

# **TECHNOLOGY AND HUMAN RESOURCE BASED ENABLERS FOR SUCCESSFUL KNOWLEDGE TRANSFER IN ORGANIZATIONS**

*Mikko Arevuo*  
*Principal, Delta Strategies Ltd*  
*Visiting Lecturer in Strategy and International Marketing,*  
*South Bank University Business School*

## **Abstract**

It has been argued that knowledge management has discrete components: knowledge creation, capture and distribution, but at what point do the two component systems generate the greatest impact to the organization's competitive advantage? To capitalize on intellectual resources, organizations must balance their knowledge management activities across the entire spectrum from knowledge creation to utilization. Much of the focus has been on technological solutions using IT infrastructures. The focus on IT systems has generated skepticism about the validity of knowledge management as a strategic orientation, which is compounded by the limited opportunity for intangible assets to create value or return that can be quantified.

As knowledge management is still in an embryonic stage, this has meant a constrained opportunity to reflect on past practices and analysis of the successes and failures in knowledge management implementation. This report looks to the current literature and thinking on the future direction of knowledge management. Fundamental to this report is the analysis of case history and the changing views within the knowledge management literature of a 'best fit' implementation of knowledge management initiatives.

Organizations either focus on technology or people to manage knowledge. Finding the appropriate balance is dependant of the context in which knowledge management is being implemented and what 'best fit' is appropriate to the organization. There is no right or wrong implementation; the results can be achieved in many ways. The focus of the organization is key: if it is the delivery of a product that can be standardized, then a more technology focused strategy may be appropriate, if the product is more innovative or customized, then a people focused strategy is possible. What neither of these actions can do is run in isolation. This report emphasizes that the two orientations, technological and human, are interdependent. It is the interaction between people, technologies and techniques that enable organizations to manage knowledge to maximum competitive advantage.

## **STAGES OF IT BUSINESS SYSTEMS DEVELOPMENT**

KPMG's Chief Knowledge Officer Michael J. Turillo is quoted as saying "knowledge management cannot be done without technology." (Hildebrand, 1999)

In a survey carried out by PA Consulting of managers, 60% saw knowledge management as being generally led by information technology or management information systems and over 80% have the technology installed. The application of IT systems within a knowledge-oriented organization is primarily focused on storage and sharing of explicit knowledge. Most organizations have a vast amount of knowledge within their existing systems i.e. best practice, know-how, processes, customer data and other marketing information, and so on. Nevertheless, this stored organizational knowledge is not necessarily managed in a structured manner.

Sveiby outlines knowledge management development, driven by the 'IT track theory, through three phases of maturity. This process reads like the three steps in the technological advances of business IT systems, rather than the growth of a new management process.

1. The first phase started in the early 1990's focusing on productivity issues, which was totally inward looking. "How can IT systems prevent us from re-inventing the wheel?" This started the trend for project databases, best practice databases, Lotus Notes and so on, large storage facilities to collect data and store documents, processes or objects.
2. Phase two changed the focus from inward to outward looking, or toward the customer. "How can we leverage information about the customer to serve them better?" Vast storage repositories collected data from various points throughout the organization in the form of data warehousing. This activity was reliant on the passive collection of large amounts of information or data being stored in IT systems with 'intelligent' search and analysis abilities for 'data mining'.
3. The third phase is where Sveiby believes we are now. We have direct interaction between customers, suppliers and the organization through intelligent IT architectures. IT systems supply interactive web pages via Intranet/internet technologies and e-business or on-line transactions both internally and externally.

### **Origins of Knowledge Management IT Tools**

The speed of IT development, something that knowledge management has probably both suffered and benefited from, has been fed by the rapid growth of software and hardware markets. The ability to supply cheap and yet very powerful computers has led to a vast increase in the amount of IT systems being installed within businesses today. The network infrastructures that have been implemented enable organizations to communicate, share, store and learn 'at the desktop'. Many of the systems or networks already installed are not fully utilized by companies and this drives the growth in developers of 'knowledge-enabling software'. These are the developments that have pushed technology into the field of knowledge management probably before the core concepts of knowledge management have been incorporated into everyday business practice and strategic management processes.

Information technology is described by some as only a catalyst and not necessarily fundamental to knowledge management. These technological 'enablers' have probably caused their own degree of skepticism in the field of knowledge management. This skepticism is predominantly being fuelled by the outlay necessary to install systems compared to the perceived or delivered 'value' or 'return on investment'. As PA Consulting's survey revealed,

80% of companies have the necessary IT systems in place but cost is normally incurred by the introduction of new software applications.

The applications that are used to facilitate knowledge management were predominantly created as stand alone or independent tools. Although the development and position of these applications has been strengthened by the potential contribution to knowledge management, they are not necessarily integrated knowledge management technologies. The fact that these tools are not fully integrated has created a barrier to the free flow of information. This, along with the need to train people in the use of such tools and to promote their continued use has compounded the skepticism about their value. However, successful implementation of the correct infrastructure, and the ability to manage its content is essential to the management of knowledge. Without any technological contribution, knowledge management as an effective or efficient organizational system would not be viable for a company operating in today's global markets.

Davenport and Prusak suggest, as part of a knowledge management infrastructure, companies "install Lotus Notes (or equivalent) or an Intranet, and then start searching for content to distribute with these tools". Davenport argues that technical infrastructures are a necessary ingredient for a successful knowledge project, and predominantly fit with existing systems already in place. It is important to note that these suggestions do not incorporate the required methods for capturing or leveraging accumulated knowledge, and without structured application end up as simply repositories for paper-based documents.

