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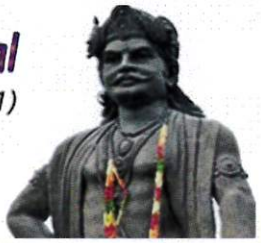

SELF - LEARNING MATERIAL

MBA, Second Year

KNOWLEDGE MANAGEMENT

MBA Second Year

KNOWLEDGE MANAGEMENT

मध्यप्रदेश भोज (मुक्त) विश्वविद्यालय – भोपाल
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SYLLABI-BOOK MAPPING TABLE

Knowledge Management

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INTRODUCTION

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Knowledge management involves enhancing organizational knowledge through sound practices of information management and organizational learning. Considerable evidence has emerged to show that what matters is not the ability to generate information but to assimilate it. Knowledge Management deals with using information that creates value.

Knowledge is present in ideas, judgments, talent, root causes, relationships, perspectives and concepts of every individual. Knowledge resides in an individual brain or is encoded in organizational processes, documents, products, services, facilities and systems. Knowledge forms the basis for, and the driver of, post-industrial economy. Knowledge is the result of learning which provides the only sustainable competitive advantage; it is the next paradigm shift in computing following data processing and information management. Knowledge is all about action, focused innovation, pooled expertise, special relationships and alliances. Knowledge is value-added behaviour and activities. For knowledge to be of value, it must be focused, current, tested and shared. This book presents strategies, techniques and tools to facilitate the design and development of an organizational Knowledge Management System.

It has been observed that the field of Knowledge Management and its underlying concepts are not understood by most people, who primarily view the field as something not easily conquerable. This has led to myriad individual perceptions and has alienated the subject from the common man.

This book, *Knowledge Management*, has been written in the Self-Instructional Mode (SIM) wherein each unit begins with an Introduction to the topic followed by an outline of the Objectives. The detailed content is then presented in a simple and an organized manner, interspersed with Check Your Progress questions to test the understanding of the students. A Summary along with a list of Key Terms and a set of Self-Assessment Questions and Exercises is also provided at the end of each unit for effective recapitulation.

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UNIT 1 INTRODUCTION TO KNOWLEDGE MANAGEMENT

Structure

1.0 INTRODUCTION

Knowledge management (KM) is a collection of strategies for developing, sharing, utilising, and managing an organization's knowledge and information. It is a multidisciplinary approach to achieving organisational goals through the most effective use of knowledge. The concept of knowledge management developed in the 1980s. The growth of information technology and the Internet also made knowledge management a weapon for companies as it gave them a competitive edge.

1.1 OBJECTIVES

After going through this unit, you will be able to:

- Understand the concept of knowledge management
- Discuss the historical progress of knowledge management

1.2 KNOWLEDGE HAS A NEW BEGINNING

The evolution of human beings primarily revolves around knowledge and the experience one has gained from it. Knowledge can also be termed as the incarnation of the soul. Knowledge basically is the way our mind creates a perception and analyses a thought process and how that is communicated and transported to another person; in the corporate field, this concept doesn't change too much.

As management science has attained its maturity, it has focused more on leveraging knowledge and keeping its use minimalistic. The nature of management science, to get updated solutions to the challenges faced by the corporate world is an aftereffect of knowledge management. This has led to it getting more and more associated with the IT world for reasons that are purely historical.

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Knowledge management primarily involves the renewal, distribution, and implementation of knowledge for the sustainability and survival of an organization. The innovation in a company depends upon how knowledge is leveraged and how capable its workforce is. Knowledge management faithfully delivers all that is expected of it.

Creation of Knowledge Societies

The use of knowledge depends mostly on the understanding and depth of the character of the person possessing it. Thus, it is very necessary to stress the fact that knowledge management is essentially about possessing information in the best possible way so that the repetition of the whole cycle occurs. But, knowledge, being intangible, entirely depends upon its usage by an individual and society.

The ancient Tamilian sage, Tiruvalluvar had stated that 'Intellect is like the water that gushes out of a shallow well near a river. The deeper you dig, the more you get'. This observation of Tiruvalluvar, aptly explains what knowledge management is deemed to do and what it does. Available knowledge resources when dug deeper help to bring out more knowledge. Mass media and now social media have helped us create knowledge societies. In this present time, the World Wide Web and the Internet are all working together in the acquisition, collation, and circulation of knowledge and this, in turn, is made easier with the use of technology.

Knowledge Management in the Corporate Sector

Today's era of information is noticeable due to the presence of tech gurus, hardware and software providers, and networking setups. The out of box solutions that are readily available are the perfect means for storing the information and statistics and these may be used later to figure out predetermined solutions based on predetermined parameters. But these simply explained concepts are illusory. The managers are too concerned with their inward thought process. They are led to believe that the data on the monitors are *ipso-facto* information and they fail to realize the fact that these are actually not true. Moreover, the abundance of information often leaves them with less or no clue at all. The plethora of information and the easy access to this information does not necessarily ensure that they are always more informed and the decisions that they make are the best.

'Managers have to embrace a very different management philosophy, grounded in an alternative set of assumptions about both individuals and institutions. This philosophy leads to some very different beliefs about the role of the company in society, about the relationship between employees and employers, and about the functions of the management. It posits a very different moral contract between the individual, the company and society.' (Sumamtra Ghoshal, Chris Barlett & Peter Moran, *Value Creation* 1996)

Paul Strassmann in his new book *The Squarandered Computer* has wisely suggested that the technology-savvy people make the difference rather than the technology itself. Successful technology is going to be one that reverberates and works at par with human behaviour and attitude rather than walking away from it. Technology should work well with human actions and reactions to solve problems.

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Knowledge Management and IT

The advancement in information technology and global telephony conversation has made knowledge a competitive weapon and given an edge over others. The generation and management of knowledge have given a lot of advantages to many developed economies and works as a standby to trade and commerce. A marked difference has also been found between cognitive values and conative values.

The accumulation and orientation of knowledge is only possible because of the easier access to information technology in general terms and the internet in particular. The coherent access to the same, along with the creation of collective and randomly accessible memory is noteworthy. Knowledge thus need not be collected or piled up together because they are at your fingertips and can remain distributed and unorganized. All of this is just a click away and gives the virtual feeling of knowing one another and remaining interconnected.

Indian Knowledge base

To know the Western way of life, their outlook, attitude, or mind setup, we need to read, cherish and value our own culture, traditions, and heritage. The Industrial Revolution that started in the 17th century was totally based on the three traits, namely survival, growth, and profitability, and among these, profit was considered to be the most important. The economy of the West survived by taking care of the famine-stricken, war-ravaged, or those facing natural calamity in spite of the fact that there was phenomenal growth and huge profits. These made the Western thinkers reflect on their ideology and wonder if their acquired knowledge had any basis. A surge in the growth of industries was possible due to huge profits but that it did not lead to an all-round development of the citizens or ensure the sustainability of the industrial process. This leads all to think of any unethical dimension attached.

Knowledge - Begins

The beginning of knowledge can be traced to the growth of our Vedas, Upanishads, and Bhagavad Gita. Vedanta is a philosophy and not a particular mode of life or religion; it is a universally accepted truth. The Upanishads tell us about the attainment of knowledge by the students sitting down near the guru while receiving spiritual knowledge. The Bhagwad Gita is a disquisition given by Lord Krishna as a piece of advice to Arjun during the Mahabharata war. Aldous Huxley has aptly described Bhagavad Gita as 'one of the cleverest and most comprehensive summaries of the perennial philosophy even to have been rendered. Hence, its enduring value not only for Indians but for all mankind..... The Bhagavad Gita is perhaps the most systematic spiritual statement of perennial philosophy'.

All these delineate the fact that despite all odds, a person's quest for knowledge is never-ending. This seems to be the ultimate truth of knowledge management.

The Grey Revolution

A well-known advocate of the Grey Revolution was R.A. Mashelkar, who was once the Director-General of the Council of Scientific and Industrial Research (CSIR). He had opined that through an intensive knowledge-gaining process, a

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country can rise to the top of the world. Trans-border collaboration in R&D is becoming the order of the day. The R&D spending abroad by top companies like IBM and HP is more than their domestic spending. Patenting is going to be the next game-changer and here knowledge management is sure to play a vital role and help the companies understand the role of knowledge management in their scope and make maximum use of it.

India has a high chance of becoming a pharmaceutical giant provided the conditions are conducive. As compared to other developed nations, India has the dual advantage of lesser drug prices and an intelligent population. The followings need to be taken care of in reality, if India wants to become a key player:

- Over the next 3 years, drug pricing and profit ceiling have to be deregulated.
- The budget on R&D has to be increased.
- A central authority needs to be set up to keep a check on excessive pricing.

Thus, leveraging what we know is the key to our own success in this era which can well be called the knowledge era. The main challenge is knowledge itself. The beginning of knowledge can be traced along the lines of the Vedas, Upanishads, and also with the way of the world of the ancients. Here also comes the reference of the grey revolution which also helps us to understand knowledge management better.

How Knowledge Management (KM) has evolved is known to us, what is yet unknown is whether the knowledge society will be the last form of societal or management evolution. It is not known what is in store for us in future, what the next turn of events will result in. However, it is expected that the KM focus will have to make way for new priorities and approaches. Within a time span of 25 to 30 years things might look quite different from what it is now with regards to KM. Despite such changes occurring, the need to manage knowledge is not expected to disappear. Instead, it is likely that management of knowledge processes evolve further to become well-developed tools, practices, and monitoring approaches.

Check Your Progress

1. Who said that the Bhagavad Gita was 'one of the cleverest and most comprehensive summaries of the perennial philosophy'?
2. Name the prominent advocate of Grey Revolution.

1.3 KNOWLEDGE THROUGH THE AGES

Knowledge is power. It is a truism that is as old as human civilization. The ability to carve instruments out of stone or sharpening tree branches to make arrows was knowledge and it translated into power.

Over the ages, knowledge has been the key to superiority. The use of knowledge to build better weapons has given civilizations an edge over their foes.

Even in medieval ages, people could read the weather in their own way, and through this, they were able to avert loss of lives to some extent during storms, tornadoes, blizzards, etc.

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The Advent of Knowledge Management

Despite this, knowledge as a tool for learning was not recognized till the 1980s. The ability to harness knowledge to improve the working of an organization or even a community had never been explored before that.

The genesis of Knowledge Management can be traced to the consulting community. This concept took shape when the following two events happened:

- When the realization dawned that the knowledge assets and information can cause a revolution within an organization.
- The advent of the internet and the realization that the internet had the potential to be the biggest information and knowledge sharing tool.

During the eighties, the world witnessed changes on many fronts. The changes that occurred in the economical, social, and technological fronts, led to companies being introduced to the concept of globalization. This phenomenon led to increased competitiveness through greater efficiency in operations and rightsizing of manpower.

With greater workforce mobility it became evident that a valuable (read knowledgeable) employee who left the organization took away with him his knowledge and the vast learning that he had acquired over the years through his varied experiences in the organization. This knowledge was lost forever and it would be impossible to recoup it in any form in near future. The lost manpower also meant lost 'intellectual property'. Years of knowledge and experiences gathered through hands-on practical working could not be replaced and were as good as lost irretrievably.

This realization by the organization made them work towards retaining this knowledge within the organization. It was at this juncture that Knowledge Management as a concept took shape.

Historical Progress of Knowledge Management

Let us look at the historical origin of knowledge management.

The 1970s

Management theory practitioners propounded the theory of Knowledge Management. It was management guru Peter Drucker who first spoke about knowledge and information as a veritable resource for organizations. Peter Senge introduced the term 'learning organization'. Leonard-Barton's well-known case study of 'Chaparral Steel', a company that had a knowledge management policy in place set the grounds for studies in knowledge management.

Everett Rogers' work at Stanford on the diffusion of innovation and Thomas-Allen's research at the MIT in information technology transfer happened during the late 1970s'; these two works contributed immensely in the understanding of the production, adoption, and diffusion within the organizations.

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The 1980s

During the 1980s, knowledge as the essence of professional competence was recognized and it was accepted that knowledge was an asset for gaining a competitive edge. The first efforts towards managing knowledge was based on work done in the field of artificial intelligence and expert systems took shape. Knowledge management grabbed more eyeballs as more and more articles began appearing in academic circles.

By the mid-1980s the importance of knowledge was more or less established. However, classical economic theory did not take into account the value of knowledge as an asset and many organizations still lacked strategies and methods of using knowledge.

The 1990s till the present

Knowledge Management evolved and found a place in the portfolio of management consulting firms. These firms started to provide in-house knowledge management programs. Top consulting firms like Ernst & Young, Hamilton, and Arthur Andersen earned a lot of revenue through the knowledge management business. In 1994, the International Knowledge Management Network (IKMN) went online.

The book *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation* (1995) authored by Nonaka and Hirotaka Takeuchi became a widely read book as more people became familiar with the concept of knowledge management. During the early 1990s', Knowledge Management came to be recognized as a scientific discipline.

Father of Knowledge Management

Dr Karl-Erik Sveiby from Sweden is acknowledged as one of the pioneers, in fact, to many, he is the founding father of knowledge management. Way back in 1986 when Knowledge Management as a concept was still in its infancy, Dr. Sveiby authored his first book in Swedish titled *Kunskapsföretaget*. This book explored how so-called 'Knowledge Companies', organizations that were not involved in traditional manufacturing, were growing with the help of knowledge and the resourceful creativity of employees. The book created waves and became an instant bestseller. Dr.Sveiby thus came to be regarded as the first mover of the Swedish Knowledge Management initiative that furthered both research and practice on the subject.

His second book published in 1990 was the first book in the world that had 'Knowledge Management' in the title, (Sw. *Kunskapsledning*). Presently he is with the Hanken Business School, Finland, and holds the chair in Knowledge Management.

How has Knowledge Management Evolved?

The progress of knowledge management as a subject has its roots in activities like discussion forums, on-the-job deliberations, mentoring, professional training, corporate libraries, etc. In the year 1999, the concept of personal knowledge management took roots and it dealt with the management of knowledge at the individual level.

On the enterprise front, early on, the case studies that were documented helped in understanding the importance of strategy, process, and measurement in the field of Knowledge Management. One of the most important lessons that were learned involved understanding people and the varied cultural norms that have a bearing on their behavior. This understanding goes a long way in the process of actual knowledge creation, dissemination, and application.

Various learning processes like the social, organizational, and cognitive learning processes are essential to the overall success of knowledge management strategy. Thus it can be said that as knowledge management evolved it became evident that knowledge management programs can yield substantial benefits to organizations and individuals if they are tailored right, i.e., They are concrete, action-oriented, and purposeful.

Process of Knowledge Management

The process of knowledge management has gone through a metamorphosis and travelled through four stages:

1. The increasing thrust on the new technology and also towards developing the 'standard practices' or 'lessons learnt'.
2. The gradual recognition of the human and cultural factors that shape the 'communities of practice' to facilitate the sharing of information.
3. Acknowledging the need and importance of designing systems that facilitate retrieval, and the vitality of data design and structure.
4. To extend the reach of Knowledge Management from the parent organization to others - users, customers, vendors, etc.

Knowledge Management has greatly evolved and has shown great resilience in its ability to stay entrenched and grow; this is unlike other business initiatives of the late 20th century that failed to take off.

Current Research

Initially, before being widely adopted and adapted, Knowledge Management progressed mostly due to individual efforts. Thanks to such individual practitioners like Leif Edvinsson of Sweden, the world's first Chief Knowledge Officer (CKO) of Skandia. The role assigned to the CKO was to manage and maximize the intangible assets of the organization. Gradually, CKOs' expanded their horizons and started to get involved in the practical and theoretical ideas of Knowledge Management. On an academic level, more and more academicians got themselves familiar with the concepts of Knowledge Management and took up the subject for further research.

From the early 2000s', knowledge management started to acquire academic maturity. In 2001, Thomas A, Stewart, the former editor of Fortune Magazine who was also associated with the Harvard Business Review, published an article on the importance of intellectual capital in organizations. Over the years there has been a substantial increase in the number of academic knowledge management journals and this is definitely a pointer about the importance and acceptance of knowledge management.

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Over the years, many ideas in the field of new business concepts have been explored, however, only some like Knowledge Management have been able to survive and grow. Initiatives like Total Quality Management (TQM) and business process re-engineering have not found much credence. In contrast, Knowledge Management has found acceptance and has been able to reach beyond its original boundary. It has been taken forward by individual companies and knowledge management has been extended to the areas of risk management, change management, benchmarking and best practices.

Check Your Progress

3. Who introduced the term 'learning organization'?
4. Who is acknowledged as the founding father of knowledge management?

1.4 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Aldous Huxley has aptly described Bhagavad Gita as 'one of the cleverest and most comprehensive summaries of the perennial philosophy even to have been rendered.
2. A well-known advocate of the Grey Revolution was R.A. Mashelkar, who was once the Director-General of the Council of Scientific and Industrial Research (CSIR).
3. Peter Senge introduced the term 'learning organization'.
4. Dr Karl-Erik Sveiby from Sweden is acknowledged as the founding father of knowledge management.

1.5 SUMMARY

- Knowledge management primarily involves the renewal, distribution, and implementation of knowledge for the sustainability and survival of an organization. The innovation in a company depends upon how knowledge is leveraged and how capable its workforce is.
- The use of knowledge depends mostly on the understanding and depth of the character of the person possessing it. Thus, it is very necessary to stress the fact that knowledge management is essentially about possessing information in the best possible way so that the repetition of the whole cycle occurs. But, knowledge, being intangible, entirely depends upon its usage by an individual and society.
- Mass media and now social media have helped us create knowledge societies. The World Wide Web and the Internet are all working together in the acquisition, collation, and circulation of knowledge and this, in turn, is made easier with the use of technology.
- Paul Strassmann in his new book *The Squarandered Computer* has wisely suggested that the technology-savvy people make the difference rather than

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the technology itself. Successful technology is going to be one that reverberates and works at par with human behaviour and attitude rather than walking away from it.

