

Reading Material

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# **KNOWLEDGE MANAGEMENT: CONCEPT, ELEMENTS AND PROCESS**

## **Introduction**

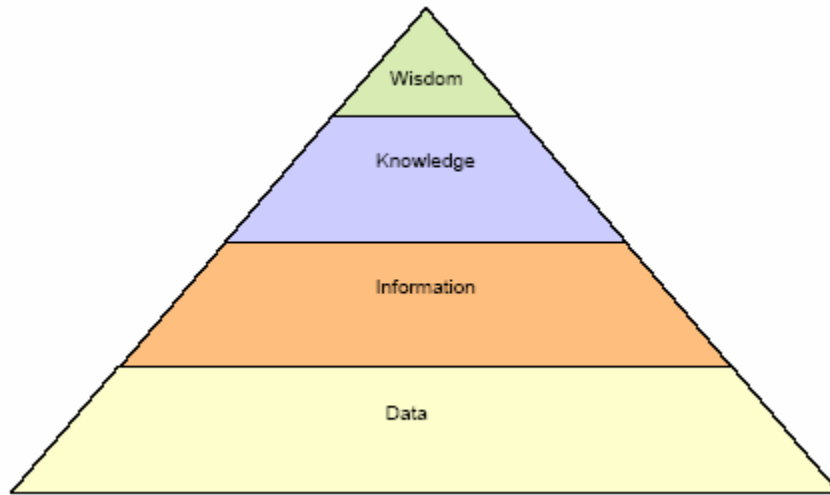
Knowledge management (KM) has been evolving as one of the prominent management concepts in recent years. Business and multilateral organizations are developing its processes, tools and techniques. It was born of the need to achieve better productivity and effectiveness from the intangible assets or intellectual capital of the organizations. Governments are also moving ahead to manage knowledge as a part of the development of public administration and an initiative to improve governance. Managing knowledge is not a new idea to an organization or a government. But the concept of KM as it is evolving focuses on the reinforcement of the established tools from the perspective of improving the management of knowledge resources (creating, storing, sharing, and transferring) within an organization and outside world. Efficient and effective management of knowledge is critical to secure benefits from the knowledge resources (data, information and knowledge) developed and obtained over a period of time.

## **Concept of knowledge and knowledge management**

Knowledge is basic to human being. We all possess some knowledge. Being a subject of everyone's interest, knowledge is susceptible to multiple interpretations. The following definitions might help to gain the perspectives of knowledge:

1. Awareness, consciousness or familiarity gained by experience or learning.'
2. Information and skills acquired through experience and education.
3. Knowledge is understanding the why, what, how, who, when, and relative to taking some action. Knowledge is the product of organization and reasoning applied to raw data.
4. Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knower. In organizations, it often becomes embedded not only in documents and repositories but also an organizational routines, processes, practices and norms.'
5. Knowledge is intrinsically a human characteristics manifested in the thinking, learning, artistic, behavioral, and problem solving capabilities of human beings acting in a social context.

The function of knowledge is to make a sense of things. Knowledge is high-value form of information that is ready to apply to making decisions and taking actions. It includes information, ideas, experience, insights and awareness. It is the synthesis of information or what we know or the state of knowing in-depth. Knowledge is often referred as the culmination of information about the context and the consequence of events. Information that has a purpose or use is knowledge.



Data leads to information and information leads to knowledge which confers a capacity for effective action. KM involves the mental processes of comprehension, understanding and learning through one or more means such as application of knowledge and skills, education, self-study, observation and dialogue. Its main features are as follows:

- ◆ Knowledge is the core of human competence. The skill to identify critical knowledge resources and use them in an objective manner enhances competence, develops self-confidence and leads to effectiveness.
- ◆ Knowledge is built and enhanced through education, training, work experience, dialogue, participation and social interactions.
- ◆ Knowledge is used to improve performance and to solve problems and contributes to career and personality development.
- ◆ Knowledge should be constantly reviewed and updated to make it relevant and effective.

The notion of knowledge may be different in the context of an institution and an individual. Institutional knowledge is the collective knowledge of all members of an institution. It is the combination of ideas, understanding and lessons learned over a period of time and accessible to

the future members of the institutions. It encompasses information that has practical value in making decisions, performing tasks and evaluating the results of performance. An individual gains and enhances knowledge through multiple processes including constant and meaningful application of skill and intelligence in performing specific tasks, continuous learning, social interaction and analyzing performance results. It is an aggregate of capabilities built through experience, applying skills and accessing knowledge resources. It is applied to accomplish tasks, to make decisions, to advance career and to achieve higher productivity.

Knowledge can be general and specific, tacit and explicit.

- ❖ Specific knowledge – implies the knowledge created and advanced through study, training and working in a specific institution and work environment over a period of time. This knowledge contributes in achieving specialization.
- ❖ General knowledge – means the knowledge gained through the process of socialization, education, self-study, and observation. It helps to widening the vision of an individual but does not focus on specialization.
- ❖ Explicit knowledge – refers to knowledge that can be expressed, captured, documented and maintained in the forms of records and publications. Knowledge that is more or less explicit can be embedded in procedures or represented in documents and databases and transferred with reasonable accuracy.
- ❖ Tacit knowledge – means to a hidden type of knowledge that is gained through socialization, observation, on-the-job training, and mentoring and joint activities such as meetings and teaming up for a project and interaction with environment. It is highly personal and hard to formalize. It deals mainly with communication and collaboration between people. ‘The challenge inherent with tacit knowledge is figuring out how to recognize, generate, share and manage it.’ Subjective insights, intuitions and hunches fall into this category. ‘Tacit knowledge is personal, context specific knowledge that is difficult to formalize, record, or articulate: it is stored in the heads of people. It is mainly developed through a process of interaction, debate, and trial and error encountered in practice.’ Such knowledge can be transferred from one person to another through extensive personal contact, experience sharing and story telling.

Good combination of factual, contextual, procedural and social knowledge makes individual and institutional knowledge comprehensive, relevant and effective.

1. Factual knowledge means knowing the fact (what happened and what was the consequence, result or output). A person who was involved in a specific event or had witnessed that event possesses such knowledge.
2. Contextual knowledge implies knowing the context of any specific event or decision. A person who was involved in the process of developing a policy, program or interactions with related parties and implementation process possesses such knowledge.
3. Procedural knowledge refers knowing the procedures to be followed or to be adopted to perform a task. Compliance with established procedures to ensure rule of law and legitimacy of the works accomplished. Fundamentally all those who are involved in the implementation are expected to have the knowledge of procedures to be complied with because of the accountability requirements to be met at various stages of development, approval and implementation of a policy, program or project or delivery of goods/services. People with the supervisory responsibility should be thoroughly aware of the procedures to be followed.
4. Social knowledge implies knowing those aspects which helps in understanding and addressing social issues such as the skill of building networks, managing social interactions and negotiations among competing forces.

KM is the art of creating value from an organization's intangible assets. It is the disciplined way of connecting people with knowledge resources and the process of applying intellectual capital effectively to enable to make informed decisions. KM is defined in different ways. Some of its definitions are as follows:

1. Knowledge management is the way organizations create, capture, enhance, and reuse knowledge to achieve organizational objectives. The word management is a misnomer, as knowledge cannot be managed. What needs to be managed are the processes by which knowledge is created, acquired, stored, acquired, validated, disseminated, and applied.
2. Knowledge management can be viewed as the process of identifying, organizing and managing knowledge resources.
3. Knowledge management is an organized effort to espouse, develop and support a program of change to create and operate a knowledge environment within an organization.
4. An integrated, systematic approach to identifying, managing and sharing an organization's knowledge and enabling persons to create new knowledge collectively and thereby help achieve the objectives of organization.

5. Knowledge itself cannot be managed, but the environment, in which, it is created and shared can be managed. In this respect, knowledge management can be defined as the creation and the effective organization and use of knowledge for development results.
6. Systematic approaches to help information and knowledge emerge and flow to the right people, at the right time to create value.

#### Knowledge Management (KM) Definitions

Author	Definitions
Wigg (1997:7)	KM is the systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprise's knowledge-related effectiveness and returns from its knowledge assets.
O'Dell and Jackson (1998:4)	KM is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance.
Darroch and McNaughton (2000:6)	KM is the management function that creates or locates knowledge, manages the flow of knowledge within the organization and ensures that knowledge is used effectively and efficiently for the long-term benefit of organization.
Turban <i>et al.</i> , (2003)	KM is the process of accumulating and creating knowledge, and facilitating the sharing of knowledge so that it can be applied effectively throughout the organization

By summarizing the above definitions, KM can be defined as a systematic and integrated process of creating, analyzing, storing and disseminating knowledge resources, intangible assets or intellectual capital. These assets may include structured databases, textual information such as policy and procedure documents, and most importantly, the tacit knowledge and expertise that reside in head of people.

In 2002, the Organization for Economic Co-operation and Development (OECD) launched a survey of KM practices of ministries/departments/agencies of central government in member

countries. The survey used the term 'knowledge management' loosely to refer to a broad collection of organizational practices related to generating, capturing, disseminating know-how and promoting knowledge sharing within an organization, and with outside world, including:

- Organizational arrangements (decentralization of authority, opening up bureaucratic divisions, use of information and communication technologies etc.);
- Personnel development (mentoring and training practices, mobility etc) and management of skills;
- Transfer of competencies (database of staff competencies, outline of good work practices etc.);
- Managerial changes and incentives for staff to share knowledge (staff performance, assessment and promotion linked to knowledge sharing, evolution of the role of managers, etc).

### **Need for Knowledge Management**

KM helps an organization to better acquire, store and utilize knowledge resources and to gain insight and understanding from its own experience. The KM ensures that decision maker has the best information available. It encompasses the process of identifying, organizing and managing knowledge resources which include explicit knowledge (information), know how (learning capacity), know who (customer capacity) and tacit knowledge in the form of skills and competencies. It encompasses the processes of

(a) the systematic, explicit and deliberate building, renewal, and application of knowledge resources for an institution's interests,

(b) securing return from knowledge resources. KM empowers many minds and provides benefits to the organization by helping people to work together. Its main features are as follows:

- (a) KM is about behavior, culture, learning attitudes and trust among people. Its motive is to better acquire, store and utilize knowledge. It depends on the competencies of human resources, their intuition, ideas and motivations. Mutual trust must be built and sustained to encourage efficient knowledge sharing and transferring.
- (b) KM is systematic and objective. The overall purpose of KM is to boost the efficiency and effectiveness of organization by creating, obtaining (receiving), analyzing, verifying, storing, preserving, retrieving and disseminating knowledge resources systematically. It supports organizations to achieve their goal by managing and using information that is

most meaningful, practical and purposeful. KM is inextricably linked to the strategic objective of the organization.

- (c) KM is ever-changing. The management of knowledge is an on-going process. Change is inevitable in an organization's life. Knowledge resources identified as critical at a certain point of time may not remain equally relevant due to a number of reasons in course of time. Therefore, knowledge resources should be constantly reviewed, tested and updated to stay relevant.
- (d) KM is value-added. KM adds value by supporting organizations to achieve their goals by providing reliable and relevant knowledge resources at the time of need and preserving those resources in a systematic manner.
- (e) KM is complimentary. KM plays complimentary role in enhancing organization's effectiveness. It supports the management of other resources of an organization by supplying critical information and preserving knowledge resources developed in course of time.

There is some degree of misunderstanding in KM practitioners on its scope. Some of them consider that KM has to do is only with

- (1) databases, and
- (2) information and communication technology (ICT).

Databases and ICT are definitely critical to KM, but not limited to these two elements. 'KM requires cultural change and it is certainly not just the automation of processes.' Policy, people, process and technology are the integral elements of KM. Its main aspects are knowledge sharing and transferring.

- a) Knowledge sharing – It is about stimulating the exchange of experiences, ideas and thoughts between people through social interaction. Sharing of knowledge among colleagues and organizing debates helps to refine and enrich knowledge. 'The human factor in knowledge sharing focuses on the drivers that trigger people to do what they do, on the possible levels of a person, and on the roles an individual play in an organization.' Three conditions (social, organizational and technological) support in sharing knowledge. Social conditions imply motivation, values, attitude, moods, emotions, skill levels and roles. Organizational conditions refer to strategy, structure, systems, and style and shared values in organizations. These elements significantly determine how a particular

organization plans to share the knowledge resources among its members to empower them and to enhance their skills. Technological conditions imply knowledge repository, knowledge route map and platform for sharing knowledge. A major tool of knowledge sharing is ICT which connects people or with the sources of explicit knowledge.

b) Knowledge transfer (KT) - It is the process of transferring ideas, knowledge and understanding from one person to another. It makes potential users aware of knowledge and/or technology opportunities and helps support, facilitate and accelerate its evaluation and eventual utilization. It involves two actions:

(a) transmission (sending or presenting knowledge to a potential recipient), and

(b) absorption (understanding of transmitted knowledge).

Knowledge that is not absorbed by the recipient is not transferred in real sense. Efficient absorption contributes in enhancing recipient's performance.

### **Trends in Knowledge Management**

Knowledge is important because it makes people and organization powerful. No organization can be better than its people. Knowledgeable people are respected and requested for consultation and advice. History has shown that an organization and a state can prosper by the support and dedication of its people and their knowledge not by the quantity of resources they own. People and organization managing knowledge (reviewing and updating knowledge resources periodically) and using them efficiently contribute substantially in raising the standards of living. 'Understanding how people and societies acquire and use knowledge – and why they sometimes fail to do so – is essential to improving people's lives – especially the lives of the poorest.' Lack of knowledge and skill to use available resources and capability to develop resources are the major reasons of backwardness. In the modern age of information, knowing is winning. 'Knowledge and innovation have played an important role in the development of society throughout history. The key to economic success is always linked to the advances in knowledge creation and innovation and the ability to translate that knowledge into products and services.' Change is an inevitable and an on-going process. Rapid changes in internal and external environment have posed serious challenges to modern organizations. Efficient management of knowledge resources and securing optimum benefit from those resources is one of the ways of staying relevant. The cost of creating and capturing knowledge may be very high. Efficient

management of knowledge can save time and resources. Organizations that succeed KM consider it as an effective tool for the creation, retention, sharing and transfer of knowledge.

The major motivations for focusing on KM are:

(a) To achieve organizational efficiency,

(b) To stay ahead of the competition,

(c) To maximize organization's potential, and

(d) To manage intellectual capital which involves human, customer, structural and business intelligence.

One of the main contributors of success is responsiveness. Comprehensive understanding of stakeholders and their expectations and the availability of accurate and useful information tailored to the organization's needs is critical to enhance responsiveness. Continuous improvement in operational efficiency and productivity is essential to long-term growth. The key to economic success is always linked to the advances in knowledge creation and innovation and the ability to translate that knowledge into products and services. Gathering correct information and using them properly is critical to stay ahead of competition. The ability of an organization to innovate depends largely on the capacity of managing knowledge.

Good reasons to pay attention on KM are as follows:

- Technological breakthrough has made the world a global village. The concepts of liberalization and globalization and the adoption of the open market policies have promoted competition. Adopting and promoting measures that support in making organization competitive is the only way of survival. Knowledge is one of the main bases of competitiveness. The traditional factors of production (capital, markets and raw materials) remain important but increasingly secondary to knowledge in establishing competitiveness in the new global market place. Economists, development workers and business managers are seeing the birth a new global economy, where knowledge is outstripping material resources and capital as a source of wealth. Knowledge economy is a recently coined term that refers to the stage of economic growth in which knowledge, as opposed to land, labor, and capital, is the key factor of production.



- Every member of organization irrespective of position is required to make some decisions. Many decisions require historical and contextual information. Decision makers always look for information that helps them in making right decisions. A well functioning KM system supports in making useful information available for informed decision making.
- Institutions spend substantial resources in developing policies, strategies and making decisions of strategic importance. Some decisions may be implemented at various stages and by multiple units independently or in collaboration. Managers implementing decisions require credible data and information on the context and basis of strategies and decisions for planning, programming, budgeting, implementation, monitoring and evaluation purposes.
- An effective KM system contributes in:
  - (a) improving the level of performance by ensuring continuity and consistency in the ways of doing things;
  - (b) promoting transparency in decision making; and

- (c) saving resources in making decisions by retaining critical information; and
  - (d) Managing operations smoothly by bridging the information gap between the departing and incoming member of the organization.
- Organizations have to continue operations even people change. Systematic process of knowledge transfer helps new staff members to learn about the work procedures, resources and environment which contributes in enhance professional skill and adopting them in an efficient and effective manner.
  - KM protects intellectual capital from deterioration, augments intelligence and provides increased flexibility. Knowledge is applied to problem solving and learning, forming judgments and opinions; decision making, forecasting and strategic planning; generating feasible options for actions to achieve desired results.
  - KM helps networking to enable people to access knowledge resources developed by other regions and countries. This also helps learning what worked well and what not. International development institutions such as the UNDP, the World Bank (WB) and the Asian Development Bank (ADB) consider that such networking will be beneficial to its staff and also to member countries. Highlighting three dimensions of KM, Vice-President of the ADB says ‘to understand KM, it’s important to understand its three dimensions. One is to manage within ADB efficiently. For instance, if somebody is designing a project in Pakistan, that person should be able to look at similar project in Indonesia and benefit from its experience. The second dimension is to learn from DMCs. The third dimension is sharing knowledge among countries with ADB as a regional bank well positioned to be a broker.’

