**CHAPTER SEVEN: MANAGING KNOWLEDGE**

After completing this chapter, you will be able to:

* Explain the importance of knowledge management
* Describes the applications useful for distributing, creating and sharing knowledge
* Evaluate the role of artificial intelligence in knowledge management
* Describe how organizations can used expert systems and case-based reasoning to capture knowledge
* Describe how organizations can use neural networks and other intelligent techniques to improve their knowledge base

**7.1 Knowledge Management in the Organization**

Knowledge has becomes a central productive and strategic asset, the success of the organization increasingly depends on its ability to gather, produce, maintain and disseminate knowledge. Hence, the process of developing procedures and routines to optimize the creation, flow, learning and sharing knowledge and information in the firm becomes a central management responsibility which brings to a term known as knowledge management. Knowledge management is the process of systematically and actively managing and leveraging the stores of knowledge in an organization. Knowledge management is the combination of activities involved in gathering, organizing, sharing, analyzing and disseminating knowledge to improve an organization’s performance.

Knowledge is usually perceived as “know-how”, which is usually accumulated through experience combined with knowing certain information or, at least knowing where information can be found. Knowledge management is the attempt by organizations to put procedures and technologies in place that do the following:

* Transfer individual knowledge into databases.
* Filter and separate the most relevant knowledge.
* Organize that knowledge in databases that either:
  + Allow other employees to easily access the knowledge.
  + “Push” specific knowledge to employees based on their pre-specified needs.

All the major types of information systems mentioned before facilitate the flow of information and have organizational knowledge embed in them. However, office automation system (OAS), knowledge work systems (KWS), group collaboration and artificial intelligence applications are especially useful for knowledge management. OAS, KWS, artificial intelligence applications and group collaboration focuses on supporting information and knowledge work and on defining and capturing the organization’s knowledge base. The knowledge base may include:

* Structured internal knowledge
* External knowledge
* Informal knowledge (tacit knowledge)

Figure 7.1 below shows the array of information systems specifically designed to support knowledge management.

Create Knowledge

Capture and Codify Knowledge

Distribute Knowledge

Share Knowledge

Group Collaboration Systems

* Groupware
* Intranets

Artificial Intelligence Systems

* Expert Systems
* Neural Nets
* Fuzzy Logic
* Genetic Algorithms
* Intelligence Agents

Office Automation Systems

* Word Processing
* Desktop Publishing
* Imaging and Web Publishing
* Electronic Calendars
* Desktop Databases

Knowledge Work Systems

* CAD
* Virtual Reality
* Investment Workstations

*Figure 7.1*

OAS helps disseminate and coordinate the flow of information in the organization. KWS supports the activities of highly skilled knowledge workers and professionals, as they create new knowledge and try to integrate it into the organization. Group collaboration and support systems support the creation and sharing of knowledge among people working in groups. Artificial intelligence systems provide organizations and managers with codified knowledge that can be reused by others in the organization.

**7.2 Information and Knowledge Work Systems**

Information work is work that consists primarily of creating or processing information. It is carried out normally by:

* *Data workers* who primarily process and disseminate the organization’s information and paperwork such as secretaries or bookkeepers.
* *Knowledge workers* who design products or services or create knowledge for the organization such as engineers, scientist or architects.

Main function is to generate information based on their knowledge.

**7.2.1 Distributing Knowledge: Office and Document Management Systems**

Most data work and a great deal of knowledge work take place in offices, so the office plays a major role in coordinating the flow of information throughout the entire organization. The office has three basic functions, which is managing and coordinating the work of data and knowledge workers, connecting the work of the local information workers with all levels and functions of the organization and connecting the organization to the external world. The major activities carried out by the workers:

* Managing documents.
* Scheduling for individuals and groups.
* Managing data.

These activities can be supported by OAS, which can be defined as any application of information technology that intends to increase productivity of information workers in the office. OAS can be a word processing system, desktop publishing system and document imaging system. Although word processing and desktop publishing address the creation and presentation of documents, they only exacerbate the existing paper avalanche problem. Locating and updating information in that format is a great source of organizational inefficiency. One way to reduce problems stemming from paper work-flow is to employ document imaging system. The diagram of typical components of a document imaging system can be found in chapter 3. Document imaging system is a:

* System that converts documents and images into digital form so that they can be stored and accessed by the computer.
* The systems store, retrieve and manipulate a digitized image of a document, allowing the document itself to be discarded.
* The system must contain a scanner that converts the document image into a bit-mapped image, storing that image as a graphic.
* If the document is not in active use, it usually is stored on an optical disk system.
* The optical disk kept on-line in a jukebox (a device for storing and retrieving many optical disks), require a certain amount of time to retrieve the document automatically.
* The system also requires an index server to contain the indexes that will allow users to identify and retrieve document when needed.
* Index data are entered so that a document can be retrieved in a variety of ways, depending upon application.

**7.2.2 Creating Knowledge: Knowledge Work Systems**

Knowledge workers perform three key roles that are critical to the organization and to managers who work within the organization. The first key role is keeping the organization up-to-date in knowledge as it develops in the external world – in technology, science, social thought and the arts. Secondly, knowledge workers also serve as internal consultants regarding the areas of their knowledge, the changes taking places and the opportunities. Lastly, this group of workers also acts as change agents evaluating, initiating and promoting change projects. Some basic requirements of KWS:

* Requires great computing power in order to handle rapidly sophisticated graphics or complex calculations.
* Quick and easy access to external databases.
* User-friendly interfaces to save time by allowing user to perform needed tasks and get to required information without having to spend a lot of time learning how to use the computer.

Examples of KWS:

* CAD/CAM, which stands for computer-aided design and computer-aided manufacturing, provides engineers, designers and factory managers with precise control over industrial design and manufacturing.
* Virtual reality systems, which provides drug designers, architects, engineers and medical workers with precise photo-realistic simulations of objects.
* Investment workstations, which consists of high-end PCs used in financial sector to analyze trading situations instantaneously and facilitate portfolio management.
  + 1. **Sharing Knowledge: Group Collaboration Systems and Intranet Knowledge Environments**

In group coordination and collaboration, they key technologies involved are like e-mail, teleconferencing, data-conferencing, videoconferencing, groupware and intranets. Out of so many different technologies, groupware and intranets are the most valuable in sharing knowledge. Groupware is software that recognizes the significance of groups in offices by providing functions and services that support collaborative activities of work groups, was the primary tool for creating collaborative work environments. It is built around three key principles – communication, collaboration and coordination (the 3 C’s).

Groupware is capable to perform the following tasks:

* Publishing – posting documents as well as simultaneous work on the same document by multiple users along with a mechanism to track changes to these documents.
* Replication – maintaining and updating identical data on multiple PCs and servers.
* Discussion tracking – organizing discussions by many users on different topics.
* Document management – storing information from various types of software in a database.
* Work-flow management – moving and tracking documents created by groups.
* Portability – availability of software for mobile use to access the corporate network from the road.
* Security – preventing unauthorized access to data.
* Application development – developing custom software applications with the software.