit knowledge provides a balance between knowledge creation and application on the one hand, and knowledge sharing and reuse on the other. This distinction has

led organizations to supplement their information technology with new organizational forms and cultures that promote interaction and collaboration. By aligning and integrating technological and organizational capabilities, these firms become well positioned to create, share and apply both explicit and tacit knowledge. However, being able to manage knowledge well, does not guarantee that the firm is managing the right knowledge.

Shahar Harel of the Goddard Space Flight Center popularized the story of how during the 1960s, NASA decided it needed a ball point pen to write in the zero gravity environment of its space capsules. After considerable research and development, the Astronaut Pen was developed at a cost of about \$1 million. The pen worked well in space and enjoyed modest success as a novelty item back on earth.

The Soviet Union, faced with the same problem, *used a pencil*.

The moral of the story is that effectively applying knowledge to create novel solutions, by itself is not sufficient. Creating and applying knowledge may merely add time and cost unless it produces something of distinct value to the marketplace or to the organization. To quote Dr. Arthur De Tore, Director of Strategic Planning and Knowledge Management at Lincoln National Re, one of the world's largest life and health reinsurance companies, "If all we do is hire a bunch of people to produce expertise, we just drive up our costs." In this spirit, I define knowledge management as *purposefully and systematically enhancing and exploiting the intellectual resources available to an organization, to increase the firm's value*. To understand how the firm builds long-term value, the place to look is its competitive strategy. If knowledge management programs are to build lasting value, they must directly support the competitive strategy of the organization.

Consider, for example, the commercial division of a leading photographic imaging firm I worked with. This firm had been managing the exchange of tacit knowledge among its sales, marketing and technical support people quite well. It had a department dedicated to bringing people in the division together for formal training and informal interaction. It was in the process of implementing a computer-based system for capturing customer, competitor, and product application knowledge gained in the field and sharing it with those in other departments. Salespeople across the country now could share knowledge including discoveries of new markets for existing photographic products and tips on how to sell film and cameras to particular customer segments. Field observations about customer requirements and preferences, competitors' products and pricing strategies, and other market trends could be shared easily with marketing and product development personnel. These online exchanges provided continuity between face-to-face gatherings and fodder for discussion at the next gathering.

This knowledge management project was judged a success. However, the company's primary strategic threat was a shift in technology from film to digital imaging. This new technology was poised to change not only the firm's products, but also the way they were developed, manufactured, marketed, sold, distributed, and used. The entire economic basis of the business was in flux. The problem with this "successful" knowledge management program was that it was focused entirely on exploiting what the organization knew about its

traditional products: physical film, cameras and related equipment. The firm knew very little about digital imaging computer hardware and software, and was not managing this strategic knowledge gap. In this situation, managing knowledge about film and cameras could be likened to rearranging deck chairs on the Titanic. The firm, having become aware of this misalignment by performing a knowledge strategy audit, began to aggressively shift its knowledge management focus towards building its know-how in the digital-imaging field.

I have found it quite common for firms to implement knowledge management programs that are entirely divorced from the strategic planning process. For knowledge to be managed as a strategic asset, however, it is essential that knowledge management be aligned with the strategy of the organization. And this requires a framework for linking knowledge and strategy.

### **The Strategic Role of Knowledge**

Companies compete by having unique resources that competitors find hard to understand and imitate or create substitutes for. These strategic resources support an organization's capability to create superior products and services for particular markets. Companies traditionally have relied on land, labor and capital as their key resources. Those that somehow become endowed with unique and valuable physical, organizational and financial assets are better able to compete. A gas station with a corner location, for example, enjoys a unique physical resource. A particular organization culture, structure, or set of uniquely efficient employees provides strategic organizational resources. Access to financial resources provides the ability to invest in more plant and equipment for scale economies or improved quality.

While these traditional resources might offer some competitive advantage, unique resources are not easy to come by. Not every firm has a corner location or a deed to a mine. Most firms in an industry tend to have access to roughly the same raw materials, financial capital and labor pools. What truly provides a unique and sustainable competitive advantage, however, is knowledge - the firm's *intellectual* resources. The knowledge of how to combine traditional resources in new and better ways can provide a competitive advantage even if those resources are not unique. In the pharmaceuticals industry, for example, developing a new drug is not a matter of having exclusive access to chemicals, but rather to the knowledge of how to efficiently narrow the infinite combinations of chemicals to a very small set that act in a useful and potentially valuable way. We can think of this as internal organizational knowledge. On the other hand, what the market knows about the firm as reflected by its reputation and brand awareness provides another source of strategic knowledge, albeit one that is less directly or easily managed because it is held by those outside the firm.

