

# CHAPTER 4

## Elements of Knowledge Management

A complete knowledge management system must contain four elements. These are: (a) knowledge creation and capture, (b) knowledge sharing and enrichment, (c) information storage and retrieval, and (d) knowledge dissemination.

### Knowledge Creation and Capture

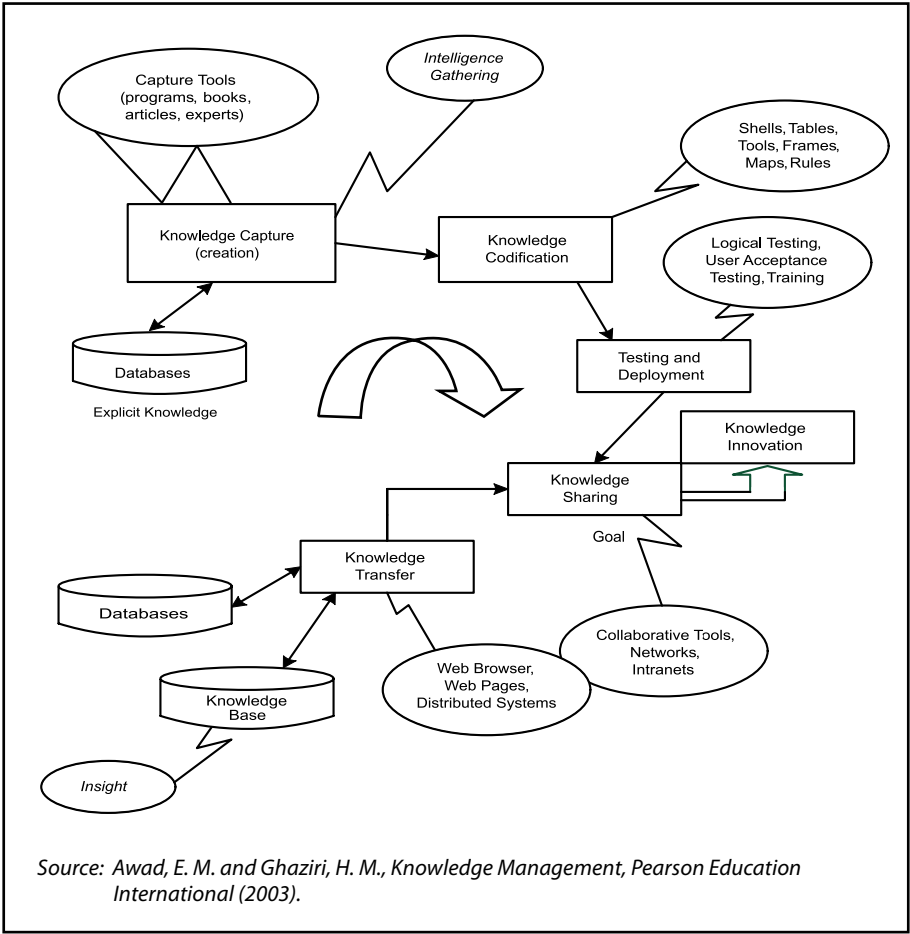
The first element of knowledge management is knowledge creation and capture. Knowledge is continually being created in any group, corporation or organization since the very interaction among people generates knowledge. One of the primary aims of knowledge management is to capture the knowledge that is produced during such interactions. As a consequence of the highly competitive nature of today's markets, there is increasing need within corporations and organizations to create new knowledge, generate novel ideas and concepts, and to capture these knowledge, ideas and concepts.

The very survival of a corporation sometimes depends largely on how much new and advanced knowledge it can generate, capture and utilize in order to produce a more competitive or attractive product or service. For this reason, two factors have become of utmost importance in determining competitiveness – creativity and innovation. These two factors have become not only important, but essential, to the long-term viability of the corporation or organization. Unless an organization is able to create new products, develop more efficient manufacturing processes, or introduce improvements in design or function, it will have great difficulty in competing in fast changing markets.

The creation of new knowledge will not be possible without creativity and innovation. These are the two most important traits or skills needed to make the organization more productive and competitive. For this reason, creativity and innovation require proper management. If managed effectively,

these skills can be harnessed to discover alternative approaches to doing things, faster way of completing tasks, cheaper methods of producing outputs, and easier paths to accomplishing desired results.