### **Knowledge management in government and international organizations**

As mentioned earlier, the KM is not a new concept and practice. Organizations were managing knowledge resources in records. KM concept gained prominence in recent years mainly because organizations realized that other resources can be more efficiently utilized and operations can be cost-effective if knowledge resources are well managed and supportive to their objectives. In addition, it was also recognized that having knowledge resources is not sufficient for development, but it must be constantly reviewed, updated and properly maintained to facilitate easy access. The aim of strengthening KM is to bring strategically important knowledge resources into effective and common use. ‘Governments are often thought to be late comers in management reforms, sometimes for good reasons such as policy continuity, the need to ensure

that good checks and balances are in place, or concerns for equity; often also because institutions, public processes of civil service rules are designed in such a way that management changes are more difficult to implement. The result of the OECD survey (2002) highlighted the importance of KM for governments mainly for the following reasons:

1. Knowledge has become a critical determinant of competitiveness for the public sector.
2. Private firms produce goods and services that are increasingly intensive in intangible capital, directly competing with the goods and services traditionally produced by the public sector.
3. Ageing civil servants and faster staff turnover also create new challenges for the preservation of institutional memory and the straining of new staff.
4. Increasingly knowledgeable citizens require governments to be on top of newly created knowledge, as it is increasingly rapidly produced by more differentiated actors.
5. Public policy goals have become more ambitious and complex than before.

Finland is one of the OECD countries where KM is advanced. Political, cultural and social factors are behind the success. Reform in public administration has been the part of political agenda which encompasses KM and strategies on information society, legislation focusing openness, making openness a commitment of public officials, carefully listening to the citizen's needs and be prepared to take their feedback for consideration are contributing factors.<sup>1</sup> International organizations are emphasizing on KM as part of the initiatives for managing development results and enhancing cost-effectiveness. The Asian Development Bank (ADB) states that its KM framework is based on the following guiding principles:

- (a) Fostering a knowledge-supportive environment – ADB considers that a corporate culture that values learning and knowledge sharing is essential to it. The KM framework aims to establish an enabling culture for effective knowledge management to promote staff contribution to knowledge activities, encouraging every staff member to be a knowledge worker.
- (b) Ensuring results orientation and continued improvements – The KM framework is designed to sharpen the results focus in undertaking KM initiative.
- (c) Enhancing operational relevance – To ensure that knowledge management initiatives will improve operational effectiveness, the KM framework will prioritize actions that have strong operational relevance.

In 1996, former President of the World Bank James Wolfensohn announced a change in the way the bank would accomplish its unchanging mission of reducing global poverty. ‘He contended that the bank should become a knowledge bank, as focused on disbursing the knowledge assets to poor and developing countries needed as it was about providing economic support for development projects.’ The vision of the knowledge bank focuses on the following:

- (a) Creating knowledge through economic and sector work research, through learning from the outside world and learning from successes and failures.
- (b) Applying knowledge through products and services.
- (c) Sharing knowledge with clients and partners.

The World Development Report, 1998 was focused on knowledge for development and concluded that knowledge has perhaps the most important factor in determining the standard of living. The WB assumes that ‘putting knowledge at the center of our development efforts will bear fruit in two areas.

The first is increased social benefits – the more effective provision of public goods, including better air and water quality, greater educational attainment and higher enrollments, improved health and nutrition, and expanded access to essential infrastructure. These benefits will accrue to the poor as well as to others in society.

The second is in better-functioning markets – for credit, education, housing, and land that more efficiently coordinate resources and allocate opportunities across society. These improvements will benefit the poor most, because they bear more than their share of the burden of information failures.’

UNDP recognizes itself as the UN’s global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life and the need of managing knowledge to improve its effectiveness. UNDP’s Knowledge Management Roadmap (April 2004) states ‘UNDP generates a wealth of development knowledge. Unfortunately, the organization does not know what it knows. It neither fully understands what its knowledge assets are, nor is it set up to leverage them to achieve maximum return. It has identified six priority knowledge gaps and target deficiencies in the organization’s ability to:

1. Leverage to global development and operational experiences more effectively;
2. Maintain consistently high professional standards for project design and development;

3. Attract, retain and ensure the continued professional growth of top-notch problem-solvers and practitioners;
4. Identify, convene and deploy the best possible teams for specific assignment, tasks and projects;
5. Tap the full potential of the virtual networks and other existing collaborative tools; and
6. Provide timely and thorough reporting on development impacts and results.<sup>ii</sup>

United Nations Economic and Social Commission for Asia and Pacific (UNESCAP) consider KM as an initiative to help attain its three objectives:

- (a) managing globalization;
- (b) reducing poverty; and
- (c) addressing emerging social issues.

The Office of Internal Oversight Services of the United Nations (UNOIOS) recently published a report on the thematic evaluation of knowledge management networks in the pursuit of the goals of the Millennium Declaration. According to the report, ‘there is no common understanding of KM or knowledge sharing in the Secretariat, and knowledge and information confused. Many develop KM strategy that typically outlines how the organization:

- ❖ Communicates knowledge about programs and projects within and outside the organization.
- ❖ Connects staff interested in cross-cutting topics to share ideas, help each other and move the organization’s understanding of those topics forward.
- ❖ Learns from projects that make learning accessible to people in other parts of the organization.
- ❖ Captures and organizes critical knowledge of staff as they transfer or retire.
- ❖ Ties knowledge sharing to organizational goals.
- ❖ Deepens and develops knowledge critical to the organization’s success.

Other international organizations engaged in the management of development cooperation have also initiated the process of strengthening KM to achieve their objectives in a more cost efficient and effective manner. Business organizations are focusing on KM to achieve optimum benefit from the investment they have made to develop intellectual capital and intangible assets and secure them from the affect of staff turnover.

## **Knowledge Management Benefits**

Knowledge Management benefits are significant in terms of intangible and derived tangible value to the organization and the stakeholder. Benefits are broadly classified in terms of knowledge benefits – faster access to best knowledge, intermediate benefits – promotes efficient operation and organizational benefits – faster innovation and productivity improvement, and improved customer service.

- ***Productivity improvement*** through operational innovation and excellence : KM enables organization to reduce cycle time for new product and service development, supply, installation etc., by preventing reinvention or duplicate activity and promotes concurrent working on a task through collaboration. This approach leads to savings and reduces costly mistakes.
- ***Enhanced value to Stakeholders'*** : Increased bottom-line and stronger revenue growth of an organization leads to satisfied employees and shareholders. Increased responsiveness to customer and partners leads to business innovation and quicker problem solving. KM enables organization to get predictive trends which lead to value added features in products and services results in customer success.
- ***Competitive advantage*** : KM enable organization to ***new opportunities*** – new markets, new products and services by systematic capture and sharing knowledge from both internal and external environment(customers, prospects, markets, competition, experts). Knowledge audit and mapping process enables decision maker to quickly respond to the business requirements.
- ***Efficient Human Resource management*** – organization can identify the real contributors, capture knowledge and introduce expert system for mission critical function and thereby reduce the vulnerability due to churning out of employees (resignation, retirement, transfer). ***Prevention of knowledge loss*** - knowledge retention. ***Out-sourcing is easier*** as the real knowledge is codified and not visible to the user.
- Improved decision-making : Auto creation of flags & Reports through

knowledge discovery and knowledge mapping process.

- Adaptability and flexibility.
- Maximization of knowledge re-use.
- Paves way for learning for better work and may require less direct supervision.
- Improved Quality – Product and services enhancements.
- Knowledge assets development – internal process and external knowledge.

## **Knowledge Management Process**

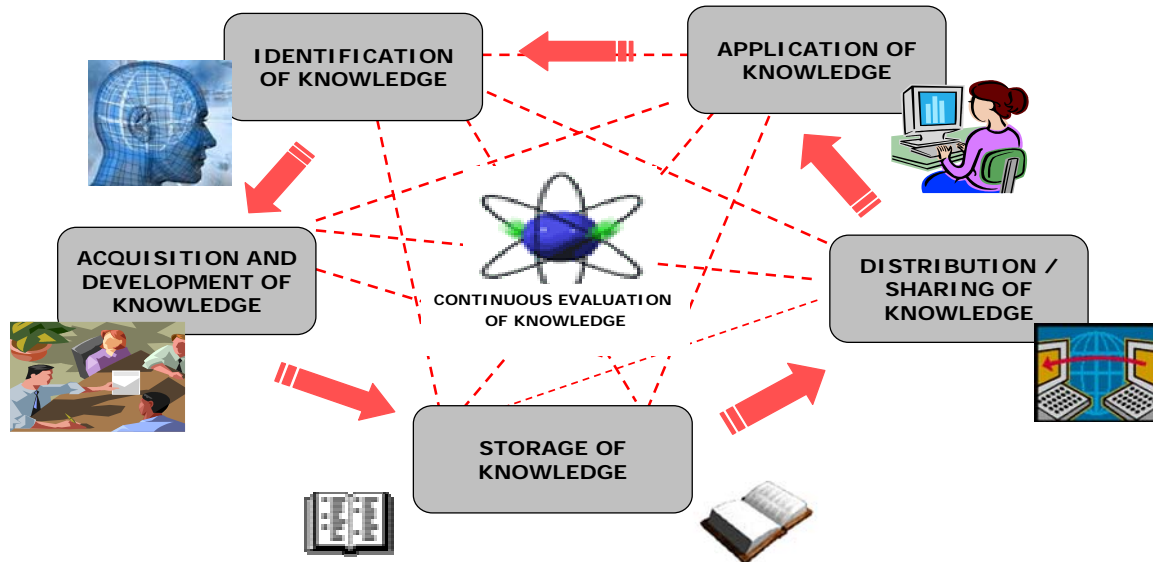
An organization can generate value from its intellectual and knowledge-based assets by managing those assets in a systematic and integrated manner. 'To get the most value from an organization's intellectual assets, knowledge must be shared and provide the foundation for innovation in products and services, enhanced employee retention, process improvement, strategic decision making, improved client relationships and greater prosperity.' Organizations need to create an environment of trust and collaboration to retain good employees, to share and to transfer knowledge. One step toward creating an environment of trust is to instill the sense of belongingness in the employees, and giving them more active role in building the future of their organizations. It makes them feel that they are making an important contribution to its success. Knowledge embodied in documents does not necessarily translate into useful and usable knowledge unless it is read, digested, manipulated and communicated from one person to another. KM requires an infrastructure capable of supporting the creation and maintenance of knowledge repositories, and an environment to facilitate knowledge sharing and organizational learning.

The major processes of KM are as follows:

- (a) Identification of Knowledge – Creation of knowledge is a gradual process of adding value to previous knowledge through a number of measures including innovation, work experience, study, dialogue and interaction. The process of preserving and maintaining knowledge resources commences only after they are created. Explicit knowledge can be captured at various stag of its development in the form of documents, publications and decision. It can also be obtained through website. Tacit knowledge can be created and captured by promoting dialogue, interaction and attending seminars and workshops. Out of three components of knowledge resources, knowledge is created and enhanced through application of skill in specific work environment, assessment of results and environmental factors etc. whereas data and information may be created manually or though the application of computerized systems. Knowledge resources relevant to the operation of the organization should be assimilated in a structured manner to enhance their usefulness.
- (b) Acquisition & Development (Verification and classification) – All information received or generated internally may not be of same value for the future. An organization creates and receives a number of data and information and makes decisions every day. Whether all these data and information should be assimilated to the knowledge base? This matter

needs to be carefully addressed by managers in day to day operations so that over flow of data and information can be prevented. Storing and preserving all knowledge resources

## Knowledge Management Process



generated and received today may not be practical for a number of reasons. Therefore, it is critical to verify and to analyze their relative significance to determine accuracy and relevance before preserving them.

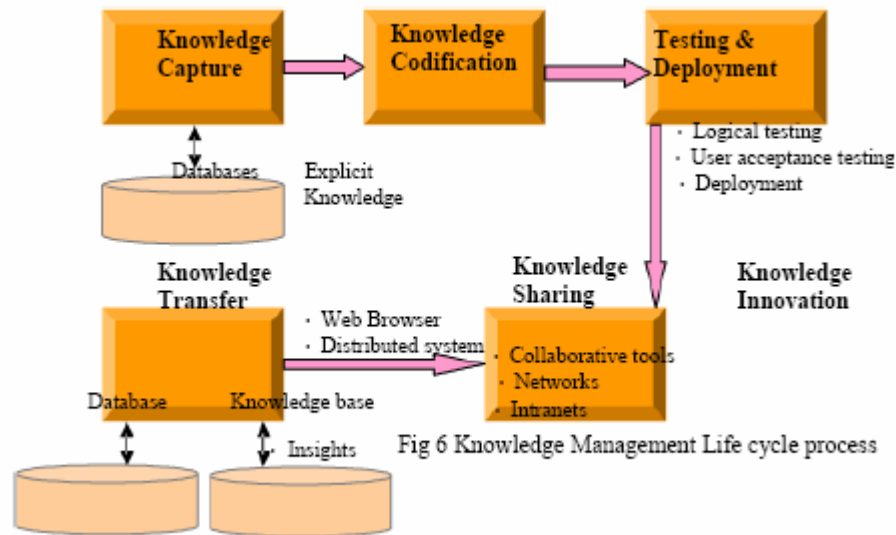
- (c) **Storage of Knowledge (Preservation and maintenance)** – Critical knowledge resources including knowledge in people’s head (tacit knowledge), maintained in organization’s records, documents and publications should be preserved safely. These resources can be stored in hard copy or in electronic format including microfilm. Organizations must have their records management policy including retention period to systematize the preservation of knowledge resources. International Standards Organization (ISO) also focuses that ‘organizations should define and document a policy for records management. The objective of the policy should be the creation and management of authentic, reliable and usable records, capable of supporting business functions and activities for as long as they are required. Organization should ensure that the policy is communicated and implemented at all levels in the organization.’ Deterioration in the quality of preserved knowledge resources could create negative consequences. Physical security is very important in addition to proper recording of preserved knowledge resources. In modern days, organizations depend more on information and communication technology (ICT)

- for preserving knowledge resources. Organizations that have no sufficient ICT resources maintain knowledge resources in hard copies.
- (d) Sharing (Retrieval and dissemination) – Knowledge resources needs to be retrieved in future to secure historic or contextual information mainly for making decisions and solving problems. The impact of knowledge resources becomes minimal without proper dissemination. Ensuring efficient dissemination of knowledge resources is critical to add value in the system and processes of operation. Selection of right means of dissemination is critical in case of tacit knowledge. Proper indexing and referencing can enhance efficiency in disseminating knowledge resources.

### **Knowledge Management Life cycle process**

Building of Knowledge Management is viewed as life cycle that encompasses review of existing knowledge and planning, cost-benefit analysis and justification, and determining the hardware and software for structure to knowledge requirements of the organization. Identification of immediate, intermediate and long-term requirements of prospective Knowledge Management system is essential. Well-defined life cycle is paramount for successful development of knowledge management system.

Knowledge Management Life cycle begins with knowledge capturing, followed by knowledge organization, knowledge refinement, knowledge transfers, and use or re-use as shown in fig 5. Knowledge management Life cycle process is shown in fig below. This process is centered primarily on business strategy and Knowledge Management objectives of the organization. This process to be reviewed periodically and improvised wherever needed. All identified business information is captured, codified and tested before this knowledge is shared and transferred. The knowledge is made available to all needed users for its effective use in their mission. Predictive models pertaining to the business requirements can be developed to ‘alert’ users through automated process by ‘flagging’ or e-mail and ensures that all prospective users know the new knowledge and used without being idle in repositories. Knowledge Management system to be attuned with the organizational culture and facilitate flow of knowledge, and encourage people to share insights, experiences and know-how, while ensuring that the right information is available with right person in right time.



### PPT Model

Effective combination of policy and strategy, process, technology and human resources (people) is critical to make KM meaningful.

- (1) Policy, strategy and approach – First of all, governing body of the organization should establish its KM policy and communicated at all levels. It should focus on the need of strengthening knowledge base. KM strategy should focus on managing the knowledge resources to support organizational change, the creation of opportunities, and rapid adaptations to changing market realities and cover the following matters explicitly.
  - (a) Contribution of knowledge resources in achieving organization’s objectives.
  - (b) Categories of knowledge resources that need to be created and shared at different levels to facilitate smooth operation at various purposes levels.
  - (c) An outline of a plan for preserving and maintaining knowledge resources that addresses issues related to people, process and technology.
  - (d) An outline of criteria to measure success in managing knowledge resources.

