
UNIT 5 AN INTRODUCTION TO KNOWLEDGE MANAGEMENT

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5.0 OBJECTIVES

After reading this unit, you should be able to:

- understand the transition of data to knowledge;
- explain different kinds of exposition of knowledge;
- decide and design a Knowledge Management (KM) model for an organization; and
- identify the constraints in KM.

5.1 INTRODUCTION

In this unit we will try to understand the concept of data, information and knowledge and the conversion of data to knowledge. Knowledge can be broadly categorized into explicit and non-explicit i.e. tacit. As it is tough to understand what exactly knowledge is, managing it is even tougher. Implementation of Information Technology offers a few tools to deal with knowledge like DBMS packages to store and retrieve and network for sharing knowledge. Competition among the commercial organizations has put the Knowledge Management on top. The need of Knowledge Management is felt in industry and commerce due to the migration of human expertise out of the organization. There are certain models of Knowledge Management proposed for distributed networked environment as well as simple environment. Librarians need to play a major role particularly when it comes to handling explicit knowledge.

5.2 DATA, INFORMATION AND KNOWLEDGE

Data, information and knowledge are three steps through which a KM system grows. Besides there are two more steps, which are invariably, associated with KM — understanding and wisdom. The later two require more human intervention. According to Russell Ackoff, (1) a systems theorist and professor of organizational change, the content of the human mind can be classified into five categories:

Data is raw. Data itself does not convey any meaning. It simply exists without any significance and usability. For example, '*Rama married Sita*' is just a crude data and does not make any sense to a person who listens to it because he/she doesn't know which *Rama* and which *Sita* we are talking about. Similarly, in computer parlance, a spreadsheet generally starts out by holding data.

Information is data that has been given meaning attaching context to it by way of relational connection. '*Rama married Sita*' makes sense only when we know that the *Rama* and *Sita* we are talking about belong to the epic *Ramayana*. Thus one should know the context and meaning related to data in advance. In computer parlance, a relational database adds context and meaning to the data stored within the databases.

Knowledge is storage of information, which can be recalled for decision-making. Knowledge in some instances is nothing but memorization. It does not provide power of inference and reasoning so that new knowledge can be generated.

For example, elementary school children memorize the “table”. They can tell you that “ $2 \times 2 = 4$ ” because they have stored it in their mind. But when asked what is “ 1457×447 ”, they cannot respond correctly because this data is not stored in their minds. To correctly answer such a question requires a true cognitive and analytical ability that is only encompassed in the next level, that is, ‘understanding’. In computer parlance, most of the applications we use (modeling, simulation, etc.) manipulate some type of stored knowledge.

There is a marked difference between Information and Knowledge

Information	Knowledge
Tangible - informs humans	Human process – thinking/awareness
Processing changes representation	Processing changes representation
Physical objects	Mental objects
Context independent	Context affects meaning
Entity	Awareness and intuition
Easily transferable	Transfer requires learning
Reproducible at low cost	Not identically reproducible

Understanding is an interpolative and probabilistic process. Here knowledge is used to infer some kind of result thus creating a new knowledge in the chain. Understanding means learning while knowledge is just memorizing something. Understanding is cognitive and analytical. It is the process of synthesis of new knowledge from the previously held one. Understanding can be built upon currently held information, knowledge and understanding itself. Say we know that *Dasharatha is the father of Rama*. Then another fact we know is that *Kusha is the son of Rama*. With this existing knowledge one can infer that *Dasharatha is the grandfather of Kusha* and this inferred knowledge enhances the knowledge base. In computer parlance, Artificial Intelligence (AI) systems possess understanding in the sense that they are able to synthesize new knowledge from previously stored information and knowledge using inferencing.

Wisdom is an extrapolative and non-deterministic, non-probabilistic process. It calls upon all the previous levels of consciousness, and specifically upon special types of human programming (moral, ethical codes, etc.). It beckons to give us understanding about which there has previously been no understanding, and in doing so, goes far beyond understanding itself. It is the essence of philosophical probing. Unlike the previous four levels, it asks questions to which there is no (easily-achievable) answer, and in some cases, for which there can be no humanly-known answer. Wisdom is therefore, the process by which we also discern, or judge, between right and wrong, good and bad. Wisdom is a uniquely human state.

The following diagram represents the transitions from data, to information, to knowledge, and finally to wisdom, and it is understanding that supports the transition from each stage to the next. Understanding is not a separate level of its own.

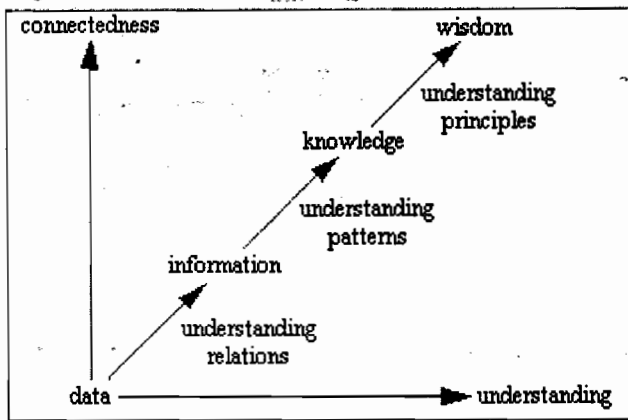


Fig 5.1: Transition of data, information, knowledge

Self Check Exercise

- 1) Draw out the difference among the concepts like Data, Information, and Knowledge.

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5.3 TYPES OF KNOWLEDGE

Knowledge can be classified in two broad categories: tacit and explicit. These categories can be subdivided into other types. Further, each category consists of various components such as intuition, experience, ground truth, judgement, values, assumptions, beliefs and intelligence.

In 1966 Michael Polanyi made the distinction between *explicit knowledge*, which can be articulated in formal language and transmitted among individuals, and *tacit knowledge*, personal knowledge embedded in individual experience and involving such intangible factors as personal belief, perspective, and values (2) Polanyi's distinction is mentioned frequently in discussions of knowledge and knowledge management, and it is one of the key premises underlying assertions about the close connection between knowledge and action.

According to Nonaka who (3) is considered to be the father of KM, there are two types of knowledge: tacit and explicit.

5.3.1 Tacit Knowledge

Tacit knowledge is subjective and experience based knowledge that cannot be expressed in words, sentences, numbers or formulas, often because it is context specific. This also includes cognitive skills such as beliefs, images, intuition and mental models as well as technical skills such as craft and know-how. Thus it is inaccessible to others. It resides in the human mind. So it is hard to formalize, often even difficult to communicate. This type of knowledge can be seen in the behavior or action of a person.

The basic problem, of course, is that tacit knowledge is rarely recorded and shared in business organizations even though tacit knowledge may be the real key for getting things done.

5.3.2 Explicit Knowledge

Explicit knowledge is objective and rational knowledge that can be expressed in words, sentences, numbers or formulas (context free). It includes theoretical approaches, problem solving manuals and databases. Thus it is well communicable and available in some media. Further it can be categorized in 'Information' (specification) and 'Processes' (work instruction). As librarians and information professionals, we basically deal with explicit knowledge.

