

Capitalising Knowledge: Corporate Knowledge Management Investments

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Knowledge is increasingly recognized as the key resource of business. Digital networks provide access to vast amounts of data and information but knowledge management tools and systems are required to translate this in a meaningful way. Knowledge management initiatives are unlikely to be successful unless they are integrated with business strategy, and related to the development of the core capabilities of the organisation. Sharing the discovery and synthesis of intellectual activity involves the creation of knowledge communities of practice. There is much evidence of commercially inspired corporate initiatives in this direction across all industrial sectors: leveraging existing intellectual capital; sharing best practice across multiple locations; data mining to build customer relationships; and creating knowledge networks to allow state-of-the-art solutions in professional services.

Introduction

Knowledge is becoming recognised as both the foundation of competitive advantage and the basis of market capitalisation of companies. Knowledge management is called many different things, and every company has its own distinctive approach, but connecting all of these initiatives is a commitment by companies to developing the production and flow of knowledge, the transmission and use of knowledge to create economic value.

The immediate practical reason why knowledge management has risen to the top of the business agenda is not hard to ascertain: IBM estimates the amount of corporate data in the world doubles every 12 to 18 months and only 15% of this is structured. The rest is digitised and stored, and remains unstructured (Knowledge Business 2000). Over three hundred million people now use the Internet, compared to three million in 1994. They can access more than a billion web pages, with an estimated three million new pages added every day (Department of Commerce 2000). As the OECD perceptively comments, "knowledge and information tend to be abundant; what is scarce is the capacity to use them in meaningful ways" (1996:11).

The Emergence of the Knowledge Economy

The emergence of economies based on the production, distribution and use of knowledge and information was charted by the OECD in their report *The Knowledge-Based Economy*:

The knowledge-based economy places great importance on the diffusion and use of information and knowledge as well as its creation. The determinants of success of enterprises, and of national economies as a whole, is ever more reliant upon their effectiveness in gathering and utilising knowledge. Strategic know-how and competence are being developed interactively and shared within sub-groups and networks, where know-who is significant. The economy becomes a hierarchy of networks driven by acceleration in the rate of change and the rate of learning. What is created is a network society, where the opportunity and capability to access and join knowledge and learning intensive relations determines the socio-economic position of individuals and firms (1996:14).

The OECD is concerned with the institutions and processes for

- *knowledge production* – the research and development of new knowledge;
- *knowledge transmission* – education, training and development of people;
- *knowledge transfer* – the diffusion of knowledge and innovation.

Different kinds of knowledge are distinguishable in the knowledge-based economy including know-what, know-why, know-how and know-who. Knowledge is a deeper concept than information, which refers to the most accessible elements of the *know-what* and *know-why* components of knowledge. Some types of knowledge come closest to being market commodities, while other types of knowledge, particularly *know-how* and *know-who* are more tacit and difficult to measure, but often are the most valuable to possess. The OECD describes these as follows:

- *Know-what* – represents an accumulation of facts, and is closest to information, in that it can be broken down into bits.
- *Know-why* – refers to scientific knowledge of the principles and laws of nature, that underlies technological development and product and process advances.
- *Know-how* – suggests the skills of capability to do something, typical of the knowledge developed and kept within a company, and the reason for the formation of industrial networks to enable firms to share and combine elements of know-how.
- *Know-who* – involves information about who knows what, and who knows how to do what, and implies the formation of special social relationships to secure access to experts, which is particularly necessary in response to acceleration in the rate of change (OECD 1996).

The development and sharing of new knowledge is so rapid in the new economy, the OECD suggests innovation has developed from a linear model to a more complex, relationship-based model of innovation. Instead of discovery and innovation proceeding along a fixed and linear sequence of phases, innovation is the result of numerous interactions of many players:

In the knowledge-based economy, firms search for linkages to promote inter-firm interactive learning and for outside partners and networks to provide complementary assets. These relationships help firms to spread the cost and risk associated with innovation among a greater number of organisations, to gain access to new research results, to acquire key technological components of a new product and process, and to share assets in manufacturing,

marketing and distribution. As they develop new products and processes, firms determine which activities they will undertake individually, in collaboration with other firms, in collaboration with universities or research institutions, and with the support of government (OECD 1996:15–16).