Knowledge offers potentially one of the most sustainable advantages. Knowledge - especially the tacit, context-specific knowledge embedded in complex business activities and processes and developed from experience - is unique and very difficult to imitate. And because it can't be purchased in the market in a ready-made form, competitors must develop it through similar experiences over time. And investing funds cannot

accelerate learning. Therefore the company that knows more than its competitors has an opportunity to stay in the lead as long as it continues to learn more about those things that support its competitive position. Successful companies I have worked with seek opportunities to engage in experiences that will provide them unique learning in strategically important areas. Consider, for example, a leasing company that took on difficult, novel leases in new markets at a potential financial loss to learn more than competitors about serving those markets, and to do so first. Lincoln National Re takes on difficult reinsurance cases at favorable rates to amass an experience base in particular strategically attractive risk markets. A major construction company has done likewise with difficult and novel construction projects.

This approach reflects the latest in a trend of how companies view their experiences in the marketplace and their move from focusing on data to information and now to knowledge. When markets were large relative to the number of firms and demand was growing, firms merely had to produce more of the same old goods with the comfort of knowing that they would be purchased. They didn't need immediate or complex information about their markets, therefore their focus was on internal operations. The key was to efficiently produce the goods and to process the data necessary to complete and record transactions and maintain financial records. Using systems terminology, this was an open system - a process that converted inputs (raw materials) to outputs (finished goods) but with little or no actionable feedback from the marketplace about how well it was performing or meeting its goals. This is a bit like a heating system without a thermostat. The boiler keeps burning fuel to make heat without any means to measure the temperature and regulate the process.

As competition increased, demand could no longer be taken for granted. Many firms moved beyond the traditional "make and sell" mindset to one of "measure and respond". Rather than the producer pushing goods through the supply chain, the goods would be "pulled" into the market based on demand. The key was to be flexible and agile enough to respond quickly to the market. This required timely information to analyze customers' purchasing patterns and behaviors and to identify market segments and niches. We experience this every day at the check-out counter of our local supermarket where our purchases are scanned, the data stored with that of other customers and exhaustively analyzed to produce information about what those consumers buy and how customers and products cluster. This represents a closed system - one where actionable feedback is received to assess how well the system has met its goals - in this case satisfying customer demand - and to regulate what it produces. Information systems, in this sense, act as an organizational "thermostat."

The leading firms of today, however, are beginning to recognize that acting in response to the marketplace, regardless of how fast it's done, is still like driving a car while looking in the rear-view mirror. These firms are adopting a mindset I call "experiment and innovate". They proactively seek to increase what they know *in advance of the market* by treating their offerings as experiments, by collaborating with customers and vendors to learn together about new opportunities, and by attempting to define or create their markets rather than respond to them. The key strategic resource is *knowledge*. This approach goes beyond systems thinking. Goals are replaced by hypotheses, plans by conjectures, probabilities by possibilities. The assumption is that

the organization does *not* know how to produce desired results. The key is to try something and interpret the outcome to increase the organization's understanding of the situation. By systematically performing repeated experiments, an organization can continually build new and valuable knowledge.

Being a "first mover" from a knowledge perspective confers additional means to sustain the advantage. Knowledge provides what economists call increasing returns. Rather than diminishing in value with use as do traditional resources, knowledge increases. For example, the more a firm knows, the more it can learn, even if its experiences are the same as its competitors. A company with richer knowledge than a competitor can interpret an experience with more complexity, refinement and sophistication, wringing more out of it and ending up still knowing more. An organization also may know something that competitors do not and which uniquely complements new learning, resulting in a unique knowledge synergy. For example a document management software company that I worked with had unique knowledge about how to codify the context of a set of documents so that a search engine they developed could "understand" the meaning of the document content, improving the results of a search query. They were competing with another firm to develop a document search capability for the biomedical research field. Each company was gaining similar knowledge about what was contained in the biomedical research documents and how they were typically searched for and used. The advantage came from the way the firm's software knowledge uniquely complemented the biomedical research knowledge.