**Figure 4.1 Knowledge Capture and Sharing**



Brainstorming is one of the most common methodologies used to bring out creativity and innovation from individuals. Different individuals have different levels of knowledge about some things as well as different ways of looking at the same thing. The process of brainstorming makes possible the sharing of views and ideas and mental models commonly used by individuals.

It is also through this process that such ideas, views and mental models can be challenged and defended and further elaborated or modified. Through brainstorming it becomes possible to bring out the diversity of perspectives and mental sets that exists in the brains of the participants. By properly managing such brainstorming sessions, it is possible to produce a composite perspective on a common problem. This composite perspective could lead to innovation and new knowledge.

The process of creating new knowledge is the most difficult to manage. Often creativity and innovation flourish when there is a minimum of intervention from management. Nevertheless, for many organizations there is no option but to find ways and means to manage this process since for some their survival as a viable organization depends on how well they can manage this process. Once new knowledge is created, it will be necessary to capture it so that it can be utilized.

Knowledge can be captured in various ways. Knowledge from outside the organization can be captured by accessing different sources such as publications, websites, emails and the Internet. Explicit knowledge from within and outside of the organization can be captured in various forms such as printed reports, record of meetings, copies of memos and the like. These documented outputs are generally generated at various stages of operation of the organization. On the other hand, tacit knowledge can be created and captured during discussions and meetings with office colleagues, stakeholders, institutional partners, consultants and experts. Seminars and workshops also provide excellent venues for creating and capturing tacit knowledge that may come from the speakers or the participants.

### ***Content management***

A principal component of knowledge creation and capture is content management which involves the creation of an information database. In general, three essential decisions are involved in the process of populating the information database.

The first decision is on how new information will be created, contributed and published. Information can be contributed in many ways. It can be submitted into the database via a prescribed form or it can be contributed through web page, email, shared public folders and shared network directories. Content management involves making a decision on acceptable means of adding content into the database.

The second decision is on who will have the access or rights to subsequently update or delete information in the database. Users of a database are usually provided multiple paths to facilitate access to information. On the other hand, contributors to the database should not encounter too many barriers as to discourage them from further contributing useful data or information. For these reasons, the system's ability to distinguish those who have rightful access from those who have not is an important component of content management.

The third decision is on which information are worthy of inclusion in the database. Information from documents, web pages and emails are generally not structured in accordance to the requirements of the database. On the other hand, information that is retrieved from the database is usually structured in a certain way. Content management requires that there be a means to determine which structured information from databases and unstructured information from other sources are to be included in the system.

### ***Submission and indexing***

There are many ways by which knowledge or information can be gathered and submitted into the KM system. Information can be collected from existing data storage systems within an organization, for example, from the hard disks of computers belonging to the staff. Information can also be automatically captured as they are created, for example, from structured reports being prepared by the staff. Alternatively, authors can first write the reports and submit them when complete. It is important that the process of submitting information or knowledge be designed in a way that it is as natural

as possible. It must be unobtrusive and as closely integrated as possible with the organization's day-to-day systems and processes. In this manner, the users will be more likely to submit their contributions and follow the set procedures.

To facilitate the subsequent retrieval of information, it is necessary to tag content as data and information are added into the database or KM system. This can be done by creating a web interface through which a user can submit a document to the system. The user will then be asked to answer a series of questions about the document. Through the answers provided by the user, the document will be properly tagged or categorized, which will facilitate subsequent search and retrieval. This is achieved through what is termed XML indexing.

#### **Box 4.1 The Role of XML**

##### **What is XML?**

XML is a subset of the standard generalized markup language (SGML) defined in ISO standard 8879:1986 that is designed to make it easy to interchange structured documents over the Internet. XML files always clearly mark the start and end of each of the logical parts (called elements) of an interchanged document. XML restricts the use of SGML constructs to ensure that fall-back options are available when access to certain components of the document is not currently possible over the Internet. It also defines how Internet uniform resource locators (URLs) can be used to identify component parts of XML data streams.

By defining the role of each element of text in a formal model, known as a document type definition (DTD), users of XML can check that each component of the document occurs in a valid place within the interchanged data stream. An XML DTD allows computers to check, for example, that users do not accidentally enter a third-level heading without first having entered a second-level heading, something that cannot be checked using the hypertext markup language (HTML) previously used to code documents.

However, unlike SGML, XML does not require the presence of a DTD. If no DTD is available, either because all or part of it is not accessible over the Internet or because the user failed to create it, an XML system can assign a default definition for undeclared components of the markup.