Knowledge as a Resource

Knowledge as a resource causes great confusion for economists, as it is the only resource which increases with use rather than diminishing. Knowledge may be expensive to generate but there is little cost to diffusion. Unlike physical goods that are consumed as they are used, providing decreasing returns over time, knowledge provides increasing returns as it is used. The more it is used, the more valuable it becomes, creating a self-reinforcing cycle (Zack 1999). As Joseph Stiglitz, the chief economist of the World Bank (which is rapidly transforming itself into a *knowledge bank*), argues, "The properties of dynamic processes driven by knowledge seem to ultimately derive from the scarcity-defying expansiveness or non-rivalrous aspect of knowledge. Once knowledge is discovered and made public, there is essentially zero-marginal cost to adding more users" (1999:8). But this is knowledge in the abstract. "It is the process of embodying knowledge in people (learning) and things (applications) that is costly in time and resources" (1999:9).

This new economy has produced a growing knowledge intensity of goods and services, referred to as the *weightless economy*, in the memorable phrase of Alan Greenspan, the Chairman of the US Federal Reserve. Greenspan argues that the icons of the industrial might of the past – steel mills, petrochemical plants, car assembly plants and skyscraper office blocks, are being replaced with "economic value best symbolised by exceedingly complex, miniaturised, integrated circuits and the ideas – the software – that utilise them. Most of what we currently perceive as value and wealth is intellectual and impalpable." (<http://kmmagn2/km199912/featal.htm>)

The view that knowledge embodied in new products and services has become the primary source of wealth creation and the source of sustainable competitive advantage is driven by a number of inter-related, apparently irresistible impulses of the new economy:

- Geographical dispersion associated with the globalisation of open goods, capital and technology markets.

- New information technology that speeds information and knowledge flows.
- New distributed organisational structures including the growth of networked organisations.
- The growing knowledge intensity of goods and services.

Most convincing of all these, in terms of its direct impact, is the growing knowledge-intensity of goods and services. In particular, the role of software in adding features and functions to products and services – as well as reducing the costs associated with producing these products and services – is rapidly expanding in industry after industry (Cole 1999).

The Digital Economy

The information and communications technology revolution and knowledge revolution fuel each other as it is only in the fusion of:

- i) the electronic network infrastructure of the Internet and other digital systems and services

and

- ii) the rapidly developing knowledge tools and systems in the knowledge-driven economy

that the full implications of electronic business and knowledge management to transform our lives can be fully realised. It is out of the critical combination of the technological infrastructure *and* the consequent knowledge revolution that e-business is emerging. It is the twin forces of electronic digital speed and the suddenly explosively enhanced capacity to utilise and leverage knowledge that provide the excitement and the potential of e-business. Though he dismissed the inflated anticipated returns on investment in e-business as "irrational exuberance," Alan Greenspan acknowledged a new economy is emerging of knowledge-based businesses competing in an electronic digital knowledge-driven economy.

As a Department of Commerce report on the *Digital Economy 2000* demonstrates, the strength of the US economy during the sustained growth of the 1990s was built on a new digital infrastructure: the synergistic convergence of dramatic increases in computer power, an explosion in connectivity, and increasingly powerful new software. These advances in technology have produced sharp declines in the prices of computer processing, data storage and retrieval, and communications, that are in turn driving both the surge

in Internet activity and the increases in business investment in IT hardware and software:

The advances in computer power overwhelm imagination. Since the 1960s, the number of transistors per microprocessor chip has been doubling roughly every 18 to 24 months, resulting in a massive increase in processing capability and sharply declining costs. Technologies associated with computer use, such as data storage technologies, have also shown dramatic improvements in performance and even more dramatic cost reductions. The capacity of today's hard-disk drives is doubling every nine months and the average price per megabyte for hard-disk drives has declined from \$11.54 in 1988 to an estimated \$.02 in 1999. As a consequence of technological advances in microprocessors, storage, and other components, already steep annual declines in computer costs from 1987 to 1994 accelerated sharply beginning in 1995. Similar improvements have occurred in communications technologies. In recent years, for example, wavelength division multiplexing, digital subscriber lines, and cable modems have produced exponential increases in the speed of data communication and the carrying capacity of the communications infrastructure. The carrying capacity of fiber is currently doubling every 12 months (Department of Commerce 2000).

The doubling of the processing power of computers every 18 months, known as "Moore's Law" after Gordon Moore the co-founder of Intel in 1965, is the equivalent of computing power increasing by a factor of 100 every 10 years. But it is when this is combined with the networking impact of the Internet that the potential to transform business is realised. As networks expand towards infinity they become more useful and cost effective. Web sites, databases and on-line services reach the critical mass required to capture markets as the cost to service these networks decreases to zero. This is sometimes known as "Metcalf's Law": the cost of a network expands linearly with increases in network size, but the value of a network increases exponentially.

