

Knowledge Management

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Defines knowledge management. Discusses its role. Describes its functions. Explains the principles of knowledge management. Enumerates the strategies involved in knowledge management. Traces its history in brief. Focuses on its interdisciplinary nature. Explains the steps involved in knowledge management i.e. identifying, collecting and capturing, selecting, organizing and storing, sharing, applying, and creating. Indicates to the pattern of knowledge management initiatives.

1. Introduction

Today we are living in the knowledge age. It started during 1990s. Information age, which was at its height between 1960 and 1990, has been superseded by knowledge age. The society of today can be labelled as knowledge society. The phenomenon is global, transcending national borders and territories. Development is dependent upon the ability to capture, share, distribute and manage knowledge. This is equally applicable to individuals as well as to organizations. Age-old dictums like "knowledge grows when shared and used" and "knowledge depreciates when not used" are becoming part and parcel of the behavioural patterns of peoples and organizations. Industrial organizations and companies are discovering that if they want to stay ahead in competition, or at least survive, they need to do better in capturing, distributing, sharing, preserving, securing and valuing knowledge. They need to get on the

information and knowledge superhighway in order to stay competitive. In this process, companies are metamorphosing into "Knowledge Organizations." They are establishing new positions to oversee and manage knowledge. These new positions are being referred to by designations such as "Chief Knowledge Officer", "Intellectual Capital Director", "Intellectual Capital Controller", "Intangible Assets Director", "Director of Lessons Learned".

It is apparent that the nomenclature such as "Librarians" and "Information Scientists" are missing in these designations, whereas librarians and information scientists have been managing knowledge since ages. They need to probe into this phenomenon. They need to understand the new perspectives of knowledge management. They need to imbibe the new methods, techniques and strategies of knowledge management into their course contents, training, learning and behavioural patterns. In this context, this article

aims at presenting a conspectus of knowledge management.

2. Intellectual Capital

Today what a company knows is as important as what it produces. This is why companies like Hewlett-Packard believe that "success in the marketplace is increasingly linked to an organization's ability to manage and leverage its intellectual capital—the intangible and invisible assets such as knowledge and competence of people, intellectual property and information systems".¹

Intellectual capital is also referred to as "knowledge assets" or "intangible assets". It may be defined as an asset that has been formalized, captured, and leveraged to produce a high-valued asset.² It includes human centered assets, intellectual property assets, infrastructure assets, and market assets. Human centered assets comprise the collective expertise, creative capability, leadership, entrepreneurial and managerial skills embodied by the employees of the organization. Intellectual property assets include know-how, copyright, patent, design rates, trade and service marks, and other related assets. Infrastructure assets cover those technologies, methodologies, and processes, which enable the organization to function.³

In other words, we can say that intellectual capital comprises knowledge assets regarding markets, products, technologies, and organizations that a business owns or needs to own and which enables its business processes to generate profits.⁴

3. Knowledge Management : What and Why

By the above discussion, it may be apparent that intellectual capital/knowledge is the most strategic asset for a company. It is the primary

source to stay in competition and also to sustain competitive advantage. As such it needs to be managed. Knowledge management can be defined as "the art of creating value from an organization's intangible assets".⁵ The managed knowledge should enable the members of the organization to deal with today's situations and effectively envision and create their future. The value of knowledge management can be better understood by taking two situations. Let us take the first situation where there is no access to managed knowledge. In this situation, every problem will be addressed based on what the individual or group brings to the problem with them. However, the situation will change when there is access to managed knowledge on demand. In such a situation, every problem will be addressed with the sum total of everything that has been ever learned about a problem of similar nature in the organization.⁶

Knowledge management provides access to experience, knowledge, and expertise that create new capabilities, enable superior performance, encourage innovation, and enhance customer value.⁷ Thus, it serves as an organization infrastructure that captures and leverages existing information and knowledge assets of the organization, facilitates information and knowledge dissemination across boundaries and integrates the information and knowledge into day-to-day business processes.⁸