### **Decision Support Systems**

A way of understanding and explaining the technological disciplines within the knowledge management field is to interpret 'methods of use'. Some research has suggested a division of these 'methods' into 'decision support systems' and 'knowledge management systems'. This split defines the convention and connections between technology and knowledge management practices. Decision support systems (DSS) are reliant on getting at, sharing and understanding large amounts of information, a task more efficiently achieved through the use of computing power. KM systems tend to focus on the generating, capturing, and distributing or sharing of knowledge within an organization.

The two systems can be broken down into functions that identify the technologies associated with them. DSS focuses on specific technologies: data warehousing, data mining and expert systems etc., whereas knowledge management is associated with the business practices and processes such as communication (e-mail), messaging and document management, and creating knowledge bases.

A data warehouse is a copy of transaction data, specifically structured for querying and reporting, or simplified, is a place where business knowledge and information is stored. This transactional data is 'mined' using tools and techniques that search for valuable business information that can generate new opportunities. This 'mining' process automates and aids the gathering of data on trends, customer-buying habits, and so on to find predictive information. These data mining tools use different development techniques to make intelligent assessments of the available data. Some of the tools include: 'neural computing', used for examining historical patterns. 'Intelligent agents and association agents', which use sets of algorithms or

known data to make human directed assessments and decisions. 'Expert systems' are another types of applications that make decisions or solve problems in a particular field by using knowledge and analytical rules defined by experts.

Decision support is a theme that has its origins in the field of technology. Davenport and Prusak (2000) refer to the attempts to use technology to capture and manipulate knowledge as having been underway for decades. Whether or not this is an old area of research in comparison with the relatively modern concepts of knowledge management, the same techniques are used heavily within the framework of knowledge management systems.

Other advanced technologies that are being developed, such as case-based reasoning (CBR) are methods to model human thought processes. This system essentially solves new problems by adapting solutions that were used to solve old problems. A comparative example of this could be Ernst and Young's knowledge repositories that are used for storing key pieces of knowledge from previous assignments. The codified knowledge is available for consultants to search through to suggest possible solutions to new problems. The computing power for this analysis becomes the consultant who has to assess the relevance, the similarities and worth of the information.

The above-mentioned technologies focus around the use of 'groupware'. In most business cases groupware means the use of either Lotus Notes (now a subsidiary of IBM) or Novell's GroupWise. Groupware repositories are essentially dependent on codified knowledge, whether this is business process, best practice, lessons learned or document management. With all systems whose core is a database or databases, size matters. The larger the amount of information stored, the longer the time spent analyzing it. The underlying technique making up both groupware and intranet based repositories is text, search and retrieval. Through a user interface (front end) a search is created based around keywords or statements. The delivered product will be the best match achieved by the search engine ordered in degree of relevance.

On the whole groupware is beginning to be a more integrated software system. It is now no longer just a method of searching databases populated with 'objects', but also combines e-mail and newsgroup clients with calendaring and group-scheduling engines.

### **Technical Implementation**

Technology is an asset and an enabler for any KMS although Davenport (2001) suggests, "Most IT programs neglect the human side of the information equation". With this he infers that the information needs of people are not being answered, they do not receive what they want or need, and there is little understanding of how they use it. It is essential for collaborative effort for the success of any technology based KMS. The phrase, 'if we build it, they will come' does not hold much ground in IT based systems.

It is also suggested that if a knowledge-focused culture is present within an organization, knowledge technologies may even have a positive effect. A company that invests in intranets and websites for information sharing may promote the 'use' of technology with individuals. Experimentation to see which systems best fit, and to observe organizational response gives a good indication of how willing and receptive people are to sharing knowledge through technology.

Expanding on these thoughts, it is conceivable that IT is capable of promoting some change within organizational culture. The introduction of IT systems has proven that it can cut through structures; it introduces or inspires informal styles of communication through newsgroups, instant messaging and e-mail. It is also possible to connect IT infrastructures with communities or social networks that are capable of transferring or sharing experiences and knowledge. The impact of multimedia enhancements has enabled the capture and exploitation of 'know-how', which has also encouraged interdepartmental collaboration fostering a culture of sharing.

These informal methods of sharing knowledge using IT infrastructures are furthermore essential in today's highly distributed or virtual organizations. Prokesh describes the importance that British Petroleum put on their "virtual team network" as one that drives the interactions between business units, without concern about their geographical location, time zone or organizational boundaries. PC's have been introduced at British Petroleum that have videoconferencing capability to enable face-to-face contact between all business units to encourage the sharing of 'tacit' knowledge. Electronic blackboards, scanners, faxes and groupware are enabling storage and transfer of knowledge, giving access to retrievable 'explicit' knowledge through an Intranet. These technologies are facilitating people to work together as if in the same room.

The technologies and concepts of the Internet have heavily influenced the ideas being implemented at British Petroleum. Personal homepages are encouraged, where people can share personal experiences, technical data, fields of expertise and interest for promoting interaction. Possibly a vital part of the British Petroleum's system is its 'ease of use' which is very important to the virtual teamwork group. The controlling department realized that, like the Internet, "if it's easy for people to connect, communicate and share knowledge, they will do it. If it isn't, they won't." (Prokesh, 1997).

Another technological advancement that cannot be overlooked that supports the field of KM is that of telecommunications. The drive behind the human aspect of knowledge management is now becoming stronger, with a focus on the person-to-person transfer of 'tacit' knowledge. With increased globalization and highly distributed virtual teams, telecommunications has become an essential part of not only human oriented methods but that of the technological as well. The telephony system that carries not only voice traffic but also data traffic is essential in today's global marketplace. The use of Internet technologies to send and receive data not only outside of companies but internally as well has seen an immense expansion of web-based systems over Intranets. It is, however becoming apparent that these systems are of no use to a company without the will or ability to use them. The introduction of an Intranet or databases alone for knowledge management implementation is very shortsighted; a more human-centered technological approach is necessary.