Electronic connectivity provides a new imperative to manage knowledge better:

The new economy is being shaped by developments not only in computer hardware and software, but also in electronic connectivity. Larger businesses have been increasing efficiencies through standardiz-

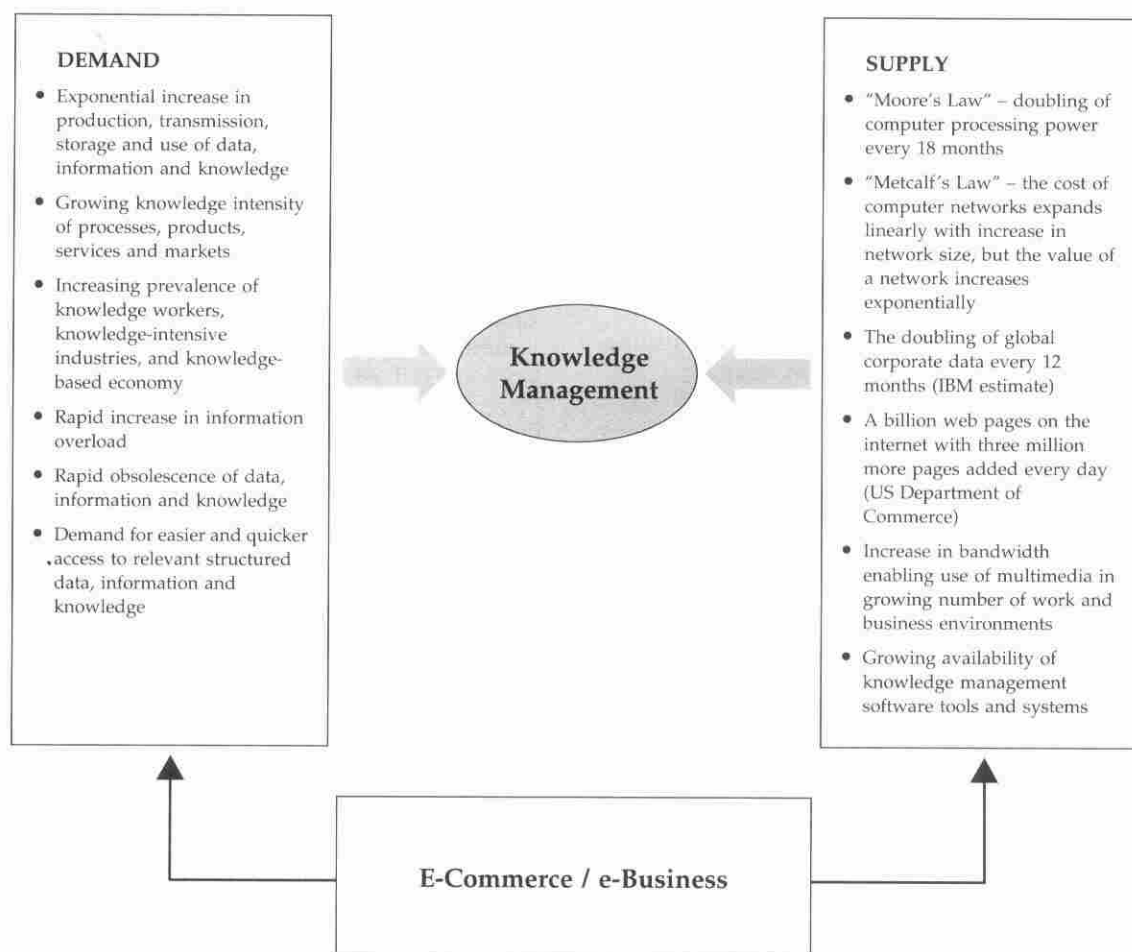


Figure 1. What is driving knowledge management

ing and automating routine transactions electronically for some time. Until recently, however, most small and medium-sized businesses found that the costs of necessary hardware, software, and communications service for these systems exceeded the benefits. The advent of the Internet as an instrument of commerce fundamentally altered this equation by cutting the costs of software and communications services needed to conduct electronic transactions. Beginning in the mid-1990s, as a result of the convergence toward digital formats and the development of *de facto* standards for digital networks, such as the Internet's technical specifications, the expansion and commercialization of the Internet made connecting computers and communications devices easier and cheaper. Commercial opportunities on the Internet and the falling costs of computer and communications hardware created an extraordinarily fertile environment for innovations that are