### **Box 4.1 The Role of XML**

XML allows users to do the following:

- Bring multiple files together to form compound documents.
- Identify where illustrations are to be incorporated into text files, and the format used to encode each illustration.
- Provide processing control information to supporting programs, such as document validators and browsers.
- Add editorial comments to a file.

It is important to note, however, that XML is not:

- A predefined set of tags, of the type defined for HTML, that can be used to mark up documents.
- A standardized template for producing particular types of documents.

XML was not designed to be a standardized way of coding text. In fact, it is impossible to devise a single coding scheme that would suit all languages and all applications. Instead, XML is a formal language that can be used to pass information about the component parts of a document to another computer system. XML is flexible enough to describe any logical text structure, whether it be a form, memo, letter, report, book, encyclopedia, dictionary, or database.

*Source: Bryan, M. "An Introduction to the Extensible Markup Language (XML)", SGML Centre  
<<http://www.personal u-net.com/~sgml/xmlintro.htm>> (1997).*

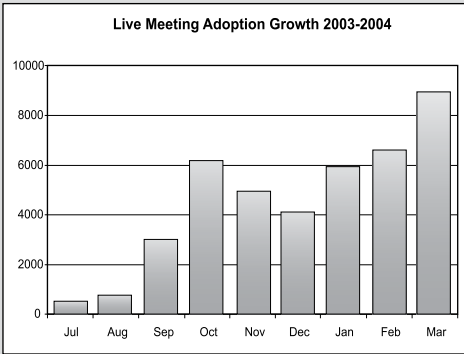
By indexing the organization's file system information and data can be captured and organized. Information can become searchable as a component of a central depository by generating a keyword index against the files. Compared to a system where users have to submit or post new documents, this system of indexing is easier to use and implement. However, this system suffers from two disadvantages: first, this indexing method does not support the same level of categorization in comparison to a more active system; and second, this may require the development of workflow processes such as an approval process to validate the information.

Knowledge Sharing and Enrichment

The second element of knowledge management is knowledge sharing and enrichment. This element is probably the most crucial among the four. It is during the process of sharing that knowledge is usually refined and enriched. Knowledge can be shared by the organization with its employees (e.g., through memos and instructions) and sharing of knowledge can occur between employees of the organization (e.g., through group discussions and internal meetings) as well as with people outside of the organization (e.g., through attending seminars and workshops).

Box 4.2 Live Meetings at Microsoft

- Users eliminated 30% of travel
- Adopted by over 10,000 employees in 6 months
- Over 40,000 meetings held
- Monthly meeting growth rate of 60%
- Cost savings of over \$30 million



Source: Kushner, J. and Rijpra, G., “Transforming to a Knowledge Management Paradigm”, (2004).

For example, an employee may share the captured knowledge on cleaner production technologies with other employees or groups who are interested or concerned with the subject matter. As the groups of employees discuss and debate the knowledge and give their own comments and inputs, new insights are formed that add relevance to and enrich the original knowledge that was shared. Furthermore, as the knowledge on cleaner production technologies is distributed by the organization to its staff, various

sector committees and thematic networks can provide a forum where new ideas can be exchanged, debated and made more relevant. Through this process of dissemination, debate and discussion, the organization's knowledge on cleaner production technologies is enriched. Additionally, when staff members attend outside seminars, workshops and meetings on cleaner production technologies, further knowledge sharing and enrichment take place.

The competitive advantage of many organizations is generally determined by the magnitude of knowledge sharing that takes place within the organization. But knowledge sharing does not automatically take place. It must be encouraged and nurtured. In general, it is necessary to facilitate communication and nurture the right culture within the organization in order for proper sharing of knowledge to take place. A worker with specialized knowledge in one area might ask, "If my knowledge is a valuable resource that makes me an essential asset of the company, why should I share it and create a competition?" On the other hand, a worker confident of his or her expertise in one field might ask, "Why should I use the knowledge of others when it might put to risk the quality of the work that I am doing?" Accordingly, a knowledge manager must take into consideration the natural tendency of human beings to hoard their own knowledge and regard that of others with suspicion when designing a knowledge management system for any organization.