There are three approaches for KM. Mechanistic approach focuses on use of information technology (IT) in the management of knowledge resources. Cultural/behavioral approach focuses on work culture and organizational behavior to encourage people to share, transfer

and preserve those resources. Systematic approach focuses on on-going process of refining and updating knowledge resources and rational analysis of knowledge related problems and resolving techniques. A willingness to learn and encourage learning is something that has to be fostered in the organizational culture to be innovative and to stay relevant.

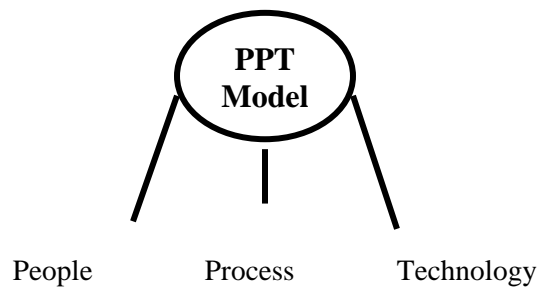
- (2) Process – Organizations should identify and develop the methods and processes of KM considering nature of operations, geographical dispersion, stakeholders, type and interrelation between knowledge resources. Process should encourage knowledge sharing culture. Due to the complexity associated with associated with knowledge sharing, a culture of knowledge sharing needs to be instilled and cultivated within an organization.

In the knowledge economy, education is a key to create new knowledge, adapting the fast changing working environment, acclimatizing to new socio-political structures and dealing with the increasing amount of information created every day. Four types of interactions (socialization, externalization, combination and internalization) within and beyond an organization help in managing explicit and tacit knowledge and converting them from one to another.

- ◆ Socialization refers to the process of sharing tacit knowledge between people. People feel confidence through socialization which can be promoted by forming informal groups and by encouraging people from different disciplines. Knowledge sharing can be between one-to-one, one to many, and many to many interaction.
- ◆ Externalization refers to the process of articulating and codifying tacit knowledge. Tacit knowledge is gradually converted into explicit knowledge through this process. People with specialized knowledge and experience are to be encouraged to express themselves so that their unique experience can be documented.
- ◆ Internalization refers the process of absorbing and utilizing explicit knowledge to covert into tacit. This requires processing and analyzing external knowledge or information, understanding it, and then internalizing it to create tacit knowledge. Individual gains practical skill and enhances his/her confidence by internalizing explicit knowledge.
- ◆ Combination refers to the process of converting explicit knowledge into complex sets of explicit knowledge. It can be shared and transferred via documents and e-mails. After an individual has accessed and retrieved the information, a reinforcing process takes place whereby information is sorted, understood and conceptualized in different

situations. Knowledge maintained in documents and publications needs to be translated into actions to enhance their practical value. Knowledge gained in different situation and information generated through application of knowledge and skill has to be used to refine current level of knowledge.

- (3) People – As the overall objective of KM is to enhance productivity and effectiveness of organization, people have the lead role to play in making it happen. Senior management should consider how knowledge sharing fostered and people related issues such as training, succession planning, mentoring, and job rotation and cross training can be addressed to facilitate KM. Tacit knowledge cannot be transferred without encouraging people to interact and share their experience, understanding and skill. As knowledge is power, making knowledge widely available through sharing might be seen as threat to career progression, hoarding knowledge becomes a natural phenomenon. But hoarding of knowledge does not help organization. The system of reward and recognition can be introduced to encourage knowledge sharing and reuse. A group of knowledge professionals can be set up in an organization to support KM. Informal networks and community of practice can also make positive contributions. Succession planning is critical to protect from the loss of critical skills. In addition, job rotation also helps in bridging knowledge gap.



- (4) Technology – KM is not about technology. But it plays important role in KM by facilitating the information dissemination process, connecting people and systems and enhancing access to large depositories of information. Technology facilitates the storage and organization of information. Information technology (IT) is widely used to generate data and information and preserve them. ‘Collaborative applications such as e-mail, calendaring, scheduling, shared folders/databases, and threaded discussions promote knowledge sharing and transfer.’<sup>iii</sup> Internet is the well recognized as the platform for communication and

collaboration between people around the world and biggest repository of knowledge resources. However, information technology can capture only explicit knowledge.

**Issues and Prospects**

Planning and a supportive organizational culture are critical in enhancing the effectiveness of KM. Organizations recognize the importance of KM for their continued relevance and to achieve effectiveness but fail in addressing issues that really contribute the systems and processes of KM. Highlighting the issues in knowledge sharing, the UN OIOS report states ‘knowledge sharing in support of the MDG’s is not sufficiently strategic, focused or well integrated with organizational objectives. Different departments take different approaches to internal knowledge sharing, which are mostly not systematic. The most common knowledge-sharing tools, such as e-mail, meetings and websites, while useful, do not work best in connecting staff seeking each other’s insights, experiences and ideas. Information and knowledge sharing is not consistently integrated with daily work. Mechanisms and processes capturing and transferring good practices, lessons learned and knowledge from departing staff are generally inadequate. Technology and knowledge sharing is generally available but not always used.’<sup>iv</sup> This situation may also be applicable to other organizations. Potential factors preventing effective KT and possible solutions are as follows:

<b>Inhibiting Factors (Friction)</b>	<b>Possible Solutions</b>
<ul style="list-style-type: none"> <li>▪ Lack of trust</li> <li>▪ Different culture, vocabularies and frames of references.</li> <li>▪ Lack of time and meeting places; narrow idea of productive work.</li> <li>▪ Status and rewards go to knowledge owners.</li> <li>▪ Lack of absorptive capacity in</li> </ul>	<ul style="list-style-type: none"> <li>▪ Build relationship and trust through face-to-face meetings.</li> <li>▪ Create common ground through education, discussion, publication, teaming, and job rotation.</li> <li>▪ Establish time and place for knowledge transfers: fair, talk rooms, conference reports.</li> <li>▪ Evaluate performance and provide incentives based on sharing.</li> <li>▪ Educate employees for flexibility; provide time for</li> </ul>

<p>recipients.</p> <ul style="list-style-type: none"> <li>▪ Belief that knowledge is prerogative of particular groups, not-invented-here syndrome.</li> <li>▪ Intolerance for mistakes or need for help.</li> </ul>	<p>learning; hire for openness to ideas.</p> <ul style="list-style-type: none"> <li>▪ Encourage nonhierarchical approach to knowledge; quality of ideas more important than status of source.</li> <li>▪ Accept and reward creative errors and collaboration; no loss of status from not knowing everything.</li> </ul>
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Promoting trust is essential to build supportive environment. Lack of trust may lead to selfish practices and poor communication which makes negative impact on the organization culture. Educating people at all levels about what, why and how of KM and their respective roles and responsibilities is first step towards consolidating KM approach.

### **Promoting Knowledge Management**

Modern organizations have to promote its intangible assets and encourage members to make best use of those assets to enhance effectiveness and optimize the return from the factors of production. The value of KM relates directly to the effectiveness with which the managed knowledge enables the members of the organization to deal with today's situation effectively envision and create their future.

The following measures should be considered to promote KM.

- ❖ Decentralization and delegation of authority – KM is a participative and dynamic process. People working at various levels possess operational, tactical and strategic knowledge. Offices located at field, regional and central level should be encouraged to manage their knowledge resources under the organization's KM strategy. Decentralization policy should recognize that knowledge resources at local levels are equally important as in central level for effectiveness. Delegation of authority encourages managers to adopt flexible approach to manage knowledge sharing.
- ❖ Improvement in managerial capacity to facilitate knowledge and information sharing – Managerial capacity should be enhanced to make managers capable to facilitate and monitor the process of sharing knowledge and information both horizontally and vertically. Collective knowledge of people at different levels makes up the knowledge resources of an organization. Facilitating horizontal and vertical sharing of information enriches such resources and supports in building capacity. As KM is emerging as a new discipline, the capacity of managers must be enhanced to adopt appropriate measures of KM.

- ❖ Incentives to staff to share knowledge and information – Sharing of knowledge requires certain incentives. People normally question why they should spend time in sharing knowledge which could reduce their importance and even challenge career opportunity. Therefore, staff should be encouraged to sharing tacit knowledge so that members of organization feel that they have required knowledge to manage operations.
- ❖ Investment and improvement in ICT – Organizations are increasingly dependent on information and communication technology (ICT) in their operations. Organizations should constantly review and update their ICT capacity in the context of changing technology and operations. Investment to ensure sustainable delivery of ICT services is essential to improve KM infrastructure. In addition, the physical quality of storage should be well maintained so that knowledge resources are well secured and retrieved efficiently.

## Knowledge Management & Role of Technology

Knowledge management is being perceived as so seamlessly intertwined with information technology that its true critical success factors may soon be lost in the pleasing hum of servers and software.

Knowledge is the critical resource of business activity in this era. The technology gurus, as well as hardware and software providers, define knowledge management in terms of understanding the relationship of data, identifying and documenting rules for managing data and assuring its accuracy and integrity. The convergent and consensus-building emphasis on such systems might be congenial to stable and predictable organizational environments. However, such interpretations of knowledge management, based primarily on rules and procedures embedded in technology, seem wrongly aligned with a dynamically changing business environment.

(1) IT investments seem to have no direct correlation with business performance or knowledge management. In the last 20 years, US industry has invested more than \$1 trillion in information technology but has realized little improvement in the efficiency and effectiveness of its knowledge workers. This failure is due to the organizations' ignorance of ways in which knowledge workers should operate through innovation, collaboration, sharing knowledge and building on each other's ideas.

(2) The same dollar spent on the same system may give a competitive advantage to one company but only expensive paper weight to another. Hence the key factor for the higher return on IT investment is the effective utilization of information as it relates to organizational performance. How corporate executives go about deciphering the mantra of effective utilization, however, remains a debatable issue.

(3) The new world of knowledge-based business ought to involve a continuous redefinition of organizational goals, purposes and "ways of doing things". Today's new business environment is characterized by radical and discontinuous change and demands cautious responses from organizational members who need to carry out the mandate of a faster cycle of knowledge creation and action based on this knowledge.

(4) Many organizations rely on information technology infrastructure; but no matter how sophisticated, it is not the key to effective knowledge management. Success depends more on the social system in which people operate. The social ecology of the company drives people's expectations, defines who will fit in, shapes individual's freedom to pursue actions without prior approval and affects how they interact with both insiders and outsiders.

(5) Management. And the myths are as follows:

First myth: Information technologies can store human intelligence and experience Databases and groupware applications store bits and pixels of data. But they do not store the skills that people possess for making sense of data bits. Moreover, information is context sensitive. The same assemblage of data can evoke different responses from different people. Many say that while people come and go their experiences can be stored in databases. But unless a person's mind can be scanned and stored directly into a database, one cannot assume that somebody else can get back the experience of the first person.

Second myth: Knowledge management technologies deliver the right information to the right person this idea mirrors an outdated business model. The new business model of the information age, however, is marked by fundamental, not incremental changes. Business cannot plan long-term; instead they must shift to a more flexible "anticipation-of-surprise" model. It is impossible to build a system that predicts who the right person at the right time is, let alone what constitutes the right information.

Third myth: Information technology can distribute human intelligence. This assumes that the company can predict the right information to distribute and the right people to distribute it to. And bypassing the distribution issue by compiling a central repository of data for people to access does not solve the problem either. The fact of information in the database does not ensure that the people would see or use the information. While most of our knowledge management technology concentrates on efficiency and creating a consensus-oriented view, the data therein is rational, static and without context. And such systems hardly account for renewal of existing knowledge and creation of new knowledge.

7) The confusion between knowledge and information has caused managers to waste billions of dollars in information technology ventures that have yielded marginal results. It is necessary for

the business managers to realize that unlike information, knowledge is embedded in people and knowledge creation occurs in the process of social interaction.

(8) A recent Mckinsey report points out that most of the companies do a poor job of managing their talent. With so many other things in the realm of Information Technology the missing ingredient is people. While focusing on hardware and software, most companies overlook the importance of the organizational structure and skills, which are absolutely necessary for successful use of data and for decision-making. Only human beings can take the central role in knowledge creation. Computers are merely tools, however great their information-processing capabilities may be. The changed business environment imposes the need for variety and complexity of human interpretation of information outputs generated by computer systems.

(9) Some of the corporate giants are realizing this fast. Ford, for instance, has been using PeopleSoft package not for handling basic HR transactions but for capturing and managing HR knowledge for purposes of talent management, general HR analysis and decision making.

(10) Nonlinear change imposes upon organizations the need for devising nonlinear strategies. Such strategies cannot be predicted based on a static picture of information residing in the company's databases. Rather such strategies will depend upon developing interpretive flexibility by understanding multiple views of the future. In this perspective, the objective of business strategy is not to indulge in long-term planning of the future. On the other hand, the emphasis should rather lie on understanding the various future world scenarios using suitable techniques.

(11) A focus based on strategic planning was pioneered and chronicled by Arie de Geus, the strategy chief of the multinational Royal Dutch/Shell as follows:

- View the organisation as a human community capable of providing diverse meanings to information outputs generated by the technological systems.
- Give more explicit recognition to tacit knowledge and related human aspects, such as ideals, values, or emotions, for developing a richer conceptualisation of knowledge management.

Implement new, flexible technologies and systems that support and enable communities of practice, informal and semi-informal networks of internal employees and external individuals based on shared concerns and interests. Make the organisational information base accessible to

organisation members who are closer to the action, while simultaneously ensuring that they have the skills and authority to execute decisive responses to changing conditions.

(12) The implementation of these issues can be viewed in terms of the shift from the traditional emphasis on transaction processing, integrated logistics and work flows to systems that support competencies for communication building, people networks and on-the-job learning. The three architectures enabling such competencies are:

- A new information architecture that includes new languages, categories and metaphors for identifying and accounting for skills and competencies.
- A new technical architecture that is more social, transparent, open, flexible and respectful to the individual users.

New application architecture oriented towards problem-solving and representation rather than output and transactions.

(13) It was the company's social ecology that contributed to Nucor Corp's success in becoming one of the most efficient steel producers in the world. Through effective management of knowledge, Nucor developed and constantly upgraded its strategic and proprietary competencies. The social ambience of the company allowed excellence in the tasks associated with sharing and mobilizing knowledge: identifying opportunities to share knowledge, encouraging individuals to share knowledge, building effective and efficient transmission channels and convincing individuals to accept and use the knowledge received.

(14) At Dow Chemicals, the head of the strategic planning department sponsored an effort to figure out how to use SAP data in new reporting processes. The IT organization worked with its users within the organization to create a number of function-specific and process-specific data marts. Over 50,000 people, from the factory floor to the CEO's office, were trained to structure and process data, access techniques and analyze tools.

(15) The workforce of a forward-looking company must be able to process and manipulate knowledge as well as perform particular skills, says Dorothy Leonard-Barton in *Wellsprings of Knowledge*. Top management must encourage creative chaos, cross-fertilization among

disciplines within the company and benchmarking with competitors. Those companies that are most enthusiastic about pursuing knowledge are those most likely to harness the power of innovation.

(16) Knowledge management embodies organizational process that seeks synergistic combination of data processing capacity of information technologies and the creative and innovative capacity of human beings. The knowledge workers need to be facile in the application of new technologies to their business contexts so that they can delegate "programmable" tasks to technologies and concentrate their time and efforts on value-adding activities that demand creativity and innovation. More importantly, they should have the capability of judging if the organization's "best practices" are aligned with the dynamics of their business environment. Such knowledge workers are the critical elements of the double loop learning and unlearning cycle that should be designed within the organizational business processes.

(17) Given the need for autonomy in learning and decision making, such knowledge workers would also need to be comfortable with self-control and self-learning. They would need to act in an intrapreneurial mode that involves a higher degree of responsibility and authority as well as capability and intelligence for handling both. Such creativity and inquiry-driven learning will, obviously, be difficult to achieve within traditional command-and-control paradigm.

(18) In an industry-wide analysis of IT investments, economist Paul Strassmann, has observed in his book *The Squandered Computer* (Economic Press, 1997) that elevating computer to the level of a magic bullet may diminish what matters the most in any enterprise: educated, committed and imaginative individuals working for organizations that place a greater emphasis on people than on technologies.

(19) Managers need to develop a greater appreciation for their intangible human assets, captive in the minds and experiences of their knowledge workers. Without these assets, companies are simply not equipped with a vision to foresee or to imagine the future.

**Technology and functionality**

<b>S.N.</b>	<b>Functionality</b>	<b>Information and Communication Technologies (ICTs)</b>
1	Searching	Search Engines
2	Categorizing	Computer Languages (XML, RDF)

3	Composing	Office Suite Applications
4	Summarizing	Artificial Intelligence
5	Storing	Storage Media
6	Distributing	Networks
7	Workflow	Groupware
8	Content Management	Content Management Systems
9	Customer Relationship	Customer Relationship Management (CRM) Software
10	Metadata Standards and Interoperability	Semantic Web Technologies

### **Knowledge Network**

Knowledge is available in individual, tools, documents, databases, knowledge bases, group, function, particular SBU and corporate. Organization to recognize the new knowledge that gets created as a by-product while individual's carrying out an activity or task or product or project or service. This knowledge is effectively useful only when it is dynamically transferred and shared as and when the knowledge is created. Knowledge Network enables knowledge transfer. Knowledge Network connects individual to organization and vice versa. Knowledge network alongwith other knowledge process can be used to capitalize this new knowledge. In Knowledge Management system, knowledge is captured, transferred, shared, synthesized and transacted in

real-time with all authorized individual. Utilization by any part of the function or department or organization independent of location leads to organizational competency.