creating new value and new efficiencies for businesses of all sizes. The Internet is both an effect and a cause of the new economy. It is, in part, a product of the powerful technological and economic changes that are shaping a new epoch of economic experience. However, the Internet and related networking technologies are also increasingly the new economy's medium. Networks, like telephone networks or the Internet, are subject to a phenomenon called "network effects" or "network externalities". Establishing a network involves large, up-front fixed costs (e.g., for purchasing equipment, laying new cable, or developing new software), but adding an additional user to an existing network costs very little. Conversely, the value of a network to participants is low when the number of participants on the network is low, but rises rapidly as network participation expands (Department of Commerce 2000).

It is this new technological platform that knowledge management systems and tools are intended to exploit. The technology provides the means to access, process and distribute vaster amounts of data and information than ever before imagined, but this remains an almost meaningless activity without processes of knowledge management to translate data and information into relevant knowledge which can be productively utilised. Knowledge management provides the means to generate, distribute, and use knowledge in ways that add value to business activity and provide new opportunities for enterprise. However, it is unlikely any of these benefits will be realised without an appropriate knowledge strategy.

Knowledge Management Strategies

Increasingly knowledge is being recognised as the most strategically important resource and learning the most strategically important capability for business. As Michael Zack argues, "Business organisations are coming to the view knowledge is their most valuable strategic resource, and bringing that knowledge to bear on problems and opportunities is their most important capability. They are realising to remain competitive they must explicitly manage their intellectual resources and capabilities... Intuitively, it makes sense that the firm that knows more about its customers, products, technologies and markets, and their linkages should perform better. However, the link between knowledge man-

agement and business strategy, while often talked about, has been widely ignored in practice".

As Figure 2 suggests, knowledge management initiatives are unlikely to be successful unless they are closely integrated with business strategy. Knowledge-based resources and capabilities need to be utilised to develop superior products and services. "Identifying which knowledge-based resources and capabilities are valuable, unique and inimitable and how these resources and capabilities support the firm's product and market positions are essential elements of knowledge strategy" (Zack 1999:3).

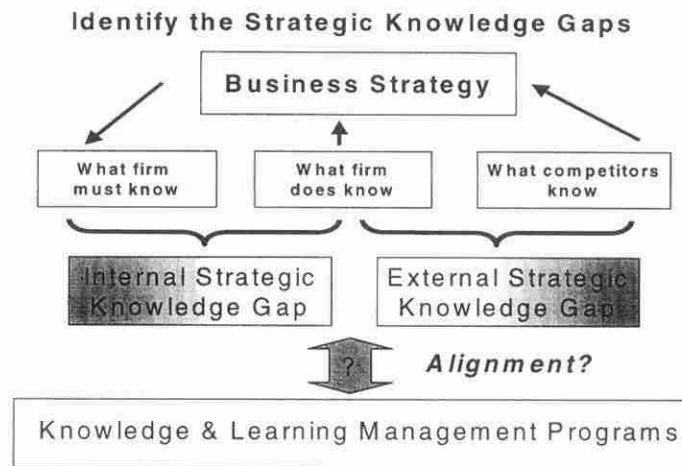
To clarify and develop the link between strategy and knowledge Zack proposes an organisation must, on the basis of its existing accumulated knowledge, articulate its strategic intent, then identify the knowledge required to execute its intended strategy, and compare that with its actual knowledge, revealing strategic knowledge gaps (Figure 3). These include internal knowledge gaps – what the company needs to know to successfully commence its strategy – and external knowledge gaps – what competitors know that will be necessary to compete successfully.

With regard to required knowledge, every strategic position requires a firm to know certain things to execute the strategy effectively, and the more unique and valuable the knowledge possessed or acquired, the greater the potential strategic advantage. However, in dynamic market environments highly developed learning is necessary in order to keep knowledge current; an organisation's learning



Source: Michael H. Zack, *Knowledge Strategy - Delivering a Methodology*, Institute for Knowledge Management, Williamsburg, Virginia, 2nd November 1999.

Figure 2: Knowledge Strategy



Source: Michael H. Zack, *Knowledge Strategy - Delivering a Methodology*, Institute for Knowledge Management, Williamsburg, Virginia, 2 November 1999.