Knowledge sharing can be enhanced through the implementation of appropriate technologies, operations and systems that stimulate collaboration, facilitate the process of sharing, and reward those individuals that share the most knowledge as well as the individuals that actually utilize knowledge that have been shared. Organizations are generally able to make decisions with impact when knowledge is efficiently shared. They are able to make and execute decisions rapidly when individuals throughout the organization can gain access to important strategic ideas. Knowledge managers, therefore, must ensure that employees have direct access to one another rather than requiring them to go through higher management whenever needed information or knowledge are required in the implementation of certain projects or the design of certain products. In this manner, the persons who have the right

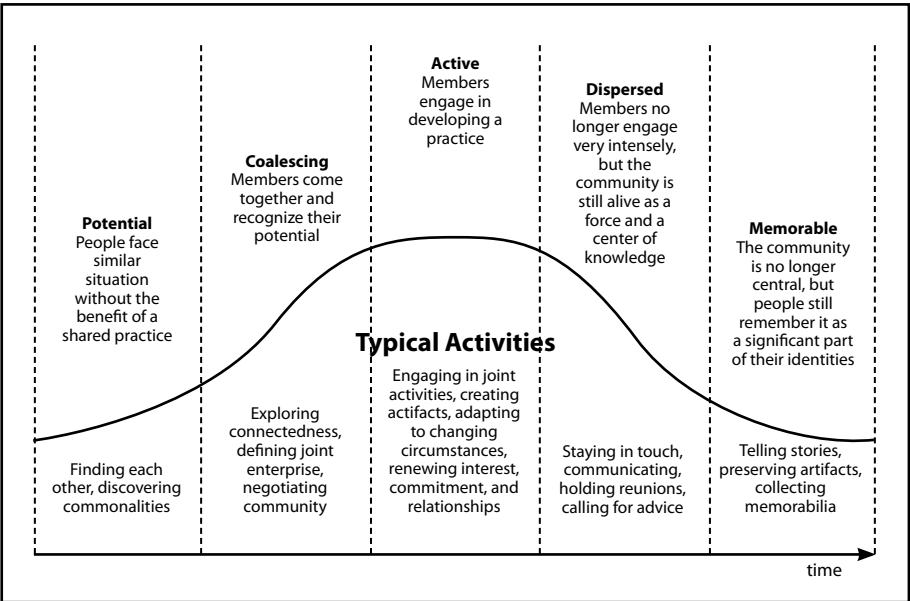


information or knowledge can readily share it with those who can use it to produce the greatest benefit for the organization.

**Communities of practice**

Communities of practice have been proven to be excellent means to share knowledge among people who have a common interest. These comprise groups of people who share knowledge, concerns or interest in a given area. As a result of their continuing interaction with one another, generally through the use and application of information and communication technologies, the members of the community enrich their knowledge and expertise in that particular area. Communities of practice provide their members with very powerful cooperative tools for further developing their expertise and abilities. These groups are an effective and flexible means to examine some knowledge issues and gain further insights into specific knowledge domains.

**Figure 4.2 Stages of Development of Communities of Practice**



Source: *COPs: Learning as a Social System*,  
<<http://www.co-i-1.com/coil/knowledge-garden/cop/lss.shtml>>, (2005).

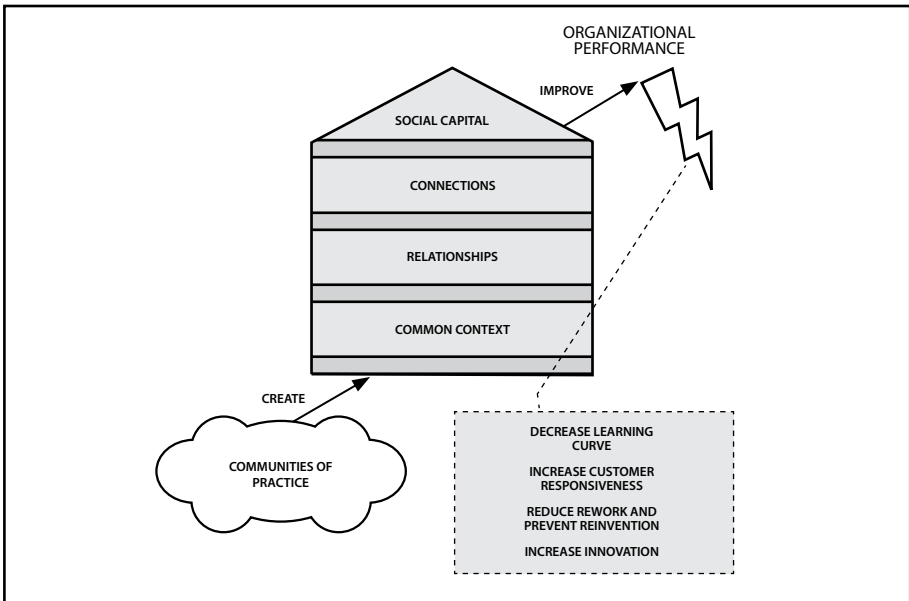
Communities of practice are not synonymous to teams or task forces that are formed for a specific purpose for a certain period of time. Rather, they are peers that form groups to learn from one another and improve their understanding of a particular subject of common interest. What binds them is their common desire to improve their knowledge and their respective need to know what the other knows. In other words, a community of practice is where members share “work stories”. During the process of “story telling” the exchange of tacit knowledge takes place. This process is particularly important to new staff members since the sharing of knowledge tends to accelerate their movement from a mere tangential contact to a fuller involvement with the older staff members.