- The advancement in information technology and global telephony conversation has made knowledge a competitive weapon and given an edge over others. The generation and management of knowledge have given a lot of advantages to many developed economies and works as a standby to trade and commerce.
- The accumulation and orientation of knowledge is only possible because of the easier access to information technology in general terms and the internet in particular.
- The beginning of knowledge can be traced to the growth of our Vedas, Upanishads, and Bhagavad Gita. Vedanta is a philosophy and not a particular mode of life or religion; it is a universally accepted truth. The Upanishads tell us about the attainment of knowledge by the students sitting down near the guru while receiving spiritual knowledge.
- A well-known advocate of the Grey Revolution was R.A. Mashelkar, who was once the Director-General of the Council of Scientific and Industrial Research (CSIR). He had opined that through an intensive knowledge-gaining process, a country can rise to the top of the world.
- Knowledge as a tool for learning was not recognized till the 1980s. The genesis of knowledge management can be traced to the consulting community.
- During the eighties, the world witnessed changes on many fronts. The changes that occurred in the economical, social, and technological fronts, led to companies being introduced to the concept of globalization. This phenomenon led to increased competitiveness through greater efficiency in operations and rightsizing of manpower.
- Management theory practitioners propounded the theory of Knowledge Management. It was management guru Peter Drucker who first spoke about knowledge and information as a veritable resource for organizations. Peter Senge introduced the term 'learning organization'. Leonard-Barton's well-known case study of 'Chaparral Steel', a company that had a knowledge management policy in place set the grounds for studies in knowledge management.
- During the 1980s', knowledge as the essence of professional competence was recognized and it was accepted that knowledge was an asset for gaining a competitive edge.
- In the 1990s', knowledge management evolved and found a place in the portfolio of management consulting firms. These firms started to provide in-house knowledge management programs. Top consulting firms like Ernst & Young, Hamilton, and Arthur Andersen earned a lot of revenue through the Knowledge Management business.

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- Dr Karl-Erik Sveiby from Sweden is acknowledged as the founding father of Knowledge Management. Way back in 1986, Dr. Sveiby authored his first book in Swedish titled *Kunskapsföretaget*. This book explored how so-called 'Knowledge Companies', organizations that were not involved in traditional manufacturing, were growing with the help of knowledge and the resourceful creativity of employees.
- The progress of Knowledge Management as a subject has its roots in activities like discussion forums, on-the-job deliberations, mentoring, professional training, corporate libraries, etc. In the year 1999, the concept of Personal Knowledge Management took roots and it dealt with the management of knowledge at the individual level.
- From the early 2000s', knowledge management started to acquire academic maturity. In 2001, Thomas A, Stewart, the former editor of Fortune Magazine who was also associated with the Harvard Business Review, published an article on the importance of intellectual capital in organizations. Over the years there has been a substantial increase in the number of academic knowledge management journals and this is definitely a pointer about the importance and acceptance of knowledge management.
- Initiatives like Total Quality Management (TQM) and business process re-engineering have not found much credence. In contrast, Knowledge Management has found acceptance and has been able to reach beyond its original boundary.

1.6 KEY TERMS

- **Industrial Revolution:** It was the transition from agrarian economies to industrial and urban economy in Britain, continental Europe and the United States, in the period from between 1760 to 1820 and 1840.
- **Artificial intelligence:** It is the simulation of human intelligence processes by machines, especially computer systems.
- **Total Quality Management:** It is the continual process of detecting and reducing or eliminating errors in manufacturing, streamlining supply chain management, improving the customer experience, and ensuring that employees are up to speed with training.

1.7 SELF-ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. Briefly mention the role of IT in the growth of knowledge management.
2. Write a short note on the Grey Revolution.
3. State the contributions of Dr Karl-Erik Sveiby to knowledge management.
4. Write a short note on the process of knowledge management.

Long-Answer Questions

1. Examine the scope of knowledge societies and knowledge management.
2. Discuss in detail the historical progress of knowledge management.

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1.8 FURTHER READING

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UNIT 2 KNOWLEDGE VISION AND PROCESS

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Structure

2.0 INTRODUCTION

Knowledge Management (KM) is a professional management discipline and collection of techniques aimed at improving individuals', teams', and organizations' ability to capture, transfer, adapt, and reuse knowledge assets in order to boost performance and innovation. The vision statement specifies what the company stands for and helps the organization to align its goals and practices. Capturing, storing, organising, verifying, safeguarding, distributing, and applying knowledge in a business is all part of the knowledge management process. This unit will discuss the importance of vision statement and the knowledge management process.

2.1 OBJECTIVES

After going through this unit, you will be able to:

- Explain the importance of the vision statement
- Describe the knowledge management process

2.2 THE KNOWLEDGE VISION

The creation of vision is an important cog in the competitive environment of the present times. Organizational destiny is driven by vision, and that is why it assumes greater significance. Vision is helpful in the development of creative strategies and at the same time, it provides a direction for change to the organizational culture.

What are the objectives of vision?

For any organization, its vision has primarily four important objectives:

1. The core beliefs and values of an organization are defined through its vision.
2. The purpose of the organization is expressed through its vision statement.

3. Vision explains the purpose of the organization.
4. The broad goals of the organization are defined through its vision.

In essence, Vision is the conceptual representation of the organization.

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What is a Vision Statement?

A vision statement is a forceful, comprehensive, and compelling statement that epitomizes whatever the organization stands for. It conveys why the organization exists in the first place and also conveys its beliefs and what it stands for.

A clearly laid out vision helps the organization align its strategies and goals through proper planning. This is achieved by creating a synergy of the available resources while adhering to the obligations of the stakeholders and society.

Organizations assign a lot of importance in the creation of vision statements and they spend a substantial amount in creating the right vision statement. These statements are beautifully worded, are eloquent, and are elegantly framed. However, this is not the essence of vision. The essence lies in the transformation of the statement into values, thereby providing direction and imbibing the correct ideology. The vision as per the statement can be achieved by the organization by fostering an environment of progress and culture. A poorly defined Vision statement can bring about the downfall of the organization.

An organization can have a sustainable competitive advantage only if it has a well-defined and well-articulated vision. Vision is enlightening as it challenges prevailing ideas, wisdom, and policies. It is for this reason that a new vision for a business helps to replace the contemporary concepts and ideas of wealth maximization of shareholders. All-round efforts are required on a sustained basis to promote ethical and compliant personal and corporate behaviour. Creating such a business environment will contribute to the well-being of customers, employees, and society at large.

The knowledge vision of an organization has its roots in the question - Why do we exist?; there is a need to go beyond the obvious reason of earning profits, and ask- Why do we do what we do? The answer to these questions is the starting point towards the broader quest for knowledge creation that provides an impetus to form the vision of the organization. Knowledge vision is a constant factor that does not change easily. Knowledge vision inspires members of an organization to create and share knowledge.

The soundness of ideology should be the beginning of an organization's ultimate purpose of existence and therefore its vision. For the vision to have clarity - it should be compelling. The ideology of the organization should have a sound foundation and it should be authentic. It naturally follows that the authenticity of ideology should be derived from the knowledge whose source is authentic. It can thus be concluded that just as God's words are considered to be the true source of moral authority, strong belief in the creation of the vision of the organization is a necessity.

Knowledge Management Vision - An Elaboration

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The following are the salient points about knowledge management vision:

1. Elements like process, technology elements, and people are in place for relevant people to innovate, share, reuse, collaborate and learn.
2. A unique global platform is available with access to community sites, websites, team sites, content repositories, and collaboration tools.
3. Each person can interact with the platform in their preferred way- through email, desktop client, mobile client, web browser, etc.
4. Global cross-functional communities for major roles of specialized nature are available and they have the same focus area and they offer a site, a calendar, useful news, and active discussions.
5. Usually, everyone is aligned to the community that is the closest fit with respect to their work area. They pay a lot of attention to what is happening among the members of that community.
6. Anyone having a query or in need of expert opinion, or having information relating to the firm can conveniently place a post in a community discussion board or microblogging tool and receive a helpful reply by the next day.
7. Everyone, on a regular basis, can be aware of what is happening with respect to the content repositories, microblogging sites, discussion boards, etc.
8. Leaders themselves practice and promote, encourage and reward people who ask, find, recognize, share, inform, suggest, upgrade, and answer.
9. What one part of the unit knows, the other part also becomes aware of it; this process of sharing and working together helps in raising trust levels and fostering transparency. The leadership within the organization guides the employees to interact among themselves and this, in turn, boosts learning at an individual level.
10. Decisions are now quick and effective. It's much easier to find information and resources. Effort redundancy is minimized and mistakes are eliminated. Expertise and expert knowledge is available. Clients are shown how knowledge can be used for their benefit and innovation. In this way, growth can be stimulated. This builds up morale and the firm's reputation becomes strong; as a result, the business progresses.

Strategy for building a Knowledge and Learning Culture

In any organization, the strategy for building knowledge and learning culture begins with the following activities:

- Building of skills,
- Tools to capture building capacity,
- Skills and tools to capture, create and share knowledge
- Improved research and analysis.

A strategic and collaborative approach to research and analysis requires a higher degree of knowledge, information, and data. Research and analysis once

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completed would be there for dissemination, collaboration, and sharing. It would be communicated with various audiences in different formats and media.

There are different initiatives of strategic nature that are resorted to for the purpose of achieving the vision:

1. **Appointing a Chief Knowledge Officer with the purpose of developing a knowledge culture**: This will help in implementing a knowledge strategy that encapsulates frameworks, plans, etc. and spearhead knowledge culture initiatives through communities of practice, knowledge maps, sharing, etc. It is also recommended that knowledge business specialists be appointed who will make sure that knowledge and knowledge components like information, data, and technology tools are identified and are applied to fulfil business needs.
2. **Conducting analysis and research by using internal resources**: Resources such as staff, analytical frameworks, reports, seminars, conferences, etc. help in the overall improvement in the skill level of the staff and they are able to absorb more knowledge.
3. **Creating relevant business infrastructure by identifying, nurturing, investing, and partnering in related projects:** Consulting stakeholders and direct efforts are made towards improving the standards and influencing policy.
4. **Providing enterprise IT services by creating and maintaining architectures, infrastructures, and tools:** This will go on to boost the business's prospects through value-added strategic and policy-driven information that the business has itself developed in-house.

What does good Knowledge Management look like?

Well, there are a few characteristics that make knowledge management stand out. These salient features are as follows:

1. Reflective practitioners and leaders provide an impetus for self-guided learners, seekers, and sharers of knowledge to learn. They are well rewarded and every member is a regular contributor to knowledge networks and communities.
2. Knowledge is a mainstay of processes and practices and is transparent by nature. In a nutshell, work is learning and learning is work.
3. Shareholders are in sync with the basic intent or purpose. IT, people, and processes are all aligned.
4. People are aware of their digital identity and they find it easy to connect and collaborate with other people.

Academicians and knowledge management gurus have different thoughts or expressions regarding knowledge management vision. Kent Greenes, a pioneer in the field of knowledge management opines that knowledge management vision is about one person learning and everyone coming to know from him or her. Individuals, groups and organizations share, transfer, and apply their collective

knowledge and experience to achieve what is perceived as correct thereby delivering quality results. Another renowned scholar Bill Ives states that Knowledge Management has the potential to become a core value driver within the connected enterprise.

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Check Your Progress

1. Mention the objectives of the vision of the organization.
2. What is a vision statement?

2.3 THE KNOWLEDGE PROCESS

There are things that all of us do to know and to learn. These things are forms of actions that help people to gain knowledge. The knowledge process is a whole gamut of activities that represent different ways of building knowledge.

What is a Knowledge Process?

The knowledge management process involves capturing, storing, organizing, verifying, securing, distributing, and using knowledge in a business. Efficient synchronization of these activities ensures its effectiveness. It leads to well-informed decision-making, stimulates collaboration and innovation across the organization. This also fosters a more proactive communication process-both internal and external.

Robust knowledge management processes ensure that the knowledge management activities like discovery, capture, organization, assessment, sharing, and creation are well ingrained in the existing business processes so that internal and external users can access, apply and update knowledge seamlessly.

Purpose and benefits of the Knowledge Management Process

The basic purpose of the processes of knowledge management is to make them really effective at the organizational level. It should look real so that it can be implemented in a business organization. They are selected based on the broader needs of the organization that support the specific objective of the business entity.

Developing the Knowledge Development Process

There are more than 80 potential knowledge management processes and the one that is best suited for the business has to be carefully selected. Initially, before selecting the management processes, an assessment of the existing business processes is done so that the right mix of knowledge management processes can be aligned to the business activities. The right pairing of activities helps to get people to access and gain the right kind of knowledge that is in line with the business needs and this, in turn, leads to better decision-making, better communication with both internal and external customers, and improved overall efficiency.

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The Knowledge Management process steps

Following are a list of the steps that a business might integrate throughout the organization with an effective knowledge management process:

- **Discovery:** The process of knowledge management starts at the point of discovery. Knowledge discovery is the process of extracting information from data that is available within the organization and can be considered useful for strategy formulation, operations and communications. It provides an impetus to relationship development. Using data mining techniques to identify trends and correlations within a pool of transactional and customer relationship data is the discovery of data.
- **Capture:** As the word signifies, capture is about assimilating and gaining relevant knowledge that is already in possession of the organization. The knowledge that exists at an individual level, among team members, in documents, and also the knowledge that exists externally has to be documented methodically and communicated to the concerned people for the benefit of the business. A regular audit of all available knowledge content and updating it through better content creation will help in plugging gaps and this is the key to capturing knowledge.
- **Organization:** With a view to easily retrieve, navigate, reuse, and share knowledge it is essential to describe, categorize, index and classify information in an orderly manner and it is precisely this process that is the essence of knowledge organization. The right knowledge management system can help in the segmentation of knowledge. It helps in making information readily available by people who genuinely require it.
- **Assessment:** Knowledge needs to be verified and validated; only then can it be used for making business decisions, improving processes both internal and external, and triggering innovation and collaboration. It is of paramount importance to ensure that the knowledge at hand is accurate, complete, consistent, and up-to-date. Assessment on a regular basis and inbuilt validation features in the knowledge management system go a long way in ensuring that the knowledge is accurate. This accuracy of knowledge is critical to the success of the process.
- **Sharing:** Knowledge sharing is about making knowledge available to those who actively seek such knowledge within the organization with the purpose of distributing it further to the user who applies the knowledge for the betterment of the business. Team leaders need to regularly encourage and promote knowledge sharing.
- **Application:** Application or reuse of knowledge occurs when an individual employee or a team derives the benefit of capturing and assessing knowledge by applying it to business operations, thereby enhancing efficiency. From completing a strategic task to communicating more effectively with internal and external customers, the application of knowledge goes a long way in taking the business forward. A well-documented interview of a complex client meeting can help another colleague facing similar challenges with his customers.

- **Creation:** Organizations maintain knowledge databases that are routinely updated when individuals or teams document and add to the existing knowledge storehouse. This is knowledge creation. This knowledge can be utilized by way of sharing and reusing and can also be extended by additions made by future knowledge seekers. The content should be updated as per content creation guidelines. The addition of new content will help establish a culture of knowledge creation among teams.

Table 2.1 *The Knowledge Process Table*

Experiencing Learning by experience entails two areas- the known and the new. The 'new' is about introducing something that is less known. But it makes sense and people are able to relate to the subject.	**Conceptualizing** Learning by conceptualizing is either by naming or by theory. The theory is about making a concept map, drawing a diagram, writing a summary or formula; anything that helps to conceptualize.
The keywords for Experiencing are - Illustrate Describe Discuss Listen Read Respond	The keywords for Conceptualising are - Categorize Clarify Calculate Deduce Define Describe
Analysing Learning by analysing can be - Functional or Critical. Functional learning is one where flow diagrams, technical diagrams, study boards, models, etc are constructed. As against this, Critical learning is done by analysing purposes, elaborating and discussing consequences, debates, and reviews	Applying Learning by applying is done by either: Appropriately writing, drawing, solving a problem, Or Creatively using the knowledge that has been gathered in an innovative manner. It will involve taking risks and applying the knowledge to the new set of problems so that the horizons of knowledge are stretched.
The keywords for Analysing are - Analyze Argue Assess Compare Conclude Contrast	The keywords for Applying are - Apply Asses Compile Design Illustrate Investigate

Implementation of Knowledge Processes

The implementation of the knowledge process requires careful planning. Change management is a key to the implementation of knowledge process primarily because the behaviour of people changes after the acquisition of knowledge. Once the knowledge is acquired people realize that they need to change. However, this change needs to be managed. People need to understand the following-

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- Why they need to change
- How they are supposed to bring about the change
- How to implement the process, the knowledge of which has been just imparted
- How to handle any related technological change that may be necessary
- Why the process was at all necessary.

Based on the knowledge process that is being adopted, it may be required to run trials to ensure smooth implementation later. Running the trial entails analysis of the feedback that is provided so that the teething problems and issues can be sorted out and the process can be implemented successfully across the organization.

Depending on the knowledge process being implemented it may be useful to run a pilot/trial first to ensure everything works the way it is expected and to make sure it has the desired impact/results. Running a pilot first allows for feedback from those in the pilot which can facilitate the implementation across the organization. It may also make sense to do the entire roll-out of the knowledge process in phases, in order to monitor and control the roll-out and results.