Figure 3: Strategic Knowledge Gaps

capability must keep pace with the changes in the competitive environment. Zack emphasises the following characteristics of strategic knowledge:

- *Unique* – the more rare a set of knowledge resources, the more potential competitive advantage they may offer.
- *Exploitable* – knowledge that can be applied to current or potential products or services for the firm's current or potential markets.
- *Valuable* – knowledge that can be exploited in a way that the marketplace values, and the value can be realised by the firm.
- *Defensible* – knowledge that cannot be easily imitated or substituted.
- *Dynamism* – knowledge that may be updated and transformed as required by changes in the environment.
- *Learning capabilities* – the intensity of learning required to maintain strategic knowledge (Zack, Smith, & Slusher 1999).

Knowledge and Capability

In fast moving, innovative environments that increasingly typify a growing number of market sectors, the capacity to generate new knowledge, to integrate and transfer knowledge, to experiment with prototypes, and to import knowledge becomes a core capability of the company (Figure 4). Dorothy Leonard of Harvard Business School defines core capability as a multi-dimensional interactive system of knowledge assets, which encompasses both process and content, has built up over time, is not readily imitated or transferred and is based on shared values. Core

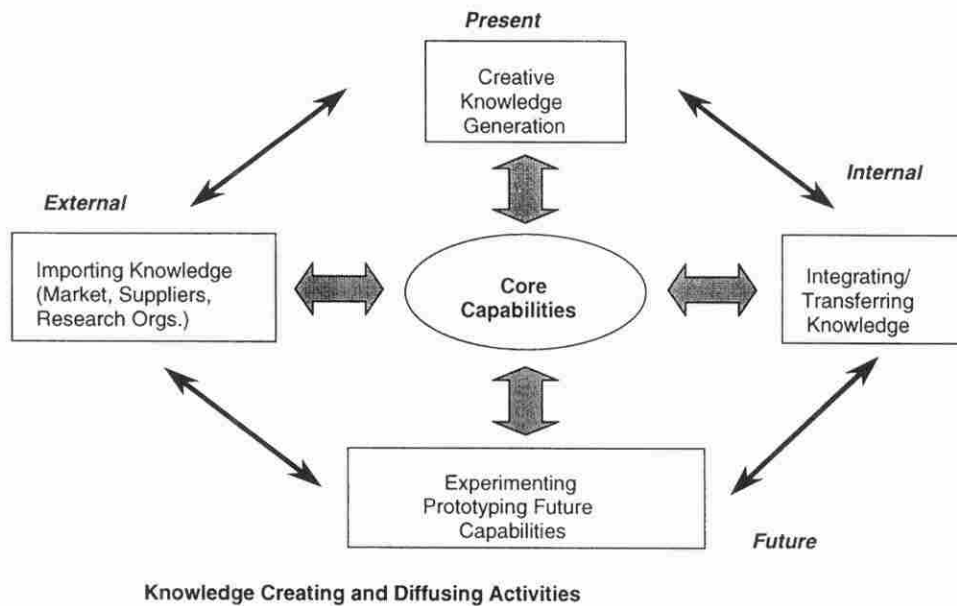
capability will provide competitive advantage by supporting the performance and innovation of multiple product lines or processes (1999).

The strategic business drivers of knowledge management therefore concern how to protect and develop the intellectual capital of the company, how to improve performance, sustain intelligence, enhance learning, and promote continual innovation. Knowledge management is driven by the need to enhance:

- Intellectual asset management
- Operational efficiency
- Knowledge worker productivity
- Customer and competitor intelligence
- Continuous improvement
- Organisational learning
- Innovation in products and services
- Time to market

Knowledge strategy must be related to the core competency of the business. For example:

- industries based on innovation will use knowledge management to accelerate the process of research and development, and to manage intellectual property.
- companies offering professional services use knowledge management to enhance their expertise.
- industries founded on the creation of intangibles such as entertainment or publishing will employ knowledge management to develop creative skills and networks, and to protect intellectual capital.
- industries relying on relationships such as retail use knowledge management to enhance customer service and offer greater product and service depth and quality.