When an organization starts to manage its knowledge to attain competitive advantage, one key initiative would be to foster the formation of communities of practice around the core knowledge of the organization. Although communities of practice generally grow spontaneously around personal relationships, it is important that organizations create a condition conducive for such growth to occur. Once in existence, there will be need to manage such communities of practice in order to optimize their contribution and help ensure their success. There will also be need to have the goals of the communities of practice aligned with the goals of the organization. Unless there is convergence of objectives, the outputs of the communities of practice would be of little use to the organization. In other words, the impact of communities of practice would be severely limited if they lack strategic relevance for the organization.

Many progressive organizations rely on communities of practice to maintain the professional excellence of project teams regardless of where the members of the team may be geographically located. Because communities of practice facilitate knowledge sharing they are critical to overcoming the challenges involved in the creation, sharing, dissemination and use of knowledge. An excellent example of this is the experience at the World Bank. Among the primary objectives of the World Bank is the reduction of poverty. It tries to attain this objective with money (e.g., through loans and grants to governments) and knowledge (e.g., through relevant publications, training, workshops and the like). In this connection, the World Bank uses communities

of practice in various fields in order to enhance its expertise in areas that are important to developing countries, for example, in water resources development, environmental protection or energy supply and generation.

**Figure 4.3 Communities of practice are linked to organizational performance through the dimensions of social capital**



Source: Lesser, E. L. and Storck, J., "Communities of Practice and Organizational Performance", *IBM Systems Journal*, Vol. 40, No. 4 (2001).

Understood correctly, communities of practice are therefore not just web sites, databases and sets of best practices, although these constitute the means by which the members interact. Rather, a community of practice consists of members exchanging knowledge, and in the process they build relationships and develop a sense of belonging and mutual commitment. To some extent, a community of practice also helps develop a homogeneous vision and common approach to solving problems, attaining a desired objective, or designing a product. The members of a community have their individual official and unofficial roles, they create reputations for themselves, and they acquire status and spheres of influence as they actively participate

in interactions. The communities of practice may therefore be viewed as social entities in which views are ventilated and shared and where conflicts and disagreements can sometimes appear but mechanisms are available to handle tensions when required.

In many organizations, communities of practice are informal groupings that are separate from but are not in conflict with the formal organizational structure or hierarchy. They act as parallel structures but do not interfere with the regular responsibilities and accountabilities of staff members. They are groups in which various areas of knowledge connect people. In all organizations, the management structure and hierarchy may change and projects start and will eventually end. Communities of practice however can continue indefinitely as long as there are groups of people that are interested in sharing knowledge. Knowledge is the continuous element that binds the members of the community of practice together. For this reason, communities of practice can provide that underlying layer of stability to many organizations.

There is an old saying that it is the string and not the pearls that make a necklace. A good example may be cited in the case of an engineer in a manufacturing industry and a marketing professional in the same company. The two may need to regularly exchange information about a specific product on which they both are working with – the engineer to produce it, and the marketing professional to sell it. They need to help one another in order to gain a broader view of the product and understand it better. The engineer needs to understand what kind of product would sell while the marketing professional needs to know what can be produced efficiently with the available facilities and materials. In a community of practice that addresses that particular product, the two will interact not so much because they have to but because they find their interaction useful. Through the community of practice, they exchange knowledge that is useful in their own particular fields of practice.

### **Box 4.3 The Value of Communities of Practice: An Example for the World Bank**

A Community of Practice is a group of people who communicate with each other because they share common work practices, interests, and aims. Generally they will have a regular system of interchange that allows the sharing of knowledge concerning their field of expertise.

COPs generally operate at an informal level although they can be stimulated and encouraged to grow by providing space and resources in which they may flourish.