Knowledge Management Specialties

Here is a list of 80 different kinds of KM specialties. Each specialty has a different path or process towards its implementation. The list below will provide a fair idea as to what steps are involved in each specialty.

- Sharing, culture, organizational design, and change management
- Innovation, invention, creativity, and idea generation
- Reuse, proven practices, lessons learned, and knowledge retention
- Collaboration and communities
- Learning, competency development, and training
- Goals, measurements, incentives, and rewards
- Social networks, organizational networks, value networks, and network analysis
- Expertise location and personal profiles
- Communications
- Facilitation and knowledge transfer
- User support and Knowledge-Centered Support (KCS)
- Content management and document management
- Analytics, visualization, metrics, and reporting
- Project management, process management, workflow, planning, and decision making
- KM methods (peer assists, after action reviews, knowledge audits/maps/models, World Café, etc.)
- Appreciative inquiry and positive deviance

- Storytelling, narrative, anecdotes, and sensemaking
- Information architecture, usability, user interface, and user experience
- Search, findability, taxonomy, ontology, metadata, and tagging
- Portals, intranets, and websites
- Databases, repositories, business intelligence, and data warehouses
- Competitive intelligence, customer intelligence, market intelligence, and research
- Web 2.0 and social media tools
- Semantic web, artificial intelligence, and natural language processing
- Wisdom of crowds, crowdsourcing, collective intelligence, and prediction markets

It is imperative to have a systematic and structured approach to knowledge management at all levels and across all areas of the business. The presence of knowledge-based software and automation tools has made it easier to implement knowledge management across the business. Document management, content management, databases, data warehouses, social networking, etc., are the backbone of the knowledge management process implementation.

Check Your Progress

3. What is a knowledge management process?
4. What is the backbone of knowledge management implementation?

2.4 ANSWERS TO 'CHECK YOUR PROGRESS'

1. For any organization, its vision has primarily four important objectives:
   - The core beliefs and values of an organization are defined through its vision.
   - The purpose of the organization is expressed through its vision statement.
   - Vision explains the purpose of the organization.
   - The broad goals of the organization are defined through its vision.
2. A vision statement is a forceful, comprehensive, and compelling statement that epitomizes whatever the organization stands for. It conveys why the organization exists in the first place and also conveys its beliefs and what it stands for.
3. The knowledge management process involves capturing, storing, organizing, verifying, securing, distributing, and using knowledge in a business.
4. Document management, content management, databases, data warehouses, social networking, etc., are the backbone of the knowledge management process implementation.

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2.5 SUMMARY

- For any organization, its vision has primarily four important objectives:
  - o The core beliefs and values of an organization are defined through its vision.
  - o The purpose of the organization is expressed through its vision statement.
  - o Vision explains the purpose of the organization.
  - o The broad goals of the organization are defined through its vision.
- A vision statement is a forceful, comprehensive, and compelling statement that epitomizes whatever the organization stands for. It conveys why the organization exists in the first place and also conveys its beliefs and what it stands for.
- Organizations assign a lot of importance in the creation of vision statements and they spend a substantial amount in creating the right vision statement. A poorly defined vision statement can bring about the downfall of the organization. Knowledge vision inspires members of an organization to create and share knowledge.
- In any organization, the strategy for building knowledge and learning culture begins with the following activities:
  - o Building of skills,
  - o Tools to capture building capacity,
  - o Skills and tools to capture, create and share knowledge
  - o Improved research and analysis.
- There are different initiatives of strategic nature that are resorted to for the purpose of achieving the vision. Some of these initiatives include appointing a Chief Knowledge Officer, conducting analysis and research by using resources, creating relevant business infrastructure, etc.
- Academicians and knowledge management gurus have different thoughts or expressions regarding knowledge management vision. Kent Greenes, a pioneer in the field of knowledge management opines that knowledge management vision is about one person learning and everyone coming to know from him or her. Individuals, groups and organizations share, transfer, and apply their collective knowledge and experience to achieve what is perceived as correct thereby delivering quality results.
- The knowledge process is a whole gamut of activities that represent different ways of building knowledge. The knowledge management process involves capturing, storing, organizing, verifying, securing, distributing, and using knowledge in a business. Efficient synchronization of these activities ensures its effectiveness. It leads to well-informed decision-making, stimulates collaboration and innovation across the organization.
- Robust knowledge management processes ensure that the knowledge management activities like discovery, capture, organization, assessment,

sharing, and creation are well ingrained in the existing business processes so that internal and external users can access, apply and update knowledge seamlessly.

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- There are more than 80 potential knowledge management processes and the one that is best suited for the business has to be carefully selected. Initially, before selecting the management processes, an assessment of the existing business processes is done so that the right mix of Knowledge Management processes can be aligned to the business activities.
- The process of knowledge management starts at the point of discovery. Knowledge discovery is the process of extracting information from data that is available within the organization and can be considered useful for strategy formulation, operations and communications.
- Capture is about assimilating and gaining relevant knowledge that is already in possession of the organization. The knowledge that exists at an individual level, among team members, in documents, and also the knowledge that exists externally has to be documented methodically and communicated to the concerned people for the benefit of the business.
- With a view to easily retrieve, navigate, reuse, and share knowledge it is essential to describe, categorize, index and classify information in an orderly manner and it is precisely this process that is the essence of knowledge organization.
- Knowledge needs to be verified and validated; only then can it be used for making business decisions, improving processes both internal and external, and triggering innovation and collaboration. It is of paramount importance to ensure that the knowledge at hand is accurate, complete, consistent, and up-to-date.
- Knowledge sharing is about making knowledge available to those who actively seek such knowledge within the organization with the purpose of distributing it further to the user who applies the knowledge for the betterment of the business.
- Application or reuse of knowledge occurs when an individual employee or a team derives the benefit of capturing and assessing knowledge by applying it to business operations, thereby enhancing efficiency.
- Organizations maintain knowledge databases that are routinely updated when individuals or teams document and add to the existing knowledge storehouse. This is knowledge creation.
- The implementation of the knowledge process requires careful planning. Change management is a key to the implementation of knowledge process primarily because the behaviour of people changes after the acquisition of knowledge. Once the knowledge is acquired people realize that they need to change. However, this change needs to be managed.
- It is imperative to have a systematic and structured approach to knowledge management at all levels and across all areas of the business. The presence of knowledge-based software and automation tools has made it easier to

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implement knowledge management across the business. Document Management, Content Management, Databases, data warehouses, social networking, etc., are the backbone of the knowledge management process implementation.

2.6 KEY TERMS

- **Change Management:** It is a systematic approach to dealing with the transition or transformation of an organization's goals, processes or technologies.
- **Innovation:** It is the practical implementation of ideas that result in the introduction of new goods or services or improvement in goods or services.
- **Crowdsourcing:** It is the practice of turning to a body of people to obtain needed knowledge, goods or services.

2.7 SELF-ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. Write a short note on the knowledge management vision.
2. Mention the characteristics of knowledge management.
3. What is the purpose of knowledge management process?
4. What do you mean by knowledge management specialties?

Long-Answer Questions

1. Discuss the strategies used for building a knowledge and learning culture.
2. Describe the steps involved in the knowledge management process.

2.8 FURTHER READING

Pasher, Edna and Tuvya Ronen. 2011. *The Complete Guide to Knowledge Management: A Strategic Plan to Leverage Your Company's Intellectual Capital.* New Delhi: Wiley.

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UNIT 3 INFORMATION AND KNOWLEDGE CORPORATION

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Structure

3.0 INTRODUCTION

In the previous unit, you learnt about knowledge vision and process. In this unit, the discussion will turn towards information and knowledge. Information denotes the organized data about someone or something obtained from various sources such as newspaper, Internet, television, discussions, etc. On the other hand, knowledge refers to the awareness or understanding on the subject acquired from education or experience of a person. It will also discuss knowledge workers and knowledge corporations. Knowledge corporations are organizations where knowledge and knowledge-based products are offered to the market. The products and services can vary from plans to prototypes or mass-produced products where R&D costs are a large part. Employees of knowledge enterprises usually have an academic education.

3.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss knowledge, data, information and their features
- Understand who knowledge workers are and what they do
- Describe how to build a knowledge corporation

3.2 INFORMATION VS KNOWLEDGE

Knowledge is the full utilization of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations. In the highly volatile and extremely competitive global economy of today, knowledge

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is people, money, leverage, learning, flexibility, power and competitive advantage. Knowledge is more relevant to sustained business than capital, labour or land. Nevertheless, it remains the most neglected asset. It is more than justified true belief and is essential for action, performance and adaption. Knowledge provides organizations with the ability to respond to novel situations and thus generate and sustain competitive advantage over their rivals.

Knowledge is inherent in ideas, judgments, talents, root causes, relationships, perspectives and concepts. It is stored in the individuals' brain or encoded in organizational processes, documents, products, services, facilities and systems. Knowledge is the basis for, and the driver of the current global economy. Knowledge is the result of learning which provides the only sustainable competitive advantage. Knowledge results in enhanced and effective action, focused innovation, pooled expertise, special relationships, and alliances. Knowledge results in value-added behaviour and activities that result in tangible benefits to an organization. However, for knowledge to be of value it must be focused, current, tested, and shared. There is no consensus on what knowledge is. Over the millennia, the dominant philosophies of each age have added their own definition of knowledge to the list. Science has added to this list as well. Organizational knowledge can be defined as the understanding of the intrinsic systems and processes that could be employed to take effective action achieving the organizational goal. There are different kinds of knowledge, and a number of different knowledge classification schemes and taxonomies. It is important to recognize the important and general classes of knowledge that influence the deployment of KM within an organization.

Data, Information and Knowledge

Data, information, and knowledge are closely interconnected. Data lies at the lowest layer in the knowledge chain and acts as the raw material for the knowledge process. Data refers to the unformatted, unstructured material freely available around us, which by itself does not provide any meaning. The various signals—acoustic, visual, tactile and otherwise that are around us could be interpreted as having information. The formal relation between data and information is that information is a structuring of data that reduces uncertainty. Information value of a message is higher if it reduces more uncertainty. In a more informal way, it could be said that information is interpreted data. Knowledge is the interpretation of information in the eyes of a learner using his own history, his experiences, insights and interpretation. It is because of this reason that the same information may lead to different knowledge for various individuals. In other words,

Data + Context = Information

or

Information = Interpreted Data

and

Knowledge = Interpreted Information

or

Information + Experiences, Insights, Judgment (of an individual) = Knowledge

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Wisdom

Wisdom is a state of the human mind characterized by profound understanding and deep insight. It is often, but not necessarily, accompanied by extensive formal knowledge. Unschooled people can acquire wisdom, and wise people can be found among the common class. Wherever it exists, wisdom exhibits itself as a perception of the relativity and relationships among things. It is an awareness of wholeness that does not lose sight of particularity or concreteness, or of the intricacies of interrelationships. It signifies the ideal blending of the left and right hemispheres of the human brain, resulting in a perfect synergy of logic and practicality. Wisdom cannot be confined to a specialized field, nor is it an academic discipline, it is the consciousness of wholeness and integrity that transcends both. The amount of knowledge that is available to the present generation is considerable. However, there has been no correlative increase in wisdom. There are several factors that contribute to wisdom. Some of these factors are the sense of proportion, the capacities to take account of all the important factors associated with a problem and understand its weightage. This has become more difficult owing to the extent and complexity of the specialized knowledge required by individuals from various disciplines.

Wisdom is needed not only for social purposes, but equally in private life. It is essential in determining the choice of ends to be pursued and in the process assures of liberation from personal prejudice. The essence of wisdom lies in viewing the world with impartiality and thereby contributing to the growth of the individual as well as the society at large. During the initial stages of progression from knowledge to wisdom, an individual is concerned only about his own physical condition. Gradually, an individual widens his/her horizon in proportion to his/her thoughts and feelings and in the process becomes less personal and less concerned with his/her own physical states, thereby achieving growing wisdom.

The question that is likely to emerge in the minds of the readers at this point of time is whether wisdom can be taught. Wisdom in some degree can be taught. This teaching must have a larger intellectual element than has been customary in what is been thought of as moral instruction. The kind of specialized knowledge which is required for various kinds of skills has very little to do with wisdom. But it must be supplemented in education by wider surveys calculated to put it in its place the total of human activities. With increase of knowledge and skill, wisdom becomes more necessary. This augments our capacity to realize individual as well as organizational purposes, and therefore augments individual as well as organizational capacity to perform unwarranted acts.

Example:

The following example highlights the progression from data to wisdom through information and knowledge:

This example uses a bank savings account to show how data, information, knowledge, and wisdom relate to the principal, interest rate, and interest.

Data: The numbers 100 per cent or 5 per cent, devoid of the context, are just pieces of data. Similarly, the words such as interest, principal, and interest rate, by

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themselves are out of context and are not of any value as each has multiple meanings which are context dependent.

Information: For an individual wishing to open a bank savings account (context), the terms interest, principal, and interest rate become meaningful in that context, with specific interpretations. In this case, principal would refer to the amount of money, ₹ 99, deposited/to be deposited within the savings account. The Interest rate, 7 per cent, would be the factor used by the bank to compute interest on the principal.

Knowledge: Knowledge refers to the realization of the individual that if he deposited ₹ 99 in the savings account, and that if the bank provided 7 per cent interest yearly, then at the end of one year, the amount in his bank account would be ₹ 105.93. This pattern represents knowledge which allows the individual to understand how the pattern will evolve over time and the results it will produce. Understanding the pattern is equivalent to gaining knowledge for the individual. The individual thus realizes that if he deposited more money in his account, he would earn more interest, whereas if he withdrew money from the account, the interest would be reduced.

Wisdom: The progression to wisdom based on the above facts is a little complicated and is contained in the systems principles. The principle is that, any action which produces a result and which encourages more of the same action, produces an emergent characteristic called growth. And, nothing grows forever, for sooner or later growth runs into limits. If one studied all the individual components of this pattern, which represents knowledge, they would never discover the emergent characteristic of growth. Only when the pattern connects, interacts, and evolves over time, does the principle exhibit the characteristic of growth. Thus over a period of time, the individual would realize that bank rates may not be steady and the current return may not be valid for the tenure of deposit or alternatively for the presence of better avenues of investment.

In light of the above example, a person with a higher level of wisdom would be able to comprehend that even though some cooperative banks may offer a higher rate of return, the associated risks are higher. Hence it would be prudent to invest in a well known nationalized bank.

Knowledge, in contrast to data and information, is highly related to the person who possesses the knowledge. However, knowledge itself is not something that is readymade in someone's cognition. Knowledge has to be mentally restructured and constructed again and again depending on the circumstances of application. This is one of the key contributory factors that make it difficult to grasp or to lay a hand on knowledge in content or in form.

3.2.1 Knowledge Workers

Knowledge workers pervade virtually every facet of the current workforce. Fueled by technology that breaks down traditional distance barriers, the 'infoworkers' or knowledge workers of today are as likely to work in homes and hotels as within office buildings. And their roles are as diverse as freelance trainer/consultant, or partner in addition to traditional employee.

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Knowledge workers represent the people and form the foundation on which an organization is built and leveraged. Given the need for autonomy in learning and decision-making, such knowledge workers also need to be comfortable with self-control and self-learning. Knowledge workers need to be cautious in the applications of new technologies to their business contexts. Such understanding is necessary 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 must have the capability of judging whether the organizations 'best practices' are aligned with the dynamics of the business environment. The knowledge workers also need to have an overall understanding of the business of their organization and how their work contexts fit within it. Such understanding is necessary for their active involvement in the organizational unlearning and relearning processes. Only if they understand the implications of changes in their work contexts for the business enterprise, do they get instrumental in synchronizing the organizational 'best practices' with the external reality of the business environment.

Knowledge has become the only source of sustainable long-term competitive advantage. Intellectual property lies at the centre of the modern company's economic success or failure. Raw materials and capital traditionally formed the pillars of any organization. The organizational IC or knowledge has replaced this, which forms the primary resource that contributes to the creation and sustenance of a successful enterprise. Raw material is bought and moved to wherever they are needed, Capital is borrowed: Knowledge forms the primary asset of an organization that has to be systematically cultivated, nurtured and maintained. An important aspect that needs to be realized is that, the employer owns only the equipment used by their workforce and cannot claim ownership of their employees' intellectual property or knowledge. As the employees leave the organization in search of greener pastures, their intellectual property also moves along with them. The issue of recognizing the dividing line between knowledge in the public domain and knowledge in the private domain assumes paramount importance. The following example highlights the significance of this issue:

- The intellectual property rights (IPR) granted to a scientist who first unraveled the functioning of a neuron must not be the same as those granted to a pharmacologist who developed a formulation to simulate the activity of neurons.
- 73 per cent of private patents were based on knowledge generated by public sources such as universities and non-profit organizations or government laboratories. This observation seeks to reinforce the theory that private, secretly held knowledge does not generate the next generation of knowledge.
- Computer software piracy leads to the violation of patents and copyright laws that do not keep up with technology. This leads to judicial decisions that inhibit the progress of technology. One such decision ruled that the 'look and feel' of a software programme could not be patented which opens up avenues to legally replicate commercial packages leading to exploitation of a software manufacturer by its competitors.

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Higher focus on technology creates a belief that KM is a product that can be brought off-the-shelf and plugged into an organization irrespective of its business, size or goals. This belief tends to shift the focus from the most important facet of an organization — Its employees to its technology which acts as an enabler in the KM cycle.

Check Your Progress

1. Define knowledge.
2. Differentiate between data and information?

3.3 HOW TO BUILD A KNOWLEDGE CORPORATION

With the decline of some well-established firms, the diminishing competitive power of many companies in a burgeoning world market coupled with the need for organizational renewal and transformation, the interest in organizational learning has grown. Senior managers in many organizations are convinced of the importance of improving learning in their organizations. This leads us to two important questions: What is a learning organization and what determines the characteristics of a good learning organization?