Besides the interaction of tacit and explicit, knowledge generates other types of knowledge that at certain periods remains tacit and at certain periods becomes explicit:

Externalized knowledge

This kind of knowledge is complex and initially remains tacit; however, its exposition can be seen in organizational products and process. One of the externalized aspects of tacit knowledge is the cognitive state that comprises beliefs, ideals, values, and mental models. These cognitive components, like any other aspect of tacit knowledge, are difficult to articulate and externalization is only seen in the development of products.

Multilocational knowledge

This knowledge can be found at two places - one within the organization and another outside the organization. Knowledge can be tacit or explicit depending on the source. The objective of knowledge management is to coordinate knowledge in such a way that it can be used in decision-making. This kind of multilocational knowledge, which is found in both forms, should to be converted into explicit knowledge. Thus the initial key to knowledge creation lies in mobilization and conversion of this tacit knowledge into a form of explicit knowledge.

Migratory knowledge

Migratory knowledge is knowledge that is independent of its owner or creator. As knowledge becomes more and more extensively codified, its capacity to move increases. But the transfer of knowledge should not lose the context and importance during the transfer. Codification means some kind of capture whether it is in documents, databases, pictures, illustrations, spreadsheets on a disk, e-mails, video tapes, or on a Web page on the corporate intranet. It is true that mobility of information is seen more in electronic format by the use of email, web pages and so on. So it is preferable to convert information into an electronic format.

Self Check Exercise

- 2) Describe the different types of knowledge and their characteristics.

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5.4 WHAT IS KM?

The knowledge available in the human mind is difficult to access and on the other hand the knowledge available in books or in other media is easily accessible. Here we are concerned about the academic knowledge, but besides, this there is administrative knowledge that is important in running the organization and taking day-to-day policy decision.

“The management process of:

- ensuring that the organization’s knowledge needs are met; and
- exploiting the organization’s existing knowledge assets.”

Thus, in the end we can say, KM is “maximum utilization of human (tacit), documentary (explicit) and corporate (corporate) knowledge for the improvement of an organization.”

Broadly speaking, the objective of KM is to manage knowledge contained in the human and documentary sources within and outside the organization to increase the productivity, such that

- Knowledge must be created in an organization and stored in an accessible repository;
- Knowledge should be shared within the organization as well as outside the organization;
- Change of culture from introvert to extrovert;
- Feeling of self learning; and
- Free flow of knowledge.

Value of Knowledge Management

In an organizational context, data represents facts or values of results, and relations between data and its context have the capacity to represent information. Patterns of relations of data and information and other patterns have the capacity to represent knowledge.

Knowledge Management enables the members of the organization to deal with today’s situations and effectively envision and create their future. A lot of repetitions can be avoided by having a knowledge base in the organization. If a particular situation is already addressed by someone and that is recorded, the same can be applied whenever similar situations arise, which avoids duplication of work.

5.5 NEED FOR KM

5.5.1 Sharing of Information

Research organizations and commercial organizations require heavy sharing of

knowledge, because they are productive. Sharing is required in order to catch production, as intellectual production in R & D organization requires sharing of research knowledge, while market oriented production in commercial organizations requires sharing of techniques and ideas in their projects. So, a lot of knowledge flow is sought in both types of organizations.

5.5.2 Decision Making

Another need of KM is decision making or policy making. KM acts as a tool for the policy makers of an organization, which assists them to take serious policy decision or day-to-day decisions. This is because it has knowledge base, which contains the decision on the same or related situations.

5.5.3 Access to Information

KM provides access to the information required by any of corporate bodies, executive or research oriented. It helps them to find the answer of their question or assists them in finding the answer. It may consist of database of literature, directory on literature or persons. It assists a researcher or executive whenever he/she requires information within the organization or outside the organization. A knowledge base can have links to the external sources too.

5.5.4 Economy

KM helps in saving resources through the proper communication among the researchers and executives. KM provides the knowledge within the organization or if needed outside the organization. So it avoids duplication of work. Even technology can be used for communication and thus transportation cost can be reduced.

5.5.5 Value Addition

Another important use of KM is value addition to the existing products or decisions. It helps to take the best possible decision, which has even futuristic approach and hence, the product will be value added and can do more than just fulfill the purpose. Through value addition and assistance in decision-making, it increases the institutional productivity.

Self Check Exercise

- 3) Justify the need of KM in an organization.

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5.6 DIFFERENCE BETWEEN INFORMATION MANAGEMENT AND KNOWLEDGE MANAGEMENT

The difference between Information management and Knowledge management can be anchored on a conceptual distinction between their respective objects:

information and knowledge. Information is a tangible representation of data or knowledge within a specific context. The key success factor is the effectiveness of the representation in communicating the information. Knowledge is information in the context of an individual's role, learning behavior, and experiences. The major steps that occur in the transforming of information into knowledge are learning, knowing, filtering, evaluating and balancing.

Knowledge is durable, general, abstract, theoretical, objective, context free, rule-like, expressed in the relationship between variables (the model).

Information is transient, specific, concrete, practical, subjective, context dependent, case-like, and expressed in the value of variables (the input/the output).

Compared to Information management, the main challenges of Knowledge management are not those of a technological nature, but organizational and cultural. That means KM is not a technical issue. KM is about how willing the organization is to allow people to learn and prosper, and how mature the organization is in implementing mechanism to make this happen. It is about openness and voluntary sharing of information and knowledge. It is about creativity and the freedom to experiment and fail, about creating a competitive working environment and a learning culture. And definitely, KM is a key to how top executives should run their business.

Knowledge management is designed to support and enhance the human communication and knowledge sharing processes. It is a team-enabling management style. This requires the development of strong and open team communications and of a knowledge sharing culture, supported by a coaching and facilitating management technology.

5.7 KM MODELS

5.7.1 Creation of Knowledge Base

There must be a knowledge base if we think about KM in an organization. This knowledge base can be in the form of database, or simply a physical repository. What should be stored and in which form is it to be identified is the first stage. Basically, for documentary resources, organizations can have a data pool where all research project knowledge has to be stored. The problem of management of tacit knowledge, which is in the human mind can be tamed to some extent by making a directory of experts or human resources. This directory can also be a database, where the expertise of a person can be recorded and retrieved on demand. This approach will facilitate the use of human resources within an organization as one can find out '*who is who*' and '*who is doing what*'.

In spite of having a knowledge base of research, projects and intellectual capital, there is the need for knowledge, which assists management to take decisions on policies. So an organization having a well laid out structure can think of a separate knowledge base, which should help the management. Such a knowledge base can also be differentiated as documentary and human base. This structure is recommended basically for distributed R & D and commercial organizations. It should be taken care to see that duplication is avoided. So the knowledge base must be relational in nature.