According to Liebowitz and Beckman, "knowledge management covers : identifying what knowledge assets a company possesses, analyzing how the knowledge can add value, specifying what actions are necessary to achieve better usability and added value, and reviewing the use of the knowledge to ensure added value".⁹

And Macintosh¹⁰ considers knowledge management to be crucial for the following reasons :

- ◆ Competitive marketplace.
- ◆ Accelerating rate of innovations that need to be assimilated at an even faster rate.
- ◆ Increasing mobility among employees leading to loss of knowledge.
- ◆ Competitive pressures leading to reduction in the size of the workforce holding special and strategic knowledge.
- ◆ Majorities of the employees have less and less time to acquire knowledge. On the other hand, knowledge acquiring is a process needing more and more time.
- ◆ Sometimes a company may take decision to change in strategic direction. It may result in the loss of knowledge in a specific area. May be, after a lapse of certain period, the company reverses its policy and feels the need of the lost knowledge. Meanwhile, it may happen that the employees with that knowledge have left the organization.

3.1. Functions

The four basic functions of knowledge management are externalization, internalization, intermediation and cognition.¹¹

Externalization is capturing knowledge in an external repository and organizing it according to a classification system. Technologies like imaging systems, databases, etc. are used to capture knowledge and store it on line. Powerful search tools are used to identify similarities among separate information sources.

Internalization is extracting knowledge from the external repository and filtering it to identify

what is relevant to the knowledge seeker. The extracted knowledge is reformatted and presented to the seeker in the most suitable manner, perhaps with some level of interpretation. Intermediation focuses on the transfer of tacit knowledge. It links the people needing information in some specific subject with the people who appear to harbour knowledge in that area. Intermediation is automated through technologies such as GroupWare, Intranets, workflow and document management systems.

Cognition is the application of knowledge that has been gained/exchanged through the preceding three functions. It is the ultimate goal of management. There are a few technologies available to automate the process of cognition. Some those that exist employ an Expert system or use some component of Artificial Intelligence.

3.2. Strategies

Karl Eric Sveiby¹² has listed six-KM strategies. These are :

- ◆ Transferring information and best practices via IT systems. It means capturing an individual employee's tacit knowledge into software. Examples are : Best practices databases, Analytical models in spreadsheets.
- ◆ Capturing about customers. Here also IT systems are used to capture customer data. Examples are : Market information databases, FAQ databases, Customer profiles, and Sales support systems.
- ◆ Leveraging R&D into several applications.
- ◆ Creating more value from existing intellectual assets.
- ◆ Creating strategy focused on individuals' innovation and knowledge creation.

◆ Commitment to a knowledge focused strategy.

3.3 Principles

As far as principles of knowledge management are concerned, they lie scattered in the labyrinth of literature produced in the field. However, one commendable attempt in this direction is by Thomas H. Davenport. He has formulated ten principles. These are :

3.3.1 Knowledge management is expensive

Knowledge management activities require investment of money in the following areas :

- Capturing of knowledge
- Adding value to knowledge through editing, packaging and pruning
- Developing knowledge categorization systems
- Developing information technology infrastructure
- Educating employees on the creation, sharing, and use of knowledge

3.3.2 Effective management of knowledge requires hybrid solutions of people and technology

Knowledge management requires an environment in which both technology and people need to be used in complementary ways. Human beings are needed to understand knowledge, to interpret it within a broader context, to combine it with other types of information, and to synthesize various unstructured forms of knowledge. Computers and communications systems, on the other hand, serve well in capturing, transferring and distributing of highly structured knowledge.

3.3.3 Knowledge management is highly political

Knowledge is power. It fetches money and success. As a corollary to it, it is associated with lobbying, intrigue and back room deals. Astute managers of knowledge do accept it. They lobby for the use and value of knowledge. They broker deals between those who have knowledge and those who use it.

3.3.4 Knowledge management requires knowledge managers

Like labour and capital, knowledge needs to be managed. It may not be possible until some groups/persons have clear responsibility for this job. Knowledge management is not an easy task. It needs professionals for capturing and categorizing knowledge, establishing a knowledge-oriented technology infrastructure, and monitoring the use of knowledge.