The value of COPs is evident in this example from a World Bank Thematic Group:

The Transport sector thematic group is a community of practice that promotes team building, compiles a knowledge base of good practices, and supports staff learning through brown bag lunches, forums, seminars, and other events. When someone in DC sent an email to the group seeking best practice examples for a National Transport Sector Strategy the first response came back a mere 20 minutes after the initial enquiry was sent. It was a useful contribution from a Bank staff member working in Beirut. Within 24 hours four other relevant contributions were made by colleagues, including letters and notes on Transport Sector Reform strategies, Terms of Reference (ToRs) for carrying out transport sector reviews, as well as reference to a recent Working Paper by the Operations Evaluation Department. Eleven country examples were obtained in response to the query and two were selected as best practice, given their applicability to the current need. By focusing on these examples it is expected that significant savings on technical assistance costs and the timeliness of the project will be forthcoming.

*Source: United Nations System Staff College, "UN Knowledge Networks and Communities of Practice", <<http://www.unssc.org/web1/programmes/km/about.asp>> (2005).*

### ***Incentive schemes***

In order to encourage knowledge sharing, certain incentive schemes will have to be provided. In many cases, a worker may feel threatened to introduce or share knowledge into a system while another may feel reluctant to actively search out knowledge that others introduce. Many may also find

the process of sharing and searching as requiring considerable amount of time and effort. In practice, the fact that knowledge is available does not necessarily mean that others will use it. Nevertheless, the knowledge manager of any organization should create an overall situation in which knowledge is shared and reused spontaneously. In other words, the principle of knowledge sharing and reuse must permeate through the entire organization. This can be facilitated through the provision of certain incentives, financial or otherwise, to those actively sharing useful knowledge and those frequently reusing knowledge that have been shared.

From a technological point of view, there are many ways of promoting knowledge sharing within the organization. The installation of an application such as Lotus Notes is one example. This should of course be accompanied by the proper training of the staff in the use of this application software. In addition to the provision of the necessary technological infrastructure, management techniques such as an annual personnel performance evaluation that takes into consideration the staff member's contribution to knowledge sharing can be of benefit in promoting the sharing and use of knowledge. Financial incentive schemes that reward active and positive participation in the organization's knowledge management system have also been found useful in promoting knowledge sharing.

Some organizations are beginning to evaluate and reward personnel who share and use knowledge. One example of this is IBM Lotus Development, which assigns 25 per cent of the total performance evaluation of its customer support employees to knowledge sharing. Another example is Buckman Laboratories, which applauds the work of its top hundred knowledge sharers and honors them with an annual conference at a resort. Similarly, ABB evaluates some managers based not only on the impact of their decisions, but also on the information they use in the decision-making process.

Table 4.1 provides a summary of the characteristics of the various communities of practice in different types of organizations studied, showing community objectives, community activities, and key value outcomes.

**Table 4.1 Summary of Study of Characteristics of Communities of Practice**

Organization	Community	Objectives	Community Activities	Key Value Outcomes
Multinational lending institution	Urban services specialists	Share experience and expertise across similar projects	<ul style="list-style-type: none"><li>• Held informal lunchtime seminars</li><li>• Conducted formal training sessions</li><li>• Facilitated Website repository</li><li>• Produced CD of relevant intellectual capital</li><li>• Captured experiences of retiring practitioners in multimedia</li></ul>	<ul style="list-style-type: none"><li>• Faster project delivery</li><li>• Greater reuse of intellectual capital developed by projects</li></ul>
Multinational lending institution	Land and real estate specialists	Share experience and expertise across similar projects	<ul style="list-style-type: none"><li>• Held informal lunchtime seminars</li><li>• Conducted training sessions</li><li>• Sponsored conferences with outside speakers</li><li>• Facilitated Web site</li><li>• Developed Web links to relevant outside content sources</li></ul>	<ul style="list-style-type: none"><li>• Faster project delivery</li><li>• Greater reuse of intellectual capital developed by projects</li><li>• Improved linkages to outside knowledge sources</li></ul>
Manufacturing company	Quality champions	Develop and exchange implementation and training techniques	<ul style="list-style-type: none"><li>• Held informal discussions among practitioners</li><li>• Developed Web sites with relevant training material and advice</li></ul>	<ul style="list-style-type: none"><li>• Increased reuse of previously developed assets</li></ul>
Pharmaceutical firm	Research chemists	Share knowledge about a new industry development	<ul style="list-style-type: none"><li>• Held face-to-face discussions and meetings to share insights</li><li>• Used video-conferencing to connect research labs</li><li>• Maintained Web site, using one of the technologies as a webmaster</li></ul>	<ul style="list-style-type: none"><li>• Development of a new business capability based on advanced research techniques</li></ul>

Source: Lesser, E. L. and Storck, J., "Communities of Practice and Organizational Performance", IBM Systems Journal, Vol. 40, No. 4, (2001).