In much of the recent literature it has been implied that the growing trend in knowledge management is not to do with technology but with culture. The use and implementation of IT should not be a barrier but a facilitator to successful knowledge management, yet organizational culture and the ability to change it can be a large obstacle. A major problem appears to be collaboration of employees with an inability or willingness to share knowledge. This cultural phenomenon originates from old habits of hoarding, 'kept' knowledge was

always perceived as being related to power. Hibbard and Carillo (1998) suggest, “getting employees to share what they know is no longer a technology challenge – it’s a corporate culture challenge.” Not only do organizations need to create new processes, but also create a “new covenant between employee and employer”. This agreement would have to ensure that the employee would still be valued after they gave up their knowledge.

## HUMAN TOOLS

In the eyes of Brooking (1999) knowledge management is about people, not about software, documents or IT. She says that the management of knowledge is, “about people who are the possessors of, and indicators to the location of knowledge in a company”. The knowledge and expertise within an organization and where it is located is key to successful knowledge management.

To reinforce the human aspects of the knowledge management process, McDermott (1999) describes knowledge in human centered terms as:

- Knowing is a human act
- Knowledge is the residue of thinking
- Knowledge is created in the present moment
- Knowledge belongs to communities
- Knowledge circulates through communities in many ways
- New knowledge is created at the boundaries of old

As we already know from Nonaka and Takeuchi that knowing, as a human act, is about tacit knowledge dimension and the emphasis that is placed upon experience, reflection, thought, dialogue and interaction. McDermott introduces knowledge within communities and the ability of these communities to store and share knowledge in terms of work routines, work products and even within the layout of workspaces. The way knowledge is passed and created through these communities is achieved through observation, through dialogue and interaction. He also expands upon knowledge creation, from reflection on past experience being applied to new information. There is also knowledge development and sharing by looking at problems from different perspectives, perhaps with a ‘new set of eyes’. All of these points re-emphasizing the individual and unique ability of the human mind, in being able to create and share knowledge.

### The Human Factor

From a purely organizational perspective, much of organizations’ knowledge is personal and embedded within the abilities and skills of the employees. The employees of modern businesses are today far more transient than ever before. This fact makes it noticeable that the ‘organization’ has become vulnerable to the loss of knowledge unless it is able to capture the ‘know how’ and experience of its employees. For continued success, it is important to codify and hold this personal knowledge within the organization so that ultimately the company and not the individual own this valuable ‘knowledge capital’.

Enforcing the process of codifying 'tacit' knowledge from individuals to gain ownership, possibly through technology has many sour implications. Swan (1999) suggests that perhaps, "encouraging key individuals to stay with the company through the more prosaic practices of people management", would be a far more effective solution. This idea of encouragement and people management would truly reflect and act upon the frequently used rhetoric in annual reports; 'employees are our greatest asset'. Therefore, changing organizational culture and people's working habits are key to the human aspects of KM but also the more difficult to address.

Sveiby is keen to point out that knowledge management is still emerging through "phases of maturity". His research describes a developing or fourth phase, which he considers is where the true value of knowledge lies, within the people. This is what Sveiby believes is the future for knowledge management, one which follows his thoughts on the "People track" theory. He, like many other proponents of the human aspects of tacit knowledge, sees knowledge management as creating new knowledge and building "environments" that have the ability to encourage the exchange and sharing of knowledge.

The practical aspect or management objectives for the management of knowledge seem to always be the same, to convert human capital (individual learning and team capabilities) to structural capital or organizational knowledge (documented processes and knowledge bases). This is probably driven by the need to see value or return from investment in a new management system. The hard codification of knowledge within processes and knowledge bases produce tangible results, evidence of which can be shown in operating efficiencies.

In Marchand et al (2001) a US consultant Tom Peters was reported to note that, "success in managing information (knowledge) is 5% technology and 95% psychology." He goes on to note that the financial support for the human attributes of knowledge sharing is minimal in comparison with the funding for new and improved technological systems. Sveiby refers to the ease at which businesses can buy new knowledge management software, which does not enable the growth of the people systems necessary for overall competitive advantage. Investing in people, recruitment, rewards and in creating a sharing environment are ways of nurturing the ability of organizations to generate new knowledge that is fundamental to 'innovation' and competitive advantage.

### **Knowledge Mapping**

Brooking (1999) has considered what human knowledge is within organizations, where to find it, and what type of knowledge is important. She suggests that these tasks are beyond the current capability of any IT system, but are in the realm of "well informed, well networked individuals." Levels of knowledge within an organization are formed from know-how, experience and competence of the employees.

The concept of competence is borne from Hamel & Prahalad's (1990) work suggesting that, "core competences are the collective learning in the organisation". They also suggest that, "core competence does not diminish with use. Unlike physical assets, which do deteriorate overtime, competencies are enhanced as they are applied and shared." Brooking places this emphasis on competences and experience as a form of measure to identify where knowledge actually resides in an organization.

Identifying where and what the 'expertise' is within an organization, and how to access it has been commonly called 'knowledge mapping'. As we saw earlier, knowledge maps give access to information about where to find knowledge, not accumulating the knowledge itself but establishing pointers to its location. This method of pointers draws upon concepts entwined in IT systems and has been referred to as 'metadata' or data about data.

These schemes have been reproduced in many forms both utilizing IT (Intranets and databases) and human systems (knowledge managers and information specialists). As has been described earlier the consultancy McKinsey deployed human resources as key points of contact for the knowledge mapping exercise. Mapping is more than a method to discover the location of appropriate knowledge; it can also assist in identifying strengths that can be exploited and knowledge gaps that need to be addressed.