Organizational learning is the capacity or processes within an organization to maintain or improve performance based on experience. Learning is a systems-level phenomenon, because, it stays within the organization even if individuals change. Learning is as much a task as the production and delivery of goods and services. While companies do not usually regard learning as a function of production, research on successful firms indicates that three learning-related factors are important for their success:

1. Well-developed core competencies that serve as launch points for new products and services.
2. An attitude that supports continuous improvement in the business's value-added chain.
3. The ability to fundamentally renew or revitalize business functions based on need.

These factors identify some of the qualities of an effective learning organization that diligently pursue a constantly enhanced knowledge base. This knowledge allows the development of competencies and leads to incremental or transformational change. In these instances, there is assimilation and utilization of knowledge and some kind of integrated learning system to support such 'actionable learning.' Indeed, an organization's ability to survive and grow is based on advantages that stem from core competencies that represent collective learning. The organizational learning process has identifiable stages. These are generalized as follows:

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- ***Knowledge acquisition:*** This stage deals with the development or creation of skills, insights, relationships.
- ***Knowledge sharing:*** This stage involves the dissemination of the learnings throughout the organization.
- ***Knowledge utilization:*** This stage provides the integration of learning so that it is broadly available and can be generalized to new situations.

Organizational learning does not always occur in the linear fashion implied by typical learning models. Learning may take place in planned or informal, often unintended, ways. Moreover, knowledge and skill acquisition takes place in the sharing and utilization stages. It is not something that occurs simply by organizing an 'acquisition effort'. The following are some of the commonly employed orientations by organizations in their quest for effective knowledge dissemination.

Knowledge Sources

Organizations need to carefully assess their sources of knowledge, i.e. they need to finalize the extent whether new knowledge is to be developed internally or seek inspiration in external ideas. This distinction is seen as the difference between innovation and adaptation or imitation. Both of these approaches have great merit as opposing styles rather than as normative or negative behaviors.

Focus on Products and Processes

Organizations need to decide whether they would prefer to accumulate knowledge about product and service outcomes or about the basic processes underlying various products. One of the factors that contribute to the success of Japanese companies is that they make considerably more investments in process technologies in comparison to companies in other countries.

Documentation

Knowledge is viewed in personal terms as something an individual possesses by virtue of education or experience. This kind of knowledge is lost when a longtime employee leaves an organization; processes and insights evaporate because they were not shared or made a part of collective memory. On the other hand, knowledge is defined in more objective, social terms, as being a consensually supported result of information processing. This calls for the development of an organizational memory or a publicly documented body of knowledge.

Knowledge Dissemination

An organization needs to establish an atmosphere in which learning evolves or in which a more structured, controlled approach induces learning. In the more structured approach, the company decides that valuable insights or methods must be shared and used by others across the organization. It uses written communication and formal educational methods or certifies learning through writing the procedures down. In the more informal approach, learning is spread through encounters between role models and gatekeepers who compellingly reinforce learning. In another approach, learning occurs when members of an occupational group or work team share their experiences in ongoing dialogue.

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Organizational Learning

Organizational learning needs to concentrate on methods and tools, to improve what is already being done or concentrate on testing the assumptions underlying what is being done. Organizational performance problems are more the result of a lack of awareness and inability to articulate and check underlying assumptions than to a function of poor efficiency. Generally these learning capabilities reinforce each other.

Value Chaining

Organizations need to build an index of their core competencies and learning investments that need to be valued and supported. Learning investments include allocations of personnel and money to develop knowledge and skill over time, including training and education, pilot projects, developmental assignments, available resources, and so on. If a particular organization is heavily focused on heavy engineering, it would have a natural bias in favor of substantial learning investments in related areas. The value chain is classified into two categories: internally directed activities of a 'design and make' nature, and those more externally focused of a 'sell and deliver' nature. The former include R&D, engineering, and manufacturing. The latter are sales, distribution, and service activities.

Skill Development

An organization needs to develop both individual and group skills. In this fashion, an organization can assess how it is doing and improve either one of those skills. It can also develop better ways of integrating individual learning programs with team needs by taking a harder look at the value of group development.

The following are some of the key facilitators for organizational learning:

1. The presence of strong marketing research functions for effective environmental scanning.
2. Measures to ensure that feedback regarding organizational functions and processes are adequate.
3. Development of metrics to gauge the effectiveness of organizational learning systems.
4. Process for encouraging pilot testing and experimentation.
5. Availability of core subject matter, experts to provide leadership to learning activities.
6. Free flow of information within the organization.
7. Continuous learning within the organization.
8. Continuous process and system improvement and re-engineering.
9. Management support.

Check Your Progress

3. What does research on successful firms indicate?
4. List the identifiable stages of the organizational learning process.

3.4 ANSWERS TO 'CHECK YOUR PROGRESS'

NOTES

1. Knowledge is the full utilization of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations. In the highly volatile and extremely competitive global economy of today, knowledge is people, money, leverage, learning, flexibility, power and competitive advantage. Knowledge is more relevant to sustained business than capital, labour or land.
2. Data refers to the unformatted, unstructured material freely available around us, which by itself does not provide any meaning. The various signals—acoustic, visual, tactile and otherwise that are around us could be interpreted as having information. The formal relation between data and information is that information is a structuring of data that reduces uncertainty. Information value of a message is higher if it reduces more uncertainty. In a more informal way, it could be said that information is interpreted data.
3. While companies do not usually regard learning as a function of production, research on successful firms indicates that three learning-related factors are important for their success:
   (i) Well-developed core competencies that serve as launch points for new products and services.
   (ii) An attitude that supports continuous improvement in the business's value-added chain.
   (iii) The ability to fundamentally renew or revitalize business functions based on need.
4. The organizational learning process has identifiable stages. These are generalized as follows:
   - ***Knowledge acquisition:*** This stage deals with the development or creation of skills, insights, relationships.
   - ***Knowledge sharing:*** This stage involves the dissemination of the learnings throughout the organization.
   - ***Knowledge utilization:*** This stage provides the integration of learning so that it is broadly available and can be generalized to new situations.

3.5 SUMMARY

- Knowledge provides organizations with the ability to respond to novel situations and thus generate and sustain competitive advantage over their rivals.
- Organizational knowledge can be defined as the understanding of the intrinsic systems and processes that could be employed to take effective action achieving the organizational goal.
- There are different kinds of knowledge, and a number of different knowledge classification schemes and taxonomies.

NOTES

- The essence of wisdom lies in viewing the world with impartiality and thereby contributing to the growth of the individual as well as the society at large.
- The intellectual property rights (IPR) granted to a scientist who first unraveled the functioning of a neuron must not be the same as those granted to a pharmacologist who developed a formulation to simulate the activity of neurons.
- Learning is a systems-level phenomenon, because, it stays within the organization even if individuals change. Learning is as much a task as the production and delivery of goods and services.
- Organizational learning is the capacity or processes within an organization to maintain or improve performance based on experience.
- Indeed, an organization's ability to survive and grow is based on advantages that stem from core competencies that represent collective learning.
- Organizations need to build an index of their core competencies and learning investments that need to be valued and supported.
- Learning investments include allocations of personnel and money to develop knowledge and skill over time, including training and education, pilot projects, developmental assignments, available resources, and so on.
- An organization needs to develop both individual and group skills. In this fashion, an organization can assess how it is doing and improve either one of those skills.
- An organization needs to develop both individual and group skills.

3.6 KEY TERMS

- **Wisdom:** It is a state of the human mind characterized by profound understanding and deep insight.
- **Knowledge Workers:** It refers to a person whose job involves handling or using information.
- **Intellectual Property:** It refers to an invention, idea, design, etc., that somebody has created and that the law prevents other people from copying.

3.7 SELF-ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. What does knowledge provide organizations with?
2. What do learning investments include?

Long-Answer Questions

1. Describe how to build a knowledge corporation.
2. Explain some of the commonly employed orientations by organizations in their quest for effective knowledge dissemination.

NOTES

3.8 FURTHER READING

Pasher, Edna and Tuvya Ronen. 2011. *The Complete Guide to Knowledge Management: A Strategic Plan to Leverage Your Company's Intellectual Capital*. New Delhi: Wiley.

Awad, Elias M. 2007. *Knowledge Management*. Noida: Pearson Education.

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UNIT 4 THE SOCIAL ROLE OF KNOWLEDGE AND THE KNOWLEDGE CREATION PROCESS

Structure

4.0 INTRODUCTION

The primary focus of most organizations throughout the industrial age and even today has been on production of gadgets that are faster, cheaper and of higher quality; through advances in technology this has been made possible today. This has been possible because of the knowledge creation process. In this unit, we will discuss the social role of knowledge that drives society and leads to its gradual progression. The essence of knowledge society as a society that is created as a result of modern-day societal changes is also discussed. Knowledge creation process, responsible for the extraction of knowledge from the various data and information sources within an organization, their storage and flow within the organization, is discussed as well.

4.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the emergence of the knowledge era
- Describe the social role of knowledge and the essence of knowledge society
- Understand the knowledge creation process

4.2 IMPERATIVES OF THE NEW AGE

The primary focus of most organizations throughout the industrial age and even today has been on production of gadgets that are faster, cheaper and of higher quality. As the information age came into existence, the power of the microprocessor

allowed companies to produce goods of high quality at speeds unimaginable during the start of the industrial revolution, at a much cheaper rate. Organizations ensured their existence by deriving competitive edge by investing heavily in advanced technologies. In other words, most of the organizations had a technology-focused strategy.

The rapid advancements in technology, brought in machines of high processing power at a low cost which widened the scope of usage and their reach. In the process, the competitive window of opportunity created by applying advanced technology which previously lasted years, came down to months or even days with the tools available today. This implies that although technology can provide tremendous advantages to an organization, it can also provide the same advantages to its competitors also. A classic example would be of the field of video editing. In the earlier days, huge production houses with adequate financial prowess to set up sophisticated labs, ruled the roost. However, today an entrepreneur with a good quality workstation and requisite software could handle many of the editing jobs, from the comfort of his home anywhere on the planet, with minimal overheads. This has resulted in the creation of a global competitive market and to ensure survival, an organization needs to be highly proactive rather than relying on its financial and technical prowess alone. This is where the practice of KM becomes critical to the success and survival of organizations in today's global economy. Products and their designs can be copied with increasing ease, but an individual's experience and creativity cannot be copied as easily. Compressing the timeframe to generate new ideas is the sole ingredient of tomorrow's global leaders. To accomplish this objective, most organizations need to break down the information silos that have formed over the years, and channel their energies into using the power of a company's most valuable asset— the knowledge of its people, and in the process build and sustain a knowledge sharing environment.

There are two key reasons to expect the management of knowledge to become an increasingly important issue in the corporate world over the next few years. One is the imperative to accomplish "more with less" in the wake of downsizing and restructuring of organizations; the other is the need to strengthen relationships with customers. Empowering employees with more knowledge can help them provide faster and better quality service to their clients. Instead of duplication of efforts, a knowledge base of concepts and information, helps employees build on previous work and customize solutions according to the client's needs.

Knowledge strategies require, proponents and facilitators, in order to succeed and an organization might require the services of consultants who specialize in a particular product/service line, capability, industry or geography. In this capacity, the consultant organizes, monitors and facilitates the flow of knowledge for a specific community of practice or a group that shares a certain type of knowledge or expertise. Knowledge managers, help the enterprise, leverage its knowledge in the following fashion:

- Understanding the information needs within the enterprise and aligning them with the organization's overall business strategy.

- Nurturing an environment that fosters learning, knowledge creation, and information sharing. This involves creating awareness so that everyone within the enterprise must understand the benefits of sharing knowledge and contributes to the knowledge pool.
- Ensuring that quality, depth and tone of the knowledge pool content evolves with the organization. This includes regularly updating the information and sustaining the ability to identify and fill knowledge gaps.
- The enterprise must have a supporting infrastructure, which permits the leveraging of knowledge to bring about benefits to the organization. The manager must be a knowledge leader who is fully versed in the tools of the trade and must also ensure that the enterprise has the proper technology at its disposal.
- Creating and enhancing business processes, synthesizing and creating new knowledge and stimulating knowledge sharing by others within the organization. The process for sharing or tapping into the knowledge pool must be simple, straightforward and efficient; else, it would discourage people from contributing to or tapping into an enterprise's overall body of knowledge.

Leveraging intangible assets is one of the most critical business issues of this decade. This necessitates the free flow of ideas, insights and knowledge within an organization along with a high degree of trust and requires a great deal of nurturing and facilitating. The organizations have to leverage knowledge effectively, without which they face the risk of being eliminated from a highly competitive business environment. This involves a radical shift from investing in technology alone and brings about an unparalleled velocity of change and innovation that involves investing heavily in training and education to help organizations survive in the fast-paced, knowledge era. It is imperative that knowledge workers must constantly upgrade their knowledge and skills in order to thrive in the new economy. Learning is not only important but is vital and requires time out from being engaged in productive activity. Some companies have devoted a fixed percentage of payroll or revenue to training and development. This necessitates the need for meaningful metrics of performance and demonstrations of payoff.

The emergence of the knowledge era places a premium on agile and productive mind work, and will remain the key trend underlying this new learning imperative. High-velocity change demands high-velocity learning which is made possible by the development of information architectures that facilitate the real-time acquisition, exchange and generation of knowledge. Knowledge is of value, only if, it is made available at the point and moment of need. The focus needs to shift from classroom training to creation of knowledge networks that enable individuals to share expertise, exchange knowledge and learn on-demand. There should be investments in intranets, groupware, interactive multimedia, telelearning technologies and performance support systems. The strategic application of learning, performance and knowledge-based technology allows an organization to acquire significant competitive edge and the resulting gains enable them to thrive in an era of customized service and contracting product cycles.

Check Your Progress

1. What did the power of the microprocessor do?
2. List the two key reasons to expect the management of knowledge to become an increasingly important issue in the corporate world over the next few years.

4.3 THE SOCIAL ROLE OF KNOWLEDGE

When we have to address a problem or find a solution to issues that need to be reformed, what do we do? Well, we look inward at first to examine:

- If we possess all the relevant information
- If there is a ready-made solution to the problem, one that can be referred to like a case study
- If we fully comprehend the issue, and
- If we have the knowledge to create the solution or reformed order.

Suppose we need to construct an economic order that's rational in nature. In such a situation it is generally witnessed that the necessary knowledge that is needed to construct this economic order does not exist in a concentrated or integrated form, it is rather available in dispersed bits. Often these nuggets of information are incomplete and frequently they are contradictory knowledge that separate individuals possess. In simple words, it can be said that the problem that occurs is about the utilization of knowledge that is not given to anyone in its totality within the society.

The social role of knowledge cannot be exaggerated, it is the knowledge that drives society and leads to its gradual progression. It is said that national prosperity is always created rather than inherited. The quality of education of a country is an index of its growth. Singapore is one country that ranks number one in many indexes due to the reason that it imparts quality education. This in turn helps to improve the quality of administration, the labour pool, and of course the currency. The success of Singapore is attributable to a large extent to the superior education levels. The teaching is directed towards a practical approach which is specific problem-solving-centric.

Any nation's progress is directly driven by the ability to apply knowledge. The competence of the nation's industries to innovate and upgrade comes directly from the knowledge base that it possesses. If we look at the nuclear-capable countries we know that these countries are technologically superior because of their technical knowledge superiority or their ability to employ people and technical expertise that is more advanced than what they have.

Societies that hold higher levels of knowledge are more prosperous than other nations. Economic superiority comes to those nations that have excellent collective knowledge. These countries have greater economic complexity and are more adept at solving problems thanks to their superior knowledge. Knowledge is a key factor or resource that boosts economic and social development. The knowledge society is built on the pillars of formal, non-formal or informal education.

One of the key drivers of social progress is collective knowledge. This refers to the ways in which knowledge is acquired and distributed or shared among the citizens or business entities of the nation.

What is Knowledge Society?

A Knowledge Society is a society that is economically and culturally characterized by a high degree of dependency on the potential to create scientific and technological knowledge. This knowledge is now a commodity in the market, a product to merchandise.

Knowledge in Organizational setups

Innovation is the key to core competency and the mainstay for competitive advantage. Organizations constantly work to re-engineer methodologies to find new ways of accomplishing tasks in a more efficient manner. They also employ themselves in their quest to bring about innovation. These efforts constantly change the competitive spirit among the organization bringing better and more efficient products and services to the market.

A higher degree of knowledge helps in greater innovation in society. Innovations manifest themselves in various forms- from new product designs, revamped production processes, training and development for higher leadership skills, a new approach to marketing, and better supply-chain management. Innovation per se requires investment in skills and knowledge. Organizations can protect their core competencies by taking out patents that can protect an invention for up to 20 years.

How does knowledge influence growth among countries?

There are some countries that grow faster than others. If we take the example of Japan or Singapore (as already discussed above) it is observed that these countries have adopted a very progressive educational system. Japan has a 100% enrolment in compulsory grades and an illiteracy rate of 0%. They happen to be one of the best-educated populations in the world. The Japanese have invested themselves in studying not only designing new products and machine tools but also specific manufacturing processes to achieve both quality and cost-effectiveness.

Here is an example of Japanese efficiency-

> IBM, the American computer giant, had once decided to test Japanese manufacturing capabilities by placing a trial order for some computer components. In the specifications, IBM had spelt out that they would accept only three defective parts per 10,000.
>
> On the exact date of delivery, the parts arrived at the doorstep of IBM. The shipment was accompanied by a handwritten letter:
>
> "We Japanese people have had a very difficult time understanding IBM business practices...
>
> However, with great difficulty, the three defective parts per 10,000 have been separately manufactured. They have been included in the consignment in separate packaging, with bold instructions – DEFECTIVE PIECES, AS PER REQUIREMENT. NOT FOR USE. We hope this pleases you."