3.3.5 Knowledge management benefits more from maps than models, more from markets than from hierarchies

The principle is concerned with the approach to be adopted in the collection and categorization of knowledge so as to make it easily accessible. Two approaches are possible. One is to create a hierarchical or analytico-synthetic model of knowledge. This approach has not paid dividends as expected. The other one is to let the market work. It means, firstly, to observe what knowledge gets requested using what specific term and, secondly, to map the terms used by users in a thesaurus like mechanism. This approach of mapping knowledge in a thesaurus has been found more satisfactory.

3.3.6 Sharing and using knowledge are often unnatural acts

Knowledge managers have to assume that it is a natural tendency among people to hoard their knowledge and look suspiciously upon that from others. Sharing and use of knowledge should not be taken for granted. Rather, it has to be motivated through time-honoured techniques such as performance evaluation, compensation etc. This is why many firms have now started to evaluate and reward personnel for knowledge sharing and use.

3.3.7 Knowledge management means improving knowledge work processes

In general, knowledge management process needs to be addressed and improved continuously. However, there are certain areas where knowledge is generated, used and shared intensively. These include market research, product design and development, and transactional processes like order configuration and pricing. They need more than enough attention.

3.3.8 Knowledge access is only the beginning

No doubt, access is very important in knowledge management. More than that, it requires attention, engagement and involvement. This can be achieved in many ways. One of the ways is to summarize it and then to report to others. The other one is to disseminate it through role-playing and games based on usage of the knowledge. Still another way is to receive knowledge through close interaction with the providers, especially, when knowledge to be received is tacit.

3.3.9 Knowledge management never ends

Knowledge management is a never-ending activity. There are many reasons for it. Firstly, the dimensions and categories of required knowledge are always changing. Secondly, new technologies, management approaches, regulatory issues and customer concerns are always emerging. Thirdly, companies change their strategies, organizational structures, and product and service emphases. Fourthly, new managers and new professionals have new needs for knowledge.

3.3.10 Knowledge management requires a knowledge contract

It involves questions relating to intellectual property. Is the knowledge in the heads of the employees the property of the employer? Is the knowledge of employees owned or rented? Further, as employees move more quickly to new jobs and new organizations, the question may arise whether their knowledge extracted and documented by the firm is their property or of the firm served by them.

4. Brief History of Knowledge Management

History of knowledge management can be traced in the writings of some notable management theorists such as Peter Drucker, Paul Strassmann, and Peter Senge. Drucker and Strassmann laid stress on the role of knowledge as organizational resource. Senge forwarded the idea of 'learning organization'.

1970s saw certain conscious attempts made by scholars to examine the facets of knowledge management. Notable among them are: research done by Chris Argyris, Christopher Bartlett, and Leonard-Barton at Harvard Business School; Everett Roger's work at Stanford in the diffusion

of innovation; and Thomas Allen's research at MIT in information and technology transfer. During this period, computer technology was also introduced in the field of knowledge management. As a result of it, some knowledge management systems were developed. One such system was designed by Rob Ackson and Don McCracken. It was an open distributed hypermedia tool. Another example is that of Doug Engelbart's Augmenting Human Intelligence System popularly known as AUGMENT. It was a hypertext/groupware application capable of interfacing with other applications and systems.

During 1980s, there was a steady growth in the development of knowledge management systems. These systems started to use the concepts and research work done in the field of Artificial Intelligence and Expert Systems. The phrase "Knowledge Management" became an established one in the dictionaries and lexicons. Books and articles began to appear in the field.

By 1990, several well-known U.S., European and Japanese firms had institutionalized knowledge management programs. Mid-1990s witnessed a spurt in knowledge management initiatives. The International Knowledge Management Network (IKMN) went online in 1994 and was soon joined by the U.S.-based Knowledge Management Forum and other KM-related groups. In 1994 itself, the IKMN published the results of a knowledge management survey conducted among European firms. As a result of it, the European Community began to offer funds for KM-related projects through the ESPRIT program in 1995. Today, knowledge management has become a big business for several international consulting firms such as Ernst & Young, Arthur Anderson, and Booz-Allen and Hamilton.