Source: Dorothy A. Leonard, *Innovation and Knowledge Management*,
Institute for Knowledge Management, Williamsburg, Virginia, 2 November 1999

Figure 4: Knowledge Creating and Diffusing Activities

- companies dependent upon the value of brands such as fashion will improve their market intelligence with knowledge management.
- companies requiring good coordination of complex activities such as manufacturing will utilise knowledge management to increase control. For every kind of business there are different strategic knowledge management solutions (CIO Communications 2000). Different knowledge management tools might be applied in different types of industry with different kinds of competencies. However most of these knowledge management tools have generic applications which can be useful to any kind of industry or profession. The preference of which tools to adopt, or whether any of these more technical knowledge management tools is necessary to improve knowledge flows depends on how organisations approach knowledge management.

Ultimately knowledge management, even as a strategic activity, consists of the systematic management of the intellectual capabilities of people within enabling business, organisational and technical infrastructures. The most effective way to promote these capabilities is by understanding how to discover, organise, share and synthesise intellectual activity. "Ideas are precious, but they are also fleeting, dispersed and difficult to capture and act on.

The capability to support human creativity and the cycle of innovation – embodied in appropriately integrated processes and technologies – is the primary focus of knowledge management. A primary theme in the literature of knowledge management is of communities, including communities of practice, communities of interest, communities of purpose. Community – shared understanding and access to the work and minds of others – is the principal element in an innovation strategy" (Compaq 1999:6).

The Value of Brains

The readiness of major corporations to focus on developing intellectual capital and to take knowledge management seriously has been greatly encouraged by the remarkable increase in the market valuation of intangible assets. Margaret Blair of the Brookings Institute calculated the relationship between tangible assets (property, plant and equipment) and the total market value for every US manufacturing and mining company in the Compustat database. In 1982 physical assets accounted for 62.3 per cent of companies' market value. Ten years later they made up only 37.8 per cent, and these were industrial companies – the physical assets of high-technology and service companies would be much lower (1995).

Comparing the recent history of the market valuation of Microsoft and of General Motors in the United States provides a dramatic illustration of the overwhelming significance that equity markets now attribute to intangible assets.

Long recognised as one of the greatest manufacturing companies of the world, during this period General Motors had a turnover approximately 15 times greater than Microsoft (for example, GM had a turnover of \$160bn in 1997 compared to Microsoft's turnover of \$11bn), yet the market capitalisation of GM was around 12 per cent of Microsoft's market capitalisation by 1999. At the time Microsoft had net fixed assets of a small fraction of its market capitalisation. "The difference between the vast market capitalisation of Microsoft Corporation and its small fixed asset base lies in the stock market assessment of the creativity, market position, and consequent revenue flow of the company" (Clarke & Clegg 2000).

Increasing efforts are being made to account for the value of intellectual assets. Among companies actively attempting to more accurately measure the development of intellectual assets, Skandia, a major international insurance firm based in Sweden, has pioneered promotion, measurement and reporting of intellectual capital. The company

prepared intellectual capital accounts for internal use in 1994, and from 1998 published an Intellectual Capital annual report. Karl Erik Sveiby and Leif Edvinsson were successive Directors of Intellectual Capital at Skandia and both advanced new approaches to focusing upon the value of intellectual assets. Sveiby categorised intellectual assets as people's competence, the internal structure and the external structure (Sveiby 1996).

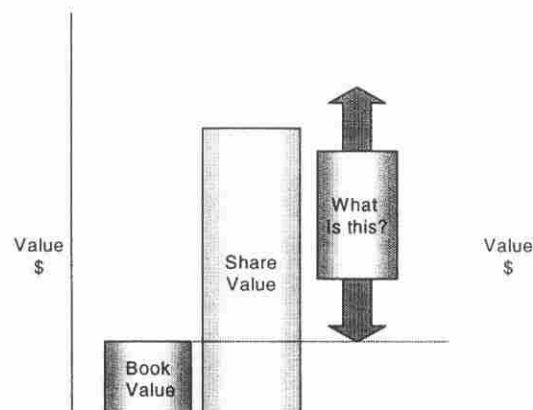
Edvinsson developed a further categorisation into human capital (personal values, competencies, skills, potential, relationships, attitudes), and structural capital which consists of customer capital (customer base, relationships, potential) and organisational capital (processes, corporate culture, innovation assets) (Strategic Policy Branch 1999). These categories and measures of intellectual capital begin to explain the mystery of the market valuation of Microsoft Corporation, what the huge valuation above the book price of the company represents in reality (Figure 5).