Microsoft takes knowledge mapping to another dimension. The focus of their mapping is not just on the 'entry level' knowledge but also the need and direction of further knowledge acquisition to stay at the 'leading edge' of the industry. This process is primarily used to match employees to jobs and work teams, but also assists the individual to identify their own training needs inline with the future development of the company. (Davenport, 2000).

Social networking and dialogue occurs within organizations already, whether this be of value or not, it can be attributed to human nature. What knowledge management relies upon is the continued growth of sharing, both formally and informally of knowledge within organizations. There are many barriers to prevent sharing throughout a company whether this is structural, physical or political. Knowledge mapping promotes sharing and facilitates the crossing of organizational boundaries thus reducing these barriers. This social interaction encourages the flow of knowledge and the growth of communities.

### **Knowledge Communities**

The concept of a community and communities of practice can be defined as groups of people within an organization, not necessarily in the same occupational group but with common business interests and goals. The ability of this group to exchange knowledge on practices and experience through shared values and beliefs enables a combined capacity to solve problems and create new ideas. The ability to expand these communities throughout an organization creates an opportunity for increased sharing of knowledge and increased trust throughout groups. Businesses need to expand their formal structures to incorporate these informal networks to enable the free flow of knowledge across all organizational boundaries.

A good example of a learning community comprising of scientists and engineers is British Petroleum. The learning community started up as a result of the scientists' and engineers' shared business and individual interest in the waste that is generated as a by-product of drilling for oil. The group would meet and openly discussed topics of interest and through encouragement participants were given the opportunity to make their thoughts visible. As a result of this openness and dialogue, the group was able to expand its own knowledge and create new ideas based on shared perspectives. This concept then expanded into using the British Petroleum's 'virtual team working' systems. Video conferencing was used to facilitate

more open dialogue and the new ideas and results of the ‘community’ were subsequently distributed and shared using e-mail and web pages on the business’s Intranet.

An addition to the transfer of knowledge through socialization is ‘storytelling’. Storytelling can be defined as the informal accounting of events that embraces the personal or experiential as critical to the transferring of knowledge. This method of knowledge transfer is often used by the military to inform new recruits of the impact and dangers of armed conflict. These ‘stories’ are replayed or retold based on the experiences of senior personnel with the aim of generating knowledge through scenario-based training.

One of the inherent problems with maintaining these face-to-face contacts, or groups of interest is the associated investment in time needed to achieve success. This is an area that organizations should invest in to promote the use of informal structures to create and share knowledge. As with technology, human systems for the transfer of knowledge will only be successful if people are familiar, trust and find commonality with one another.

### **Trust and Relationships**

Creating commonality and trust amongst people and groups increases organizational linkages and further expands sharing. The sharing of knowledge within an organization is reliant on trust, a truly human emotion. Bukowitz (1999) breaks down the management of trust into the following four challenges:

1. *Support a contract of reciprocity.* Organizations understand people are valuable for what they know and also what they continue to learn. The encouragement of continuous development invites acceptance of an informal contract. People or employees will contribute to the organization with the expectation that they will receive something in return.
2. *Create explicit policies for the use of intellectual assets.* Establishing guidelines for the recognition of individual or group ideas and by giving feedback will encourage the creation and sharing of knowledge.
3. *Use self-publishing to promote ownership:* This is recognition of both individual and group needs to be proud of work or ideas. This has become noticeable with the use of home pages on intranets and indeed the Internet where self-publication is very prominent. This point is reflected in BP’s communities publishing findings on the company’s intranet.
4. *Overlap spans of trust:* Trust is based upon relationships. Individuals create groups of contacts with which they share knowledge, which can ‘span’ business boundaries. By overlapping these groups or ‘spans of trust’ the flow of knowledge is facilitated. This flow, or distribution is fundamental to sharing knowledge across business areas within organizations.

There appears to be general recognition that the cultural or human side of knowledge management is of great importance. The key to successful management of knowledge is the ability to generate a culture, which emphasizes trust, collaboration and responsible autonomy.

The use of the word ‘autonomy’ is important in the sense that people need to be empowered to be able to make decisions, experiment with ideas and to make mistakes without reprisal.

It is very apparent in certain industries, consultancy being one that reappears again and again, that knowledge management processes need to fit the ‘type’ of organization. The one-size fits all approach may not be acceptable for a knowledge intensive service organization. For these firms codified knowledge has value, but it is the creation of new and unique knowledge faster than the competitors that are far more essential. The human approach to knowledge management tends to focus more on this innovation and creativity, producing more of a ‘learning organization’, rather than one reliant on distribution of existing explicit knowledge.

McElroy’s (1999) white paper refers to the second generation of knowledge management focusing on human resources and process initiatives and more generally the creation of knowledge. He suggests that, “enhancing the conditions in which innovation and creativity naturally occur,” will help organizations create new knowledge faster. He also suggests that second-generation knowledge management is the convergence of the knowledge management and organizational learning practices. In a rapidly changing environment, in order to stay competitive, organizations need to become adaptable; this can be achieved through learning. The connection that McElroy makes is based around the work of Peter Senge (1992) who believes adaptive learning needs to be combined with generative learning or learning that enhances creativity. We will discuss the principals of organizational learning in a later chapter.

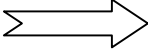
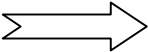
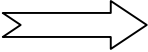
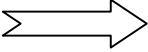
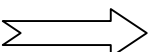
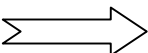
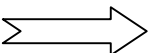
With all the above concepts of the human aspect of knowledge management, the major problem will always be trying to change organizational culture to accept and embody sharing and collaboration. The majority of change involves the demanding task of altering the beliefs, perspectives and history of the employees. This challenge is itself not the only barrier to the successful management of knowledge, but is probably the most difficult to overcome.