***Direct Knowledge Neural system***

<p>Knowledge Network perspective :</p> <p><b>Process :</b> Bundle of connection ‘within’ &amp; ‘between’ tasks, functions, SBU’s, Corporate and SBU, and Environment – customer, vendor, other expert knowledge centers etc. Dynamic knowledge exchange takes place..</p> <p><b>Outcome:</b> Speedy organisation’s actions &amp; Reponses to customer or tasks</p>
<p>Knowledge system :</p> <p><b>Process :</b> Knowledge is acquired, processed, stored &amp; retrieved from</p> <ol style="list-style-type: none"> <li>1. Individual knowledge,</li> <li>2. Corporate culture of learning &amp; transmitting knowledge,</li> <li>3. Knowledge embedded in organizational processes,</li> <li>4. Physical archives,</li> <li>5. Organizational structure</li> </ol>

Direct Knowledge Neural

***Indirect Knowledge Neural system***

Indirect knowledge	Corporate					SBU-
Transfer	Direct knowledge				Strategic Business Unit	
	SBU1	SBU2	SBU3	SBU4	SBU5	--n--
	D	D	D	D	D	D

- Centralization allows use of scare resource to multiple purposes.
- Apply Corporate knowledge to tasks & form a portfolio of Organizational competencies.
- Intensity of knowledge transfer depends on relatedness of SBU’s(Strategic Business Unit) & degree of centralization.
- Knowledge transfer take place between SBU’s to corporate and then to other SBU’s; or SBU to another SBU and then to yet another SBU or corporate. This is an indirect knowledge transfer.

Indirect Knowledge Neural Network

Technology that is available is potentially adequate to connect all knowledge workers in real-

time. Speed, accuracy, volume, distance, security and maintenance are critical factors to build a network. Intranet, Internet, Extranet, Local area network, Wide Area Network, dial-up links, and Legacy networks are widely used depending upon the size and requirement of the organization. Increased connection between employees will be productive knowledge transfer and leverage the expertise of an individual across the organization. Knowledge Networking enhances the individual and organizational learning which will aid business requirements. Knowledge network constitutes of both 'Direct knowledge neural network' and 'Indirect knowledge neural network' as shown in fig above SBU's can be geographically distributed in different location or some SBU's can be distributed in one country or across many countries, and all can be connected in Knowledge network. This feature facilitates collaboration and execution of activities concurrently. Neural system is dynamic. Interrelation continuously transforms and activates various functions depending upon the stimuli from environment and/or within organization.

## **Knowledge Audit and Mapping business process**

### **Knowledge Audit**

Knowledge audit is a systematic appraisal of the organization's intellectual resources and capabilities with respect to identification of existing knowledge, adequacy, gaps, sources, sinks, flows and recommend measures to augment the required knowledge. Audit reveals on how the knowledge that exists and not exploited, knowledge required but not explored, and the extent of utilization of organizational knowledge flows around. Knowledge audit provides evidence-based qualitative assessment to individual, team, function, SBU and corporate. Identification of knowledge sources within the organization and the best external sources leads to quicker acquisition of knowledge required for the business. Knowledge audit enhances the stakeholder value by this process.

Various Knowledge audit methods are used. Snowden (1999) believes that the best representation for knowledge map is stories that contain context, value, and the message. Dataware (1998) believes that productive analysis require to answer questions like What knowledge we have, what knowledge is missing, who needs this knowledge, and how it will be used? Wiig's (1993) knowledge analysis is summarized below:

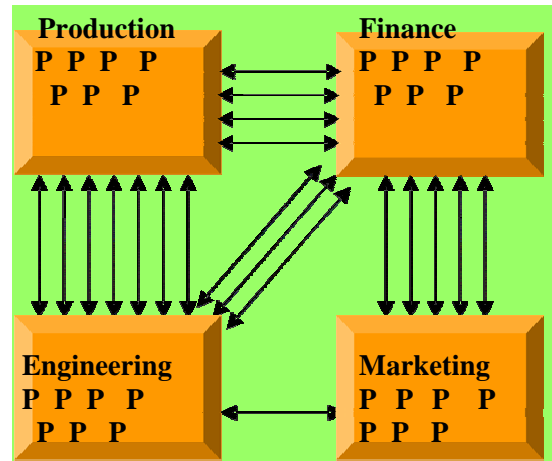
- **Questionnaire-based knowledge surveys** are used to get an overview of various operations of an organization.
- **Middle management target group sessions** are used to understand their need for management support.
- **Task environment analysis** is used to understand the existing knowledge and its extent of application.
- **Verbal protocol analysis** is used to identify knowledge elements.
- **Basic knowledge analysis** is used to identify aggregated knowledge.

- **Knowledge mapping** is used to develop concept maps as hierarchies or nets.
- **Critical knowledge function analysis** is used to identify knowledge-sensitive areas.
- **Knowledge use and requirement analysis** is used to identify how the knowledge is used for business purposes and how situations can be improved.
- **Knowledge scripting and profiling** is used to understand the details of knowledge intensive work and the role knowledge plays in delivering the quality products.
- **Knowledge flow analysis** is used to gain an overview of knowledge exchanges, losses, inputs of the business processes.

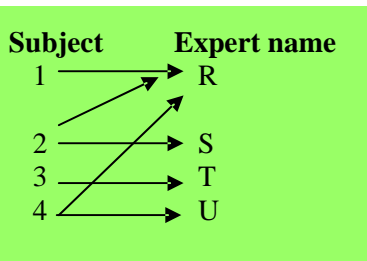
**Knowledge Mapping**

Knowledge map is a visual contextual representation in graphs used to codify the knowledge. Formal, informal, explicit, tacit, internal and external knowledge can be represented in knowledge map to identify the business issue. Knowledge map is used to generate job specific knowledge requirements, to communicate complex process, develop knowledge structure that represents concepts and their relationship, building employee knowledge competency and understanding. Various methods are used to create knowledge map and few are illustrated in fig.. Marketing function has

Knowledge mapping



very less interaction with Engineering and more interaction with Finance as depicted in bidirectional arrow line(P-person). Where as the interactions to be otherwise as Marketing need to have more interaction with Engineering than with Finance.



If the subject 1, 2 & 4 are associated, then the expert R is very useful. Suppose 1, 2, 3 & 4 are totally different, then the earlier assumption will not hold.

Knowledge map

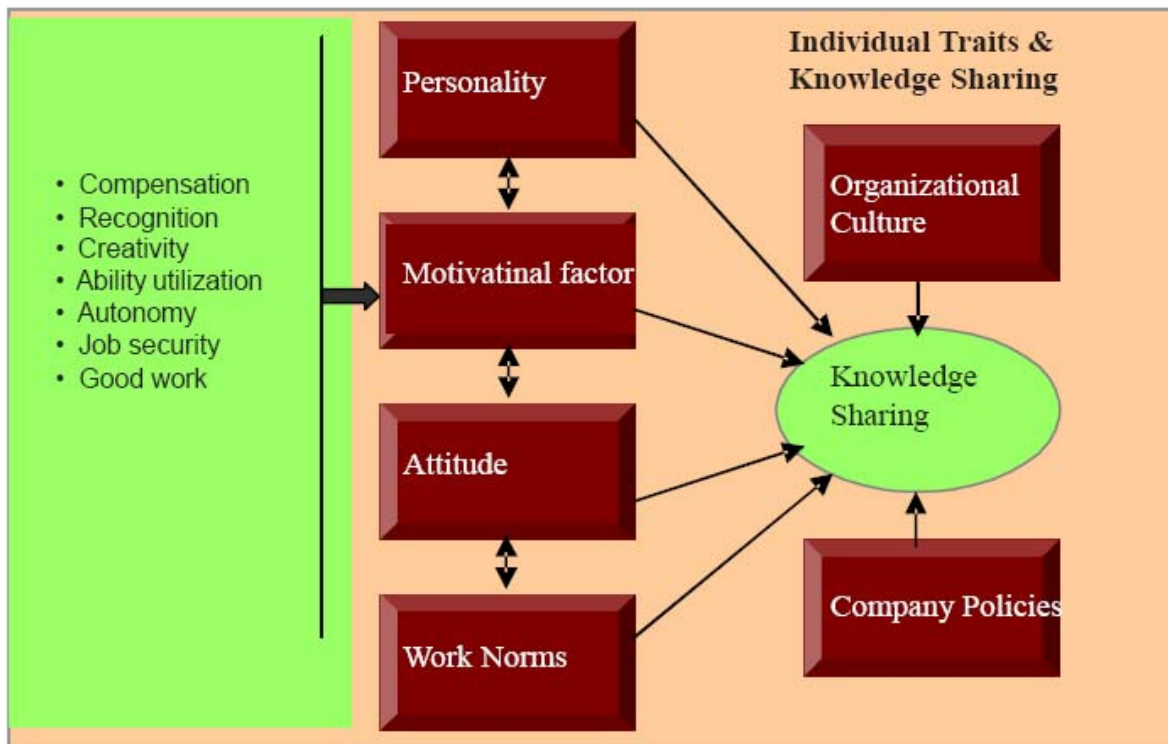
Critical factors	Available	Not available	Who has
Design knowledge	Yes		K
Production knowledge	Yes		L
Strategic planning		No	

Fig.17 illustrates the area of concern as Strategic planning and depicts who has knowledge in each function. Knowledge mapping is very useful for effective decision-making.

## Knowledge Management Tools

### Community of Practice

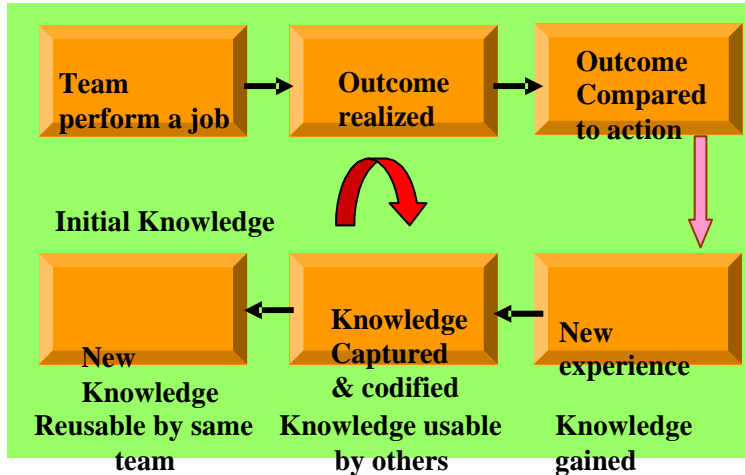
Individual knowledge is shared with the other team members during the discussions or correspondences, when they work on a subject or find solution for a problem or carrying out a task or a job or jointly working on a project. Knowledge is still available with the individual but not with the team. Individual behavioral traits, motivational factors - recognition and rewards, organizational culture and company strategies and polices have an impact on this knowledge sharing process as shown in fig below



When the team collaborates with the common purpose over an extended period, the ideas, alternative approaches, expertise and solution to a subject do emerge. This knowledge is captured and shared to other teams within the department(s) or functions or strategic business

unit or corporate. Following such practice within a community enables social learning, nurturing new knowledge, stimulating innovation or sharing the existing tacit knowledge within the organization. A typical illustration is shown in fig. below.

**Knowledge creation via Team**



From the above process, the individual learning startlingly increases through collaborative learning and also the organization benefits by the business solution. Moreover, the organizational learning increases and the knowledge get accumulated in corporate memory. After review and approvals, the organization can share

this new knowledge to other allied communities within the same industry or anyone who seeks similar

knowledge could use readily without much effort. This social learning shared practice within community is known as Community of Practice (CoP). Generally, CoP is formed within a single discipline so that the effort can be focused. Technology that exists today ameliorates multi-disciplinary participation.

Etienne Wenger (1998) has described CoP in terms of interlaying four fundamental dualities such as 'participation vs reification', 'designed vs emergent', 'identification vs negotiability' and 'local vs global'. 'Participation vs Reification' duality is of utmost interest to knowledge management. Reification is an abstract form and represented in document. Reification is necessary to avoid teamwork turning into informal group activity in the name of co-ordination and mutual understanding. Participation is an active involvement in teamwork or social process. Involvement of an individual must go beyond repeating the reified description and must challenge and readdress its meaning.

### ***Community Practices – Features***

- Promotes innovation through problem-solving, learning, knowledge creation, Self manage & Self-govern.
- Combats isolation. Support one another to enhance learning and performance.
- Enable productive inquiry for creation of job-critical knowledge and exchange. Members create knowledge base. Enhance speed of response to customer.
- Share knowledge through collaborating and learning.
- Use a variety of synchronous and asynchronous collaborative tools via multiple channels including face-to-face meetings and on-line platform Supported by the organization as a valid way to learn and collaborate. Increases capabilities and meta-capabilities. Creates competitive advantage.

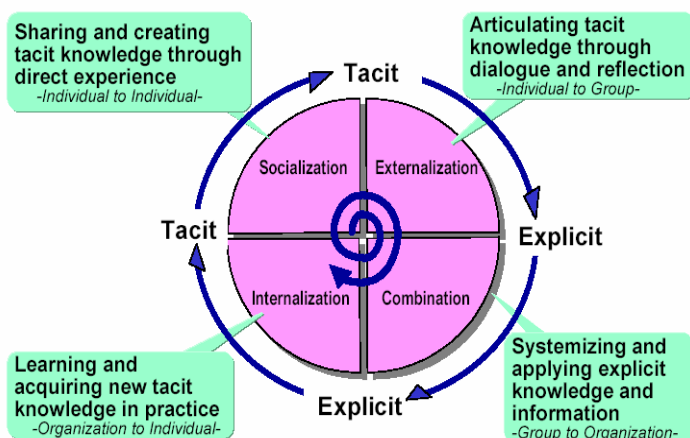
## Knowledge conversion

Merely storing structured knowledge constitutes only some part of knowledge management.

Every process used to create, communicate and apply tacit knowledge will result in new knowledge e.g.: a worker applies knowledge from a similar problem / resolution from Database and the final solution may differ in some way. This successful resolution to be documented and saved and will now expand the organizations knowledge base. To convert tacit knowledge to explicit knowledge, following goals are required to be achieved to address this objective.

- Prevention of Knowledge Loss due to employee turnover on transfer, retirement, resignation, mindset of individual etc.,
- Prevention of duplicate activity. Everyone need not re-invent when somebody within the organization had already done that activity.
- Adaptability and Flexibility – allows employees development to better grasping power of their work and may require less direct supervision and fewer interventions.
- Capturing of Technical Problems and Solutions can be easily referred during problem analysis thereby reduce time.
- Promote collaborative learning through Communities of Practice.
- Motivate individual with reward system for knowledge sharing and capture in document for further transfer.

Fig **Knowledge Creation Spiral**



For conversion of tacit knowledge to explicit knowledge, the process to be developed by identification of mission critical functions, formulation of systems, format structure and key factors that are to be captured, content, procedures, and measures required to promote

involvement of individuals and associated functions or departments

Knowledge conversion process is shown in fig 2. Nonaka and Takeuchi (1995) developed four-stage spiral model for knowledge conversion within business process.

### ***Externalization***

Tacit knowledge of the expert or key personnel within the organization can be made explicit by documenting the knowledge one possesses or procedure or steps followed up in completing a given task and the experience gained. This codified manual can be shared and incorporate this

knowledge in development of other products and services. This process of converting tacit knowledge to explicit knowledge is known as externalization.

### **Internalization**

The reverse process of conversion from explicit knowledge to tacit knowledge is known as internalization. The codified context specific explicit knowledge to be reviewed and absorbed by the employees so that the formal rules and procedures can be adapted in the same way when such similar requirement arises during the development of new product and services.

### **Socialization**

This is a conversion from tacit knowledge to tacit knowledge through sharing of experiences, models, imitations and practices. This type of knowledge transfer takes place during coaching, apprenticeship, presentation, seminars, meetings, conferences, training, workshop and any other informal interactions within and outside the organization.

### **Combination**

The accumulated knowledge is disseminated by sharing among one another or within the function(s) or group(s) or community or communities. It is a conversion of explicit knowledge to explicit knowledge This transfer process is a primary way to leverage knowledge.