NOTES

Japanese efficiency focuses on an array of activities- from shipbuilding, machine tool manufacturing, steel-making, electronics, home appliances, consumer electronics, materials science, to industrial equipment. This is done through kinds of integrated conglomerates called *Keiretsu*. In simple terms, Keiretsu is a set of companies that have interconnected business relationships and shareholdings. It is actually an informal business construct that helps to organize alliances within the social world of Japan's community.

The Essence of Knowledge Society

Knowledge society is a society that is created as a result of modern-day societal changes. New technological innovations coupled with institutional transformation are happening due to the progress that human beings have made intellectually and emotionally. It is about personal growth, creativity, experience, and collective efforts at generating knowledge. Nations that thrive do so because they are able to ensure that their knowledge sources are passed on and the younger generations learn from it without having to again go through the whole process of experience gathering. The primary role of nations in a knowledge society is to ensure that the knowledge sources are passed on much like a baton change in a relay race.

Socio Economic development emerges from the forceful role and contribution of knowledge. The Knowledge Society is well aware of this and it duly acknowledges and values the potent role of knowledge. A significant study carried out jointly by Harvard and MIT discovered that a new measure based on a country's collective wisdom or knowledge accumulation can be a reason for high levels of income variations across nations. A book titled *The Atlas of Economic Complexity,* authored by Rocardo Hausman, Caesar Hidalgo,Sebestian Bustos, Michele Coscia, Alexander Simoes, and Muhammed Yildrim, dwells on the subject of the quantum of knowledge that is required to manufacture a product and how it varies greatly from one product to another. Most modern products - like say a fighter aircraft, require more knowledge than what a single person can hold. Any product that comes into existence in present times is the fruit of a number of people's collective knowledge, thought processes, and actions. On a macro level, Human resource management becomes the driving force towards building and developing organizations and nations. Individuals prefer working for large interconnected organizations that are well-structured and for this to happen the quality of education is important. Ultimately it is the level of quality education in a society that will help to push the frontiers of human understanding.

To solve the economic problems that society faces it requires the ability to quickly adapt to changes under the particular situation and circumstances. It would be a logical process to think that solutions to such problems will ultimately emanate from the people who are more accustomed to the particular circumstances. The people who are aware of the situation and have the knowledge about the task at hand can better handle the issue. Knowledge if kept centralized will not always be helpful because in such situations it is the decentralized knowledge available with the relevant people in society who will stand up to devise a solution to the problem.

This decentralization of knowledge is required because only then can it be ensured that knowledge will be used for the particular circumstances at the right time without undue delay. It is the man at the spot who needs to decide and act. It

is still an issue to actually devise a system to distribute the knowledge to the particular person so that it fits his decisions and this pattern changes when the society is a part of a larger economic system.

Check Your Progress

3. What is a knowledge society?
4. How does any product come into existence in the present times?

4.4 KNOWLEDGE CREATION PROCESS

The knowledge processes and functions play a very crucial role in leveraging the IC of an organization. They are responsible for the extraction of knowledge from the various data and information sources within an organization, their storage and flow within the organization. KM Implementations involve distinct and repeatable cycles or processes irrespective of the terminologies used or the path followed. There are five distinct processes that are as follows:

1. Knowledge creation
2. Knowledge acquisition/capture
3. Knowledge organization
4. Knowledge sharing
5. Knowledge renewal

These must not be confused with the concept of knowledge life cycle mentioned earlier in this unit. These processes confirm to the organizational knowledge life cycle. KM involves connecting people to people and people to information and in the process creates sustainable competitive advantage for organizations (Figure 4.1). In Figure 4.1, we can see that when organizational information is provided to an employee, it results in information transfer. When that employee acts on the organizational information provided, it results in new knowledge being created. The subsequent section presents the five key knowledge processes as listed above.

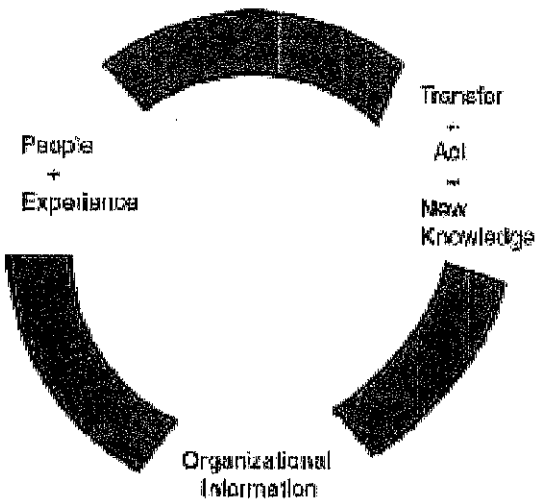

Fig. 4.1 Organization knowledge Transfer

Knowledge creation: One of the fundamental questions that arise in the minds of the readers is 'Is knowledge created or is it discovered?'. In the normal course of an individual's or an organizations work, knowledge is created, discovered, transformed, and shared. The process is cyclic and contributes to the development of the knowledge base of an organization. The following sections would highlight the above concepts. Organizational knowledge can and does take many forms. Some of these forms are:

i. Competitor knowledge
ii. Customer knowledge
iii. Supplier knowledge
iv. Product knowledge
v. Technology knowledge
vi. Process knowledge

The consistent components of these types of knowledge is the organizational context and the ways in which they are created, and are commonly referred to as the knowledge creation cycle. Generally, knowledge within organizations is created in two distinct cycles as mentioned below. While these two cycles and types of knowledge are created and often used differently, they are interrelated as illustrated in Figure 4.2 as follows.

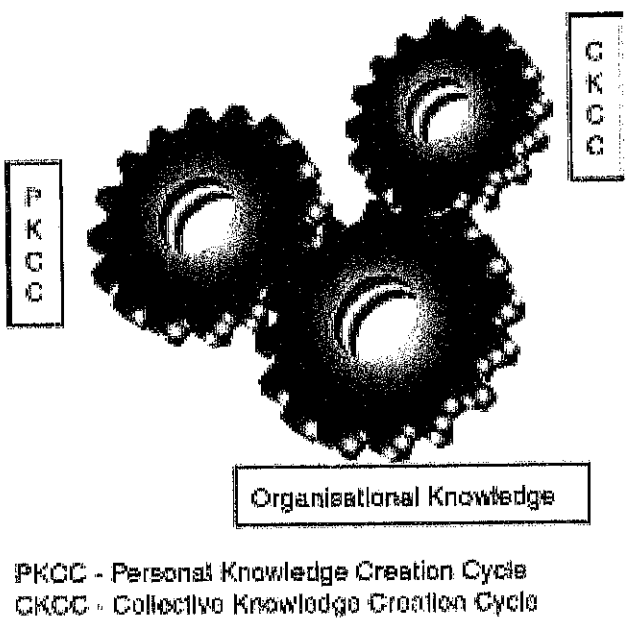

Fig. 4.2 Organizational Knowledge Creation Cycle

Personal knowledge creation cycle: Personal knowledge is created through the experiential exposure to information. The input (information) can and does take several forms. It can be conversational, reports, memos and papers, etc. This input is then refined based on personal experience, expertise, and through the serendipity factor, which has the effect of building upon or adding to one's existing knowledge that is then used as new input to the cycle as illustrated in Figure 4.3

below. This type of knowledge when applied within the organizational context generates new knowledge that is then applied to the organization, thus creating or enhancing the organization's knowledge.

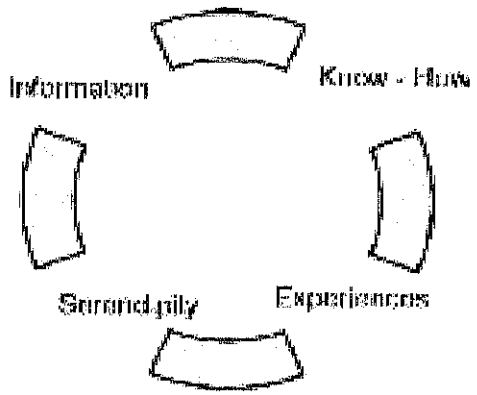

Fig. 4.3 Personal Knowledge Creation Cycle

Collective knowledge creation cycle: The organization and the information within its context constitute collective knowledge. This knowledge is generated by the application of context sensitive personal knowledge derived through the personal knowledge creation cycle, as well as the explicit information contained in systems (procedures, processes or technology). In a normal cycle, information is acquired, shared, and subsequently acted upon. This actionable information is then fed back into the collective knowledge creation cycle (illustrated in Figure 4.4 below) and acts as further input to the personal knowledge process described above.

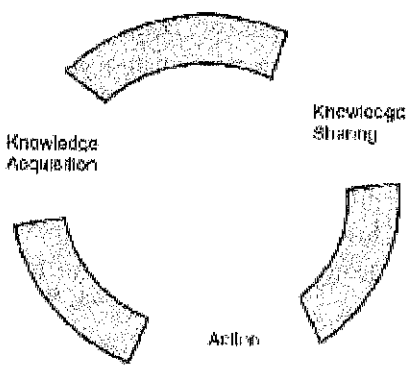

Fig. 4.4 Collective Knowledge Creation Cycle

The two knowledge creation cycles described earlier form a system that feeds on itself to create a reusable knowledge base while receiving and acting on external inputs, thereby refreshing the organization's collective and personal knowledge by providing new information and insight.

Knowledge acquisition/capture: In today's internet age, enormous amount of data is available to individuals as well as organizations at the click of a mouse. This has fuelled a growing need to manage explosive amounts of information effectively. Although indexing and linking documents and other information sources

is an important step, capturing the knowledge contained within these diverse sources is crucial for the building as well as effectively using organizational information repositories. Knowledge acquisition has been a challenging area of research in artificial intelligence and has stemmed from the initial efforts to develop expert systems. Driven by the modern Internet culture and by knowledge-based industries, the study of knowledge acquisition has a renewed importance. Although there has been considerable work accomplished in the area of knowledge capture, activities have been distributed across several distinct research communities. In a shop floor, apprentices acquire knowledge by keen observation of a skilled mechanic performing a task. In the human-computer interaction community, programming-by-demonstration systems learn to perform a task by watching a user demonstrate how to accomplish it. In knowledge engineering, modelling techniques and design principles have been proposed for knowledge-based systems, often exploiting commonly occurring domain-independent inference structures and reusable domain-specific ontologies.

The methodologies as well as the tools for knowledge acquisition/capture are elaborated in the next unit.

Knowledge organization: Knowledge organization refers to the design and development of a knowledge base or knowledge repositories and the associated conceptual access structure to ensure easier retrieval, creation and sharing of knowledge for user communities. The organizational KM system must ensure strategically that all important knowledge assets and flows are known, utilized and enhanced according to their respective long-term contribution to the business value. The creation of an optimal conceptual access structure requires the careful design and steady maintenance of additional knowledge. In order to provide the most useful subject access points for various user communities, developers who generate indexes must judge the potential subjects of an item within a collection from various viewpoints.

According to Alexander Sigel, a leading proponent of this field, knowledge organization is an interdisciplinary cultural activity which adds informational value to collections containing knowledge. It assigns subject access points to items so that the needs of the user groups of the associated information system are served best.

Knowledge organization refers to the description of documents, their contents, features and purposes, and the organization of these descriptions so as to make these documents and their parts accessible to persons seeking them or the messages that they contain. Knowledge organization encompasses every type and method of indexing, abstracting, cataloguing, classification, records management, bibliography, and the creation of textual or bibliographic databases for information retrieval.

All issues of knowledge organization currently focus on the problem of how to organize on line resources. The organizational intranet/internet provides a setting in which knowledge organization naturally finds its place, but at the same time needs constant revision and adaptation to fit new requirements. Consequently, principles like cataloguing and indexing as well as supporting tools change constantly. Within Networked Information Discovery and Retrieval (NIDR), one of the most

prominent issues of knowledge organization on the intranet/internet is the question of how to cooperatively describe resources with metadata, especially, from which knowledge organization schemata draws the entries, and how to interrelate the same from among different descriptions.

Knowledge sharing: Traditional institutional frameworks and static disciplinary boundaries are major impediments in the development of critical knowledge and creative approaches that are needed to solve complex problems. The educational needs and skill sets of practitioners need to undergo rapid changes to accommodate increasing specialization of knowledge and the fast pace of technological development. Vast amounts of information generated through routine processes, are lost on account of the inability of current people, processes and systems to manage, interpret and act on it. Knowledge, unless effectively shared and acted upon, does not possess intrinsic value for an individual as well as an organization. This calls for an increased need to access as well as share extra-disciplinary knowledge and to engage in meaningful trans-disciplinary activities. Knowledge is an object that is articulated in words or is made explicit through language. This facilitates the distribution and analysis and gathering of new knowledge.

The desire to collaborate through knowledge sharing and reuse has arisen within a segment of the broad knowledge representation community that is interested in scaling up to larger systems and that views the sharing and reuse of knowledge bases as a means to this end. Closely related to this effort is a concern for building embedded systems in which knowledge representation systems support certain functions rather than act as ends in themselves. The sharing and reuse of accumulated knowledge leads to increase in the productivity of the associated KM system which is further enhanced by the incorporation of the following three mechanisms:

1. Libraries of multiple layers of reusable knowledge bases that is either incorporated into software or remotely consulted at execution time. Layers in such knowledge bases capture conceptualizations, tasks, and problem solving methods.
2. System construction is facilitated by the availability of common knowledge representation systems.
3. The ability (comparent) to translate between the various representation systems.

This new reuse-oriented approach offers tools and methodologies that allow developers to find and use library entries useful to their needs as well as pre-existing services built on these libraries. These tools are complemented by systems that allow developers to offer their work for inclusion in the libraries.

Knowledge renewal: The processes used to create, communicate, and apply knowledge results in the generation of new knowledge and resultant expansion of the organization's knowledge base. This cyclic process transforms data into information which is enhanced and converted into knowledge. The application of this knowledge then creates new data and information thereby repeating the cycle, as depicted in Figure 4.5.

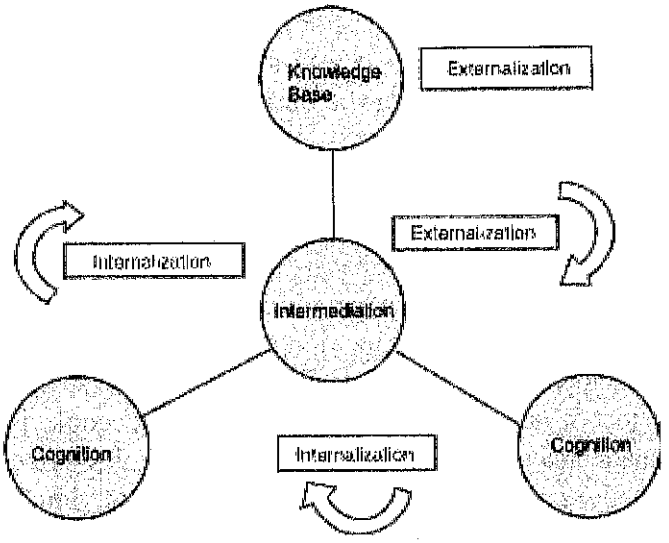

Fig. 4.5 Organizational Knowledge Conversion/Renewal

The most critical issue that must be addressed by any KM system or by any knowledge based application is the process of converting tacit knowledge within an organization into explicit knowledge and building of a self sustaining system that channels this knowledge back to the knowledge workers thereby enhancing the quality, while providing a channel for dissemination of knowledge.

Check Your Progress

5. What is the most critical issue that must be addressed by any KM system?
6. What does knowledge organization refer to?

4.5 ANSWERS TO 'CHECK YOUR PROGRESS'

1. As the information age came into existence, the power of the microprocessor allowed companies to produce goods of high quality at speeds unimaginable during the start of the industrial revolution, at a much cheaper rate. Organizations ensured their existence by deriving competitive edge by investing heavily in advanced technologies.
2. There are two key reasons to expect the management of knowledge to become an increasingly important issue in the corporate world over the next few years. One is the imperative to accomplish "more with less" in the wake of downsizing and restructuring of organizations; the other is the need to strengthen relationships with customers.
3. A knowledge society is a society that is created as a result of modern day societal changes.
4. Any product that comes into existence in present times is the fruit of a number of people's collective knowledge, thought processes, and actions.

5. The most critical issue that must be addressed by any KM system or by any knowledge based application is the process of converting tacit knowledge within an organization into explicit knowledge and building of a self sustaining system that channels this knowledge back to the knowledge workers thereby enhancing the quality, while providing a channel for dissemination of knowledge.
6. Knowledge organization refers to the description of documents, their contents, features and purposes, and the organization of these descriptions so as to make these documents and their parts accessible to persons seeking them or the messages that they contain. Knowledge organization encompasses every type and method of indexing, abstracting, cataloguing, classification, records management, bibliography, and the creation of textual or bibliographic databases for information retrieval.