5. Cross-disciplinary Knowledge Management

Knowledge management is today a cross-disciplinary discipline. It draws from a broad spectrum of disciplines and technologies.¹⁴ These are :

- a) **Cognitive Science** : It provides insights into learning and knowing. These insights are proving to be of tremendous help in improving tools and techniques for gathering and transferring knowledge.
- b) **Artificial Intelligence and Expert Systems** : Tacit knowledge is crucial to knowledge management. Its extraction and organization is not an easy task. AI and related technologies have contributed a lot to this area of knowledge management.
- c) **Library and Information Science** : Knowledge management needs tools and techniques for organizing knowledge. In this connection, Library and Information Science has a rich body of research and practice to contribute to knowledge management.
- d) **Organizational Science** : This discipline is now explicitly dealing with the need to manage knowledge.
- e) **Technical Writing** : It is relevant to effective representation and transfer of knowledge.
- f) **Decision Support System** : Research work in this area has provided insights to knowledge managers in the performance of cognitive tasks.
- g) **Computer-supported Collaborative Work (Groupware)** : Since sharing and collaboration are vital to knowledge management, groupware technology has immense potentialities for knowledge management.

h) Relational and Object Databases : The models of relational and object databases are providing useful ideas to represent and manage knowledge resources.

i) Simulation : This technology is gradually becoming a component of knowledge management for learning and creating knowledge.

j) Other Technologies : These include Hypertext, World Wide Web, Full Text Search and Retrieval, Performance Support Systems, Object-Oriented Information Modelling, Help-Desk Technology and Electronic Publishing Technology.

6. The Knowledge Management Process

Knowledge management process involves seven steps/stages. These are identifying, collecting and capturing, selecting, organizing and storing, sharing, applying and creating.

6.1 Identifying

This stage is very crucial in the sense that it addresses strategic issues such as :

a) Determination of Core Competencies that are critical to success. A core competency may be defined as the bundle of expertise, tools and methods needed to produce related strategic capabilities for a product line or service.¹⁶ For example, every organization needs continuous flow of knowledge about its customer's needs and expectations, products and services, finances, processes, management, employees, and other organizational and environmental aspects.

b) Identification of Knowledge Domains to support core competencies. A knowledge domain is always identified as a narrow and well-bounded speciality, field, discipline, or subject matter.¹⁷ There are several reasons to identify

knowledge domains. Firstly, power lies in the relationships between pieces of data, information, and knowledge. Secondly, it is easier to build, enhance and ensure the quality of knowledge with the help of separate knowledge domains. Thirdly, Knowledge Repositories and Performance Support Systems can be built around knowledge domains. Fourthly, expertise can also be organized around each knowledge domain to support the growth and quality of Knowledge Repositories.¹⁸ Some of these domains under core competencies can be mentioned as :

Market : Industry, competition, pricing, suppliers, distributors and partners.

Customer : Needs, values, expectations, requirements, constraints, feedback.

Product : Features, functionality, cost, quality.

Service : Marketing, purchase, support and repair.

Process : Models consisting of steps with triggers, inputs, resources, outputs; and measures of cycle/work time, cost, value-added/non-value added, error/rework rate, internal and external customer satisfaction.

Management : Business strategy, workflow/process, workforce, assets and improvement.

Employee : Performance, skills, knowledge, career goals, interests, benefits and payroll information.

c) **Assessment of the Existing Levels of Expertise** in the workforce for each knowledge domain. This leads to the identification of gaps between existing and needed expertise. Once gaps have been identified, training needs of the workforce are determined. Consequently, domain experts, working together with training and IT professionals, start building educational programs and constructing Intelligent Tutoring Systems and Integrated Performance Support Systems (IPSS) to improve expertise and performance levels.