5.7.2 Active Process Management

Once it is decided what should be the categories of a knowledge base, the next step is what the content should be. Will the documentary knowledge base give the location of availability or the knowledge in full text? The second approach leads to the digitization of documents and thus creation of an in-house digital library. The content of human knowledge base should be the profiles of the persons concerned with specific areas of interests and positions in the organization. As soon as information arrives for addition to the knowledge base, it should be classified and then placed in the appropriate knowledge base category.

5.7.3 Development of Nodes

The nodes of storing and processing of knowledge should be clearly designed according to the requirements. If the organization is too big and has different centers then it is good to have a decentralized structure. But if the organization is small and needs more economy it can be centralized. If there are different centres then it is good to have a decentralized structure.

5.7.4 Rapid Change of Technology

The technology adopted should simplify the communication. If it is required video conferencing or teleconferencing should be adopted so that, the transportation cost can be reduced, and knowledge flow becomes continuous. Besides, the technology should be adopted to foster shared projects or research. So adoption of technology should be done within the organization's interest.

5.7.5 Knowledge Web

The culture of collaboration or sharing of knowledge should be incorporated in the system. If a person is unwilling to share, he/she can be persuaded to share. They should be educated for the positive side of such sharing. It is a good idea to provide incentives to those who share knowledge.

5.7.6 Weeding

It is one of the most important acts, which should be done periodically so that, unnecessary information can be removed. Since it is difficult to find which information is outdated, the best way is to have a centralized position where such information can be dumped and if by chance it is required, it can be retrieved. But such dumping should always be centralized because of economy.

5.7.7 Utility

If knowledge is available in the knowledge base it should be utilized to its best. The provision can be either in anticipation or on demand. The customization of such knowledge should be friendly to those who use it. These customized knowledge packages should contain relevant knowledge as well as pointers to the other knowledge sources.

Self Check Exercise

- 4) Identify the checkpoints to be considered in designing a Knowledge Management System.

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Structural Model for KM in Distributed Environment

It is not easy to plan a Knowledge Management System (KMS), which supports organizational decision-making and understanding. The model taken here is that of an organization, which has different centers at different locations. This model is well suited to distributed R & D as well as commercial organizations that have distributed centers or collaboration and are involved in different projects and R & D.

Since, designing such a model requires great care and attention, this model can be a first stage blue print of a proposed network, because KM system is a sequential activity of the following:

- Plan: It is the first stage of system development, where a model of the system is chalked out. This model is thus only the first stage of KM system development.
- Do: This is actually the implementation stage when the laid down plan is put at work. Here gathering, storage processing of knowledge is done.
- Outcome: The result achieved is the out come of such a plan after implementation.

So in the proposed plan the system is distributed and in this example only three centers or nodes are considered, but it can be even more. The proposed system can be an intranet working on the Internet backbone, using HTTP protocol and browsers or any other networking based solution. It should or should not be accessible to anybody outside the organization depending on the policy of organization.

In the first stage of plan, different centers can create the database of organizational knowledge.

The knowledge of an organization should be categorized in two major groups.

- 1) Academics/research/projects
- 2) Administration

Each individual group can be further categorized in

- Human resources
- Documentary resources

	Academic/Research	Administration
Human Resource	Profile of researchers should be created in a database. It should be done in order to capture the tacit knowledge. Even there can be further subgroups according to the specialization of experts.	Profile of administrators should be created in this knowledge base. The position held in present and past should be recorded. In most of the institutions or organizations academic or research personnel are also responsible for administration. So in that case the administrative or academic knowledge base profile should also contain the positions held, so that in a relational database environment redundancy can be minimized.
Documentary Resources	It can be knowledge base for the documents related to projects, books, and research reports. The option is whether the location of a document can be recorded or all the documents can be digitized. In the second effort a digital library can be prepared, and thus full text documentary knowledge can be available for the users.	This knowledge base shall be a full text collection of all the administrative reports, gazettes, policy decisions and so on.

In the second stage, all the centers can be connected through a network for organizational knowledge sharing. In order to have information about expertise outside the organization a centralized knowledge base can be created at any one of the nodes.

Thus the proposed system can be a decentralized system where knowledge bases will be distributed on different nodes and any node can access any other node. But still there can be one main server, which can handle additional knowledge bases like corporate projects, extra-organizational knowledge and weeded knowledge.

Functional Model of Knowledge Management Systems

The functional and compositional definition of Knowledge management system

is 'a system comprising the entire set of activities or functions from generation (to a certain extent) or location to dissemination of knowledge and then the loop of feedback and readjustment of the system.

In the words of Alian Godbout, the fundamental notion of management is to establish and execute a process, which is intended to achieve results. Although there are variations around the descriptions of the steps involved, it is basically cyclical and comprised of a planning/conceptual step, an organizing/resourcing step, an action/decision step, and a control/evaluation mechanism which provides the feedback/adjustment loop.

Knowledge management encompasses a very wide range of activities, links and tools. It is difficult to demarcate the modules and assign the tasks involved because many of the tasks are over-lapping or should be conducted in recursive loops. Simplifying the complex functional definition to a more work-driven one, the processes involved in KM can be enlisted as follows:

— As a set of activities comprising the following actions on knowledge

Development – acquiring, capturing, creating, discovering

Application – using, enacting, executing, exploiting

Assessment – appraising, evaluating, validating, verifying

Preservation – storing, securing, conserving, retaining

Updation – evolving, improving, refreshing, maintaining

Transfer/dissemination – communicating, deploying, disseminating, sharing

Transform/Re-packaging of knowledge – compiling, formalizing, standardizing, explicating, extracting.

The design aspect mainly depends on agreeing upon the boundaries that define KM. The solution perhaps is in marking the difference between 'information' and 'knowledge'. The two terms are often used as synonyms. But it is necessary in the light of KM, to note the difference.

The term "knowledge" is used to refer to processed information, the acquired skills and experience, the resources and the understanding that individuals need to perform complex jobs or solve a problem.

The recommended approach is a multi-perspective modeling approach. Several models need to be developed, each of which represents a different perspective on the organization which can be characterized as "How, What, Who, Where, When and Why"

- How the organization carries out its business - modeling the business processes
- What the processes manipulate - modeling the resources
- Who carries out the processes - modeling capabilities, roles and authority
- Where a process is carried out - modeling of the communication between agents
- When a process is carried out - this specifies the control over processes.

Taking into consideration the above discussion a model for KMS the functional model is illustrated in the figure 5.3.

The services that are rendered through the Knowledge Management System are mainly of two types:

- Active (in anticipation) or,
- Passive (on demand)

The nature of work involved is almost always in anticipation. Even more, the products both direct and indirect ones may have to be generated 'just-in-time' when the need arises.