### **Barriers to Successful Knowledge Sharing**

The will and interest of a business’s employees is fundamental to successful knowledge management, even if processes and structures are in place. Dougherty (1999) refers to this as the choice, “of sharing or concealing knowledge, wanting to know more, wanting to learn”. This is one of the biggest issues for knowledge management, how to convince or coerce people within organizations to share their knowledge and develop themselves in line with the firm’s goals.

There are many areas that can be called barriers to successful knowledge management, whether they are structural, people or management based. Without adaptable solutions to overcome them they will ultimately prevent knowledge creation and sharing. These barriers are often referred to as “frictions” that slow or prevent transfer, reducing the value of knowledge as it travels through the organization. The most common frictions and methods of overcoming them are listed in the Table 1. below.

Table 1. Frictions in the Transfer of Knowledge

<b>Friction</b>		<b>Possible Solutions</b>
Lack of trust.		Build relationships and trust through face-to-face meetings.
Different cultures, vocabularies, frames of reference.		Create common ground through education, discussion, publications, teaming, and job rotation.
Lack of time and meeting places; narrow idea of productive work.		Establish times and places for knowledge transfers: fairs, talk rooms, conference reports.
Status and rewards go to knowledge owners.		Evaluate performance and provide incentives based on knowledge sharing.
Lack of absorptive capacity in recipients.		Educate employees for flexibility; provide time for learning; hire for openness to new ideas
Base knowledge is prerogative of particular groups, not invented here syndrome.		Encourage non-hierarchical approach to knowledge; quality of ideas more important than status of source.
Intolerance for mistakes or need for help.		Accept and reward creative errors and collaboration; no loss of status from not knowing everything

*Source:* Davenport and Prusak, 2000

Haldin-Hergard suggests there are difficulties rather than barriers in the diffusion of knowledge amongst employees. His 'difficulties' can mainly be related to perception and language but they also involve time, value and distance. Perception and language relates to the internalization of knowledge and the inability to put deeply ingrained levels of intuition

and behavior into words. (This area of knowledge sharing has been discussed before in the problems of capturing and codifying ‘tacit’ knowledge).

Outside of this ability to capture knowledge is the difficulty ‘experts’ have sharing knowledge with novices/apprentices. Industries use differing jargon or terminology, which is knowledge externalized over time associated with diverse areas of expertise. This ‘language’ can lead to misinterpretation by ‘novice’ or new employees where a certain amount of understanding can be lost in the knowledge transfer. By formalizing or standardizing language, and codifying it over time it may be possible to address this problem.

Time is an important factor in the sharing of knowledge, the creation of communities, spans of trust and other cross boundary relationships are only built up over time. Compounding problems involved with ‘time’ is the advent of flattening structures, streamlining, business process re-engineering (BPR) and so on. The thinning out of employee numbers means that the time to learn and digest knowledge is at a premium, which also places restrictions on the time available to share knowledge. It is possible that past emphasis on streamlining and BPR rather than creating knowledge and promoting innovation is now having an adverse affect on employees.

Value is often associated with measurement. What is the ‘value’ of knowledge to an organization and how should it be represented? The phrase “knowledge is power” is firmly embedded in the minds of individuals and is a concept that drives knowledge management initiatives. A problem arises when this does not refer to the collective organizational knowledge but that of the individual. This is analogous to the organization being a battlefield for exploiting colleague’s knowledge and hoarding your own, resulting in restricted and defensive sharing.

Distance is also a barrier that is far more common now than it was some ten years ago. The introduction of virtual organizations and highly distributed global markets has led to problems sharing knowledge. With the emphasis on social interaction to create/generate knowledge the face-to-face aspect of knowledge management is difficult to achieve over distance without the introduction of supporting technologies. With these virtual offices or organizations there could be a perceived loss of control, and a reliance on employees to share information across cultural and organizational boundaries. Malhotra (2001) emphasizes the use of a “company’s broad vision and strategic goals which are communicated through the shared culture and common corporate values,” to overcome concerns about control and trust.

However, there are also obvious advantages and necessities of barriers to sharing within organizations. The competitive nature of some industries promotes the need to keep at the ‘cutting edge’ of the market, and within government, some departments operate policies of ‘need to know’ to deliberately restrict distribution of knowledge and information. By making the duplication of methods and sharing of knowledge and ideas difficult, prevents external distribution and hence a possible loss of competitive advantage. An organization needs to be capable of overcoming barriers (if necessary) in an efficient way by ‘motivating’ employees to share (or withhold) relevant information.

### **Reward for Knowledge Sharing**

Motivation can be seen through reward or incentive as a method of breaking down barriers to sharing. According to Bukowitz (2001), “people will only share their knowledge if they feel sharing has some benefit to them, although how people define benefit varies widely.” Although reward systems appear important for motivation there are some definite pitfalls to their introduction. Reward does not instinctively mean financial benefit; there are many research institution employees whose pride at being at the leading edge of their field of research drives the need to share.

Hewlett Packard (HP) uses a unique system of reward to promote sharing and knowledge creation. By using its intranet infrastructure it has introduced an electronic payment scheme that charges a small fee to departments when downloading or viewing information. This initiative was designed to traverse the problem of sharing across the organization and also to give a value to the knowledge being shared. Information on the “transactions” is stored and individuals and departments are presented monthly with details of the charges incurred. HP believes this to be a successful method of motivating employees who can see the value of their individual and collective knowledge creation and sharing.

At Texas Instruments (TI) semiconductor plants, a reward system was implemented to encourage the transfer of knowledge across organizational boundaries. Rather than employees being rewarded for increased yield on individual plants, it was offered for collective increases across all plants. This policy encouraged plant management to meet and share knowledge on ‘best practice’ techniques where previously this did not occur. TI estimated that this process alone increased productivity and saved \$1.5 billion. This system gave reward a more collective, community characteristic promoting the sharing of knowledge across the organization and building a business focus.