Knowledge, then, provides a unique opportunity to create a sustainable or renewable advantage. By identifying strategically valuable areas where your organization's knowledge leads the competition, and by investing time, effort and resources to continually built that knowledge and to seek complementary knowledge, your organization will be able to maintain its knowledge superiority.

On the other hand, creating knowledge can be a long-term activity. Once embedded in a particular knowledge position, an organization can find it quite difficult to change rapidly in the face of major environmental discontinuities (e.g., the shift from film to digital imaging). This requires a knowledge scanning function. For example, Lincoln Re monitors medical research to gain long-lead time indicators of changes in the medical landscape that may affect the products and services it offers. They continually experiment with new risk management programs in collaboration with their customers to create "options" on various future scenarios.

To begin to implement a knowledge strategy, executives need a framework for identifying and mapping strategic areas of knowledge, one that is grounded in business strategy

### **Knowledge and Strategy**

Talk to anyone who has studied or formulated business strategy and chances are they will be familiar with SWOT analysis. SWOT - strengths, weaknesses, opportunities and threats - is a framework developed in the 1960s by Professor Ken Andrews of the Harvard Business School, and has formed the basis for the study and

practice of business strategy ever since. Organizations are advised to assess the opportunities and threats of their chosen competitive arena relative to their internal capabilities - their strengths and weaknesses. The prescription is to take strategic actions that capitalize on opportunities and mitigate threats while preserving or sustaining strengths and reducing or offsetting weaknesses. Strategy is the act of balancing over time the firm's capabilities (strengths and weaknesses) with the demands of its competitive environment (opportunities and threats). This may involve either choosing environments that play to one's strengths or developing the capabilities to take on attractive competitive positions.

Every competitive position implies some things a firm must be able to do to compete, which in turn implies some things it must know and know how to do. What a firm does know constrains what it can do. The gap between what it must do and can do represents a strategic positioning gap - the stuff of traditional SWOT analyses. The gap between what a firm must know to support a competitive position and what it does know represents a *strategic knowledge gap*. It is this gap that knowledge management must address to add significant and lasting value.

We can adapt the SWOT framework to what I call *knowledge strategy*. Organizations must assess the competitive opportunities to exploit or enhance what they know, while mitigating the threat of attempting to compete with less knowledge than their competitors. They must choose competitive positions that play to what they know and less so to what they do not. This implies the need to create a knowledge map - a description of what the firm knows and how it compares to what it needs to know and what its competitors know.

### **Strategic Knowledge Mapping**

Knowledge mapping has become a standard technique in the knowledge management arsenal. The reasoning is that by knowing where the knowledge resides, it can be more effectively and efficiently shared and exploited. While this argument has merit, there is a more strategically compelling argument for mapping knowledge. Given the firm's strategy, it is crucial to identify and evaluate those pockets of *strategic* knowledge - the knowledge the firm needs to execute its strategy. To identify strategic knowledge strengths and weaknesses, the firm can benchmark what it does know against what it needs to know. This represents an internal knowledge gap. The firm also needs to benchmark its strategic knowledge against what its competitors know, to identify external knowledge opportunities and threats. To sustain its knowledge advantage, the firm should target its knowledge management and learning initiatives towards continually advancing and improving its knowledge. It can also identify opportunities to leverage its superior knowledge across additional product or market positions. To ward off threats, it must target learning opportunities that provide first mover/learner advantages and create learning barriers for the competition, for example by entering into exclusive alliances or joint ventures with key trading partners. To mitigate weaknesses, the firm needs to target initiatives towards closing strategic knowledge gaps, or repositioning itself competitively in such a way as to play more to its knowledge strengths and mitigate its weaknesses.

While there are many popular ways to categorize knowledge, for example tacit vs. explicit, individual vs. collective, general vs. specific, and declarative (know-about) vs. procedural (know-how), none directly address the strategic dimension of knowledge. Each of these characteristics is important for managing the creation and use of knowledge. However, determining which knowledge to manage requires a strategic focus. Through my research, I have developed a useful means to mapping knowledge, which highlights the strategic and competitive aspects. This approach maps the firm's knowledge along two dimensions: the degree to which it supports the firm's strategy, and its quality relative to competing firms. Returning to the three knowledge strategy questions raised earlier, an organization must determine:

1. what it needs to know to execute its strategy,
2. what it does know,
3. what its competitors know.