5.8 ROLES OF LIBRARIES AND LIBRARIANS IN KNOWLEDGE MANAGEMENT

Definitely librarians easily fit into the framework of organizational model of KM. But there are certain things we should be very clear about before blundering into the Knowledge management. Looking at it from a point of view it a novice, you will find the heart of KM is nothing but the coordination of the components of organization for achievement of the goal of organization. The value of it increases in particular when there is a rapid change in the organizations working environment and work culture as well as in many cases the objectives too. That makes it more like a management kind of job. This involves managing documents as well as the individuals. As information professionals, we are more concerned with explicit knowledge or in other words we are more competent to handle the explicit knowledge than the tacit knowledge.

As Knowledge Management players, librarians understand better the ways in which people communicate their information needs and the patterns of information use. Unlike others, librarians are more conscious of resource sharing and avoiding duplication of work.

And of course, a Knowledge management team is not a one-man show. There are many components to it. These components belong to the areas such as Commerce, Management, Information Technology, Library Science and so on. The job of librarians here is to give the right information at the right time whenever and wherever it is asked. Thus we can conclude that librarians are an unavoidable element of the knowledge management team but it is difficult to say, at this point, if a librarian should head the knowledge management team without having the professional skills of management.

5.8.1 Role of Libraries in KM

5.8.1.1 Libraries Promote Knowledge Innovation and Management

Knowledge innovation is the core of the knowledge society. Libraries provide a base to research by collection, processing, storage and distribution of knowledge and information, and thus libraries become an indispensable element in the chain of knowledge generation procedure. Libraries create a link between information and the information seeker. These act as bridges between the information source and users and strengthen the flow of knowledge. Not only that, libraries carry out research for easy access of information using technology and developing knowledge resources.

Knowledge management not only makes libraries work on free flow of information, it further enhances the use and development of distributed networked system for production, diffusion and transfer of knowledge. In order to manage such a networked system three major aspects should be considered:

- Theoretical development
- Technical development and
- Organizational management

Theoretical development requires looking into the latest trends in resource sharing in library science. At this level a feasibility study should be undertaken to look at the practical feasibility of the proposal or suggestions made.

Technical management is to manage the network systems constructed by institutions and organizations that relate to the full course of technological development.

Organizational management is to create a set of effective organizational management systems adaptable to the requirements in the electronic library era to support and strengthen Knowledge Management activities.

In order to develop such systems we require to have leaders, who can take initiatives and formulate plans as well as coordinate all knowledge management related activities. The second approach is creation of Electronic resources or procuring them. The last step is to provide the services from these documents including distribution of documents to assist in decision-making.

5.8.1.2 Knowledge Dissemination Management

Knowledge dissemination is another area where libraries can work. Obviously the creator who creates the knowledge does not have time to disseminate it. The libraries can take initiatives to acquire knowledge from the creator and make it accessible to the users. But it is also difficult to pull all the knowledge from the creator's mind, as he himself cannot express many things. For the same, libraries can use various methods of standard representations.

Internet has opened a new horizon for information communication. But commercialization as well as its enormous growth has made the searching devices non-trust worthy as far the search results are concerned. Therefore, it is necessary to strengthen knowledge dissemination management in libraries as follows:

- Uninterruptedly strengthening the creation of the libraries' own document resources and deepening the development of document information resources;
- Continuously raising the quality of libraries' staff and strengthening continuous engineering education of working staff;
- Giving full play to the special role of the expert system in knowledge dissemination;
- Making a comprehensive utilization of all media to ensure security of operation of networks, and prevent online criminal activities and online dissemination of inappropriate information.

5.8.1.3 Knowledge Application Management

In the 21st century libraries should also attach importance to a provision of services for people to acquire knowledge and achieve maximum functions and efficiency of knowledgeable information. Therefore, knowledge services based on high-speed information networks should be carried out by:

- 1) The small scale organization with less funding finds it difficult to have an information centre. For such an organization libraries can create web-based libraries or virtual libraries thus facilitating the information use among the users.
- 2) The 21st century has shown the trend of having more and more web-based and online information provision. This whole activity involves user level customized information service systems such as information dissemination, information search and special supply of information; quickening the creation of digitized libraries; studying the methods, means and techniques of information distribution and search with the Internet as the base and WEB technique as the core.
- 3) The electronic libraries or digital libraries are the technical manifestation of developing trends in library services. This includes the distribution and creating a combined network of database of collection of different libraries including the list of periodicals and serials. Online provision of books could be also possible using such networks. Efforts should be made to make available the existing non-electronic collection to electronic format. But it is not so easy as it sounds because of existing Intellectual Property Right Laws.

5.8.2 Role of Librarians

5.8.2.1 Knowledge Maps

This involves constructing an actual map or yellow pages of a special database, which points to where the resources are available. Using the knowledge map it is possible to contact the resource person or access the required data. Quite a few companies like Microsoft, have used this idea to some advantage.

5.8.2.2 Acquisitions

Acquisition of documents from external sources, will be based on a list of topics denoting the missing areas of knowledge within the organization. The collection building should also be extended to knowledge available inside the organization. The librarian works with the knowledge team to survey the various in-house documents, to identify and 'digitize' those of archival and retrieval value. Technical organizations have a substantial collection of this kind- drawings, standards, reports and records of technical discussions.

5.8.2.3 Categorising

The knowledge located, inside or outside, has to be represented in a manner suitable for access or transfer. For this purpose, it has to be categorized in hierarchical schemes based on a controlled vocabulary. Obviously the librarian is the most suited professional for this task. An additional task is that of

coordinating and linking the various pieces of knowledge gathered by the respective technical departments, called knowledge communities.

This knowledge vocabulary task involves creation of thesauri, search tools and indices. This task is well within the realms of the librarian's skills.

5.8.2.4 Narratives

This involves extracting success stories and technical anecdotes from resource persons and diffusing them over a corporate network. Surprisingly this age old mode of dissemination has proved quite effective in certain companies.

5.8.2.5 Capturing Tacit Knowledge

It might be seen that the most difficult codification task pertains to tacit knowledge, as it is personal expertise built over the years, which cannot adequately be expressed in words. Yet it is a rewarding effort.

The traditional method of apprenticing juniors to veterans, so as to transfer their expertise before retirement, still holds good. Videotaping or DVD making of conversation and actions of technical 'veterans' is a possibility.

A hi-tech but expensive method is to employ multimedia computing and intranet hypertext methods.

5.8.2.6 Managing Databases

It is said that, for the tasks of maintaining the intranet, managing new inputs, user access control, etc., which can be viewed as extensions of circulation control, SDI, ...etc., the librarian is a good choice.

Self Check Exercise

5) What is the role librarians can play in Knowledge Management?

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5.9 PROBLEMS OF KM IN IMPLEMENTATION

KM is not an easy task. It poses several challenges:

5.9.1 Intellectual Capital

Knowledge is often tacit. The management of tacit knowledge is the biggest challenge for knowledge managers, because it resides in the human mind unexpressed and the boundary of such knowledge is fuzzy. It can be seen only in one's behavior. So it is very difficult to understand and codify what is there in one's mind.

5.9.2 Culture

Most of the people don't want to share their knowledge. This is mostly due to insecurity or narrow mindedness. Besides, there is another group, which is neutral and has the opinion not to interfere, thus it is neutral and away from knowledge sharing.