4.6 SUMMARY

- Organizations ensured their existence by deriving competitive edge by investing heavily in advanced technologies. In other words, most of the organizations had a technology-focused strategy.
- Today an entrepreneur with a good quality workstation and requisite software could handle many of the editing jobs, from the comfort of his home anywhere on the planet, with minimal overheads.
- Knowledge strategies require, proponents and facilitators, in order to succeed and an organization might require the services of consultants who specialize in a particular product/service line, capability, industry or geography.
- Innovation is the key to core competency and the mainstay for competitive advantage. Organizations constantly work to re-engineer methodologies to find new ways of accomplishing tasks in a more efficient manner.
- The knowledge processes and functions play a very crucial role in leveraging the IC of an organization. They are responsible for the extraction of knowledge from the various data and information sources within an organization, their storage and flow within the organization.
- KM involves connecting people to people and people to information and in the process creates sustainable competitive advantage for organizations
- Personal knowledge is created through the experiential exposure to information. The input (information) can and does take several forms.
- The organization and the information within its context constitute collective knowledge. This knowledge is generated by the application of context sensitive personal knowledge derived through the personal knowledge creation cycle, as well as the explicit information contained in systems (procedures, processes or technology).

- Traditional institutional frameworks and static disciplinary boundaries are major impediments in the development of critical knowledge and creative approaches that are needed to solve complex problems.
- This decentralization of knowledge is required because only then can it be ensured that knowledge will be used for the particular circumstances at the right time without undue delay.
- Knowledge, unless effectively shared and acted upon, does not possess intrinsic value for an individual as well as an organization.
- This calls for an increased need to access as well as share extra-disciplinary knowledge and to engage in meaningful trans-disciplinary activities.

4.7 KEY TERMS

- **Knowledge:** Knowledge is an object that is articulated in words or is made explicit through language. This facilitates the distribution and analysis and gathering of new knowledge. It is a key factor or resource that boosts economic and social development. The knowledge society is built on the pillars of formal, non-formal or informal education.
- **Knowledge society:** It is a society that is created as a result of modern-day societal changes. New technological innovations coupled with institutional transformation are happening due to the progress that human beings have made intellectually and emotionally.
- **Personal knowledge creation cycle:** The organization and the information within its context constitute collective knowledge. This knowledge is generated by the application of context sensitive personal knowledge derived through the personal knowledge creation cycle.

4.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Questions

1. How did the creation of a global competitive market come about?
2. Why do nations thrive?
3. How do innovations manifest themselves?
4. Define the personal knowledge creation cycle.

Long-Answer Questions

1. Describe how knowledge managers, help enterprises, leverage its knowledge?
2. Describe the economic problems that society face.
3. Examine how the sharing and reuse of accumulated knowledge leads to increase in the productivity.

4.9 FURTHER READING

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Pasher, Edna and Tuvya Ronen. 2011. *The Complete Guide to Knowledge Management: A Strategic Plan to Leverage Your Company's Intellectual Capital*. New Delhi: Wiley.

Awad, Elias M. 2007. *Knowledge Management*. Noida: Pearson Education.

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UNIT 5 KNOWLEDGE MANAGEMENT TOOLS AND TECHNOLOGIES

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Structure

5.0 INTRODUCTION

In this unit, you will learn about knowledge management tools and their uses in daily life. Organizational knowledge creation and organizational knowledge mapping techniques are explained in the unit. The unit also discusses knowledge technologies and their subject areas. KM implementation techniques and their phases are also discussed in the unit.

5.1 OBJECTIVES

After going through this unit, you will be able to:

- Describe knowledge management tools
- Explain knowledge technologies
- Discuss KM implementation and its organizational structure

5.2 KNOWLEDGE MANAGEMENT TOOLS

The knowledge acquisition, modelling and representation communities have developed a wide range of tools relevant to the development and management of large-scale knowledge-based systems, but the majority of these tools run on individual workstations and use specialist data formats making system integration and knowledge interchange very problematic. The development of knowledge-based systems involves the management of a diversity of knowledge sources, computing resources, and system users, often geographically distributed. The World Wide Web (WWW) is a distributed hypermedia system available internationally through the Internet. It provides general-purpose client-server technology which

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supports interaction through documents with embedded graphic user interfaces. Worldwide expenditures on IT have generated significant benefits for the knowledge workers and are growing in importance. As organizations grow, they are challenged by rapidly changing economic forces, that necessitates the development of faster, more accurate responses. At the same time, the explosion of information threatens to overwhelm individual and corporate response mechanisms with information overload. Experts in the field of systems management have striven to create improved systems for information collection, management, and analysis under various classifications since the 1940s. They have been aided by advancements in mathematics, linguistics, and neuroscience that have contributed to improved electromechanical machines. The widespread availability and adoption of computers during the past three decades has brought more highly evolved systems for constructing, acquiring, storing, and representing knowledge. The wealth of opportunities presented by technology tools has resulted in divergent methods for their application within organizations, especially businesses, in order to increase value.

A Knowledge Management System [KMS] can be described as, "A system for managing, organizing, filtering, analyzing, and disseminating knowledge in all of its forms within an organization." It supports organizational functions while addressing the needs of the individual within a purposeful context (departments or divisions). Accordingly, KMS software can be classified into the five KM categories (Figure 5.1) as listed below:

1. Knowledge gathering
2. Knowledge storage
3. Knowledge communication
4. Knowledge dissemination
5. Knowledge synthesis

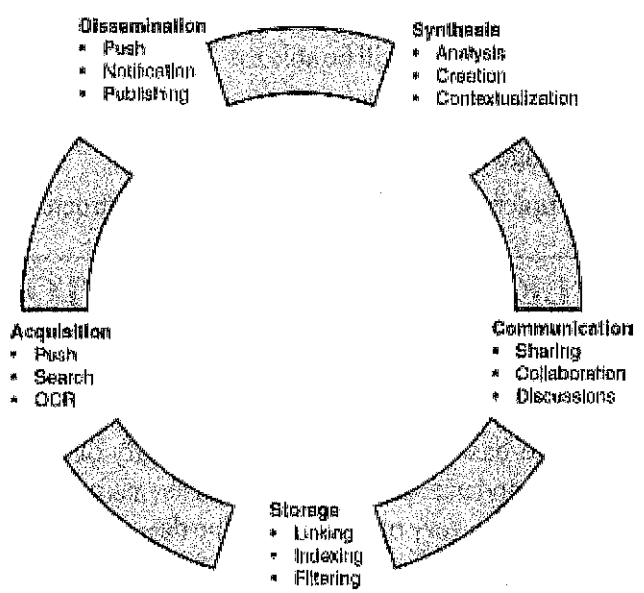

Fig. 5.1 Key Knowledge Management Processes

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KM Software can be grouped into five common categories that represent the current software market:

1. Document management
2. Information management
3. Searching & indexing
4. Communications & collaboration
5. Expert systems

A sixth category comprising of systems for managing intellectual property can be added to the above list. Although they aren't specifically KM tools, they help codify the intellectual assets of an organization and are certainly part of the KM domain. Geographic Information Systems (GIS) as well as visualization techniques can also be effectively deployed in the development of a KMS. For example, GIS could be employed for indexing purposes within an organization.

The key organizational knowledge processes described in the previous chapter are based on my experiences, insights and research in this field. Some of the techniques presented in the subsequent sections may be employed in more than one process, which should not be a cause of confusion to the reader. The perceived overlap is intentional and the objective is to present the core processes and the subtle differences between them.

Organizational Knowledge Creation

Organizational knowledge is created through the personal as well as collective knowledge creation cycles, as described in the preceding chapter. The knowledge so created is fed into the organizational knowledge base, a structured storage base, wherein the knowledge is further refined and subsequently supplied to the organizational knowledge workers for personal consumption as well as actionable outputs. During this flow, the knowledge is enriched by the addition of the personal knowledge of every individual (tacit knowledge) including their insights, judgements, experiences, the collective knowledge of the departments, divisions as well as project teams, and finally flows back to the knowledge base. New knowledge so acquired is appended to the organizational knowledge base and obsolete knowledge is deleted. The process mentioned above is cyclic and self sustaining and is explained in detail in the following sections.

In order to locate and access information that is appropriate for an organization, one needs to understand how information and new knowledge are created, organized, and stored using the currently available technologies. Individuals as well as organizations often take information for granted, unaware of the complex process that takes place before new knowledge is produced. It is a commonly accepted fact that ideas form the basis for research. Ideas that are meticulously researched and developed and can eventually lead to new knowledge. However, the complex process of developing a new idea into new knowledge can take a long time while costing a great deal. Scientific research is usually the most costly, but research in the humanities and social sciences also costs money. Researchers spend a lot of time writing and submitting grants to various organizations, agencies, and others to try and secure funding for their research projects.

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However, the conversion of ideas into commercial revenue streams is the essence of innovation. Idea creation is simply the starting point. In an organization, the percentage of those people whose ideas are implemented, are measured by the innovation quotient, is very low as compared to the percentage of employees with good ideas, measured by the idea quotient. Innovation provides organizations with a definite competitive advantage. Stated in other words "the secret to competitive advantage is innovation." Innovation can help businesses meet all of their strategic challenges, not just competition; for example, in confronting accelerating rates of change, globalization, rapidly advancing technology, a more diverse work force, and a change from an industrial to a knowledge-based economy. Meeting all of these challenges helps the firm achieve competitiveness, and meeting these challenges appropriately depends on innovation. The major issues faced by organizations in this respect are:

- Sharing individual ideas that eventually become a part of the organization knowledge base.
- Nurturing relevant ideas and shaping them into projects and prototypes.
- Encapsulating the resulting knowledge into products and processes and the organization's IC.

This can be achieved by considering the innovation process in terms of flows of knowledge and its conversion between tacit and explicit — flows between people, codification into designs and databases, combination and restructuring of knowledge into new forms. However, it has to be noted that the process is non-linear as well as non-sequential. It depends on knowledge flows across various organizational and discipline boundaries and extensive informal networking by the organizational knowledge workers, including customers and business partners.

In the subsequent section, we shall explore the three commonly employed knowledge creation techniques, employed by organizations to harness their IC.

Knowledge Networks

There is no doubt regarding the fact that better management of knowledge within the organization will lead to improved innovation and competitive advantage; The goal being the better utilization of internal and external knowledge. However, the approach to be adopted by organizations to achieve the above mentioned goal is debatable and varied among the proponents in the field of knowledge management. The views presented in this text reflect the commonly accepted norms in this field and also reflect my experience in the subject. With time, further advancements in technology, increased research coupled with the development of key standards, further more effective approaches may emerge. The peculiarity and the uniqueness of the Indian culture and its corporate functioning have also been taken into account in the process of authoring this text.

Numerous vendors and consultants propound a technology driven approach to KM implementations within organizations. As mentioned earlier, this view is in tune with the "off-the-shelf" approach adopted by software vendors. On the other hand, there is another commonly held view that an organizational learning culture coupled with an opulent reward structure would automatically drive knowledge creation and sharing within an organization.

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However, the effective utilization of knowledge and learning requires both culture and technology. A successful organizational KM implementation entails the creation of an organizational learning and sharing culture coupled with the deployment of technology as an enabler. Explicit information and data can be easily codified, written down, and stored in a data base. Any organization worth its name would have the requisite skills and tools to handle this form of business information. However, an important point to be noted is that, simple data is frequently not where competitive advantage is found. An organization's real edge in the marketplace is often found in complex, context-sensitive knowledge, which is difficult, if not often impossible, to codify and store in a typical binary form. This core knowledge is found in individuals, communities of interest and their connections. An organization's data is found in its computer systems, but a company's intelligence is found in its associated biological and social systems. Computer networks must support the people networks in the emerging fluid and adaptive organizations of today. The reverse is however not possible.

Implementation methodology: A typical organizational hierarchy along with the associated charts and reporting structures are effective for control and planning. This comprised of sufficient knowledge in a time when organizations faced gradual change. The current fluid business environment does not allow only static structures and does not reward those that follow prescribed configurations in the face of rapid change. The fast economy requires flexible, adaptive structures that self-organize internally in response to changes externally. The current knowledge-critical economy necessitates the creation of charts to depict members with base operational knowledge, or primary members within an organization, as well as members with knowledge to complement these primary members, or in other words the secondary members. In addition to typical organizational hierarchy charts, visualizations of the massive interconnectivity that occurs in the learning systems within the organizations are required. The formation of such multi-tier structures is required to build and sustain effective learning systems within an organization that form the key to a successful development of an effective organizational KMS.

Knowledge is the capacity of people and communities, continuously generated and renewed in their conversation, to meet new challenges and opportunities. People responsible for knowledge value creation can be inspired and supported, but they cannot be "managed" as people were managed in the industrial era, as mere extensions of the machinery. Organizations need to shift the focus of their knowledge initiatives to developing an open culture of communication and collaboration that is supportive to the sharing of innovative work and business practices.

The knowledge networks discussed above, is a subset of an organizational ecosystem or a network of conversations, face-to-face and electronic meetings, facilitated for results, richly hyperlinked with, feeding, and fed by knowledge repositories of what, who, why, how, where, and when. Communities of practice co-evolve with their shared body of knowledge, and the protocols and tools for upgrading it. The dynamic force of this co-evolution is the network of conversations, in which, critical perspectives, new needs, circumstances, and better solutions to meet them are introduced.

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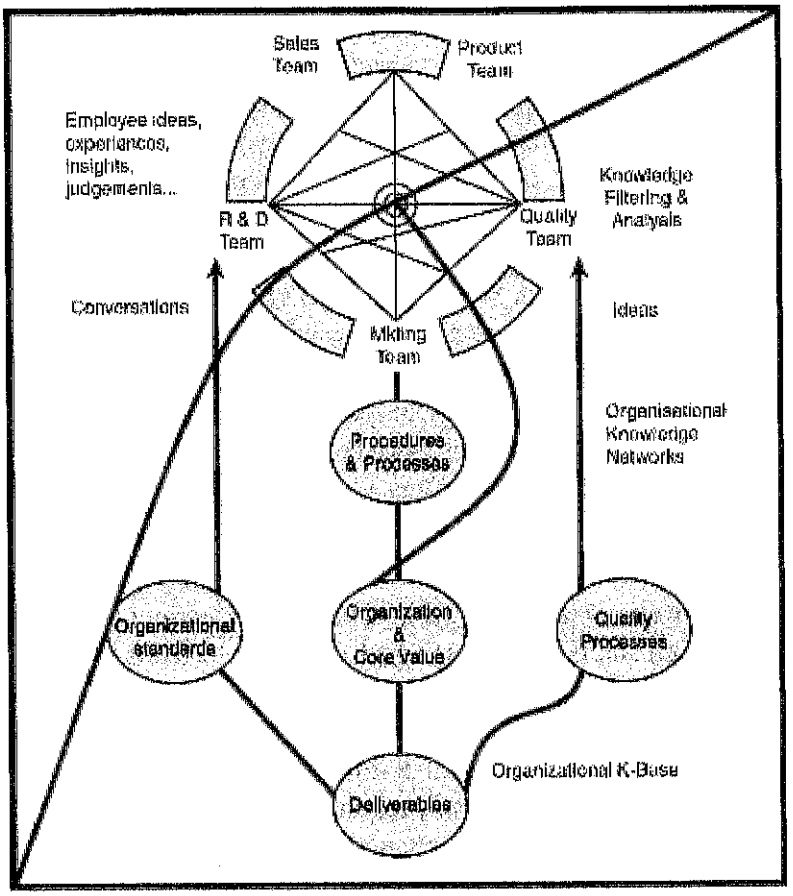

Fig. 5.2 Organizational Knowledge Networks

Organizational knowledge ecosystem A knowledge ecosystem can be construed as a tri-layered network comprising of the following:

(a) People network

(b) Knowledge network

(c) Technology network

As listed above, this includes a network of people with productive conversations facilitated for continuously creating a knowledge network of ideas, information and inspiration, that cross-fertilize and feed on each other, supported by a technology network of knowledge bases, communication links, action scripts, sense-making and negotiation tools, that generates business and social value through the action of its members augmented by the intelligence of the whole ecosystem. A knowledge ecosystem can be construed as a complex adaptive system of people in communities co-located in the same space, physical and/or virtual, in which they cultivate relationships, tools, and practices for creating, integrating, sharing, and using knowledge.

Knowledge ecology is an interdisciplinary field of management practice, emerging from the confluence of management strategy, communities of practice, adaptive systems and knowledge management. It is a growing body of knowledge and practices focused on continuously improving the relationships, tools and methods for creating, integrating, sharing, using, and leveraging knowledge.

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Organizational network analysis: Organizational Network Analysis [ONA] is a software supported methodology, that reveals the inner workings of an organization. It uses the rigor of systems analysis to reveal the behaviour inside and between organizations. Knowledge networks are mapped that uncover interactions within and across the boundaries of the organization. These visualizations are in effect similar to a medical x-ray and reveal the true internal functioning, learning and adaptation within an organization. Without these visualizations, core activities are hidden, or not normally visible on the surface. ONA exhibits both how knowledge is shared in emergent communities of practice, and how it is utilized in key business processes. In short, it uncovers the hidden dynamics that support learning and adaptation in the modern organization.

The management within an organization can now visualize the connections that matter and can further also measure and benchmark them. Based on recent research, an organization can now be benchmarked in key dynamics such as adaptability to external environment, learning capacity, openness to the environment, ability to span boundaries, brittleness of its structures, probability of project success, and efficiency of information flow. This technology provides the ability to drill down into a complex organizational system and find emergent subject matter experts, natural leaders, bottlenecks, breakdowns in communication and communities of practice. The organization can be viewed and measured from the system per se, to the group level, and down to the individual as well as their interrelationships.

ONA is an outgrowth of many knowledge disciplines including social network theory, organizational behaviour, interpersonal communications, chaos theory, complex adaptive systems, artificial intelligence-based search and pattern-matching, communities of practice research and a branch of mathematics called Graph Theory. ONA is basically an Object-Oriented (O-O) model of an organization, with objects such as people, teams, and technologies interlinked, sending messages to each other and invoking their respective methods to accomplish the goals of the firm.