### **Knowledge use and reuse**

Knowledge based system known as 'Expert system' is developed with business specific domain knowledge from one or more experts. The expert system can have features of 'fully automatic' for closely repetitive process or 'semi-automatic' for varying repetitive process and 'manual' option for first time creation. Expert system is essential for organization that has high-level of know-how experience and expertise and cannot be easily transferred to other members. Thorough review of business process with respect to the following key factors is essential before deciding on substitution of 'Expert system' to the existing process.

- Criticality of the process (e.g engineering, production, marketing etc).

- System / methods currently followed for development of new product or engineering of equipments or custom-built equipment for a given plant or services.
- Identify the current knowledge level and the missing knowledge.
- Percentage of application or reuse of the existing design knowledge (part or component, equipment information), additional information added to complete the activity.
- Cumbersome or expertise required for an individual process is high.
- Productivity requirements - Present cycle time and required to address market requirements and capacity utilization.
- Rework or repair resulting out of a particular process due to inconsistency or overlapping in certain steps followed in that process.

### Knowledge dissemination

To use knowledge to deliver products and services-, make knowledge to solve problems and the like. Dissemination is the primary way to leverage knowledge throughout the organization. Both explicit and tacit knowledge is shared in a real-time environment that will assist employee to perform unique functions effectively. By this process, individual can access to divers resources and new expertise. Such cross-fertilization of knowledge creates value to an organization.

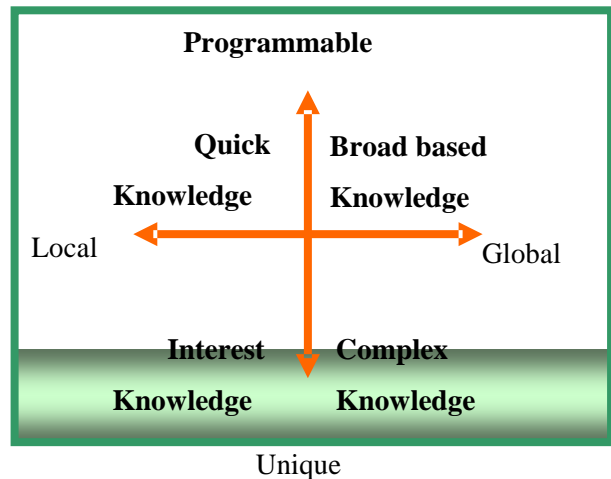


Fig. Knowledge sharing

Knowledge transfer is done by working together, learning by doing, apprenticing, face-to-face discussion, or embedding knowledge through procedures and document exchange. The collective learning of an organization is gleaned from learning of its members as well its stakeholders and customers. Collaborative technologies are used to aid in effective knowledge flow. Knowledge sharing recognizes the nature of knowledge and classifies them as 'quick knowledge', 'broad based knowledge', 'interest knowledge' and 'complex knowledge' and accordingly shared as shown in fig.. The term share is an exchange of knowledge between individuals, between or within teams or between individuals and knowledge bases, repositories, and so forth.

### **Knowledge security**

Captured knowledge is treated as a competitive weapon. The security levels for knowledge sharing need to be deliberated in all business process levels. It is also felt that it is potentially dangerous to share the documentation, as the credibility of the users cannot be established concretely. However, an attempt has to be made to underline the need of security of information while deciding the sharing of information among the working groups. Knowledge Management system must be secured from any unauthorized access either internal or external. In addition, it must allow secure access for any authorized user, no matter where they are. The system should support security features like electronic signatures, firewalls, encryptions, HTTPS etc.

- Build security features like electronic signatures, firewalls, encryptions, HTTPS etc.,
- Protecting the data from external threats.
- Protection against network attack, malicious code, virus, unauthorized application execution, Security at desktop level, User management etc.,
- Implementation of access control at different levels such as user level, functional role level, etc., to control access to the Knowledge Management system.
- Create and maintain an access control list for each object created within the system.
- Build an audit mechanism to keep track of access, check-in/check-out, status change etc

Customization of Policy based integrated enterprise level security software to be introduced for

protection against network attack or malicious code or virus or unauthorized downloadable application execution etc. is to be prevented through access control, Security and Firewall systems.

### **Knowledge Discovery**

Knowledge discovery is used for knowledge creation in Knowledge Management system such as discovery of business intelligence, insights, new relationship, trends, patterns etc., from various functions or processes. Various information from different or associated processes are to be captured, classified, compared, synthesized and derive the insights, trends, patterns etc using software tools that exists today or customized tool to suit the required business process. From this knowledge discovery process, Knowledge Management system is to enable creation of management information report automatically and alert the user by flag or e-mail in addition to provision of business process interlocks between processes. Knowledge discovery process aids organization to solve interdisciplinary problems, improve business process efficiency, productive and proactive.

Knowledge discovery system to provide unified access to information assets, regardless of format, repository or media type and increases user productivity by reducing the time and cost of finding information in the sea of data. Filtering new information in real-time, convert data to knowledge discovery, personalize and organize the retrieved information in folders, or share expertise with associates shall stimulate knowledge discovery across the enterprise. It shall utilize a variety of indexing, concept and entity extraction, and content filtering methods regardless of content type – unstructured, semi-structured, and structured.

- Create high level abstract business insights, trends, patterns etc and make it available for effective decision-making.
- Knowledge discovery system shall be scalable and have consistent taxonomies for categorization and pragmatic classifications for information access.
- Create semantic Indexing based on domain-specific application indexes
- Develop strategies for Data Management and applications.
  - Data sources – Flat files, Relational databases, Data warehouses, Business unit wise databases, Time series databases, geographical databases, etc.,
  - Taxonomy of Data –Business transactions, Technical design methodology and calculations, Process related, Testing related, personnel related, Text and

documents, repositories etc.,

- Data preparation – Evaluating data quality, Handling missing data, Processing outliers, Normalising data, Quantifying data etc.,
- Model building – Association rules, Classification trees, Neural networks.

**An overview of knowledge discovery tools and techniques are summarized below :**

### **Case based reasoning (CBR)**

CBR can assist in capturing of tacit knowledge from process-centered activities and manage procedural knowledge. Interactive CBR techniques are widely used for knowledge discovery in knowledge Management system.

### **Text mining**

Text mining involves extracting patterns, behaviors and general knowledge from large collection of textual information, which are found in knowledge repositories. Text knowledge mining process aids to develop Self-Organizing Maps (SOM's), clusters and productive models (Rules). SOM brings together related concepts and shows their intensity or frequency within the data/text based as well as their proximity to other concepts. Fuzzy clusters provide a spatial analysis of documents and semantic concepts in the form related aggregations.

### **Neural networks**

Neural networks are used to infer patterns from data, knowledge and image e.g.: GUESS (Generically used experts scheduling system). Push Technology, Quantitative analysis, Data mining tools etc are also used for knowledge recovery.

### **Data mining**

Data mining is a process that uses sophisticated statistical analysis and modeling techniques to uncover patterns, correlation and relationships that exist within the data but are not recognizable using conventional data analysis techniques. Data mining provides response to extracted patterns, selection of the right action, learning from past actions, and turning action into business values.

### ***OLAP*** (On-Line Analytical Processing)

The need for non-static reporting system has led to the development of On Line Analytical Processing. It is possible to drill down into the ultimate detail of a parameter and zoom up for a general view. OLAP have the ability to answer what-if and why questions along with Multidimensional views of data, Calculation intensive capabilities, and Time intelligence.

### **Knowledge Management and Organizational culture**

Organizational culture is to be conducive for knowledge transfer and knowledge sharing. Knowledge transfer provides knowledge to someone else whereas knowledge sharing is an exchange of knowledge between individuals or teams and knowledge bases. Individuals will resist sharing for competitive and self growth. Almost any organization and all global ones have multiple cultures. Organization also must make employees to believe that their services are required for long-term and not as replaceable commodity, which will enable them to share knowledge between peers. Organization must provide tools-for capturing, storing, sharing; training and education; time-to absorb, use and share new knowledge; and empowerment to use knowledge. Making knowledge available and sharing with employees or sharing between individuals connotes certain level of trust. For a positive knowledge sharing, co-operation, collaboration and collective learning, building altruistic culture by development of on-line and off-line systems of knowledge dissemination promotion and measurement system with motivational drivers like reward, recognition, compensation etc is essential. Positive organizational cultural values are Leadership, understanding the mission, internalizing the management practices, and trusting one another.

Top management must have conviction, commitment and support in word and deed for implementation of Knowledge Management as this endeavor calls for change management in the area of process, values and business strategy. Otherwise, Knowledge management implementation efforts will be strained due to the diversity of interests. Organizational cultural change takes time to attune to the knowledge based strategy driven culture and particularly the outcome depends on leadership. Organization requires having patience and persistence while certain employees resists for change. Knowledge exchange process will also certainly enable positive change in the organizational culture.

## **Precursors to success**

- Top management conviction, commitment and leadership endorsement
- Shared sense of purpose and ownership
- Self-initiated view of learning and readiness to learn from each other
- Climate of trust and involvement
- Partnering mindsets and capabilities
- Strong technology platform
- Constructive suggestion to take KM implementation forward

## **Pitfalls**

- Looking for the ideal approach under all circumstance
- Resistance. Excuses for not sharing content
- Emphasizing only on concept and planning, over execution
- Top management ambiguity. Emphasizing only on what's already there
- Underestimating the technology that exist today
- Failure to identify organization's position with respect to global competitors.
- Inadequate focus and value for development of core competency for New Product development, Facility and overall process system improvement
- Senior internal executives not freed-up to drive KM program due to exigency of work

## **Overview of software tools and solutions for KM**

Diverse products and services are provided by organization(s) to different market segments. Technology varies for different product, process and services do. Also the requirements and KM strategy of different organization will also vary. Knowledge audit and scoping needs includes requirement gathering, understanding the existing process and IT systems, review of best practices, review of software products, vendor evaluation, visits to the organization where KM is already implemented, taking support from KM consultants, proof of concepts demo etc will have to be done before selecting the software and hardware products. There is no single software addresses all requirements of all organization and some combination of software tools are required for KM. e.g. for engineering enterprise, integration of many discipline and software, and exploitation of software features for different business process are critical while selecting the software for KM.

Some vendors have homogeneous solution for many requirements of KM. Few vendors have built-in knowledgeware in their software products which will provide bidirectional, synchronous and asynchronous features for applications. Many of the vendors use all KM jargons but it is felt that the degree of their product features is varying widely. Few vendors are having software that will meet only few KM requirements and they get different software from different vendors and integrate them to meet the total KM requirements. In this scenario, the solution is offered from heterogeneous sources. Many vendors specify software architecture as web-centric but the method of realization and features are also varying widely. Architecture, product development roadmap, integration compatibility, software customization capability, human resource capability size, financial stability, partners, risks and the total life cycle cost are the key evaluation criteria's. Merger, acquisition, geographical dispersion, change in business strategy after acquisition and obsolescence declaration, etc are all serious concerns as KM is a long-term strategic decision.

For a comprehensive KM solution, both software tools and their implementation partners are to be carefully evaluated for their ability to deliver, support, maintain and enhance the KM solution. Capability and competency of this implementation team is critical for understanding of the business process of the organization, best practices and the software product knowledge for successful implementation.

## **Human Resource Management**

The key strength of any organization is its human capital. It is the expertise of its employees which ensures that customers are acquired and retained, and the processes work efficiently to satisfy the customer's needs. That human capital is the basis for the creation of customer and structural capital.

*For a knowledge base on the knowledge worker*

In the information technology (IT) industry, this section starts examining the issues relating to the human capital of an organization. If people hold the key to prosperity anywhere, it is more so in the IT industry, which employs knowledge workers. Here, human capital is not merely one component of capital; it is the critical component that forms the basis for other forms of capital: People with their expertise are the sole creators of value to the customer and people through their effort are the key to the optimization of its process efficiency.

Perhaps the natural corollary to this is the high attrition rate in the IT industry. So IT organizations have a critical need to know the value they would forego when they are about to lose a person. This knowledge is important in taking appropriate action, in making counter-offers, in keeping up a constant preventive effort to fine-tune the compensation structure. All these should always be in line with the value being provided by the employees.

## **Competency mapping**

An employee has a bundle of competencies, each of which needs to be valued. In the computer software field, classifying competencies under five major heads - domain, technology, project management, initiative and leadership. A software project attempts to computerize applications such as production scheduling in a manufacturing organization, trade settlement in a stock exchange or recoveries for an insurance company. An analyst developing the requirements for the system must have expertise in the specific business area such as manufacturing, securities trading or insurance. We call this business knowledge the domain expertise. A software designer must be knowledgeable about the technology that provides the platform for the system and makes it work. Similarly, project management is an essential area of expertise for a person leading a part or whole of a project, to ensure that resources are marshaled to yield effective results in the required time. Besides these, what makes a person valuable to the organization is the consummate acumen for enterprise and

execution - the generation of ideas and the speed of implementation. These come under the umbrella of initiative.

Finally comes the quality of being an inspiration to others: Is a person a thought leader? The ability to apply a new technology in ways unanticipated is one example of displaying thought leadership.

A person has a set of competencies and a value is assigned to each of these competencies. The sum total of it is the value of an employee and the sum total of the value of all employees is the human capital of the organization. This human capital, together with the customer and structural capital produces the revenue.

When an employee leaves, an organization loses that much of capital as determined by the valuation given above. The organization's response to this situation should be guided by the value being lost. Unfortunately, there may be no escalation when a valuable employee leaves. The senior management gets into the act only when a very experienced employee leaves, irrespective of whether he has a higher or lower value than a less experienced person. An organization needs to look for a system for the scientific computation of employee values, stored in a constantly updated database, and with triggers for intimation to top management based on employee valuation. Management can then be made to sit up and take notice whenever high-value employees leave, irrespective of the years of service. In fact, compensation across the board can be structured to be in line with this valuation system. The Process of recruiting the substitute person will also involve cost for the organization.

Human resources valuation has remained an academic exercise and largely ignored even in industries where the expertise of employees is the key differentiating factor. The process of valuation is complex and challenging.

The factors, which play an important role in retention of knowledge workers

- ❖ Recruiting and hiring
- ❖ Training and Professional development
- ❖ Work Space deployment
- ❖ Compensation
- ❖ Employee Friendly Workspace
- ❖ Aligning employees performance expectation with competencies
- ❖ Establishing valuable result oriented measures of individual and group
- ❖ Providing rating and feedback that shows the difference between performers

- ❖ Continuous learning and improvement
- ❖ The culture and mind of managers towards their work force is constantly monitored
- ❖ Job Process tools and mission support : The jobs , tools and support are designed such that it always improves the performance of the employees.
- ❖ Hire and retain people according to competencies

## **HUMAN RESOURCES MANAGEMENT ISSUES**

The speed with which global operations are being established in the service sector is faster than previous global expansion seen in the manufacturing sector. For many organizations, the time to build the business case, select outsourcing vendors or staff “captive” operations, and start operating is less than a year. One U.S.-based high-tech company grew its Indian operations over 2.5 years from 1 employee – the HR person – to 4,500 employees across two cities. The current plan is to increase the number to 10,000 employees by the end of 2005. Such short timeframes for launching and growing offshore ventures make decisions regarding human resources management absolutely critical to the success of these global operations. The human resource implications of global talent sourcing in the services sector are vast, affecting professionals in both the U.S. and “offshore” locations. However, the specific HR challenges vary depending on the business model chosen, how home country employees’ jobs are affected by the creation of offshore operations, and the extent of communication and integration of workflow across multiple geographies. In general, a company’s pursuit of a captive, outsourced, or hybrid business model has greater impact on the HR activities and challenges in the offshore location than in the home country.

For companies newly expanding captive operations in India, for example, virtually every area of human resource management needs to be addressed: recruiting, selection, training, management development, compensation and benefits, building a consistent company culture, and planning tactics to improve retention or manage turnover. Companies pursuing an outsourced business model have far fewer hands-on HR challenges because the day-to-day management of employees is handled by the outsourcing vendor.

HR activities in the home country are more affected by decisions regarding the future employment of home country staff than by the business model in the offshore location. For instance, when offshoring leads to the reduction or reallocation of work among existing home country employees, active communication, change management, and transition assistance facilitate the successful introduction of an offshoring strategy and help maintain morale among

the affected employees.

In all offshore business models, business leaders must decide how home country and offshore staff will interact. As a result, HR professionals face many challenges associated with managing disparate workforces, incorporating stylistic and cultural differences in communication and problem solving, and developing flexible policies appropriate for multiple labor markets. Cross-cultural relations are perhaps one of the most important issues companies face in managing offshoring arrangements. The following sections address the variety of HR challenges associated with the global sourcing of talent.

### **HR Issues for the Home Country Workforce**

The global sourcing of talent impacts the home country workforce irrespective of the configuration chosen for offshored operations. That being said, a captive business model will likely require more active early-stage involvement from senior HR leaders in the home country than other business models, particularly while the company's leaders select an offshore location and recruit local management. HR professionals have a central role in communicating the offshoring decision and its underlying strategic imperative to the workforce, and in facilitating the transition of work and employees affected by it. This section examines three main challenges in the domestic context: communicating the initial offshoring decision, transitioning affected employees to new roles, and getting buy-in, particularly from middle managers, for organizational changes.