Sveiby suggests that the majority of professionals are not motivated by money, but by, “intangible rewards, such as peer recognition, learning opportunities and independence.” Training and development is often used as an incentive within organizations, which promotes continuous learning and the creation of new knowledge. Some companies are turning to the same technologies that are delivering information to the desktop to offer computer-based training.

However, Brooking (1999) takes a more negative perspective to financial reward and believes that a KM system is encompassed into operating procedures or as part of, ‘the way we do things around here’ i.e. embedded in the culture. This analysis can possibly be seen as restrictive in its application as operating procedures should be continuously assessed from differing perspectives in alignment with the external environment. To help counter this argument Starkey (1996) suggests that to, “encourage innovation, organizations must base rewards on actual performance,” whether this be bonuses, stock options, salaries or promotions. He also says that it is important to, “make innovation an important dimension of individual and group performance.” Some companies, such as Microsoft, use stock based incentives to both empower employees and give them a greater sense of achievement, (Malhotra 2000).

As has been indicated, intangible incentives can motivate employees and individuals to develop knowledge sharing and to promote the success of KM initiatives. Direct support,

leadership and drive from top management help generate enthusiasm and commitment toward sharing. Dedicated personnel can be used to nurture this enthusiasm and create social structures to support innovation and learning. These ‘knowledge personalities’ are essential for the refining of information or knowledge and for controlling the quality and relevance of organizational information.

### **Knowledge Personalities**

Knowledge needs to have an “owner” who cares. Sharing knowledge across organizations needs to be guided and encouraged by all employees, although not all the people or communities have a need for the same type of information. To attain value from knowledge it is the responsibility of the employees to control, collect and manage the documents and information that make up knowledge bases. This can be achieved in many ways, but important to these actions is maintaining the quality of knowledge content and context. Organizations should have dedicated people to perform aspects of collecting, sorting and adding value to information and data. Within a knowledge driven organization it is ultimately the responsibility of all employees to achieve ‘knowledge worker’ characteristics to achieve full benefit from knowledge management systems. Organizations are progressively turning to ‘knowledge positions’ to enthruse people to participate in knowledge sharing and creation.

One such senior function is the creation of a Chief Knowledge Officer (CKO), who from an external perspective acts as an intermediary between employees and incoming information. The title is by no means fixed and the position has also been known as, “director of intellectual capital, director of knowledge transfer, global director of intellectual asset/capital manager,” indicating that this is a new concept.

Zack proposes the function of a CKO as to, “comprehensively handle knowledge management as a cross-organizational process.” The role expands into one of ‘champion’ or a primary focus for employees to recognize and believe in the organizational commitment to knowledge systems so that the critical roles of the CKO are, “building a knowledge culture, creating a knowledge management infrastructure and making it all pay off economically”.

The title of ‘knowledge manager’ is also becoming more popular within organizations. It can refer to either an independent group of employees or individuals within every section. Whose role it is to promote knowledge sharing and administer the content and context of collected knowledge.

A comparison can be made between these new ‘knowledge positions’ and librarians as ‘integrators’ of knowledge, or individuals who are skilled at framing and structuring knowledge. For example, Andersen Consulting has, “knowledge integrators, who are sufficiently expert in a particular field to know what knowledge is most valuable and how to synthesize it. Andersen also employs “knowledge administrators” who are responsible for capturing, storing and maintaining the knowledge others produce. This idea for arranging information and making it more accessible has had an impact on the old paper based library systems of many organizations. Companies such as Ernst & Young and Owens-Corning are now transforming their ‘libraries’ into what has been termed Knowledge Resource Centers or Knowledge Cafés.

The rationale for knowledge positions is based around inwardly focused internal information and processes. The core reason to employ these positions is to promote and organize the sharing of knowledge. External information sources such as the internet (a vast repository of information and knowledge) appear to be ignored. Technology, the 'information age' and the Internet have all had an impact on the development and emphasis of knowledge creation and learning environments within organizations. The use of people to regulate and organize this vast amount of information is essential; the Internet is capable of being a positive or negative resource for any organization.

Duffy (2000) refers to Moss Kanter who points out that, "recognizing the ways in which it knowledge management intersects with social institutions and human relationships.... poses three challenges to everyone engaged with the Internet:

1. The Internet can greatly empower and connect people, but can also isolate and marginalize them.
2. The Internet can enable user communities to form and grow, but it can also use them to attack and deny.
3. The Internet can help build businesses and communities, but it can also destroy them.

*Source:* Moss Kanter, 2001

Kanter's opinion of the 'information age' and its impact on knowledge management indicates both the advantages and disadvantages of the Internet as a source of information. She also draws upon the important relationship that occurs between human and technological aspects of knowledge management. The focus of any knowledge management strategy undertaken by a company needs to be aligned with the culture, strengths and weakness of the organization. This alignment needs to complement methods of implementation and progress the future strategic direction of the firm.

## **IMPLEMENTING KNOWLEDGE MANAGEMENT**

The knowledge management function is to promote organizational adaptability and effectiveness using knowledge resources for key reasons; competitive advantage, speed to market, distributed workforce, globalization and more demanding customers, and so on. To have an impact on these market needs it is necessary to make a judgment on the focus of a knowledge management program and how to execute it. Any initiative in combination with the organization needs to be thoroughly assessed before taking steps toward implementation.

The first question that needs to be answered is whether it is appropriate for an organization to even attempt implementation. Introducing knowledge management is an organic process and needs to be approached in a way that best suits the organization and its culture. If it is necessary to radically alter or change culture or business processes, the introduction will be that much more difficult if not impossible.

The size of an organization is an important factor in deciding whether a knowledge management system will provide tangible benefits. Large highly distributed firms would profit from systems that share knowledge across organizational, location and time boundaries.