Tools

NETWRK 4.2: It is a new and improved package to analyze a network at several hierarchical levels. The bilateral relationships between any two system components via all pathways are quantified. A description of how much each population feeds at the various levels is provided, and the complex web of relationships is mapped into an equivalent chain, useful for evaluating the efficiencies of the overall system at each level. Thirdly, a number of information specific indices that can be used to describe the organizational status health or integrity of the network as a whole can be calculated. Finally, all the pathways for recycle within the system are listed, and the system network is decomposed into two webs — one that consists entirely of recycled flow, and the other an acyclic mesh comprising of dissipative information.

InFlow 3.0 - Network Mapping Software: InFlow is designed for consultants, by consultants. Inflow has been used to map and measure organizational networks since 1988. InFlow has been successfully applied in the following projects:

- Knowledge management
- Post-merger integration
- Organization design

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- Workforce diversity
- Team building
- Internetwork design
- Network vulnerability assessment
- Industry ecosystem mapping
- Diffusion of innovation
- Community development
- Building productive networks

The version 3.0 provides new metrics, new network layouts, new what-if analysis, and is designed to work with Microsoft Office and the internet.

Organizational Knowledge Mapping Techniques

Knowledge mapping represents the ongoing quest within an organization (including its supply and customer chain) to help discover the location, ownership, value and use of knowledge artifacts, to learn the roles and expertise of people, to identify constraints to the flow of knowledge, and to highlight opportunities to leverage existing knowledge. Knowledge mapping is an important practice consisting of survey, audit, and synthesis. It aims to track the acquisition and loss of information and knowledge. It explores personal and group competencies and proficiencies. It illustrates or "maps" how knowledge flows throughout an organization. Knowledge mapping helps an organization to appreciate how the loss of staff influences IC, to assist with the selection of teams, and to match technology to knowledge needs and processes.

It is a commonly known fact that, knowledge is sought primarily within the context of a problem and is to be applied rather than purely contemplated. Problems also commonly referred to as issues or opportunities; tend to be the primary drivers for the acquisition of knowledge. The nature of the problems being encountered by organizations across the globe is highly varied and complex and very different from the well defined problems of yesteryears. With the advent of issues relating to the environment and culture outside an organization, significant problems are transdisciplinary and cannot be effectively dealt with the existing systems. Solutions to these classes of problems will determine long-term sustainability of an organization. Hence, developing reliable means of coping with them is critical. The shift to knowledge based economies and cultures necessitate major structural changes to the current economy and social institutions. The management of complex transdisciplinary problems necessitates a mapping to an organizational knowledge base. As mentioned earlier, the ability to synthesize and apply essential knowledge is possible through subject matter experts in each discipline. In order to reach this point, experts have to practice in a field for a long period of time. Experience, eventually erodes the inconsequential and leaves the essential framework or knowledge map. Experts report that the ability to handle knowledge increases significantly once this plateau of essential knowledge is reached. However, the means by which the expert draws conclusions is not explicit and universally accessible. Knowledge mapping therefore represents an opportunity not only to solve complex problems, but also to democratize the understanding of transdisciplinary processes.

The following are some of the major challenges faced by organizations in their quest for an effective KMS.

Core Implementation Issues

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1. An escalating rate in the growth and diversity of knowledge and information available to and within an organization.
2. The fractionation of the disciplines into narrow specialty fields, thereby augmenting a trend towards depth rather than breadth.
3. An increase in professional mobility, leading to a discontinuity of focus and experience within an individual's career (the saying "jack of all trades, master of none" is very valid in the current recessionary markets), and ultimately fewer real subject matter experts.
4. The lack of any formal framework which explicitly represents the collective knowledge base and problem solving processes, in order to enable meaningful dialogue and action, irrespective of expertise.

Knowledge maps: An organizational knowledge map is a navigational aid to explicit (codified) information and tacit knowledge, highlighting the importance and the relationships between knowledge stores and dynamics. The organizational knowledge map is an outcome of synthesis within the organization and portrays the sources, flows, constraints and sinks (losses or stopping points) of knowledge within an organization. An organizational knowledge map highlights the following:

1. Location, ownership, validity, timeliness, domain, sensitivity, access rights, storage medium, use statistics, medium and channels of common organizational data, information and knowledge pools or sources.
2. Organizational documents, files, systems, policies, directories, competencies, relationships, authorities
3. Boundary objects, knowledge artefacts, stories, heuristics, patterns, events, practices, activities
4. Explicit and tacit knowledge which is closely linked to strategic drivers, core competencies and market intelligence.

Organizational newsfeeds, contact addresses, network transactions, helpdesks, patent information, Human Resource Department (HRD) databases, customer complaints, WAN/LAN directory structures, library, record archives, process descriptions, push profiles, metadata directory, organizational best practices, and competitor information form the primary sources for the construction of knowledge maps.

Organizational benefits

1. Encourage reuse of organizational knowledge and prevent re-invention, saving search time and acquisition costs.
2. Highlight islands of expertise and suggest ways to build bridges to increase knowledge sharing.
3. Discover effective and emergent communities of practice where learning is happening.
4. Provide a baseline for measuring progress.

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5. Reduce the burden on experts by helping staff to find critical information quickly.
6. Improve customer response, decision making and problem solving by providing access to applicable information.
7. Highlight opportunities for learning and leverage of knowledge.
8. Provide an inventory and evaluation of intellectual and intangible assets.
9. Research for designing a knowledge architecture or a corporate memory.

Implementation methodology: Knowledge mapping is a technique that is dependent on the understanding of the organizational knowledge structures and the mediums of representations appropriate to these structures. The given media will control the types and forms of representation possible to employ. Implicitly, the mapping starts from the idea of having access to shared symbolic structures for the communication of knowledge. Knowledge maps and mapping are not explicitly directed at making new languages but for supporting a wide range of existing representational strategies appropriate to knowledge representation suited to cater to the organizational requirements. This means that there must be some agreement on the shared languages and mediums necessary to start mapping and to create maps. There has to be some initial agreement by users of the technique on the notational and organizational structure to be used. The technique is heavily dependent on the desire to make knowledge explicit and accessible and an ongoing commitment to the process of material knowledge formulation. It is further dependent on the need for a shared network of developers and users that would critically and constructively interact in advancing the technique. There is a large burden (time, resources, etc.) placed on the mapmaker to initiate dialogue with others, describe, document and represent the constructs in explicit ways. There are numerous techniques that can be effectively used to map organizational knowledge. However, these techniques effectively map only around fifty percent of the knowledge necessary to really capture key processes and allow individuals to replicate or negotiate a given example.

Example: The process of filling up a manpower recruitment form in an organization will add some experimental dimensions (tips and tricks) but will be meaningless unless the process is actually executed.

If the technique were used to describe all the constructs and relationship in, for example, cricket game or a soccer match you would not have the beauty or excitement experienced in a real game.

However, these approaches may not be able to communicate the alternative paths of action if required; for example, the additional information to be furnished or additional columns to be filled in case the manpower requirements are not regular budgeted positions. These techniques may not be significant in understanding the strengths and weaknesses of conventional approaches but contribute significantly in bridging the gap between the conceptual and the contextual design elements.

Knowledge map construction: The development of an organizational knowledge map begins with the development of a conceptual framework in conjunction with a working dictionary of the major organizational structure being

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considered. These structures can be construed as 'spaces,' wherein, the knowledge map is organized and formalized. A general organizational map is constructed of four interconnected representational 'spaces' as mentioned below:

Dialogue space: The dialogue space represents an area for free exploration, notation and diagramming that helps the organizational knowledge mapper to question and clarify intents, identify justifications, categorize the key constructs and explore the possible relationship between constructs. This space is analogous to whiteboards, brain storming sessions or similar techniques employed for effective problem solving.

Construct-Relation space: This space represents the area where each of the constructs developed in the dialogue space is formally defined, described and whose key characteristics are listed based on the described relationship. This includes information about the author of a construct (references, pedigree, date, etc.), its inheritance (level of dependence), what other constructs and relationships it is dependent on or what other constructs are defined or organized by it. It is a complete record of the definitions of the domains, constructs and relationships and the symbols (legends) used to represent them.

Operational space: The place where the constructs defined above are represented, located, combined, classified, categorized and interrelated resulting in the generation of further structures and emerging domains (combinations of key constructs and relationships). It is where the operational evaluation of the approach to the solution is carried out to observe whether the stated intents are achieved. It is the space that shows the evolving map of the overall organization.

Interpretive space: The additional knowledge that may be required by a user to understand the map created in the operational space is introduced or additional references are provided through the interpretive space. It is the space, where one creates the navigational constructs and relations necessary to guide the user through specific pathways in the process of solving a problem. It is where one can explain how the effects of different judgments, values, constraints and priorities influence bias or limit navigation through the association space.

Knowledge map creation — an example

1. The mapping process starts by identifying critical constructs and relationships central to the intent. This is achieved by organizing initial thoughts in the 'Dialogue Space' by expressing intent, arguments, questions, diagrams, pictures, etc., to clarify the intent.

   If the intent was to clarify certain KM concepts, an individual would begin by trying to locate the organizational Subject Matter Expert (SME) in the field of KM. Once this has been achieved, this would be followed by means to contact the concerned person. This involves two constructs and one relationship map. The various possibilities (in this case, the various persons with the requisite knowledge), their location and the means to contact them would be entered into the dialogue space.

2. The key characteristics of the construct would then be defined in the construct-relation space. They are as follows:

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(i) Construct 1 — Starting location (Division / Department, Mail ID, owner of the construct, etc.)

(ii) Construct 2 — Location of the organizational subject matter expert (SME), (Division/Department, Mail ID, Name of the subject matter expert.)

(iii) The descriptions which include the label and form of symbolic representation used to express the constructs, i.e., starting location and location of the SME, each described by a circle.

(iv) The next step involves the definition of the relationship between the constructs. This is conceived by finding out the relationship between the constructs. In the example mentioned above, the two constructs are related by the sharing of the relevant information (regarding knowledge management). The definition of the relationship also includes characteristics such as the method (E-mail, phone call..,) of contacting the source, the parameters (E-mail ID, phone number…) and ends with a label.

(v) Definitions of the constructs and relations are kept in the construct-relation space so that one could easily locate the descriptions and processes employed and the symbols used to represent them. The ability to independently inspect the descriptions of the constructs, relations and symbols becomes important as complexity of organization is increased.

(vi) The symbols defined in the preceding step (circle, lines, picture, etc.) are placed in relation to each other. The user has access to all the spaces within the map or inherits a copy of the map. Additional assistance would have to be provided to interpret the map. This information could be made a part of an area termed as interpretive space. Here the intent, the entry level of knowledge and the best way to navigate the knowledge could be included.

(vii) The interpretive space should also allow the user to 'deposit' questions or notes about the impediments or insights that she considers relevant to understanding the map. This questioning allows feedback to the map makers. It helps to indicate, what in this case might be, a strategy for a better map that meets the same intent. It is more explicit about the knowledge and could be used by people who do not have any working knowledge of the intent.

The user may alter any of the spaces to reflect a more useful dialogue, constructs, relationships, associations and interpretations. This type of feedback demonstrates that an important issue is not only the user's inheritance of the map but also the mapmaker's inheritance of the user's map (questions and changes). It is always important to remember that the purpose of mapping is to share and develop better knowledge within a given intent and context. In order to make the maps usable, formalisms need to be imposed in the basic approach. The technique relies initially on the notation and organization of the spaces, that have been imposed

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to help foster explicitness and allow for interpretation and controlled interaction. It is up to each user to determine the most useful and usable strategy for making and interpreting the map. The structures proposed are necessary to support a robust environment for knowledge development and transfer.

Knowledge mapping tools: Visual concept is a "visual thinking software"; providing a medium for all kinds of creative and systems thinking. It enables ideas to be developed as a basis of planning, designing, authoring, organizing, relating, mapping, scenario building and countless other activities. It enables one to easily structure ideas and print them out, communicate them, transfer them and relate them to other visual maps with links to ideas expressed in any Windows environment. It also helps one capture large amounts of information and creates knowledge maps either as ideas occur or as they are extracted from audits, meetings, lectures or texts. The software acts as an outliner to automatically develop clearly structured stories, essays and reports. By mapping interrelationships, one can greatly increase the organizational capacity to understand complex issues. On a corporate network, Visual Concept comes to the fore as a medium for sharing and developing ideas. 'Ideas Pools' and other knowledge sharing files become the arena for ideas exchange with links to source material in other Windows-base applications or on the internet. The following are some of the key advantages of this software:

1. The software greatly enhances the structuring of thoughts to write essays, to make speeches or write articles, for prioritizing, for planning simple or complex tasks, for thinking through fuzzy issues, for communicating thinking to others.
2. Visual Concept is particularly valuable as a medium for involving others in sharing information and for thinking together.
3. Visual Concept helps access the full power of an individual's mind, provoking the kind of thinking that is needed at a given time. It provides a way of making thinking visible, utilizing a workstation's power to map, model and structure thought processes making it possible to develop and explore one's intrinsic environment and its relationship to others, thereby helping one develop systemic and holistic thinking.
4. Visual Concept can be used to access knowledge repositories and to enhance organizational thinking. It has applications at the personal level as a study tool, as a planning medium and to help in exploring and expressing ideas of all kinds. For groups and teams, it is particularly valuable for helping share thought processes, aligning energies and giving shared ownership of resulting plans. At the organizational level, it is invaluable for strategic thinking and as a means of developing and accessing corporate knowledge

Concept mapping: Concept maps are tools for organizing and representing knowledge. The fundamental idea as promulgated by David Ausubel — an expert on learning psychology is that, learning takes place by the assimilation of new concepts and propositions into existing concept propositional frameworks held by the learner. The basic idea is similar to that of a knowledge map. They include concepts — usually enclosed in circles or boxes of some type — and relationships

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between concepts or propositions, indicated by a connecting line between two concepts. Words on the line specify the relationship between the two concepts.

Key concepts: A concept can be perceived as a regularity in events or objects, or records of events or objects, designated by a label. The label for most concepts is a word, although sometimes symbols such as + or % are employed. Propositions are statements about some object or event in the environment being considered, either naturally occurring or constructed. Propositions contain two or more concepts connected with other words to form a meaningful statement. Sometimes these are called semantic units, or units of meaning.

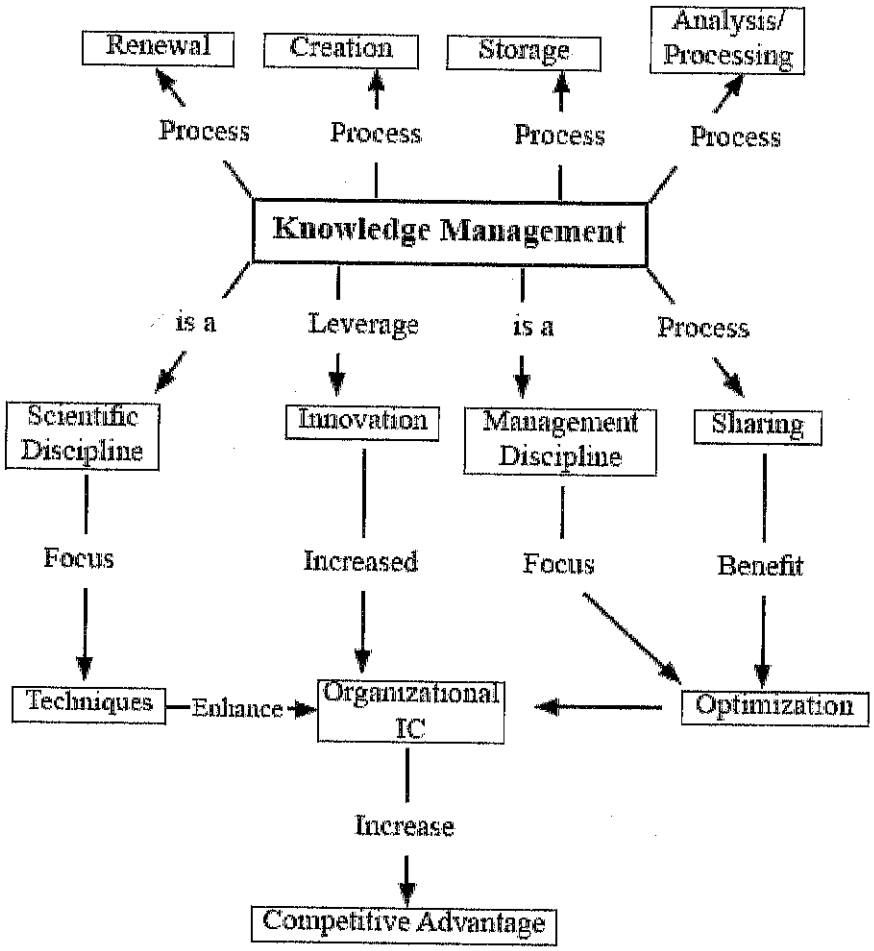

Fig. 5.3 Structure of a Concept Map

The above figure illustrates an example of a concept map that describes its structure as well as the characteristics as described in the preceding section. The entire process and the steps involved in the construction of the map depicted above are beyond the scope of this text and has not been depicted.

Representation: Concepts are represented in a hierarchical fashion with the most inclusive, most general concepts at the top of the map and the more specific, less general concepts arranged hierarchically below. The hierarchical structure for a particular domain of knowledge also depends on the context in which that knowledge is being applied or considered. Therefore, it is best to construct concept

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maps with reference to some particular question, situation or event that represents the need to organize knowledge in the form of a concept map. The relationships (propositions) between concepts in different domains of the concept map are represented using cross links. Cross-links help one to easily visualize how certain domains of knowledge represented on the map are related to each other. In general, cross-links often represent creative leaps on the part of the knowledge mapper, especially when new knowledge is being mapped. The three important features of a concept map that facilitates creative thinking are:

1. The hierarchical structure
2. The ability to search for and characterize cross-links
3. Specific examples of events or objects that help to clarify the meaning of a given concept.