5.9.3 Obsolescence

Information is booming up and in this environment obsolescence is too rapid. There is information of many kinds which becomes obsolete as soon as it is generated. For example, Stock-exchange information. The difficulty lies on how to use the knowledge base, having such information. This type of knowledge base is ever changing and thus the earlier one becomes obsolete as soon as new information is added to it. So it is required to "push" such information to capable users for proper utilization. But the difficulty is, how to find a capable user and then, in what form should the information be "pushed".

5.9.4 Overloading

Knowledge gets accumulated, but we know that it becomes obsolete too, which is basically due to the obsolescence of information. So if obsolete information is not removed from the knowledge base it makes it overloaded with useless information. But the distinction between useful and useless information is difficult.

5.9.5 Technology

It is also difficult to keep track of changing technology. The obsolescence of KM tools is also high. Technology itself is not KM but it helps KM to a large extent. Besides the changing technology, the challenge is, how to simplify the communication of knowledge so that, whatever knowledge is available in an organization it will be easily accessible among the users.

5.9.6 Structure

Another challenge for KM is to define the structure of KM system, i.e. the structure should show overall economy. Often there is discussion for a centralized and decentralized system. Each has its pluses and minuses. In a centralized system, concentration of knowledge is always at a single nod. It has a great degree of economy, but side-by-side, it enhances traffic in only one point. While the decentralized approach is less economical it provides security from damage to data, and also provides easy access.

Self Check Exercise

- 6) Identify the problems for implementation of Knowledge management.

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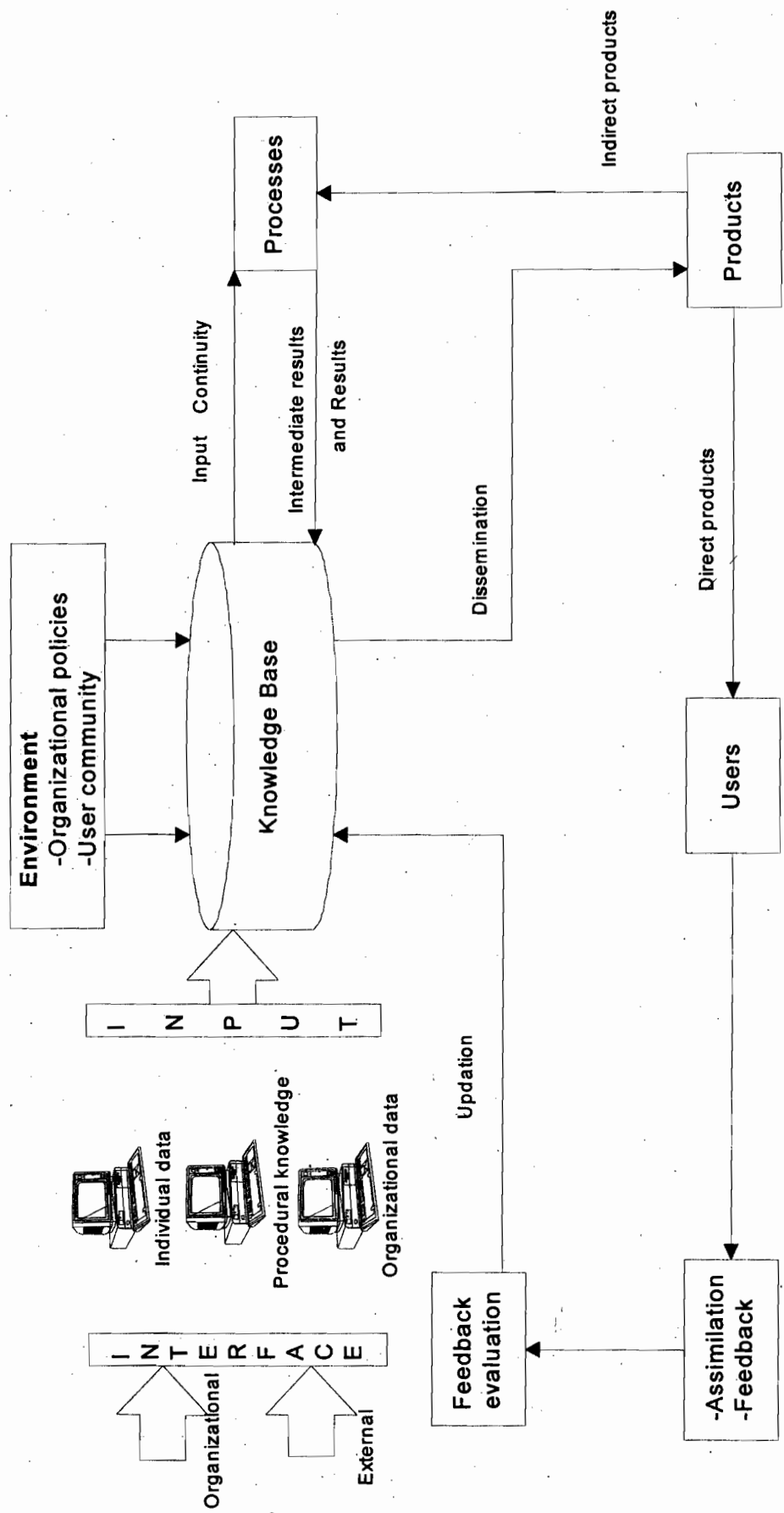