#### Communicating about Global Sourcing

Communicating the intention of global sourcing initiatives is an essential place for HR intervention. More and more C-level executives visit potential locations as part of the offshoring decision, and are generally returning to corporate headquarters enthusiastically supportive and driving the mandate for global expansion of outsourcing. Often, the top-level strategic thinking is not clear to the workforce, seriously jeopardizing buy-in, and undermining the strategy's success. Demonstrating the linkage between business strategy and the global sourcing initiative, and developing an effective action plan for transitioning affected employees is a key role for HR. This role is considerably more challenging when domestic employees need to be laid off.

A major financial services company that outsourced much IT work to India provided a

good example of an effective communications plan. The company announced its intention to outsource IT work offshore in a series of “town hall meetings” with employees in the technology groups affected by the company’s outsourcing decision. To stem speculation among employees, whose departments had recently experienced two rounds of layoffs, “We told them what the whole process was going to look like and said they were not going to lose their jobs,” recalled the former HR business partner to the IT organization. “These people were working on technology that customers needed – not a legacy system – so there were other IT roles in the company for them.” As the outsourcing was implemented, the company continued to hold town-hall style meetings every two to three weeks, during which the the CIO, head of strategy, managers for the products involved, IT leaders, and the HR leader for the IT organization participated, candidly answering questions and taking suggestions.

### Transitioning Employees

Effectively facilitating the transition of employees whose workload is going to be sourced elsewhere is important for morale and the company’s public image. When work moves to another location, there are three options for transitioning affected employees: they can be reassigned, redeployed, or laid off. The distinction between “reassigned” and “redeployed” is subtle in language but significant in practice. To be “reassigned,” the company actively manages the transition, looking for other opportunities in the organization that are appropriate for the individual’s skill set and experience. To be “redeployed,” in contrast, places the responsibility for finding a new position in the company squarely on the employee. The former approach conveys the message that while labor arbitrage is making it economically necessary to transfer an individual’s work to a lower cost location, that individual’s knowledge and experience is still valuable to the organization. The latter approach conveys a message that once critical talent is now expendable, with work performed by the lowest bidder, which can be demoralizing for the employees directly affected as well as their co-workers, though not as demoralizing as lay-offs.

Both “reassignment” and “redeployment” can be managed more easily when an effective workforce management system already exists, such as having an inventory of employees’ skills and work experiences, a comprehensive database of current vacancies and anticipated future openings, and a recruiting platform that matches internal candidates with appropriate roles. Variable staffing models, in which contingent workers provide additional flexibility for companies to scale up or down based on project loads, also help to shelter “core” employees for reassignment elsewhere in

the company. The financial services company mentioned earlier hoped employees would stay with their teams in order to train the vendor's staff, while at the same time helping employees find jobs in other divisions of the company. If a match was found, the company allowed the employees to start other jobs before the outsourcing transition was complete thereby demonstrating the company's commitment to the employees' careers.

### Change Management and Getting Buy-in

Getting buy-in from middle managers is particularly important to the success of offshoring initiatives, as these managers are responsible for ensuring the effective knowledge and process transfer to the offshore location. To make offshoring work, they often have to redeploy or lay off or reassign U.S. team members whose work is being offshored as well as manage a faraway team. Another important aspect of change management is knowledge transfer, which may be achieved differently depending on the offshore business model. With outsourcing arrangements, vendor representatives often come to the home country for several months to learn about the business and specific work tasks. The impact of on-site vendors on home country employees' morale depends in large part on whether the employees are "training their replacements" and how the company has communicated about the offshoring strategy.

A Boston-based software company pursued an aggressive offshoring strategy in 2003-2004 in order to reduce its cost of operations. The company transferred software development work from Massachusetts, Michigan, and Northern California to its existing captive operation in Pune, India, growing the Pune office from 300 employees to between 500 and 600. U.S. employees were laid off and the transition was intended to occur in a two-month period. For the "leads" who had the technical knowledge and project management capability to transfer knowledge to Indian counterparts, the company paid significant retention bonuses – between 50% and 100% of their annual pay – in a 90-day period. The interim costs of the transition, which was done explicitly for cost saving purposes, were high.

In addition, several other factors made the software company's offshoring transition a difficult change management situation. The number of employees affected triggered the U.S. Worker Adjustment and Retraining Notification Act (WARN), which required the company to

provide 60 days' advance notice to people who were going to be laid off, which had negative consequences for employee productivity and morale.

Second, the development staff was under a tight timeframe to achieve a critical product launch, so needed to continue working at a high level of productivity. Third, while top executives knew offshoring was needed to keep the company alive, the mid-level managers who led R&D and product marketing for the products affected were not as supportive of the transition. Lastly, the individuals whose jobs were being eliminated had the longest tenure of any segment within the company. Laying these people off

“gutted the heart of the company,” including its product knowledge and shared history, according to the HR executive interviewed. Compounding these U.S.-based change management challenges was the need to train new staff in Pune on the company's sophisticated design modeling software, increasing the time it took to transfer capabilities to the offshore location.

### **HR Issues in the Offshore Location**

In the following sections we provide an introduction to some of the HR issues specific to the offshore location. The types of HR issues a company will face in the offshore location depend primarily on the business model. As Table 6 illustrates, a captive model requires more hands-on involvement in establishing and managing day-to-day operations, while an outsourcing arrangement leaves most of the tactical people-management responsibilities with the vendor. Because of the greater complexity of HR issues associated with captive operations, the following sections focus more on these challenges than on those experienced by companies outsourcing their offshore operations to a third party.

<b>Table: Offshore Location HR Issues and Challenges by Business Model</b>	
<b>Captive Business Model</b>	<b>Outsourced Business Model</b>
<ul style="list-style-type: none"> <li>○ Involves establishing office from scratch; need to build brand as a good employer.</li> <li>○ Responsible for all recruiting, training, retention</li> <li>○ Manage day-to-day operations</li> <li>○ Expatriates likely involved</li> <li>○ Need to stay current on compensation and benefits trends</li> <li>○ Need to develop management capabilities</li> </ul>	<ul style="list-style-type: none"> <li>○ No direct control over day-to-day operations</li> <li>○ Foster collaboration with client employees across organizational and geographic boundaries</li> <li>○ Have short-term expatriate representative from client in offshore vendor location</li> </ul>

The experience of Convergys, an employee and customer care services company, provides an example of the HR issues associated with establishing captive operations.

The company, which employed more than 63,000 people and generated nearly \$2.5 billion in annual revenue in 2004, created Convergys India Services (CIS) in 2000 as a wholly owned subsidiary with operations in Gurgaon and Bangalore. In establishing CIS, the company customized best operating practices developed in its U.S.-based contact centers with input from the Indian management team. Attracting the right candidates and careful screening were critical issues as CIS employed 3,500 people initially and grew by late 2004 to 10,000 employees across seven locations in four cities. The company announced plans in February 2005 to grow employee headcount in India to 20,000 within two years through organic growth and possible acquisitions. To support the rapid recruiting activity, the company used multiple recruitment sources, including online, print advertisements, college campus recruiting, referrals, and the company's database of qualified applicants.

Early in its operations CIS placed a quarter-page help-wanted advertisement for customer service staff in a weekday edition of a target publication. The HR department received over 7,300 resumes within three days of the advertisement's publication. CIS managers interviewed over 1,000 candidates, of which over 300 were considered qualified. In contrast to the talent pool from which Convergys was able to recruit call center staff in the U.S., all candidates in India were college graduates and 60% had previous business experience, 25% of whom had previous contact center work. Following screening and background checks, CIS' selection rate was 1 out of 35.

The company ultimately extended 150 job offers from this single recruitment source.

### Recruitment

Setting up a captive offshore operation is similar in some ways to starting up a new venture, beginning with selection of the location to establish operations. When selecting the appropriate offshore location some of the HR issues to analyze include characteristics of the local labor market – such as English language skills, percentage of technical or business college graduates, wage rates, and competition from other employers. Whereas a company may be widely recognized as a top employer at home, in other countries the company’s hiring managers may find themselves starting from scratch and competing against well-established global employer brands such as American Express, GE, IBM, Proctor & Gamble and Unilever, as well as against leading Indian companies such as Infosys, Tata or Wipro. As evidence of the availability of talent in India and the tough competition for the best applicants, both Infosys and Wipro received more than one million applications in 2004 for little more than 10,000 positions. The challenge to build captive operations quickly puts significant pressure on companies to fill middle- and top-management positions fast, potentially leading to lower quality hires. HR executives we interviewed, both in the U.S. and India, stressed the importance of adapting screening and hiring practices to Indian conditions. The ideal candidate profile should be localized to reflect the education level and business workflow in the offshore location; companies cannot simply search for the same profile of those in the home country. For example, one company establishing a technical support call center Thomas L. Friedman, “A Race to the Top,” The New York Times, June 1, 2005, A27. that initially screened resumes and hired for technical knowledge. What the company found, however, was that an individual’s accent – and the ability of that accent to be “normalized” – was a more important hiring criterion than technical capabilities. It was much easier to provide training to create technical competency for provision of a high service level than it was to “normalize” the accent to enable the person to communicate effectively with the U.S. customer. The company changed its hiring process and began telephoning promising candidates as its first screening mechanism, in which it assesses the candidate’s accent. This company then moves forward with the recruiting process only if the accent is acceptable. If necessary, the company makes up for its new employees’ deficiency in technical knowledge with training.

### *Recruiting the Family*

In India, strong family ties often mean a job candidate's parents are actively involved in the recruitment process. Dell, for example, recognized that parental influence was significant, particularly for the young workforce hired into Dell's customer and technical support call centers. "If parents don't know about the company or what their child is doing, they generally have a tendency not to support those roles," said an individual involved in managing Dell's HR activities in India in 2003 and 2004. Dell not only sends a quarterly letter to employees' homes providing an update on the employee's progress but also invites the parents to attend an event where their son or daughter is going to receive a recognition award. Dell also holds a "family day," attended by the country's vice president and general manager, to allow employees' families to see where their children or family members work. In addition, while on a visit to Dell's operations in India, Chairman Michael Dell invited employees' families to an event where he welcomed them into the Dell family.

### *Background and Reference Checks*

Screening candidates for global operations can be challenging, due to the lack of information comparable to a criminal background check in the U.S. However, multinationals can work with reputable local HR consulting companies that can assist in this process.

### *Longer Notice Periods*

The Boston-based software company that doubled its staff in India in 2003-04, observed that new recruits provided relatively long notice periods to their employers when resigning their positions. Whereas the standard notice period in the U.S. is two weeks, the company experienced notice periods of two months while recruiting staff for its operations in Pune. The extended timeframes provided more opportunities for the original employer to make a counter-offer or for other employers to recruit away the hired employees. As a result, the local HR manager had to stay in contact with the new hires during this interim period to manage any of the transitioning employee's emotions or concerns and to prevent the new hire from rescinding the acceptance of the job prior to the start date.

## Compensation and Benefits

Although wage rates in offshore locations are low compared to the U.S., total compensation increases dramatically in India as a professional matures and develops expertise. According to one high-tech executive, companies can hire recent college graduates in India and China for 15-20% of the labor cost for technical jobs relative to U.S. salaries. But for an experienced manager, the cost differential narrows significantly. Salaries in the Indian IT sector, at both Indian and multinational companies, rose an average of 19% from 2003 to 2004; those with more than 10 years experience fared better, earning an average pay increase of 26%.<sup>12</sup> Perks frequently provided to managers in India include transport to and from the office, which is often located in an office park on the outskirts of the city, either via employee shuttle or a car with driver, and providing for a maid or other household support. Figure 3 shows the changing types of perks and benefits companies provided in the IT sector in 2003 and 2004.

### Employee Retention: Setting Expectations

High employee turnover is an issue cited by many companies that have offshored BPO and IT services work in India. One senior HR executive from a high-tech company characterized the mistakes his company made by saying:

"We've put the wrong people in the wrong jobs, in the wrong career paths, with the wrong training. Essentially, as we now realize, the Indian workforce, particularly college grads, has the same expectations and ambitions as their U.S. counterparts. They feel undervalued by U.S. employers and/or the world. They do not want to answer phones, and they need career challenges consistent with their skills. Their aspired career path, upon hire, is to be in technical support for no more than six months, then software development, then move to the U.S. The best performers at call centers and in technical support are promoted, perhaps two to four levels in 18 months, by age 22." Different retention strategies are being used for employees with varying levels of experience and work roles. The contrast between retention in BPO operations versus technology services provides an example. BPO operations are more likely to employ unskilled recent university graduates who are good English speakers. BPO operations also employ women more often than men. However, the nature of the work (e.g., data entry), night shift work schedules, and lack of career paths help to fuel turnover rates as high as 40%.<sup>13</sup> A 2004 survey of employees in the BPO sector highlighted three top reasons for joining a BPO company: good

work environment (72%), high growth opportunity (69%) and good salary (56%).<sup>14</sup> The same survey provided a different perspective on the challenges companies face when retaining employees, with salary being the most cited reason (at 47% of respondents) for leaving a company, followed by no growth opportunity or lack of promotions (45%). As part of efforts to manage operational continuity despite high employee turnover in the BPO sector, companies are building staffing models and business processes that take into account the anticipated or likely turnover. Highly skilled technical professionals, in contrast, often possess skills valued highly in their employing organizations. The expanding array of perks provided in the IT sector (shown in Figure in the previous section) are evidence that employers take action to provide compelling remuneration for valued technical employees. In addition to perks, learning opportunities through job rotations or working visits to the U.S. have been used as retention techniques with technical professionals.

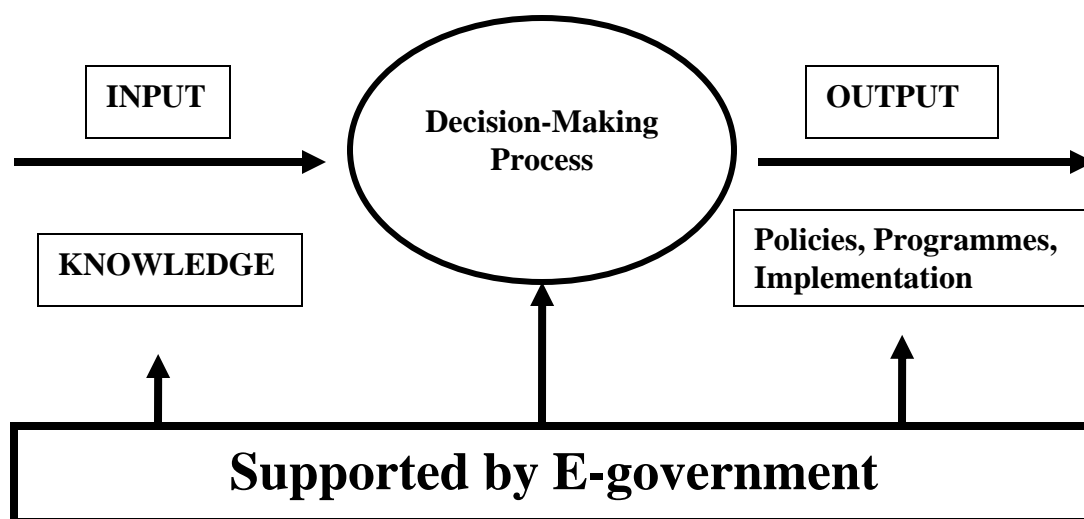
### **Knowledge Management (KM) for E-government**

At the macro level knowledge management (KM) may be defined as leveraging of knowledge for attaining objectives of productivity and competitiveness of a national economy. At the level of a government, knowledge management (KM) for government (KM4G) may be defined as leveraging knowledge for improving internal processes, for formulation of sound government policies and programmes and for efficient public service delivery for increased productivity. Finally, knowledge management (KM) for e-government (KM4Eg) may be defined as management of knowledge for and by e-government for increased productivity. KM4Eg is a management tool for government decision makers and its programme implementers.

Government has been the principal user of knowledge since times immemorial. Primary function of government is decision-making and e-government provides unique support to decision-making. Government also has largest repositories of information and databases and e-government helps in their efficient management. Government always had access to the best available technology of the day to manage its affairs and e-government provides some of the latest and best available technology. There has also been information explosion in recent years and e-government provides an important tool to cope up with it. Office documents lead in storage on paper, which highlights the need for *paperless office*, and which is an important promise of e-government.

### **Importance of Knowledge Management (KM) for E-Government (KM4Eg)**

Print, film, magnetic, and optical storage media produced about 5 exabytes of new information in 2002 (SIMS 2003) (1 exabyte=  $10^{18}$  bytes). 92% of the new information was stored on magnetic media, mostly in *hard disks*. Film represents 7% of the total, paper 0.01%, and optical media 0.002%. Almost 800 MB of recorded information is produced per person each year (ibid.). Governments, therefore, face *information explosion* and KM4Eg can help governments in coping with *information explosion* leading to better policy formulation, better programme implementation and need-based skill formation for increased productivity. KM4Eg is no longer a choice but an imperative if economies have to survive in the unfolding era of privatization, liberalization and globalization.