The negative aspects for large firms are the possibility of barriers to sharing, ingrained cultures, inflexible structures and reluctance to accept change. Small, single location companies with a limited number of employees are more likely to have informal knowledge sharing systems already in place and possibly be more flexible in accepting change. Employees in small firms are more likely to acknowledge and understand organizational goals, know where to find information and who 'expert' personalities are.

When deciding if knowledge management could benefit an organization size is only one aspect to consider, more fundamental is organizational culture or employee beliefs. How employees perceive knowledge with reference to organizational goals is fundamental to whether it is necessary or indeed possible to attempt change. If an existing culture of knowledge sharing and informal social networks is dominant, promoting knowledge management will be more acceptable. A culture of protectionism with knowledge being related to power and personal development the opportunity to implement change is far more complex. Kay (1999) suggests that, "any organization can exploit knowledge management if it understands its culture and how to apply knowledge management in its own way." He suggests that having the correct mix of technology; approach to implementation and the right "quick wins" will achieve the necessary positive results.

When looking at different organizations, it can be assumed that they are not 'all knowing' with regard to internal processes and external industry. No one employee possesses all the relevant knowledge for accomplishing all his or her complex responsibilities. It is the interaction between people, technologies, and techniques that support an organization in accomplishing complex and novel tasks. It is therefore part of the implementation of a knowledge management system to coordinate and fit the different types of knowledge through identification, sharing and delivery. Knowledge sharing and learning may require cultural change, perhaps new management practices, commitment from senior management and technological support.

These thoughts reiterate the need to look holistically at organizations to achieve 'best fit' and to attain tangible results with knowledge management. As we have stated before, to succeed in any implementation, knowledge management needs to best serve and support the strategic goals and objectives of an organization.

Ericsson, a highly decentralized company that encourage spontaneous developments and open thinking, have used a strategy that is 'competence based', where two streams of KM run concurrently. The first of the two emphasizes the more 'explicit' side of KM; information sharing and virtual community building using intranet based systems. The second is within a 'competence management' initiative, which connects people in face-to-face situations. This system identifies strategic (long-term) and critical (short term) competence needs where development plans can be established. The competence requirements are based upon the Ericsson strategic plan and measurements of the current competence level.

Hansen et al looks at knowledge management being driven by a company's competitive strategy. The inference is that, "understanding why customers buy a company's products or services rather than those of its competitors", is key to the direction in which knowledge management should be driven. Prioritization of knowledge management is given the labels of codification and personalization, which reflect the explicit and tacit knowledge types. The

questions proposed to help decide the type of knowledge management support offered to the competitive strategy are:

- *Do you offer standardized or customized products?*
- *Do you have a mature or innovative product?*
- *Do your people rely on explicit or tacit knowledge to solve problems?*

A company that produces standardized or mature products or services will probably not vary processes to a great extent. It is conceivable that a knowledge management strategy of reuse using codified knowledge is probably best suited to this situation. Conversely customized and innovative products need flexibility and individuality, leaning toward a personalization model. The third question is fundamental to knowledge management i.e. what knowledge is necessary to achieve best results. The answers to the three questions only suggest perspectives for a knowledge management strategy, emphasizing the diversity but not how to lead the process.

### **What to lead with?**

Having identified the need to link knowledge management to strategy, every strategic position is linked to intellectual resources and capabilities". Understanding the expectation of customers desired 'value' from a company is essential information to discover how and what impact knowledge has. Once connection has been made between value and knowledge, a firm can focus on what knowledge it must acquire, develop and how to approach it.

Davenport and Prusak advocate the principle of starting small and achieving results as the best approach to knowledge management. As suggested above, the importance of knowledge and what impact it has on core competences is an area to start, ensuring that there is potential for success. Knowledge management is borne of varied management practices, using the systems already implemented to support an initiative and leverage its beginnings is practicable.

The areas that Davenport and Prusak believe should lead the 'knowledge management charge' have both positive and negative impacts. The three aspects concentrated on are: technology, quality/best practice and organizational learning. In this chapter, technology and IT systems have been depicted as a facilitator to knowledge management. Many organizations have invested heavily in introducing IT technology and are constantly looking for new ways to exploit and create value from them. A KPMG knowledge management research report in 1999 showed 93% of respondents having Internet access, 78% with an Intranet, 63% with data warehousing and 61% with document management systems. Even though many firms first steps into knowledge management is through IT systems it is said that to lead with it is probably a mistake.

Swan in 1999 used the example of E-Bank, a large European bank, where the emphasis or lead to knowledge management was on technology, with little or no focus on people or business issues. The implementation of an organization wide Intranet failed, due to a lack of people involvement. The infrastructure could be described as a 'technical success', however it failed to encourage knowledge sharing by not addressing people's attitudes or understanding. To counter this argument is the efforts made by Andersen Consulting who have been largely

successful with their “knowledge Xchange” system. Even though this initiative was led by technology, Andersen ran concurrent schemes supporting the human and business aspects of knowledge management. The consultancy had the advantage of having an existing culture of sharing and social interaction to build upon.

To concentrate on quality an organisation is reliant on identifying and codifying best practice. By identifying internal and external processes, (which can be codified and stored), is a useful way to kick start a KM initiative. The ‘knowledge’ stored is available for all to share and ratifies a company’s levels of quality. Davenport and Prusak (2000) use Texas instruments as an example of leading by ‘best practice’. The organization implemented the system because senior management couldn’t, “tolerate having world-class performance next door to mediocre performance.” Best practice is centered around the explicit, ‘know what’ of knowledge rather than the more tacit, ‘know how’. This idea is quite contrary to that of using organizational learning as a lead to KM.