6.2 Collecting, capturing and selecting

Collecting stage is concerned with capturing knowledge. It deals with "acquiring knowledge, skills, theories and experience needed to create the selected core competencies and knowledge domains. In order to be useful, knowledge, expertise and experience must be formalized by making it explicit and capturing it electronically or on paper. In order to acquire expertise, valid knowledge sources must be identified".¹⁹

6.3 Knowledge sources

There are three sources of knowledge : formal, informal and tacit. Knowledge recorded on any media such as paper, audio and video or electronic is formal knowledge. Informal knowledge is the knowledge stored in the memories of individuals and organizations. Tacit knowledge resides in the unconscious minds of humans and in the culture of organizations. It is difficult to detect and elicit it, as it is not readily available for inspection, either through documents or discussions.

6.3.1 Formal knowledge

Formal knowledge is acquired from a

variety of external and internal sources. These sources can be identified as :²⁰

6.3.11 External Sources

- Publications : books, periodicals, reports etc.
- Industry advisory services
- Industry domain experts
- Commercial databases and expert systems
- Industry conferences
- Training courses, seminars and workshops
- Market feedback/data
- Customer feedback/data
- Supplier feedback/data
- Management consultants
- Academic research
- Benchmarking and best practices research
- Environmental monitoring and scanning of events, status and trends
- Internet search
- News media : print, TV, radio

6.3.12 Internal Sources

- Domain experts in the organization
- Internal customers and suppliers
- Organizational evaluations including measurement systems and Management Information Systems
- Processing, modelling and simulation
- Policies, practices and procedures
- Internal training and education
- Business future : mission, vision
- Business strategy : core competencies, IT, plans, forecasts

- Business reengineering
- Operational planning and budgeting
- Corporate governance : authority, roles and responsibilities and organization charts
- Organizational structures and work types
- Lessons learned
- Projects, initiatives, task forces
- Employees' suggestions
- Corporate newsletters

6.3.2 Informal knowledge

Informal sources of knowledge comprise employees, customers, suppliers, Stakeholders, regulators, government, industry and academia. They also include communication systems such as grapevines, observable behaviours of leaders and workers, unwritten policies and reward systems. Informal knowledge needs to be converted into formal knowledge as soon as possible, lest it may be forgotten or lost.

6.3.3 Tacit knowledge

Tacit sources of knowledge include individual employee's expertise, memories, values and beliefs. They also include corporate culture and social and political norms. Extraction of tacit knowledge is not an easy task. Help is being sought from the disciplines of Artificial Intelligence and Cognitive psychology. As a result of it, some elicitation techniques have been developed. These techniques are used to extract and convert tacit knowledge into explicit and formal knowledge.

6.4 Capturing strategies

Knowledge is captured in three ways. The first is to purchase/buy it. The second one is to

rent knowledge and skills. The third alternative is to develop it. Daniel Tobin²¹ has suggested many ways as how to buy, rent and develop knowledge.

6.4.1 Buying Knowledge

- a) To hire new employees with the knowledge and skills
- b) To develop a partnership with another organization
- c) To outsource a function to another organization on permanent basis

6.4.2 Renting Knowledge

- a) To hire a consultant
- b) To obtain help from customers, suppliers, academia or professional associations
- c) To subcontract a work to another organization

6.4.3 Developing Knowledge

- a) To send employees to training outside of the organization
- b) To impart in-house education and training by developing their own programs
- c) To do in-house training by hiring outside experts
- d) To develop train-the-trainer programs

6.5 Selecting

Selecting implies a filtering mechanism used to determine the suitability of the collected items for inclusion in the Corporate Memory and related Knowledge Repositories. In other words, selection serves as the mechanism for quality control. Certain criteria are adopted for this purpose. Some of these can be mentioned as:²²

- a) Is it relevant?
- b) Will it add value to the knowledge domain?
- c) Does it represent accurate knowledge?
- d) Is this piece of knowledge already in the Corporate Memory?
- e) Will it help in locating, developing or creating missing knowledge?
- f) Will it help in identifying and resolving conflicting knowledge?
- g) Will it assist in establishing multiple views for unresolvable conflicting knowledge?
- h) Will it be of use in proving or improving uncertain knowledge?
- i) Does it contain insight?