In responding to each question, knowledge can be classified according to whether it is core, advanced, or innovative. *Core* knowledge represents the basic knowledge required to operate in an industry. It is the ante required just to play the game. Because it is usually common to all members of an industry, it provides no competitive advantage, but does represent a knowledge barrier to those not part of the industry. *Advanced* knowledge differentiates a firm, enabling it to compete and remain viable. Some firms compete head-on in particular knowledge domains, hoping that their knowledge is better than the competitors. For example, Lincoln Re competes by having risk management knowledge superior to other reinsurers offering similar products to the same markets. Other firms seek to differentiate themselves based on what they know. For example, one firm may know more about marketing than another competing in the same product/market space, while the second may know more about high-quality production. *Innovative* knowledge is truly unique and enables a firm to significantly differentiate itself from its competitors. Innovative knowledge often results in changing the industry in fundamental ways. For example, the development of the personal computer, mouse, graphic user interface, and local area network by Xerox PARC (although never commercially exploited successfully by Xerox) changed the entire face of computing while creating entirely new industries. Innovative knowledge is crucial in that it is better to know enough to obsolete your own products and even your industry, than to be put in jeopardy by firm's outside the industry. The move to digital imaging is but one example. The rapid shift to electronic commerce is providing many others.

The answer to each of the three questions can then be plotted on a strategic knowledge map ([Figure 1](#)). Comparing what the firm needs to know to what it does know identifies internal strategic knowledge gaps. The firm identifies the core, advanced and innovative knowledge it needs to execute its strategy, and compares that to what it currently knows, categorized in the same way. This highlights areas of knowledge strength and weakness. Similarly comparing what an organization knows to what its competitors know, using those same categories, identifies external strategic knowledge gaps - areas of knowledge-based opportunity and threat.

## Benchmark Your Learning Capability

Of course, knowledge is not static, and today's innovative knowledge is tomorrow's core knowledge. The key to maintaining knowledge superiority and defending a knowledge position is the ability to continually learn, and to do so better, faster and more effectively than the competition. Organizational learning must take place on two fronts. Firms must identify their areas of intellectual strength and weakness relative to their current strategy and competitive position and focus their efforts on continually improving their strategically important knowledge. Secondly, firms must continually experiment to push the boundaries of what they know, in a sense managing what they do not know. Continual learning in one domain often creates barriers to innovative, "out-of-the-box" thinking. Innovation may require creating research groups, think tanks, skunk works, communities of interest, and other organizational structures that are separated from, but still connected to the main organization.

Therefore, to remain competitive, organizations need to benchmark their learning capability as well as their knowledge. First they must assess the general rate of learning and innovation in the industry. Second, they must assess their own learning capabilities relative to that of competitors. Competing head-on in particular knowledge domains requires a superior learning capability. Knowledge differentiation strategies may provide some relief, however all knowledge strategies require some learning capability or the firm's knowledge position eventually will become vulnerable.

In summary, then, organizations wishing to compete effectively on knowledge must answer the following:

1. What is your organization's competitive strategy - how do you want to "play the game?"
2. Given that strategy, what does your organization need to know to execute it successfully?
3. What does your organization currently know?
4. Comparing what your organization knows to what it needs to know, what is your organization's internal knowledge gap - its knowledge strengths and weaknesses?
5. What do your competitors know?
6. Comparing what your organization knows to what your competitors know, what is your organization's external knowledge gap - its knowledge opportunities and threats?
7. What is the pace of learning and innovation for your industry in general and for particular competitors?
8. How effective are your organization's capabilities for learning and innovating?
9. Comparing your organization's learning and innovation capabilities with those of your competitors and industry, what is your learning gap?
10. To what degree are your current knowledge management and learning initiatives focused on these strategic knowledge and learning gaps?

Based on the results, your organization has two options. It must either align its strategy with its existing knowledge resources and learning capabilities, or initiate knowledge management and learning programs to enhance those resources and capabilities sufficiently to support its strategy. Strategically managing knowledge requires identifying what knowledge matters most to an organization. That can be determined only by understanding what an organization needs to know to compete effectively. And only by making this link can knowledge management efforts provide long-term value to the organization.

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