Organisational Knowledge

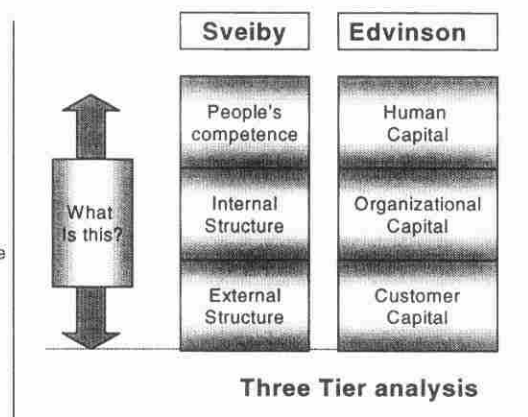
Knowledge produced and carried by individuals only reaches its full potential to create economic value when it is embodied in organisational routines, that is when it has

The Market Valuation of Microsoft

The gap between book value and share value



The Scandinavian approach



Source: Stephen Denning, *The Knowledge Balance Sheet*, Institute for Knowledge Management, Williamsburg, Virginia, 2 November 1999

Figure 5 The Market Valuation of Knowledge

been converted into organisational knowledge. This conversion is neither automatic nor easy. Companies have a tendency to invest in information technology rather than in developing social relationships, and not many have attempted the cultural and organisational transformation needed to promote knowledge transmission and circulation. As Cole convincingly argues:

The gap between data warehousing and knowledge creation can be large indeed. It is one thing to slice and dice information from an integrated customer base to segment markets and conduct more focused sales campaigns. It is quite another to use that information to reorganise work routines in ways that embed knowledge in new products and services that lead to sustained competitive advantage. While informal mechanisms for the effective conversion of information into knowledge may limit wide dissemination, formal procedures packaged in powerful information technologies often inhibit learning. A redoubling of efforts to leverage explicit knowledge through new information technologies is bound to disappoint (1999:19).

Problems with an information technology approach to knowledge management include:

- Information and knowledge are only loosely coupled, and decontextualised information is often of little use.
- Technical approaches often concentrate on "low hanging fruit", for example efforts to rationalise patents portfolios and licencing contracts, rather than transforming the generation and transmission of new knowledge.
- While knowledge is carried in the heads of individuals it needs to be embedded in organisational routines to fully maximise its utility. Information technology is an effective means of moving information around from one head to another; organisational change is required to embed knowledge in routines.

Information technology is part of the essential infrastructure of the knowledge revolution, but it is a necessary not sufficient condition: "Ironically, while the knowledge revolution is inspired by the new information systems, it takes human systems to realise it. This is not because people are reluctant to use information technology. It is because knowledge involves thinking with information. If all we do is increase the circulation of information, we have only addressed one of the components of knowledge. To leverage knowledge we need to enhance both thinking and information. The most natural way to do

this is to build knowledge communities that cross teams, disciplines, time, space, and business units" (McDermott 1999:116). Four key challenges are involved in building such communities in business:

- *Technical*

The technical challenge is to design human and information systems that not only make information available, but also help community members to think together.

- *Social*

The social challenge is to develop communities that share knowledge and still maintain enough diversity of thought to encourage thinking rather than sophisticated copying.

- *Management*

The management challenge is to create an environment that values sharing knowledge.

- *Personal*

The personal challenge is to be open to the ideas of others, willing to share ideas, and to maintain a thirst for new knowledge (McDermott 1999:116).

Knowledge Stocks and Flows

When knowledge is equated with information to be delivered by technology, it is conceived of principally as a *stock* rather than a *flow*. It is viewed as a thing or an object that exists on its own and may be captured and transmitted among individuals and stored in multiple databases in an organisation.

The notion of knowledge as a flow suggests a radically different conception of knowledge. It is constant flux and change. It is central to day-to-day doing and being. Individuals create it and it is largely self-generating. Moreover it connects, binds, and involves individuals. In short, it is inseparable from the individuals who develop, transmit, and leverage it. The prevalent view of knowledge as stock is grounded in large measure in the thrust of every educational system from school through university: learn the facts and regurgitate as required in the relevant examination. This orientation is in turn reflected in and reinforced by the pervasive information technology approach to the management of data and information: capture, store, retrieve and transmit. Although organisations obviously need to manage their data and information using these technology-centred models, knowledge is a substantially different thing and thus needs different models. In many

firms, knowledge simply becomes another object to be managed. It is viewed as something separate from the organisational processes that help generate and nurture it (Fahey & Prusak 1998).