Fig. 5.2: A general knowledge management system

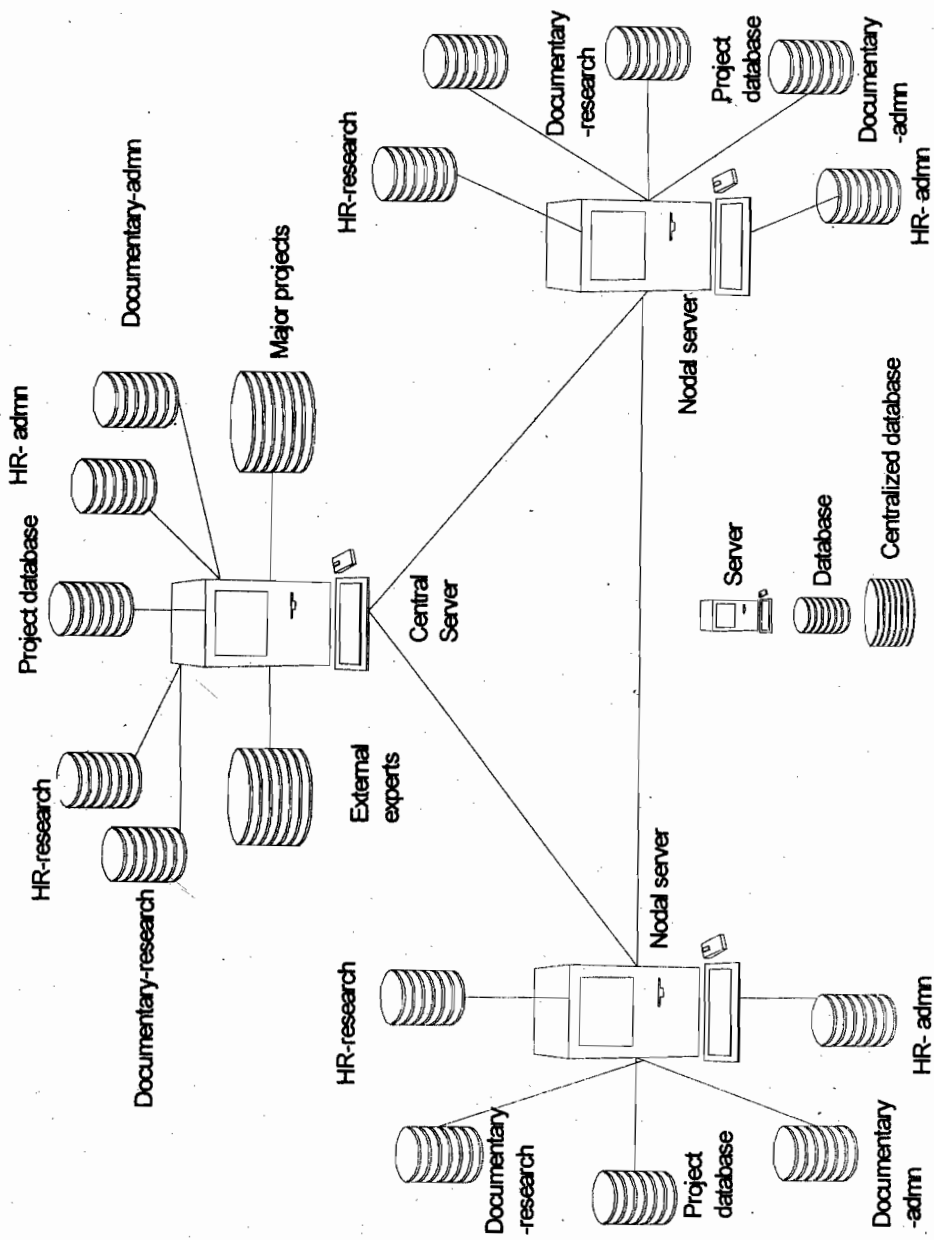


Fig. 2 Model Plan for KM Network

Fig. 5.3: Structural Model for KM in Distributed Network Environment

5.10 SUMMARY

Knowledge is a multidimensional entity. It has a complex structure. The basic unit of knowledge is data. Data is a simple fact and without context. Once the context is added to data it becomes Information. Information once accumulated, stored and used becomes Knowledge.

Knowledge, which resides in the human mind and is intangible, is known as tacit knowledge. Another category, which is stored and is tangible, is known as explicit knowledge.

Knowledge management is managing organizational knowledge to solve the corporate problems. It includes managing tacit as well as explicit knowledge.

There are many constraints in knowledge sharing like, culture, technology, information overloading and so on. Library and information professionals with skills in processing, organizing and disseminating knowledge are an indispensable part of KM.

5.11 ANSWERS TO SELF CHECK EXERCISES

- 1) Knowledge to become knowledge requires building blocks, which is nothing but information and information consists of Data. But this relation is not that easy as it appears. Data cannot become information as such, unless a context is added to the data. Data is nothing but raw facts. It simply exists and has no significance beyond its existence. It can exist in any form, usable or not. It does not have meaning by itself.

Information is data that has been given meaning by way of relational connection. Thus one should know the context and meaning in advance related to data. That is why information is always context dependent. When information is added to the human mind or say to the knowledge base of an expert system and forms a pattern, it becomes Knowledge. Thus Knowledge is the appropriate collection of information, such that its intent is to be useful. Knowledge is a deterministic process. When someone “memorizes” information then they have amassed knowledge.

- 2) Basically there are two types of knowledge: tacit and explicit.

Tacit knowledge

It is inaccessible to general people. It resides in the mind of people. Thus it is hard to formalize, even often difficult to communicate. This type of knowledge can be seen in the behavior or action of a person.

The basic problem, of course, is that tacit knowledge is rarely recorded and shared in business organizations even though tacit knowledge may be the real key to getting things done.

Explicit knowledge

It is easily communicable and available in some media. Commonly this type of Knowledge is tangible. For example, books, lectures, etc. Thus it

is formalized knowledge and readily available. Explicit knowledge can also be categorized in Information (Specification) and Process (Work instruction).

3) Knowledge management is an important component of an organization. An organization can be benefited in the following ways:

- **Sharzing of information** will be facilitated within the organization.
- **Decision-making** becomes easy because the availability of ready made data.
- The process of **Access of information** becomes handy as cooked and stored data is provided by Knowledge Management Centre of organization.
- It provides overall **Economy**.
- **Value addition** information can be served as and when it is asked for by users.

4) The following steps should be taken care of while designing a Knowledge Management Centre:

- Design and development of the knowledge base should be based on categories as required.
- Identification of content in terms of documentary as well as human resources.
- Development of nodal centres.
- Understanding the supporting and appropriate technology for the system.
- Creating motivation towards sharing of knowledge.
- Weeding out irrelevant information.
- Generation of services according to the organizational need in a person as well as in anticipation.

5) Librarians can play an active role as a member of the Knowledge Management Team:

- Creating Knowledge Maps to find out where what is available.
- Acquisition of documents from external sources.
- Categorizing the knowledge located, inside or outside, the organization for easy retrieval.
- Generation of knowledge vocabulary for standardization of terms for easy retrieval.
- Extracting success stories and technical anecdotes from resource persons and diffusing them over a corporate network.
- Capturing Tacit Knowledge.

- Maintaining managing databases, the intranet, managing new inputs, user access control, etc, which can be viewed as extensions of circulation control, SDI, ...etc., the librarian is a good choice.
- 6) There are many problems associated with creation of the Knowledge Management System.
- i) **Managing Tacit Knowledge:** The management of tacit knowledge is the biggest challenge for knowledge managers, because it resides in the human mind unexpressed and the boundary of such knowledge is fuzzy.
 - ii) **Culture:** It is even more difficult to manage information residing in the minds of those who are unwilling to share or who keep neutral.
 - iii) **Obsolescence:** Information is of many types, which becomes obsolete as soon as it is generated. One of the approaches is to push such information to users as soon as it appears but sometimes such pushing of information may annoy users who are unwilling to accept such information.
 - iv) **Overloading:** Identification and removal of information is another big challenge for those who are working with it.
 - v) **Technology:** It is difficult to keep track of changing technology. The obsolescence of technological tool for KM is very high.
 - vi) **Structure:** Identification of the structure of Knowledge Management System is another problem because the overall structure must show economy.