**Figure: The decision-making process in government supported by e-government**

KM4Eg may be viewed from a variety of perspectives, for example, process perspective, user perspective, technical perspective, organizational perspective, legal perspective, knowledge perspective, cultural, societal and political perspective (Wimmer 2002).

S.N.	Type of Content	Terabytes
1	Books	39
2	Newspapers	138.4
3	Office Documents	1,397.5
4	Mass market periodicals	52
5	Journals	6
6	Newsletters	0.9
7	Total	1,633.8

Source: How much information 2003 (SIMS 2003)

**Table: Worldwide production of printed original content: Storage content: Paper**

## **Exploding Five Myths in Knowledge Management for E-government**

*Myth 1: KM is a fad.*

Wrong. It is here to stay whether we call it by this or any other name.

*Myth 2: KM is not for government.*

Wrong. Government being knowledge-based, it is very much for government.

*Myth 3: KM is not for civil servants*

Wrong. Being knowledge workers, civil servants are very much concerned with *KM*.

*Myth 4: KM is not for e-government champions.*

Wrong. *KM* being an integral part of e-government, e-government champions, whether politicians or civil servants, are vitally concerned with it.

*Myth 5: KM is theoretical discipline.*

Wrong. It is a practical *management tool*, which has tremendous potential for increased productivity and competitiveness.

## **Issues in Knowledge Management for E-government**

A number of issues, some old and some new, have arisen in knowledge management for and by e-government in government, for example,

- (i) information is not up to date.
- (ii) required information is not available,
- (iii) too much information is collected,
- (iv) very little information is used in actual decision-making,
- (v) there has been information explosion and
- (vi) new areas like information and communication technology (ICT) and e-government have emerged calling for collection of new information.

## **Knowledge Pyramid for E-government**

Knowledge pyramid is frequently used by knowledge management (*KM*) scholars (see, for example, Cong and Pandya (2004) section 1. Knowledge management (*KM*) for e-government has *four* components of

- (a) *data*, which consists of facts and figures,

(b) *information*, which is *interpreted data* (data + interpretation),  
(c) *knowledge*, which is *use of information* ( data + interpretation + use), and  
(d) *wisdom*, which is *application of knowledge* (data + interpretation + use + application). Note that wisdom, defined here as application of knowledge, and not knowledge *per se*, is the highest form of knowledge.

### **Knowledge management (KM) toolbox for e-government**

A number of knowledge management (KM) tools and techniques exist for e-government. For example,

1. *After Action Reviews* (AARs) (Pioneered by U.S. Army; for learning lessons from an activity or project),
2. *Communities of Practice* (COPs) (killer app of KM for sharing of knowledge),
3. *Knowledge Audit* (A systematic process to identify an organisation's knowledge needs, resources and flows, as a basis for understanding where and how knowledge can add value - de Brun 2005. Also comparison of performance against preset standards).
4. *Knowledge Plan* (Based on knowledge strategy)
5. *Exit Interviews* (Capturing knowledge of departing employees)
6. *Sharing Best Practices* (Identifying, capturing in one part of organisation and sharing with all others)
7. *Knowledge Centres* (Connecting people, information, databases)
8. *Knowledge Harvesting* (Capturing knowledge of "experts" and making it available to others).
9. *Peer Assists* (Learning from experience of others before undertaking an activity or project)
10. *Social Network Analysis* (Understanding relationships between people, groups and organisations as to how they facilitate or impede flow of knowledge)
- 11 *Storytelling* (Ancient art of sharing knowledge still widely used), and
- 12 *White Pages* (Preparing a directory of Experts) (Source: Adopted from De Brün 2005)

### **Knowledge Management Cycle**

KM can be viewed as a cycle consisting of six successive phases: 1.Undertake Knowledge Audit, 2 Create Knowledge, 3 Capture Knowledge, 4. Store Knowledge, 5. Use Knowledge, and 6 Review Knowledge.

#### Phase I Undertake Knowledge Audit

Ask questions like: Who collects what information? Why is it collected? Is it collected in time? Is collected knowledge put to any use? Is there a better way of collecting knowledge? Is required information being collected?

#### Phase II Create Knowledge

Take stock of existing knowledge. Assess knowledge needs of the organization. Determine who will create what information, when and in what format Use knowledge management (KM) tools for knowledge creation.

#### Phase III Capture Knowledge

Transform tacit knowledge into storable explicit knowledge (Neve 2003). Record one-to-one conversations. Record a brainstorming session Record minutes of the meetings and other proceedings Record success profile of individual e-government champions.

#### Phase IV Store Knowledge

Organize knowledge into codifiable and noncodifiable categories (Warren et al. 2006). Use electronic media for knowledge storage. Open a knowledge centre in the ministry/department. Identify and use “best practices” in knowledge storage.

#### Phase V Use Knowledge

Knowledge captured and stored should be made accessible to all concerned personnel. Distribute and share knowledge. Set up knowledge distribution and knowledge sharing mechanisms. Provide knowledge inputs to policy makers. Monitor knowledge use

#### Phase VI: Review Knowledge

Scan the horizon to anticipate knowledge needs of ministry/department Review the existing stock and flow of knowledge. Make use of simple but effective knowledge indicators. Involve stakeholders in knowledge review. Has knowledge led to better decision making and/or higher productivity? The knowledge management cycle may be seen in Figure 4.

## **Ten Guiding Principles for introduction of knowledge management (KM) in e-government**

*Guiding Principle 1: Develop a knowledge management (KM) strategy for the organisation*

Leverage knowledge for achieving organisational goals and serving citizens and non-citizens.

*Guiding Principle 2: Proceed step-wise, from simple to the complicated.*

Adopt modular approach. Do not attempt anything highly ambitious in the initial stages.

*Guiding Principle 3: Do not re-invent wheel. Make use of existing knowledge and insights.*

Undertake knowledge needs assessment. Only then plan the next step.

*Guiding Principle 4: Make use of information and communication technologies (ICTs)*

But do not forget GIGO, garbage in, and garbage out.

*Guiding Principle 5: Make use of people, process and technology (PPT) model.*

But do not forget: Computers: fast, accurate, *dumb*, People: slow, sloppy, *smart*

*Guiding Principle 6: Prepare a simple and modular knowledge sub-plan incorporating knowledge management (KM) strategy.*

Do not use any complicated knowledge management (KM) tool or mechanism that cannot be successfully implemented.

*Guiding Principle 7: Include knowledge management (KM) sub-plan in the e-business plan of Ministry/Department.*

Do not prepare any stand-alone knowledge management (KM) sub-plan. It is more likely to fail than succeed.

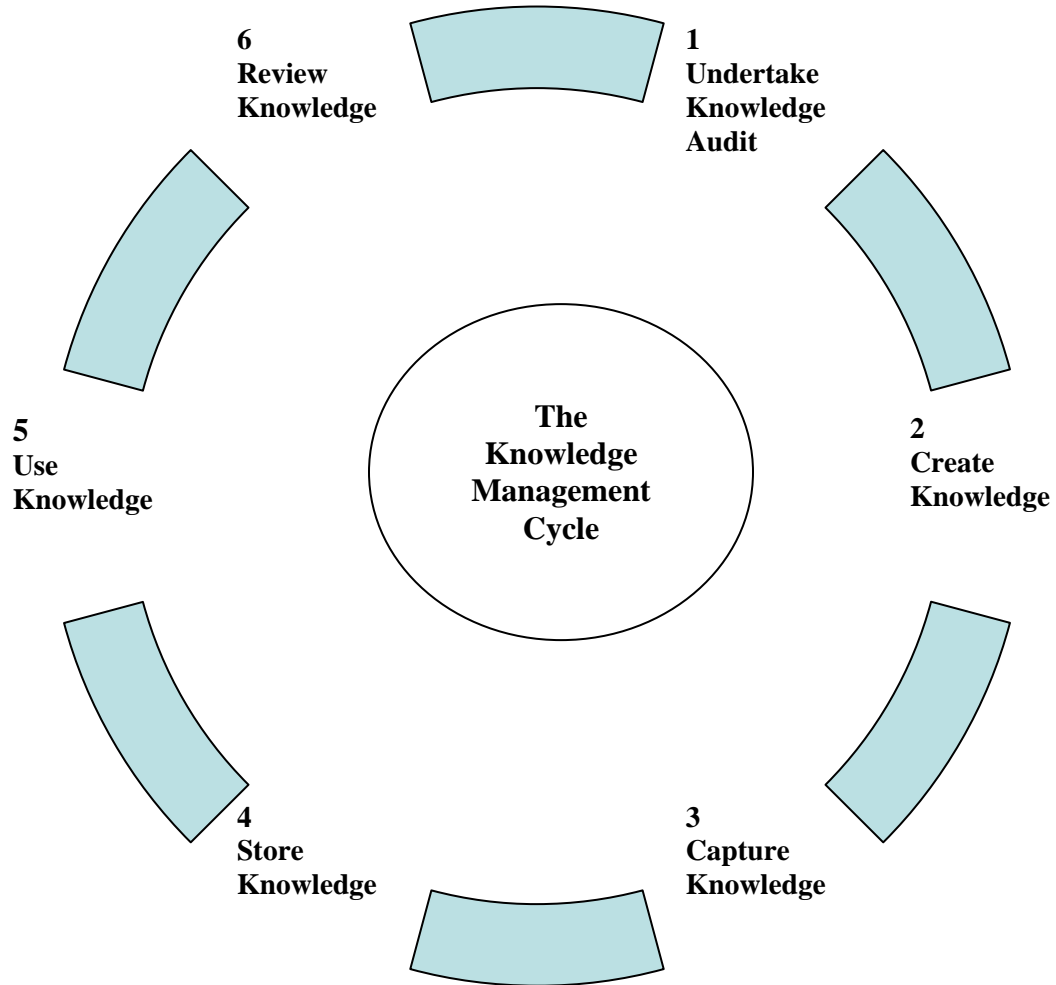
*Guiding Principle 8: Secure top management support to knowledge management (KM) sub-plan.*

Remember, no plan can succeed without top management buy-in. This is to be a priority.

*Guiding Principle 9: Demonstrate results.*

Remember, the best way to convince any one about practical utility of knowledge

management (KM) is to show concrete, verifiable results.



**Figure: The Knowledge Management Cycle**

*Guiding Principle 10: Review the implementation of knowledge management (KM) sub-plan from time to time.*

Review the implementation of the knowledge management (KM) sub-plan against the following *three* criteria: Has the implementation of the knowledge management (KM) sub-plan

resulted in: (a) better decision-making by *government*, (b) better service delivery to *citizens and non-citizens*, and (c) better performance by *civil service*.

## **Knowledge Management & Its Application in India**

### **CASE-1**

#### **INFOSYS TECHNOLOGIES**

Infosys Technologies is the first Indian company to be inducted into the Global Most Admired Knowledge Enterprises (MAKE) Hall of Fame. Infosys features among 22 other global organizations including Dell, General Electric (GE), Hewlett Packard (HP), Accenture, IBM and Microsoft. Infosys has been recognized for its organizational learning and for transforming enterprise knowledge into shareholder value. It is also the first and only Indian company to win the Global MAKE award for the third consecutive year.

The 2005 Global MAKE Winners were recognized by a panel of senior Global Fortune 500 executives and internationally recognized knowledge Management experts as leaders in:

- Creating a corporate knowledge-driven culture
- Developing knowledge workers through senior management leadership
- Delivering knowledge-based products/solutions
- Maximizing enterprise intellectual capital
- Creating an environment for collaborative knowledge sharing
- Creating a learning organization
- Delivering value based on customer knowledge
- Transforming enterprise knowledge into shareholder value

The award stands as a testimony to clients, emphasizing the strength of their partner. The 2005 Global MAKE award winners offer long-term potential due to their intellectual capital-driven wealth creation. A total of 10 Global MAKE Winners rank among the global top 100 companies by market capitalization. Similarly, for the publicly traded 2005 Global MAKE Winners, return on assets was nearly four times that of the Global Fortune 500 company median. Infosys Technologies ranked among the highest in this category.

Acknowledging the award, Nandan M Nilekani, CEO, President and MD, Infosys Technologies said, "At Infosys, Knowledge Management (KM) is central to a core strategy of providing differentiated value to customers and enabling their business growth. KM has helped us develop a

pervasive culture of beneficent knowledge exchange across geographies. We are therefore extremely delighted to be ranked among the world's Most Admired Knowledge Enterprises and to be inducted into the Global MAKE Hall of Fame.”

Rory Chase, Managing Director of Teleos, which administers the MAKE program, said: "The Global MAKE Winners are effectively transforming enterprise knowledge into wealth-creating ideas, products and solutions. They are building portfolios of intellectual capital and intangible assets which will enable them to out-perform their competitors in the future. "

Commenting on the award, Dr. J.K. Suresh, Principal Knowledge Manager, Infosys Technologies Limited, said, “At Infosys, we consider KM as a powerful medium for creating sustainable networks of people across intra-organizational boundaries. It also provides a symbolism for aligning individual initiative and creativity with organizational growth.

## **CASE - 2**

### **E-ENABLING RELIANCE**

Reliance intends to provide customised, and personalised services, to its customers, drawing upon the power of the Internet.

It intends to implement suitable Supply Chain Management (SCM), Customer Relationship Management (CRM), and Knowledge Management (KM) strategies, substantially cutting inventories, increasing responsiveness, and hence provide enhanced services to customers. The entire procurement cycle - forecasting, planning, replenishment, supply chain financing, and transportation - will be automated, leading to significant cost savings.

## **CASE – 3**

### **HINDUSTAN LEVER LIMITED (HLL)**

Hindustan Lever Limited (HLL) has identified 9 new business initiatives, which along with the present businesses, will drive the company’s ambition to double its turnover every four years. The

9 new growth engines comprise entry into categories new to HLL, and unique business systems for specific channel or segment opportunities.

**Rural Business System:** HLL has developed appropriate products for rural India. It deploys communication and information technology to establish connectivity in the distribution system at a scale never attempted before. Finally, in a win-win partnership, it will join hands with rural self-help groups; the initiative will create critically needed sustainable jobs for thousands of villagers, while for the company it will translate into extending its distribution into hitherto unexplored territory.

**The Internet Opportunity:** HLL has developed a 3-pronged strategy to leverage the Internet. First, the company will Connect. The web-enabled extended supply chain of stockists, suppliers, banks and even potentially top retailers will create the most capital-efficient supply chain optimised for handling product, cash and information flow. Second, HLL will Attract consumers, and further strengthen relationships by becoming the preferred online provider of information, products and services on health, beauty and nutritional needs.

#### **CASE - 4**

##### **ASIA'S MOST ADMIRABLE KNOWLEDGE ENTERPRISE**

In the late 1990s, Tata Steel began to introduce knowledge management initiatives in the company. It started with a small group of people from within the organization. The group formed a "knowledge repository", where all the employees shared their experiences and knowledge. One year after the knowledge repository was formed, the company formed "knowledge communities", which was a platform for like-minded people to meet and share their experiences. In 2001, Tata Steel developed a "KM index" to evaluate the performance of individual employee in the KM initiative. Later, it linked performance evaluation to KM and used a balanced scorecard to monitor the performance of individual employees, divisions, as well as the organization as a whole, in KM. All these initiatives of Tata Steel seem to have paid off; in early 2003, Tata Steel was recognized as one of Asia's Most Admired Knowledge Enterprises. It was the only steel company in the world to have received the MAKE award.

In 2003, Tata Steel was chosen as one of Asia's Most Admired Knowledge Enterprises (MAKE). It was the only company in the manufacturing sector in India and the only steel company in the world to receive this award. The award was in specific recognition of Tata Steel's knowledge management (KM) initiatives, which were started in late 1990s. Tata Steel was the only manufacturing company in India to have implemented KM. Tata Steel's management expected KM to play a key role in establishing intellectual assets, rather than physical assets, as the growth driver of the company.

KM was also expected to be an important source of competitive advantage for Tata Steel. Tata Steel was early to recognize the significance of KM for the success of a company. It made it compulsory for all its employees to participate actively in its KM program. The company based its new performance assessment program on the participation of each individual employee in the KM program through the introduction of a "KM index".

The index tallied the points achieved through participation in the KM program, giving the employees a benchmark for their participation. Tata Steel also encouraged employees to experiment with new ideas, for which they were rewarded.

Tata Steel's KM initiatives were successful and the number of hits at KM sites of Tata Steel in 2001-02 was 1100 compared to Shell's (second most admired company in Europe) 1000 hits, even though Tata Steel had only 3000 registered users as compared to Shell's 10000 registered users. Through Tata Steel's KM initiatives, expert skills became available throughout the organization and productivity increased. As employees were encouraged to come out with innovative ideas, their job satisfaction increased, and another benefit was a reduction in the R&D expenditure.