**Table 4.1 Summary of Study of Characteristics of Communities of Practice**

Organization	Community	Objectives	Community Activities	Key Value Outcomes
Software development company	Programmers	Respond to needs for customization of a standard product	<ul style="list-style-type: none"> <li>• Maintained internal listservs for individuals to post comments about modifications</li> <li>• Maintained Web site to support sharing of software components</li> <li>• Provided access to "spearhead" experts around the company</li> </ul>	<ul style="list-style-type: none"> <li>• Greater reuse of existing software assets</li> <li>• Increased innovation around new software products</li> </ul>
Specialty chemical company	Researchers	Share and innovate new solutions to satisfy customer needs	<ul style="list-style-type: none"> <li>• Maintained extensive discussion database where individuals can post and seek answers to customer problems</li> <li>• Employed knowledge brokers and editors to cull through discussion databases and identify frequently asked questions and other knowledge needs</li> <li>• Held informal "breakfast seminars" to share discoveries and engage other researchers in problem solving</li> </ul>	<ul style="list-style-type: none"> <li>• Faster response time to customer problems</li> <li>• Greater linkage between customers and research staff in developing new solutions</li> </ul>
Telecom company	Project managers	Transfer experience and techniques across industry groups	<ul style="list-style-type: none"> <li>• Held initial face-to-face meeting with community members to outline community objectives and opportunities</li> <li>• Developed email-based expert access/question-and-answer system to post and distribute inquiries</li> </ul>	<ul style="list-style-type: none"> <li>• Faster response to project bids and request for proposals</li> <li>• Greater reuse of existing knowledge assets</li> </ul>

Source: Lesser, E. L. and Storck, J., "Communities of Practice and Organizational Performance", IBM Systems Journal, Vol. 40, No. 4, (2001).



## Information Storage and Retrieval

The third element of knowledge management is information storage and retrieval. The organization should ensure that acquired or shared knowledge is readily accessible to others. This can be done by storing information in a centralized location with sufficient provisions for easy retrieval. For example, reports, statistical data on economic, social and environmental areas can be stored in databases while official documents, once approved, should be categorized and stored electronically in suitable file systems. The documents and information in databases could then be retrieved through the Internet or the organization's intranet websites.

### **Box 4.4 The Productivity Challenge: A Closer Look**

- Average information worker spends over an hour and a half on email each day, which is 20% of their work time
- Employees get 50% - 75% of their relevant information directly from other people
- More than 80% of enterprise's digitized information reside in individual hard drives and personal files

*Source: Information Worker Productivity Council Research, (2004), and "The Knowledge Worker Investment Paradox" Gartner Research, (2002).*

There are four main options for storing the information that are captured or shared. These are: (a) file system storage (local and network directories and folders); (b) databases; (c) e-mail; and (d) websites (intranet and external).

In most organizations, the bulk of information is likely to be in relatively unstructured formats. These can be in the form of typical business or office documents such as reports, memos, spreadsheets or emails. These documents normally contain valuable information but they are not easily searched and found. For a knowledge management system to be effective, it must provide for search engines that can deal with such unstructured information. In most

cases, however, some form of information structuring is necessary in order to facilitate subsequent information retrieval and use.

Some information may require more than a storage format. For instance, Online Analytical Processing (OLAP) systems convert data from Online Transaction Processing (OLTP) into a format more suitable for aggregation and analysis. OLAP operates against this secondary data store rather than the production system.

### ***Information organization***

In order to facilitate retrieval, a two-step process has to be implemented: first, the information should be divided into manageable units; and second, each unit should be categorized.