5.12 KEYWORDS

Data	:	It is raw fact.
Information	:	Context based data.
Knowledge	:	Appropriate collection of information, such that its intent is to be useful.
Tacit Knowledge	:	Knowledge, which resides in the human mind and is intangible.
Explicit Knowledge	:	Knowledge which can be expressed on paper, is verbal or of any other media and is tangible in nature.
Knowledge Management	:	Maximum utilization of tacit and explicit knowledge for improvement of organization.
Information Management	:	Storing documentary knowledge, processing and retrieving is known as Information management.
Model	:	Model is an exact replica of the actual and is used in simulation studies.

5.13 REFERENCES AND FURTHER READING

Amidon, Debra M. (2001). *Innovation Strategy for the Knowledge Economy*, Oxford : Butterworth-Heinemann, 2001.

Bellinger, Gene, Castro, Durval, Mills, Anthony. *Data, Information, Knowledge, and Wisdom*. <http://www.outsights.com/systems/dikw/dikw.htm>

Polanyi, M. (1993) *The Tacit Dimension*. London: Routledge & Kegan Paul.

Tiwana, Amrit (2000). *The Knowledge Management Toolkit: Practical Techniques for Building a Knowledge Management System*. New Jersey:Prentice Hall, 2000.

Robert M. Taylor, *Knowledge Management*.
<http://ourworld.compuserve.com/homepages/roberttaylor/km.htm>

Kochikar (V. P.). *Knowledge- the Currency of New Millenuim, Part2*.
<http://www.inf.com/corporate/thought-papers/knowledge.htm>

Miranda, G.F.; Ginestet, J.; Burr, J. and Timmermans, J. *Information manager and Knowledge manager: two jobs one role?*
<http://www.icml.org/posters/post38/poster38.htm>

Tripathi, Aditya (2000). "Knowledge Management: An Introduction to Plan a System", XIX IASLIC Seminar-2000.

Godbout, Alain J. *Information Vs. Knowledge: Small Contribution to an Old debate*. <http://www.3-cities.com/~bonewman/ajg-002.htm>

Madalli, Devika P, *Knowledge Management: A Shift in the Information Systems Paradigm* (Unpublished)

Enterprise Channel:(Relationship Management). www.ciol.com/content/services/ebiz/artdisplay.asp?thid=2&article=250

Shanhong, Tang. *Knowledge Management in Libraries in the 21st Century*. IFLA Council and General Conference Jerusalem, Israel, 13-18 August. <http://www.ifla.org/IV/ifla66/papers/057-110e.htm>

Bahra, Nicholas. (2001) *Competitive Knowledge Management*. New York : Palgrave, 2001.

Bellinger, Gene. *Knowledge Management Emerging Perspectives*. <http://www.outsight.com/systems/kmgmt/kmgmt.htm>

Bonafeild, Peter. *Knowledge Management Strategy at BT*. *Information Management*, 6(6), July/August, pp.26-29.

Boone, Mary E. (2001). *Managing Interactively: Executing Business Strategy, Improving Communication, and Creating a Knowledge-Sharing Culture*", (New York : McGraw-Hill, 2001).

Brown, John Seely and Duguid, Paul. (2000). *The Social Life of Information*, Boston : Harvard Business School Press, 2000.

Bysinger, Bill and Knight, Ken. (1996). Investing in Information Technology: A Decision-Making Guide For Business and Technology Managers. New York : Van Nostrand Reinhold, 1996.

Carroll, Michael L. (1996). Cyber Strategies: How to Build a Internet-Based Information System. New York : Van Nostrand Reinhold, 1996.

Cassidy (Anita). (1998). A Practical Guide to Information Systems Strategic Planning. Boca Raton : St. Lucie Press, 1998.

Chen, Rui (1998). The eighth stage of Information Management: Information Resource management (IRM) vs. Knowledge Management (KM), and the Chief Information Officer (CIO) vs. the Chief Knowledge Officer (CKO). *International Forum on Information and Documentation*, 23(1), January/March, 1998, pp.18-23.

Cross, Robert L. and Israelit, Sam B. (2001). Strategic Learning In A Knowledge Economy: Individual, Collective And Organizational Learning Process. Oxford : Butterworth-Heinemann, 2001.

Currie, Wendy and Galliers, Bob. (1999). Rethinking Management Information Systems: An Interdisciplinary Perspective, Oxford : Oxford University Press, 1999.

Davenport, Elisabeth and Cronin, Blaise. Knowledge Management: Semantic Drift or Conceptual Shift? http://www.alise.org/nondiscuss/conf00_Davenport-Cronin_paper.htm

Davenport, Thomas H. (2000). Mission Critical: Realizing the Promise of Enterprise Systems, Boston : Harvard Business School Press, 2000.

Davenport, Tom and Probst, Gilbert (2000). Knowledge Management Case Book: Siemens Best Practices, Munich : Publicis MCD Verlag and John Wiley & Sons, 2000.

Davis, Rob (2001). Business Process Modelling with ARIS: A Practical Guide. London : Springer, 2001.

Despress, Charles and Chauvel, Daniele (2001). Knowledge Horizons: The Present And The Promise Of Knowledge Management. Oxford : Butterworth-Heinemann, 2001.

Devenport, Thomas H. and Prusak, Laurence (1998). Working Knowledge: How Organizations Manage What They Know, Boston : Harvard Business School Press, 1998.

Downes, Larry and Mui, Chunka (1998). Unleashing the Killer App: Digital Strategies for Market Dominance. Boston : Harvard Business School Press, 1998.

Doyle, Diane and Toit, Adeline du. Knowledge Management in a Law Firm. *ASLIB proceedings*, 50(1), January 1998, pp.3-8.

Goldratt, Eliyahu M.(1990). The Haystack Syndrome: Sifting Information Out of the Data Ocean, Massachussettes, North River Press, 1990.

Grimshaw, David J. (2000). Bringing Geographical Information Systems into Business. 2nd ed. New York : John Wiley & Sons, Inc., 2000.