6.6 Organizing and storing

Once knowledge has been selected, it needs to be organized and represented for storage and retrieval. It has been already made clear in the preceding sections that knowledge exists in three forms—formal, informal and tacit. Informal and tacit knowledge must be formalized in explicit forms such as text, data, images, charts, tables, cases and rules so that it can be read, interpreted, discussed and applied. Then only it can be stored and distributed on paper or electronically through Knowledge Repositories.

A Knowledge Repository is an online computerized system containing expertise, knowledge, experience and documentation about a particular knowledge domain/expertise. Several Knowledge Repositories constitute Organizational Memory. About knowledge domains, we have already

discussed in section 6.1. An Organizational Memory may include knowledge on :

- Knowledge sources
 - Plans and schedules
 - Procedures
 - Principles, guidelines
 - Standards, specifications
 - Policies
 - Causal models
 - Workflow
 - Data stores
 - Decision rules
 - Performance measures and other data
 - Worked cases
 - Stakeholders and customer profiles
 - Products and services
 - Domain workforce profiles
 - Current state assessments and learnings
- All these represent different kinds of knowledge. The question arises whether these different kinds of knowledge can be organized and represented by the same system of knowledge representation. No doubt, Library Science has claims to such systems. But hardly any experimentation with these systems has been attempted in the field of Knowledge Repositories. On the other hand, Knowledge Repositories have been found using a number of different knowledge representation schemas.

Kinds of knowledge	Schemas
Databases	Relational, Network, Hierarchical
Text	Hypertext, Form Templates
Worked Cases	Worked cases serve as examples for decision-making and problem solving. A case is represented as a problem situation depicting its attributes and values as well as solution. This representation works by comparing a new situation with the existing cases in the casebase and retrieves the most relevant case as a guide.
Decision Rules	Pieces of knowledge are organized into if and then statements/rules. Inference engines are used for reasoning. The inference engine applies the rules in two ways. One is called "Forward Chaining" and the other "Backward Chaining". One major issue to be sorted out in rule system is conflict resolution. It arises when several rules are applicable to a given situation. The problem is solved by adopting conflict resolution strategies.
Images	Digitized images and video
Workflow	Process maps
Other types of knowledge	Knowledge representation schemas such as Semantic Networks, Frames, Scripts, and Conceptual Dependency are used when a consensus framework of concepts and objects exists in the domain. These systems revolve around the concept of structured objects. A structured object is regarded as an ideal model of the object or situation with which objects being studied are compared. An object is considered to have a number of attributes. As such, these systems reflect the attributes of objects. Moreover, they also define relationships between the objects in terms of class hierarchies and causation. These systems can represent all types of knowledge.

Each of these representation systems has two components. One is known as knowledge structure. The other one is called reasoning mechanism. Knowledge structure organizes the items of knowledge into a structure determined by the system. Reasoning mechanism manipulates the knowledge structure to produce outputs and inferences. For example, databases need query languages; text-based systems use hypertext links and key word search; rule-based systems use inference engines.

6.7 Sharing

Sharing means retrieving knowledge from the Knowledge Repositories and making it available and accessible to users. It needs efficient query languages, browsers and navigation systems. The simplest form of sharing is when an individual navigates through Knowledge Repositories and retrieves what he needs. A higher stage than this is when the workers make their needs and interests known to the Organizational Memory which then automatically distributes new

incoming knowledge to workers according to their needs and interests. A still higher stage involves sharing ideas, opinions, experience, and knowledge between individuals, teams and organizational units. This type of sharing is mostly done through the use of such technologies as telephone, fax, voice-mail, e-mail, groupware and audio, video and computer conferencing. IT is very crucial to knowledge sharing, making it available anywhere, any time, and in any form. Periodic domain conferences also add to sharing of knowledge.