The ‘learning organization’, developed from the ideas of Senge is very conceptual in its make up. The key focus is on the tacit, human and cultural systems of a company without much interest on structured, codified knowledge. As has become apparent throughout this chapter that the people are the key to successful knowledge management initiatives. As such using organizational learning with its heavy focus on the human aspects of learning is possibly a model for success. However, no matter what an organization decides to lead with it is vital to have balance to achieve required returns for success.

### **Drawing Together the Stages of Implementation**

Drawing together ideas of focus, performance and balance of ‘core competence’, knowledge management exists in four primary contexts; strategic, knowledge, organizational and technical. The ‘strategic context’ addresses the organizations ability to use its knowledge for competitive advantage. This necessitates not only a company’s ability to link strategy, knowledge and performance, but also how employees view their ability to have an impact on competitive advantage. The ‘knowledge context’ assesses the content and quality of the knowledge an organization possesses and the ability of this knowledge to realize competitive goals. The ‘organizational context’ reflects the roles and structure of the company including behaviors, culture and reward systems. This encourages opportunity for knowledge creation and sharing through nurturing a collaborative culture. The final context being ‘technological’, which as has been described revolves around creating and using systems to facilitate the effective management of knowledge resources.

KPMG have built on the recent methods of implementation by creating a guide or measure to where and how far organizations are in what they term “The Knowledge Journey”. (See Appendix 1) This system can help organizations identify their position in the field of knowledge management and how they stand relative to their customers and competitors. The concept also attempts to indicate barriers to progress and guides companies to look at methods of improving knowledge management initiatives.

It has been shown that companies need to consolidate efforts towards knowledge management rather than isolate individual areas. The best value or return is achieved by coordinating human, technological and strategic systems. With strong focused leadership, organizations

can implement, overcome skepticism and achieve valuable returns from knowledge management systems.

## SUMMARY

- Knowledge management profession spends more time suggesting what is not perfect about the current systems rather than trying to promote better understanding and operation. The selling of the knowledge management concept within organizations needs to be approached with more finesse to generate acceptance and create improvements in line with existing goals and objectives.
- The negative aspects of the human/technological divide should not be a topic of debate, but to promote further thought on how to combine the two to get 'best results' and achieve tangible outcomes. Currently there is too much emphasis placed upon failed technical system integration, rather than on the lack of holistic or strategic implementation of KM.
- The argument against technology being the knowledge management driver is a sound one. The people or employees will always be fundamental to business success with the human ability to think, create and manipulate information and knowledge. However the technological systems that are being developed and exploited are fundamental to facilitate improved performance in many aspects of knowledge management. The primary failing in knowledge management approaches is the lack of successful integration between IT and the human resources.
- As with the majority of indicators of business failure or disappointment, the lack of tangible improvements or return is the evidence used. These failings are always seen in terms of the costly investment in systems, which are too easily attributed to new technologies. Without a holistic approach to the culture and people of an organization, compounded by limited use of training and support in the technologies rarely achieve instant results.
- Employees need to understand the reasons behind the sharing of knowledge. Without the combined efforts of the people and systems generating a strategic approach to knowledge management, tangible return will not be realized.
- The knowledge management divide is propagated by lack of understanding. However with greater cooperation and simplification of systems this divide will eventually diminish. The ability to address all key knowledge management resources; technology, people, content and funding will be fundamental to the groundwork of successful knowledge management
- The goal of knowledge management is to connect people together, whether this is to share knowledge or to help with problem solving. Knowledge management is not just about capturing, storing and distributing information, it is more about interpretation and organization.

- To sustain long-term competitive advantage there is a need for integration of both technological and organizational/social initiatives to provide an infrastructure to support the knowledge management processes.
- If organizations are able to deliver an appropriate support culture in line with strategic objectives and an enabling infrastructure it is possible to take advantage of the knowledge held by its employees, often espoused in rhetoric as the, 'most important resource'.

## APPENDIX 1

### The Knowledge Journey

1. **Knowledge – chaotic:** The organization is unaware of the importance of knowledge to the achievement of its goals. This stage is characterized by the storage and management of knowledge in an ad-hoc manner across the organization. The accessing and retrieval of information is difficult and time consuming because of the difficulty of identifying sources of knowledge. Systems may be incompatible. Processes for collecting information may be ineffectual or non-existent. People may be reluctant to share information or simply lack the time or incentive to do so.
2. **Knowledge aware:** The organization is aware of the need to husband its knowledge and some attempt has been made to do so. Knowledge processes and sources within the organization have been identified and documented. The retrieval of information is facilitated by a catalogue of the available knowledge sources and their use within the established knowledge processes. However, awareness and implementation across the organization may not be uniform. Ownership and sharing of knowledge may be an issue.
3. **Knowledge-enabled:** Knowledge management is beginning to benefit the business. Standard procedure and tools are utilized across the organization to access information stores. Knowledge resources have been inventoried, evaluated and classified, and procedures have been implemented to maintain this listing. A number of the cultural and technological barriers have still to be addressed.
4. **Knowledge managed:** The organization has an integrated framework of procedures and tools to discover, create, maintain and retrieve information. The technological and cultural issues have been overcome. The organization's knowledge strategy is reviewed and improved on a continuing basis.
5. **Knowledge-centric:** The organization's mission is the application and enhancement of its knowledge base, which is providing it with demonstrable sustainable competitive advantage in its markets. Knowledge management procedures are an integral part of organizational and individual processes. Knowledge management tools are highly integrated and reside on a robust technological backbone that allows knowledge to be mission-critical to the enterprise. The assessment and improvement of the knowledge environment are

standard operating procedures. The value of knowledge to the organization is being measured and reported to stakeholders, is reflected in the organization's market value and is being managed as the organization's knowledge capital.

*Source:* **KMPG, 2001**