- Hackney, Ray Ed. and Dunn, Dennis. Business Information Technology Management Alternative and Adaptive Futures, London : MacMillan, 2000.
- Hallows, Jolyon E. (1998). Information Systems Project Management: How to Deliver Function and Value in Information Technology Projects, New York : American Management Association, 1998.
- Harvard Business School (1998). Harvard Business Review On Knowledge Management, Boston : Harvard Business School Press, 1998.
- Harvard Business School (1999). Harvard Business Review On The Business Value Of IT. Boston : Harvard Business School Press, 1999.
- Kinney, William R. (2000). Information Quality Assurance and Internal Control for Management Decision Making, Boston : Irwin McGraw Hill, 2000.
- Knowledge management. <http://www.aiai.ed.ac.uk/~alm/kamlnks>
- Koulopoulos, Thomas and Frappaolo, Carl. (1999). Smart things to know about Knowledge Management, Capstone US, 1999.
- Laudon, Kenneth C. and Laudon, Jane P. (2001). Essentials of Management Information Systems: Organization and Technology in the Networked Enterprise. 4th ed. New Jersey : Prentice Hall, Inc., 2001.
- Liebowitz (Jay) (1999). Information Technology Management: A Knowledge Repository. Boca Raton : CRC Press, 1999.
- Liebowitz, Jay (1999). Knowledge Management Hand Book, Boca Raton : CRC Press, 1999.
- Liebowitz, Jay (2001). Knowledge Management: Learning from Knowledge Engineering. Boca Raton : CRC Press, 2001.
- LIU Kencheng et. al. (2001). Information, Organization and Technology: Studies in Organizational Semiotics, Boston : Kluwer Academic Publishers, 2001.
- LU Qiwen (2000). China's Leap into the Information Age: Innovation and Organization in the Computer Industry, New York : Oxford University Press, 2000.
- Macdonald, Stuart (2000). Information for Innovation: Managing Change from an Information Perspective, Oxford : Oxford University Press, 2000.
- Malhotra, Yogesh.. Knowledge Organizations and Knowledge Workers: A View from the Front Lines. INTERVIEW WITH Maeil Business Newspaper. <http://www.brint.com/interview/maeil.htm>
- Marchand, Donald A. and Davenport, Thomas H. (2000). Mastering Information Management, London : Financial Times/Prentice Hall, 2000.
- Marchand, Donald A.; Kettinger, William J. and Rollins, John D. (2001). Making the Invisible Visible: How Companies Win with the Right Information, People and IT, Chichester, John Wiley & Sons, 2001.
- Marchand, Donald A. (2000). Competing with Information: A Manager's Guide to Creating Business Value with Information Content", Chichester : John Wiley & Sons, 2000.

McLeod, Raymond and Schell, George (2001). *Management Information Systems*, 8th ed. New Jersey : Prentice Hall, 2001.

Mertins, Kai; Heisig Peter and Vorbeck, Jens (2001). *Knowledge Management: Best Practices in Europe*, Berlin : Springer, 2001.

Meta data coalition Knowledge Management models in OIM.

<http://www.mdcinfo.com/OIM/kmm.html>

Miranda, G.F.; Ginestet, J.; Burr, J. and Timmermans, J. Information manager and Knowledge manager: two jobs one role?

<http://www.icml.org/posters/post38/poster38.htm>

Natarajan, Ganesh and Shekhar, Sandhya (2000). *Knowledge Management: Enabling Business Growth*, New Delhi : Tata McGraw-Hill Publishing Company Ltd., 2000.

Negroponte (Nicholas) (1995). *Being Digital*. UK : Coronet Books, 1995.

Neil M. (1999). The Knowledge Management Misnomer. IN *Knowledge Management*, December 1998/January 1999, p. 4.

Nickerson, Robert C (2001). *Business Information Systems*. 2nd ed. New Jersey : Prentice Hall, 2001.

Nonaka, Ikujiro and Takeuchi, Hirotaka (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, New York : Oxford University Press, 1995.

Nonaka, Ikujiro and Teece, David J. (2001). *Managing Industrial Knowledge: Creation, Transfer and Utilization*, London : Sage Publications, 2001.

Norris, Grant et. al. (2000). *E-Business and ERP: Transforming the Enterprise*. New York : John Wiley & Sons, Inc., 2000.

Prestoungrange, Gordon; Sandelands, Eric and Teare, Richard. (2000). *The Virtual Learning Organization: Learning at the Corporate University Workplace Campus*, London : Continuum, 2000.

Probst, Gilbert; Raub, Steffen and Romhardt, Kai. (2000). *Managing Knowledge*, Chichester : John Wiley & Sons, 2000.

AE Purba. Sanjiv (1999). *Handbook of Data Management*. New Delhi : Viva Books Private Ltd, 1999.

Reddi, C.V. Narasimha. (2001). *Public Information Management*", Mumbai : Himalaya Publishing House, 2001.

Ringbeck, Jurgen et. al. (1999). *Do IT Smart: Seven Rules for Superior Information Technology Performance*. New York : The Free Press, 1999.

Rosenberg, Marc J. (2001) *E-Learning: Strategies for Delivering Knowledge in the Digital Age*. New York : McGraw-Hill, 2001.

Rowley (J.). (1999) Owners of the Knowledge IN *Library Association Record*, 101(8), 1999, p. 475.

Schreinemakers, J. F.. Knowledge Management Organisation, Competency and Methodology" in *Proceedings of the fourth international ISMICK symposium*

- [ed. J. F. Schreinemakers], 21-22 October 1996, The Netherlands, Wurzburg, Ergon Verlag, 1996, p.309.
- Schwarzwalder (R.) (1999). Librarians as Knowledge Management Agents in *Econtent*, 22(4), 1999, pp. 63-65.
- Shanhong, Tang. Knowledge Management in Libraries in the 21st Century. 66th
- Shapiro, Carl) and Varian, Hal R. (1999). Information Rules: A Strategic Guide to The Network Economy, Boston : Harvard Business School Press, 1999.
- Skyrme, David J. (2001). Knowledge Networking: Creating the Collaborative Enterprise, Oxford : Butterworth-Heinemann, 2001.
- Smith, D.V.L. and Fletcher, J.H. (2001). Inside Information: Making Sense of Marketing Data, Chichester : John Wiley & Sons, Ltd., 2001.
- Sparrow (John) (1998). Knowledge in Organizations: Access to Thinking at Work, London : Sage Publications, 1998.
- Stead, William W. (1998). Information Management through Integration of Distributed Resources. *Bulletin of Medical Library Association*, 76(3), July 1998, pp.242-247.
- Stewart (Thomas A.) (1997). Intellectual Capital: The New Wealth of Organizations. London : Nicholas Brealey Publishing , 1997.
- Streatfield, David and Wilson, Tom. Deconstructing Knowledge Management. *ASLIB proceedings*, 51(3), March 1999, pp.67-71.
- Sullivan, Patrick H. (2000). Value Driven Intellectual Capital: How to Convert Intangible Corporate Assets Into Market Value. New York : John Wiley & Sons, Inc., 2000.
- Tim, Frederick W. (2000). "Winning the Information Game: Seven Steps to Market Domination", Provo : Executive Excellence Publishing, 2000.
- Tiwana, Amrit (2000). The Essential Guide to Knowledge Management: E-Business and CRM Applications. Pearson Education Asia, 2001.
- Vittal, N. and Mahalingam, S. (2001). Information Technology: India's Tomorrow, New Delhi:Manas Publications, 2001.
- Willard, Nick (1999). Knowledge Management: Foundation for a Secure Structure. *Managing Information*, 6(5), June 99, pp.45-49.
- Wilson, Owen (1998). Knowledge management: Putting a Good Idea to Work. *Managing Information*, 5(2), March 98, pp. 31-33.
- Zack, Michael H. (2001). Knowledge and Strategy, Oxford:Butterworth-Heinemann.
- Zytkow, Jan M. and Quafafou, Mohamed (1998). Principles of Data Mining and Knowledge Discovery: Second European Symposium, Berlin:Springer.