6.8 Applying

Applying involves using the retrieved knowledge in solving problems, performing tasks, making decisions, researching ideas and learning. Application is very prominent when an organization goes for business reengineering project. Such projects are undertaken when large-scale changes are needed to be made in the production or customer service process. Amount of knowledge required for reengineering can be gauged by the remark of Beckman²³ that says "reengineering is the fundamental rethinking and radical design of an entire business system to achieve dramatic improvements in customer value and organizational performance."

Application of knowledge in performing tasks is monitored by establishing Integrated Performance Support Systems (IPSS). Actually IPSS is an Expert System. It provides the employees information, advice, training, job aids, reference and administrative and personal resources in performing a task.

7. Creating

Knowledge, when used and applied, may result in the creation of a new piece of

knowledge. This new knowledge also needs to be captured and incorporated in the Organizational Memory. There are always many avenues in an organization through which new knowledge creation is possible.²⁴ These include:

- Customer feedback and analysis
- Causal analysis
- Benchmarking and best practices
- Business reengineering
- Environmental monitoring
- Competitive intelligence
- Knowledge elicitation from experts
- Lessons learned
- Exploration and experimentation
- Creative thinking
- Automated knowledge discovery and data mining

Knowledge discovery applies techniques from various fields such as Statistics, Online Analytical Processing, Causal Modeling and Machine Learning. It enables to identify new, valid and useful patterns in data. Data Mining is the key to knowledge discovery. It helps in identifying trends about a domain, which leads to better predictions. Data Mining involves operations such as classification, regression, clustering, summarization, dependency modeling and change and deviation detection.

8. Knowledge Management Initiatives

Today knowledge management has become a forceful movement spreading from one company to another. Newer and newer initiatives are being taken by companies. Karl Eric Sveiby²⁵ has grouped these initiatives under three

categories, namely, external structure initiatives, internal structure initiatives and competence initiatives. External structure initiatives comprise gaining knowledge from customers and offering customers additional knowledge. Internal structure initiatives include building knowledge sharing culture, creating new revenues from existing knowledge, capturing individuals' tacit knowledge and measuring knowledge creating processes and intangible assets. Competence initiatives encompass creating careers based on knowledge management, creating microenvironments for tacit knowledge transfer and learning from simulations and pilot installations.

9. Conclusion

To conclude, it may be reiterated that knowledge management is the art of creating value from an organization's intangible assets. Human centered assets, intellectual property assets, infrastructure assets and market assets comprise intangible assets. Knowledge management process involves certain steps such as identifying, collecting, selecting, organizing and storing, sharing, applying and creating.

Knowledge management is crucial to an organization. It should enhance an organization's ability and capacity in four dimensions viz. mission, competition, performance and change. Mission involves what is an organization trying to accomplish? Competition means how is an organization trying to gain a competitive edge? Performance implies how does an organization deliver the results? Change denotes how does the organization cope with change?

Extraction of tacit knowledge is a challenging area of knowledge management. Techniques

adopted from the fields of Artificial Intelligence and Cognitive Psychology are proving fruitful in this area.

Last but not the least, information technology is critical to knowledge management in capturing, organizing, sharing, applying and creating of knowledge. Artificial Intelligence disciplines such as Expert Systems, Knowledge Representation, Machine Learning have wide applications in the field of knowledge management.

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The Review is expected to contain the following :

1. A brief introduction to the field, or, as the case may be, the area of a field, to which the book under review belongs. The introduction will lay emphasis on the status of development in the field/area of a field, and indicate the link of the book to the stated development.
2. The purpose/aim of the book as stated in the Preface/Introduction, and assessment as to how far the purpose/aim is evident in the text.
3. A gist of the contents of the book; the specific subject-matter/topics dealt with; assessment as to the extent and coverage, and noticeable lacuna/lacunae in the contents.
4. An account of the treatment and exposition of the subject-matter/topics and assessment as to how far the treatment aims at an inextenso study or an in-depth study, or both. Comments on the exposition.
5. Besides assessments specifically in respect of items 2, 3 and 4 mentioned above, a general assessment of the merits and limitations of the book as a whole.
6. The assessments/comments should be, as far as possible, objective, that is, based on the evidence of the text of the book under review.