## **CASE - 5**

### **SATYAM COMPUTERS**

Satyam Computer Services Limited has received the IBM Lotus Award in the Knowledge and Content Management Solution category for the Tenth Annual IBM Lotus Awards (formerly

known as the Lotus Beacon Awards). IBM Lotus Awards recognize exceptional IBM PartnerWorld business partners that specialize in Lotus software solutions and have excelled at providing quality products, innovative solutions and superior services to customers.

For the R&D branch of an Indian Fortune 500 customer in the oil industry, knowledge management was a prime corporate initiative. Satyam helped the organization treat its wealth of scientific knowledge much like any capital asset, improving collaboration and efficiency on R&D projects.

The interactive Web-based solution integrates IBM software technologies like IBM WebSphere Portal and a suite of Lotus Products, to offer more than 200 scientists a better way to collaborate and share vital knowledge and information.

## **CASE - 6**

### **ITC Ltd**

#### **A digital transformation**

ITC began the silent e-revolution of rural India with soya growers in the villages of Madhya Pradesh. For the first time, the stereotype image of the farmer on his bullock cart made way for the e-farmer, browsing the e-Choupal website. Farmers now log on to the site through Internet kiosks in their villages to order high quality agri-inputs, get information on best farming practices, prevailing market prices for their crops at home and abroad and the weather forecast – all in the local language. In the very first full season of e-Choupal operations in Madhya Pradesh, soya farmers sold nearly 50,000 tons of their produce through the e-Choupal Internet platform, which has more than doubled since then. The result marks the beginning of a transparent and cost-effective marketing channel. Bringing prosperity to the farmers' doorstep.



Smart Cards enable farmer identification to provide customised information on the echoupal.com website. Online transactions are captured to reward farmers for volume and value of usage.

### **Linking farmers to remunerative markets**

Farmers grow wheat across several agro-climatic zones, producing grains of varying grades. Though these grades had the potential to meet diverse consumer preferences, the benefit never trickled down to the farmers, because all varieties were aggregated as one average quality in the mandis. Enter ITC's e-Choupal intervention. The e-Choupal site is now helping the farmers discover the best price for their quality at the village itself. The site also provides farmers with specialised knowledge for customising their produce to the right consumer segments. The new storage and handling system preserves the identity of different varieties right through the 'farm-gate to dinner-plate' supply chain. Encouraging the farmers to raise their quality standards and attract higher prices.

# **2006 Indian Most Admired Knowledge Enterprises (MAKE) Report**

## **Executive Summary**

The Indian Most Admired Knowledge Enterprises (MAKE) study is part of Teleos' MAKE research program. The Indian MAKE study was established in 2005 to recognize organizations (founded and headquartered in India) for their ability to create shareholder wealth (or in the case of public and non-profit organizations to increase societal capital) by transforming new as well as existing enterprise knowledge into superior products/services/solutions.

The Indian MAKE research is based on the Delphi methodology. This research tool employs an expert panel's perceptual knowledge to identify critical issues – in the case of the Indian MAKE study to identify those organizations which are leaders in creating organizational intellectual capital and wealth through the transformation of individual/enterprise knowledge into world-class products/services/solutions. Through several rounds a consensus is developed among the panel's experts. It is this consensus of expert opinion which provides the validity to the Delphi, and Indian MAKE study results.

A blue ribbon panel of senior Indian business executives and leading Indian-based knowledge management / intellectual capital experts selects the Indian MAKE Winners. In the Indian MAKE study there are three rounds of consensus building. In the first round, members of the expert panel nominate enterprises founded and headquartered in India.

In the second round, each member of the expert panel selects a maximum of three organizations from the list of nominations. Those organizations selected by at least 10% of the expert panel are recognized as Indian MAKE Finalists. In the third and final round, the Indian MAKE Finalists are ranked against each of the eight knowledge performance dimensions which form the MAKE framework and are the visible drivers of wealth creation:

- creating an enterprise knowledge-driven culture.
- developing knowledge workers through senior management leadership.
- delivering knowledge-based products/services/solutions.
- maximizing enterprise intellectual capital.

- creating an environment for collaborative knowledge sharing.
- creating a learning organization.
- delivering value based on customer knowledge.
- transforming enterprise knowledge into shareholder value.

A total of 37 organizations were nominated as 2006 Indian Most Admired Knowledge Enterprises

### **2006 Indian MAKE Finalists**

#### **Enterprise Industry**

- Bharti Airtel Telecommunications
- Eureka Forbes Consumer products
- Infosys Technologies IT solutions
- Larsen & Toubro Construction & engineering
- MindTree Consulting IT consulting & solutions
- Patni Computer Systems IT solutions
- Satyam Computer Services IT solutions
- Tata Consultancy Services IT solutions
- Tata Steel Metal fabrication
- Wipro Technologies IT solutions

*Table 1: A total of 10 organizations were selected as 2006 Indian MAKE Finalists (based on nominations from at least 10% of the Indian MAKE expert panel).*

A total of 7 Indian MAKE Finalists were recognized as 2006 Indian MAKE Winners (based on the total composite scores). The 2006 Indian MAKE Winners are shown in alphabetical order in Five organizations repeated as Indian MAKE Winners: Eureka Forbes, Infosys Technologies, Tata Consultancy Services, Tata Steel and Wipro Technologies. For the first time, Tata Steel was recognized as the 2006 overall Indian MAKE Winner. Last year's inaugural overall Indian MAKE

Winner was Infosys Technologies. Newcomers to this year's Indian MAKE Winner's circle are: Bharti Airtel and MindTree Consulting. Enterprises failing to repeat as Indian MAKE Winners are: i-flex solutions and Satyam Computer Services.

### **2006 Indian MAKE Winners**

## **Enterprise Industry**

1. Bharti Airtel Telecommunications
2. Eureka Forbes Consumer products
3. Infosys Technologies IT solutions
4. MindTree Consulting IT consulting & solutions
5. Tata Consultancy Services IT solutions
6. Tata Steel Metal fabrication
7. Wipro Technologies IT solutions

Senior executives tend to look through the ‘lens’ of high-level strategic issues and how well organizations are meeting these challenges. Nominations from this group are influenced by strong leadership and the results of knowledge-driven metrics, such as market capitalization, expanding intellectual capital assets, customer loyalty and shareholder value.

The panel of chief knowledge officers and knowledge management / intellectual capital experts tend to see things through the ‘lens’ of the development and implementation of enterprise approaches and strategies leading to knowledge-driven excellence in terms of superior products/services/solutions.

## **Enterprises Receiving the Most 2006 Indian MAKE Nominations**

### **Indian Senior Executives CKOs and Leading KM/IC Experts**

- Bharti Airtel Bharti Airtel
- Eureka Forbes Eureka Forbes
- Infosys Technologies Infosys Technologies
- Tata Consultancy Services Tata Steel
- Wipro Technologies Wipro Technologies

## **Key Findings**

• Many of the Indian MAKE leaders adopted their corporate knowledge strategies during the late 1990s and early 2000s. Although starting several years after pioneering Western companies, Indian-based organizations have been very successful at benchmarking and transferring knowledge best practices found in Asian, European and North American MAKE Winners. Today, only a few Indian MAKE leaders have reached parity with their Western MAKE counterparts – most Indian organizations still lag behind regional and global MAKE leaders.

- Indian MAKE leaders are focusing on intellectual property, intellectual assets and brands, but as a rule still do not have in place enterprise-wide intellectual capital management strategies.
- Advanced IT-enabled collaborative knowledge sharing tools are now a core competency for MAKE Winners. It appears, however, that Indian, Asian and North American MAKE leaders are more ‘innovative’ in applying new Internet-based tools to effectively share and reuse knowledge in an increasingly global workplace.
- European and North American MAKE Winners have improved their scores in managing customer knowledge. Many Indian organizations continue to fall well below the MAKE leaders’ standards. In order to move into higher value-adding product/service segments, Indian enterprises must focus on this important knowledge performance dimension.
- Financial reporting for Indian companies is more opaque than found in North America and Europe. As a result, Indian companies have placed less emphasis on managing, measuring and reporting their effectiveness in transforming enterprise knowledge into increased shareholder value. Investors and national/global financial regulators are increasingly demanding greater ‘transparency’ in reporting this information. Indian firms will come under growing pressure to implement best practices in this area.
- According to the MAKE expert panel, the Indian knowledge-based economy is driven by the following key business sectors (based on the number of MAKE Finalists in each industry): IT software/solutions, manufacturing and telecommunications.
- The second annual Indian MAKE study has revealed that the country’s knowledge leaders are few and concentrated in one business sector – IT solutions. This large concentration of Winners from a single business sector indicates that there are few knowledge ‘role models’ available throughout Indian business and industry.
- It also should be noted that there is a significant gap (in the total composite score) between the ten Indian MAKE Finalists and other nominated organizations. The result is a two-tier Indian knowledge league table. In other words, the Indian MAKE Finalists have knowledge processes which match those of MAKE leaders from around the world. However, the remaining Indian MAKE nominees are still in the early stages of implementing their enterprise knowledge strategies and must spend more time and effort before they can join the Indian MAKE Winners’ circle.
- The Indian government and national business associations face the challenge of creating programs that encourage and facilitate the sharing of best knowledge practices between the Indian

MAKE Winners and the rest of country's business and industry. This structured transfer of knowledge skills and competencies will enable all of Indian business to more effectively compete in today's global knowledge economy.

### **Overall 2006 Indian MAKE Winner – Tata Steel**

Established in 1907 by its founder J. N. Tata, Tata Steel is India's largest integrated private sector steel company with annual sales of US \$5 billion and over 40,000 employees. Over the years, Tata Steel has emerged as a thriving, nimble, steel enterprise due to its ability to transform itself rapidly to meet the challenges of a highly competitive global economy and commitment to becoming a supplier of choice by delighting its customers with services and products. Constant modernization and introduction of state-of-the-art technology at Tata Steel has enabled it to stay ahead in the industry and successfully meet the expectations of all sections of stakeholders.

The company's fifth phase of the Modernization Program focused on leveraging the intellectual capabilities of its employees to generate sustainable value for the stakeholders. Now, as Tata Steel marches towards its goal of becoming a Global Leader, the Knowledge Management initiative is working as an enabler to grow and utilize the physical assets to the maximum. The 2006 Indian MAKE panel has recognized Tata Steel for creating an environment for its knowledge-driven organizational culture (1st place) collaborative knowledge sharing (1st place), organizational learning (1st place), and managing customer knowledge (1st place).

### **2006 Indian MAKE Winners**

The remaining 2006 Indian MAKE Winners are (in alphabetical order):

#### ***Bharti Airtel***

Bharti Airtel is a part of Bharti Enterprises, and is India's leading provider of telecommunications services. The company has annual revenues of US \$2.5 billion, employs 10,000 people, and has over 27 million customers. Bharti Airtel is structured into three individual strategic business units: mobile services, broadband & telephone services (B&T), and enterprise services. The mobile services group provides GSM mobile services across India in 23 telecom circles, while the B&T business group provides broadband & telephone services in 92 cities. The Enterprise

services group has two sub-units -- carriers (long distance services) and services to corporations. All of the services are provided under the Airtel brand.

The 2006 Indian MAKE panel has recognized Bharti Airtel for its organizational learning, and managing customer knowledge.

### ***Eureka Forbes***

Eureka Forbes, part of the Shapoorji Pallonji Group, has single-handedly created markets for “concept product categories,” such as water purification systems, vacuum cleaners and air purifiers through the direct selling method. The company’s vision is: “A happy, safe and pollution-free environment built on trust and lasting relationships with customers.” Headquartered in Mumbai and expanding throughout South-East Asia, the company has over 6,000 employees known as Eurochamps (including a 5,000-strong direct sales force). In the fiscal year ending March 2006, Eureka Forbes reported revenues of US \$153 million.

The 2006 Indian MAKE panel has recognized Eureka Forbes for its knowledge-based products/services/solutions (1st place), and transforming enterprise knowledge into shareholder value (1st place).

### ***Infosys Technologies***

Infosys Technologies provides consulting and IT services to clients globally. With 2005 annual sales of US \$2.2 billion and employing over 66,000 people worldwide, the company uses a low-risk Global Delivery Model (GDM) to accelerate schedules with a high degree of time and cost predictability.

During the past several years, Infosys has made a concerted effort to provide an integrated solution to meet the knowledge needs of the organization in the four basic dimensions of knowledge management: people, process, technology and content.

The 2006 Indian MAKE panel has recognized Infosys Technologies for maximizing the firm’s enterprise intellectual capital.

### ***MindTree Consulting***

MindTree Consulting, an international IT and R&D services company, was established in 1999 by 10 industry professionals who came from Cambridge Technology Partners, Lucent

Technologies and Wipro. The company, co-headquartered in Somerset, New Jersey, USA, and Bangalore, India, has annual revenues of US \$100 million and employs over 3,000 people.

MindTree develops applications to help companies enhance their enterprise operations. The company also delivers product development services and designs reusable building blocks for high-tech companies.

The 2006 Indian MAKE panel has recognized MindTree Consulting for its knowledge-driven organizational culture, developing knowledge workers through senior management leadership (1<sup>st</sup> place), and managing customer knowledge.

### ***Tata Consultancy Services***

Tata Consultancy Services (TCS) is a leading information technology consulting, services and business process outsourcing organization. Founded in 1968, TCS has annual sales of US \$2.8 billion and employs over 78,000 consultants located in more than 35 countries. TCS has engineered some of the world's most complex applications and next-generation IT infrastructures. TCS's unique 'web of participation' structure enables the company to maximize the benefits of its depth, diversity and delivery capability to offer innovative solutions across business and technology domains.

The 2006 Indian MAKE panel has recognized Tata Consultancy Services for maximizing the firm's enterprise intellectual capital (1st place).

### ***Wipro Technologies***

Wipro Technologies provides comprehensive IT solutions and services, including systems integration, information systems outsourcing, package implementation, software application development and maintenance, and research and development services. The company has more than 40 'Centers of Excellence' that create solutions around specific needs of industries. Wipro Technologies has annual sales of US \$1.6 billion and employs over 30,000 people.

The 2006 Indian MAKE panel has recognized Wipro Technologies for organizational learning, and transforming enterprise knowledge into shareholder value.

This 2006 Indian MAKE study sets a benchmark for future Indian MAKE research. It is an invaluable baseline for measuring the progress of Indian organizations as they strive towards becoming world-class knowledge-driven enterprises.

The Most Admired Knowledge Enterprises (MAKE) research program is providing Indian business leaders, practitioners and researchers with a clearer 'picture' of how organizations are using knowledge as a key competitive differentiator in the 21st century economy. As our understanding grows, so will our ability to manage knowledge for the benefit of the individual, the organization and Indian society.

## **Teleos**

Teleos, an independent knowledge management and intellectual capital research firm, administers the Most Admired Knowledge Enterprises (MAKE) program. The KNOW Network is a Web-based global community of organizations dedicated to achieving superior performance through benchmarking, networking and best practice knowledge sharing.

## **2006 Indian MAKE Nominees**

A total of 37 organizations were nominated as 2006 Indian Most Admired Knowledge Enterprises:

1. Bharti Airtel (Telecommunications)
2. Bharat Petroleum (Oil & gas)
3. Bhilai Steel (Metal fabrication)
4. Byrraju Foundation (Non-profit)
5. Dr. Reddy's Laboratories (Pharmaceuticals)
6. Essar Group (Diversified manufacturing)
7. Eureka Forbes (Consumer products)
8. Grasim Industries (Diversified manufacturing)
9. HCL Technologies (IT solutions)
10. Hero Motors (Vehicle manufacturing)

11. Hindustan Construction Company (Construction & engineering)
  12. Hindustan Lever (Consumer products)
  13. Honeywell Technology Solutions Labs (IT solutions)
  14. i-flex solutions (IT solutions)
  15. ICICI Bank (Financial services)
  16. Indian Defense Research & Development Organization (Government agency)
  17. Indian Oil (Oil & gas)
  18. Infosys Technologies (IT solutions)
  19. Larsen & Toubro (Construction & engineering)
  20. Mahindra & Mahindra (Diversified manufacturing)
  21. MindTree Consulting (IT consulting & solutions)
  22. Nihilent Technologies (IT solutions)
  23. Oil & National Gas Corporation (Oil & gas)
  24. Pantaloons (Retail)
  25. Patni Computer Systems (IT solutions)
  26. Polaris Software Labs (IT solutions)
  27. Premier Evolvics (Testing & measurement equipment)
  28. Reliance Industries (Diversified manufacturing)
  29. Satyam Computer Services (IT solutions)
  30. Steel Authority of India Limited (Metal fabrication)
  31. Sundram Fasteners (Metal fabrication)
  32. Tata Chemicals (Chemicals)
  33. Tata Consultancy Services (IT solutions)
  34. Tata Steel (Metal fabrication)
  35. 3i-Infotech (IT solutions)
  36. Wipro Technologies (IT solutions)
  37. Zensar Technologies (IT solutions)
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