This approach influences how efforts to manage knowledge are assessed, and the measurement of the results achieved. An increasing number of organisations seek to measure knowledge directly rather than through its outcomes, activities, and consequences. They emphasise the scope, depth and number of databases and the number of people connected technologically; the number of 'hits' on intranets; and the number of knowledge projects. "Yet... such indicators do not provide any sense of an organisation's stock or flow of knowledge or its contribution to decision-making and organisational performance. This vain pursuit of metrics... misconstrues what knowledge is, it consigns human intervention to a secondary role, it further disconnects knowledge from its uses, and stock is given prominence while flow, because it is so difficult to measure, receives minimal attention" (Fahey & Prusak 1998: 274).

Yet it is the dynamic process of knowledge generation and sharing that will determine the future success of companies.

Knowledge Management Framework

In a survey of international best practice in knowledge management in leading international corporations conducted by Christine Rollo and myself for Standards Australia in support of their publication of a knowledge management framework, we were surprised to discover the range of knowledge management initiatives across industry sectors (Table 1). Knowledge management is called many different things, and every company has its own distinctive approach, but connecting all of these initiatives is a commitment by companies to developing the production and flow of knowledge, the transmission and use of knowledge to create economic value.

From the many corporate approaches to knowledge management it is possible to discern several distinct strategies. Firstly chemical and pharmaceutical companies and

other organisations with significant sunk investment in research and development, seek to leverage the intellectual capital they already possess, by for example utilising existing patents more effectively and speeding up the process of patent application. A second group of companies engaged in manufacturing in highly competitive international markets such as Texas Instruments in consumer electronics, or Ford and General Motors in automobiles, seek to use knowledge management techniques to enhance and speed up the process of best practice sharing across multiple international production sites. (In this mode knowledge management partly represents a further advance of total quality management).

A third group of companies with large client bases such as banks and insurance companies utilise knowledge management to improve data mining and exchange between different functions and managers of the company in order to develop customer relationships and pursue further business opportunities with existing customers. Finally professional service companies such as the large accountancy and management consultancies employ knowledge management to create knowledge networks that allow the ready sharing of knowledge from complex assignments to allow the application of state-of-the-art solutions to particular client problems.

Conclusion

Technology platforms may assist, but no technology will stimulate the flow of knowledge without attention to the cultural and organisational context in which people are encouraged to develop and share their knowledge. Creating knowledge communities presents a challenge to business the results of which will determine corporate success in the new economy. Conceived and implemented more carefully in alignment with organisational objectives and core competencies, knowledge management retains the promise to become one of the most significant management movements of the present century, enabling the release of the knowledge resources of enterprises competing in the knowledge economy.

Table 1. Companies Developing Knowledge Management Strategies

Agro-K Corporation	Agricultural Knowledge
Amazon.com	Internet Customer Capital
Arthur Anderson	Knowledge Consultant Group
AT & T	Internet Enabled Knowledge
Bank of Montreal	Business Intelligence
Boeing	Digital Cooperative Work
BP Amoco	Multimedia Collaborative Network
Buckman Laboratories	Customer Knowledge Bases
Canadian Imperial Bank of Commerce	Leveraging Human Capital
Charles Schwab & Co	Knowledge Systems
Chase Manhattan Corporation	Relationship Knowledge Management
Chevron	Industry Best Practice
Cisco Systems	Leveraging Intangible Assets
DaimlerChrysler	Automotive Intelligence
Dow Chemicals	Intellectual Capital
Ernst & Young	Network of Knowledge Centres
FedEx	Internet Intelligent Commerce
Ford Motors	Leveraging Intellectual Capital
General Electric	Boundaryless Learning Culture
General Motors	Knowledge Network
Hewlett-Packard	Learning Communities
Hoffman LaRoche	Knowledge Map
IBM	Intellectual Capital Management
KPMG	Knowledge Web
McKinsey & Co	Client Knowledge Repository
Microsoft	Digital Nervous System
Motorola	Knowledge Leadership
Pfizer	Collaborative Intelligence
PriceWaterhouseCoopers	Empowering Employees With Knowledge
Rolls Royce	Knowledge Engineering
Seimens	Communities of Practice
Shell	Learning Centres
Skandia	Human and Intellectual Capital
Telstra	Information Velocity
Texas Instruments	Best Practice Sharing
United Technologies	Communities of Practice
US Department of Defence	Knowledge Network
Westpac	Knowledge Transfer
World Bank	Knowledge Bank
Xerox	Integrating Knowledge

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