Before the information is divided into smaller units, there is need to determine the size, or granularity, of each meaningful unit. The finer the subdivision or granularity of each unit the more tedious and time consuming the cataloging effort will be. Let us take, for example, the case of cataloging a book describing how to build a particular machine. There are several questions that we need to ask. Shall we consider the entire book as one unit and catalogue it as such. Or, shall we consider as one unit one chapter of the book, or one section or one paragraph of the book? The larger the unit the more difficult it is to find the exact information one is looking for. In some cases, the manner of dividing into units presents itself as obvious. One example is an anthology of short essays by different authors. It is obvious that it can be divided into several units where one unit constitutes one short essay by each author. Some products implicitly assume levels of granularity. For instance, Index Server is based on individual words. On the other hand, databases usually work with fields and records as units for searching and retrieval.

After the information is divided into smaller units, the units must then be categorized by content type. In order to do this, it is necessary to create a list of all the content types for the organization. This list may include classifications such as proposals, invoices, white papers, and correspondence. Each entry is

then tagged with content attributes, including metadata such as document title, author, client, and approval status. These predefined categories and attributes constitute the site vocabulary. Microsoft Site Server has facilities for managing content type and attributes.

### ***Information retrieval***

Once the repository of information is created and populated, the next step will be to provide various means for users to have access to the information needed. This involves designing and providing information retrieval pathways. These pathways should be designed with the user community in mind and made as user-friendly as possible. Since users have different levels of technical expertise and have different purposes for accessing information, multiple access methods will have to be provided. Each access method should be designed to meet a specific user level. In this manner both casual and intensive users will be provided access to the same body of information.

Since different users require different views of the knowledge base, the ability to personalize these views will greatly increase the ease of use. Personalization taps into user profiles to control what content is offered. After the right to access of the user has been verified, personalization can apply the user's preferences for how and what to present on the page. For example, from the same information database, an engineer may be shown the technical drawing and specifications of a new machine or product that has been entered into the system. On the other hand, a marketing specialist may see the innovative features, the different models and price list of the new product. It is also possible for users to specify the language, font or layout they prefer.

Portals, such as Microsoft's Digital Dashboard, are capable of showing data from heterogeneous sources side by side and simplifying navigation by consolidating views of data. By using integrated search tools, it is possible to reach across application boundaries to find information. For example, it is possible to integrate human resources, finance, and time and accounting applications by cataloging their data into a single repository. This system can then allow searches against database, file system, and web data in a

single query. As a result, a search page can be configured to query multiple repositories at the same time.

There is another form of information retrieval called “push” technology. In this case information retrieval is initiated by the system rather than by a user. In this form of information retrieval, the users subscribe to areas of interest. They then receive updates via e-mail delivery, personalized web pages and personalized corporate portals or home pages. For instance, Site Server provides for pushing information through Active Channels. The Digital Dashboard also offers push capabilities.

The consolidation of information from diverse sources can be consolidated using web-based knowledge portals. These portals allow the user to reference, collaborate, and interact with information. These ubiquitous web browsers allow easy access from any location. With these systems, intranets, extranets, and even Internet knowledge management implementations are possible.

### **Knowledge Dissemination**

The fourth element of knowledge management is knowledge dissemination. Unless knowledge is effectively disseminated, the development impact of knowledge will remain limited. For knowledge dissemination to be effective it will require the transformation of highly individualized tacit knowledge into explicit knowledge that can be more widely shared. In an organization where there is fear of the management or hierarchy, the employees will have a tendency to keep their knowledge to themselves and share it with others only cautiously. In cases such as this, management must take the lead in creating an environment of understanding, cooperation and learning. It should also encourage knowledge sharing, even if the positive results of doing so are not readily apparent. Such results can best be measured in the long term.

Publications, presentations, websites and libraries are the most obvious forms of dissemination of knowledge. Participation in external networks, establishing partnerships with other organizations, and creation of

knowledge centers are also effective means to disseminate knowledge. The Asian Development Bank, for example, participates in over 300 networks with professional and other organizations throughout the world, which serve as forums for information exchange and sharing. Through these networks, the Bank is able to disseminate best practices and lessons learned, among many others.

#### **Box 4.5 Initiative for Knowledge Sharing and Dissemination**

The Asian Development Bank launched the Center for Learning, Information, Communication and Knowledge (CLICK) initiative at the World Summit on the Information Society in Geneva in December 2003. Under this initiative, ADB will set up ICT-based interactive knowledge centers in its developing member countries. Through CLICK, ADB will support distance learning on key development topics for developing member countries with up-to-date knowledge products and services that are tailored to clients' needs. CLICK will also enable developing member countries and ADB's development partners to disseminate their own knowledge products and services through this facility.

*Source: Asian Development Bank, <<http://www.adb.org>> (2004).*