Construction: The general steps involved in the construction of maps are outlined. This should, however, not generate a simplistic view of the entire process in the minds of the reader.

1. In learning to construct a concept map, it is important to begin with a domain of knowledge that is very familiar to the person constructing the map. Since concept map structures are dependent on the context in which they will be used, it is best to identify a segment of a text from a manual, an organizational procedural activity, or a particular problem or question that one is trying to understand. This creates a context that will help to determine the hierarchical structure of the concept map. It is also helpful to select a limited domain of knowledge for the first concept maps.
2. Once a domain has been selected, the next step is to identify the key concepts that apply to this domain.
3. These are to be listed, and then from this list a rank order should be established from the most general, most inclusive concept for this particular problem or situation, to the most specific, least general concept. Although this rank order may be only approximate, it helps to begin the process of map construction.
4. The next step is to construct a preliminary concept map. This can be done by writing all the concepts on Post-its, or preferably by a software program. Post-its allow a group to work on a whiteboard and to move concepts around easily. Application packages are effective and facilitate moving of concepts together with linking statements and also the moving of groups of concepts and links to restructure the map.

Figure 5.3 illustrates a concept map that addresses the question, "What is KM." The output depicted here represents only one of the various possibilities that may exist. It is important to recognize that a concept map is never finished. After a preliminary map is constructed, it is always necessary to revise this map. Good maps usually undergo three to many revisions. This is one reason why a computer software program is helpful. After a preliminary map is constructed, cross-links should be sought. These are links between different domains of knowledge on the map that help to illustrate how these domains are related to one another. Finally,

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the map should be revised, concepts positioned in ways that lend clarity, and a "final" map prepared. Since all concepts are in some way related to one another, it is necessary to be selective in identifying cross-links, and to be as precise as possible in identifying linking words that connect concepts. It is very important to note that sentences, from which entire subsections of a map can be created, should never be used in the construction of a concept map. This is as illustrated in the following Figure 5.4.

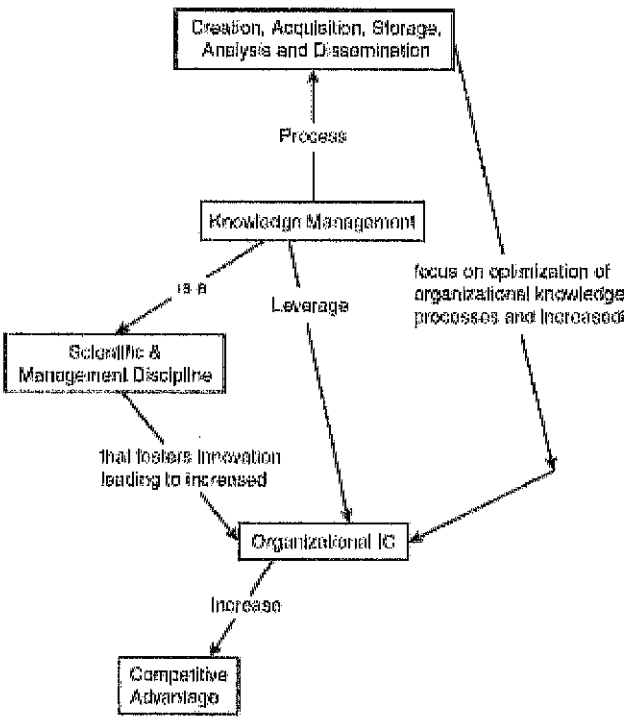

Fig. 5.4 Incorrect Concept Map

Usage

Concept mapping is an easy way to achieve very high levels of cognitive performance, when the process is done well. This is one reason why concept mapping can be a very powerful evaluation tool.

Instructional design: Concept maps can be enormously useful in instructional design. They present in a highly concise manner the key concepts and principles that are fundamental to the topic being taught. The hierarchical organization of concept maps is very helpful in achieving a highly optimal sequencing of instructional material. In order to achieve meaningful learning, new knowledge needs to be integrated with a learner's prior or residual knowledge and propositional frameworks. There needs to be a gradual progression from the more general and inclusive concepts to the more specific information in order to enhance meaningful learning. The instructional design process should commence with the construction of a global map at a macro level showing the major ideas that are to be presented in the whole course, or in a whole curriculum, followed by more specific maps or micro maps to depict the knowledge structure for a very specific segment of the instructional program.

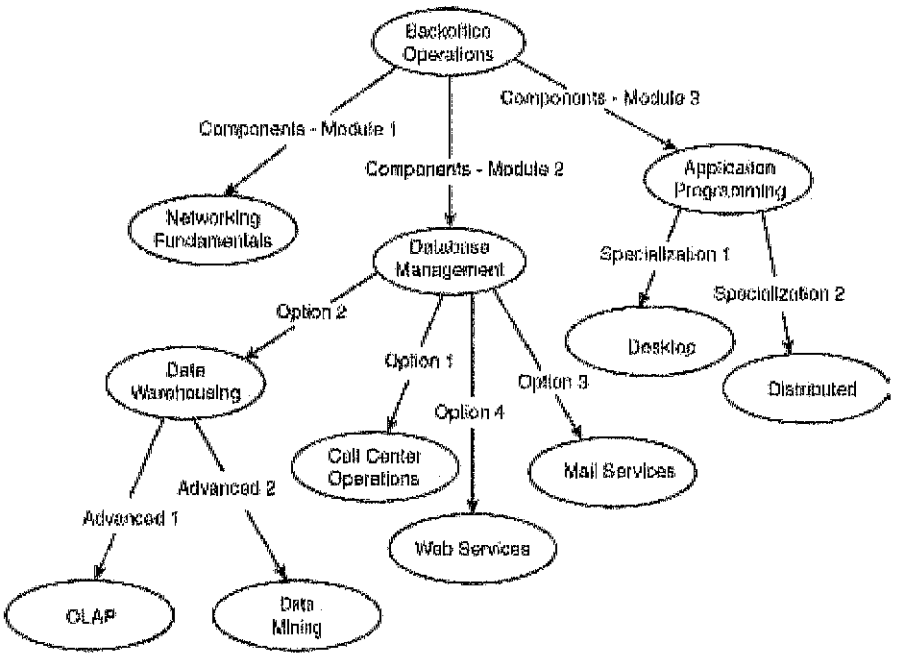

***Fig. 5.5** Concept Maps in Instructional Design*

The usage of concept maps in instructional design helps to make the instructional mechanism conceptually transparent to the intended participants. Concept map can greatly reduce the learning curve of most participants and would be highly helpful in learning areas of science and engineering. The construction of relevant concept maps can be a highly helpful tool for participants with average or below average learning levels. An example is as illustrated in Figure 5.5.

Organizational cooperative learning: Considerable amount of research in the area of learning and development of learning methodologies have proven beyond doubt that, positive and highly effective learning occurs when individuals work in small groups and cooperate to learn. In most cases and contexts, the usage of or the development of concept maps have speeded up the process to a considerable extent. Concept maps are now beginning to be used in corporations to help teams clarify and articulate the knowledge needed to solve problems ranging from the design of new products to marketing to administrative problem resolution.

Concept maps for evaluation: Concept mapping is being increasingly employed in educational institutions as well as educational material to summarize understandings acquired by participants after the completion of a unit, chapter, module or semester. They can be also employed in organizations to evaluate the learning levels at the end of a training session or a workshop as well as evaluate the on-the-job skills of employees.

Concept mapping tools

Inspiration: Inspiration is currently one of the most popular computer software programs for creating concept maps. Organization of concepts, and brainstorming and mapping of ideas are some of the primary functions of this program. The graphical capabilities of Inspiration makes it a useful program for creating graphs

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for various purposes. Nodes may be shown in many different useful preset and user-defined shapes. Links may be straight or curved and may be labeled. Arrowheads may be placed on any side, and everything may be set to any color. This helps in effective construction and presentation of maps.

Check Your Progress

1. What are the five categories KM software can be classified into?
2. Where is concept mapping employed?

5.3 KNOWLEDGE TECHNOLOGIES

In this section we will dwell upon the subject of knowledge technologies. In simple terms, knowledge technologies are information technology that facilitates knowledge management.

Genesis

Technologies that support the formation and organization of knowledge among different levels - individuals and society are called knowledge technologies. Necessarily, these technologies need to be intelligent, informative, and interactive to cater to the needs of the present generation as well as to the myriad challenges of this century.

It also refers to all those technologies that involve the assemblage of knowledge, its transmission from one place to another, and also to its access by anyone from anywhere through any electronic medium.

Knowledge management systems are supported by knowledge management technologies and are greatly benefited from the knowledge management infrastructure, especially the information technology infrastructure. Knowledge management technologies constitute a key component of knowledge management systems.

It may be deduced that information technology and knowledge management Technologies are intrinsically not very different in nature. However their focus is on knowledge management rather than the processing of information

Knowledge Technology and Information Technology

We are now living in a period of information technology (IT). The collection and accumulation of the huge volume of data and information have been possible due to the advancement in computing, communications, virtual garage technologies, and high throughput data/information collection. Based on their perceptions and observations, many researchers are of the opinion that knowledge technology would succeed Information Technology and take its place.

The development of information technology has immensely helped in the development of knowledge technology. Technology here is used in the transfer and exchange of knowledge. Based on this, we can very well understand the fact that

when there is any technological development, it psychologically affects the management of knowledge and the technologies associated with this.

Subject areas of Knowledge Technologies

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- **Knowledge Engineering:** Artificial intelligence has given birth to this. It Is associated with the building up of a computer system to solve problems in the same way as human beings would do.
- **Knowledge-based engineering:** This has come from Computer Aided Designing. Engineers (especially design engineers) can do their job more efficiently and effectively with the help of this Computer system.
- **Knowledge Management:** This has emerged from the business initiative of different companies. In this case techniques and tools are used to make better use of intellectual assets in an organization.
- **Ontological Engineering:** Knowledge Engineering, Philosophy, and Computer Science has given birth to this. Different Computer systems and archives are allowed by the construction of knowledge structures to understand each other's contents.

Technologies involved in Knowledge Management

The technologies involved in knowledge management are as follows:

Knowledge Portal

The presence of a knowledge portal is very important. Here we should note that there should not be any confusion between 'knowledge portal' and 'information portal'.

An information portal is often defined as the path to information to facilitate the users to have one or more simple ways of finding the needed information. But, the knowledge portal is quite different from this. Besides providing information, knowledge portals contain some sort of software technologies. Besides supporting and combining the processes of team communication virtually, this software also helps in managing knowledge. Furthermore, the intelligent agent software included, successfully identifies, and distributes information and knowledge to knowledge seekers based on the knowledge description provided.

Knowledge Profiles

Within the knowledge portal, there is scope for the knowledge seekers for updating and maintaining a personal 'knowledge profile' which keeps address track of their specific knowledge needs, areas of interest, and frequency of distribution.

Collaborative Workspaces

Shared workspaces can be set up, within the knowledge portals for each new team or project. These will serve as the knowledge storehouses from which new knowledge will be regularly and systemically processed and shared and distributed across other teams in the organisation. Within the shared and mutual workspace, at least, the common functions like specific team goals, duty management, team contract, knowledge banks, open access to emails, harnessing of new ideas and information are some of the many available options that can be performed.

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Scope for Urgent Requests

It is very necessary and important to have the scope to enter any 'Urgent Request' into the knowledge portal and also the process to get back any responses or feedback from across the organisation. Rather than specifically directing the request to some specific person, it is openly entered and those with know-how participate and support with their responses and feedback. This is a very effective way of capitalising the knowledge across the organisation.

Document Libraries

The document library is generally the place where all documents are stored. These libraries must be subject or condition related and should be such that they can be easily accessed by one and all. The Electronic Document and Records Management System (EDRMS) is being used by many companies for the safe and organised storage of documents. But along with this, it is necessary to integrate the EDRMS with all other relevant information and knowledge sources.

Server and services dedicated towards Knowledge Management

To promote knowledge networking across the entire organisation and support knowledge processes for creating, retaining, leveraging, reusing, measuring, and optimising the use of the organisational knowledge assets, a dedicated knowledge server is required that will:

- Manage the communications, and collaboration between networks of people
- Helps in sharing knowledge between the people by making it accessible by one and all.
- Advanced search capabilities
- Collaboration services
- Search and discovery services
- Publishing services based on user knowledge needs and knowledge profiling
- A knowledge map (taxonomy)
- Knowledge repository for information and process management
- Text summarising and conceptualising
- Intelligent agent ware
- An Intranet infrastructure for integrated email, file servers, internet/intranet services

Knowledge Bases (Banks)

A knowledge base has to be created and maintained for each area of knowledge that comes under discussion and is of utmost importance.

A knowledge base should have the following:

- both structured and unstructured discussion forums
- rich 'knowledge objects' that have been designed for the efficient and effective transfer of knowledge using multimedia, video, audio

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- embedded communications theory (e.g. storytelling)
- critically review knowledge nominations and turn them into improved knowledge
- automatically find and publish knowledge to users according to users knowledge profiles

Benefits of Knowledge Technologies

These are as follows:

1. The efficiency of the non-experts is improved to do better jobs.
2. The loss of knowledge is reduced or stopped when experts move out of an organization.
3. IT and web resources are successfully used by filtering and demonstrating the information in such a way that they are user-specific.
4. Inefficiencies that are created by the presence of multiple databases and IT systems can be reduced proficiently.
5. Cost and time reduction related to business processes can be efficiently done and this, in turn, will help the experts to be more productive.

Conclusion

Technology plays a vital role in our everyday life and we use it for everything from doing mathematics to reading a book. Along with this, we can aptly say that knowledge technology plays no lesser role. Knowledge Technology has made some huge advances in the past couple of years and thus have got linked up with all and sundry. All these have been possible due to the advancement in the field of Computer Science and Information Technology. Without the help of these two, knowledge technology would have been handicapped and would not have been able to reach the pinnacle of success and advancement that it has reached today. Knowledge Management Mechanisms and technologies work in tandem and have an effect on each other.

5.4 KM INFRASTRUCTURE

For any organization, knowledge is a strategic asset. Organizational performance is directly proportional to the effectiveness of knowledge management (KM) within the organization. In order to ensure the overall effectiveness of KM, the organization must be aware of the role of KM infrastructures in supporting the relevant knowledge management processes. There exists an inter-connection between KM Infrastructure, KM Strategy, KM Processes, and individual competence. In the current scenario where knowledge-intensive organizations are competing in a highly competitive market, knowledge infrastructure assumes a lot of significance primarily because it is the pivot in ensuring the success of knowledge process implementation.

The Foundations of Knowledge Management

Knowledge Management Infrastructure refers to the basic foundations of Knowledge Management. This foundation rests on five major components. These components are as follows:

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1. Organization Culture
2. Organization Structure
3. Organization's information technology setup
4. Common knowledge
5. Physical Environment

Organization Culture

Organizational culture is about the basic tenets of behaviour, beliefs, and values that guide the members of the organization. Interaction for the creation and sharing of knowledge is the prime mover of organizational culture in the context of KM infrastructure. The different components of organizational culture that relate to knowledge management also include knowledge management practices, managing support for knowledge management at all levels.

Organization Structure

The organizational structure goes a long way in determining the degree of implementation of Knowledge Management in an organization. The structure of the organization spells out how and to what extent the power, roles, and responsibilities are delegated, coordinated, and controlled. It also decides how the information is supposed to flow between the different distinct levels of management.

The commonly occurring structures in organizations are hierarchical, decentralised, or centralised in nature. They are flat or tall sometimes. Traditional hierarchical structures of organizations detail the role of each employee in the form of an organogram. This structure spells out how and with whom the individual employees are going to interact and share knowledge. The reporting structure determines the flow of information and data. The structure also decides who makes the decisions and how that is documented for the creation of knowledge. In most cases, the senior and top management are the decision-makers for the organization.

In a decentralised structure, the decisions are made at the unit level and the authority to make decisions is delegated in a distributed manner and the units have different levels of autonomy.

A lot of organizations encourage sharing of knowledge and facilitate knowledge management through the use of '*communities of practice*'. The concept of communities of practice is about a group of people who may not be residing at the same place but are connected to each other on a regular basis for discussing issues of mutual interest. Communities of practice provide an opportunity for people beyond traditional departmental boundaries to learn and enrich themselves. These communities of practice also provide access to external knowledge sources, they are dynamic in nature and gain substantially from emergent information technologies, including blogs and social networking technologies.

Information Technology setup

The organization's Information Technology Infrastructure facilitates its knowledge management initiatives. There are instances where tailor-made information technology systems are built with the purpose of pursuing knowledge management.

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However, it is the organization's internal information technology infrastructure that is the backbone of the organization's Information Technology needs that actually provides the right impetus for knowledge management.

Information technology infrastructure is the sum-total of data processing, storage, and communication technologies and systems (databases, servers, routers, devices, etc) that combine to make everything work. The entire gamut of activities relating to the organization's information systems that include transaction processing and management information systems are the essence of Information Technology Infrastructure that nurtures knowledge. Databases, data warehouses, and Enterprise Resource Planning Systems also are an integral part of the IT ecosystem.

Common Knowledge

Common Knowledge is another very important component of the KM infrastructure. It epitomizes the organization's collective experiences that help it to comprehend a type or category of knowledge and the principles that define and support communication and coordination.

Common knowledge, as the name signifies, brings commonality or unity to the organization and it includes-

- Language and vocabulary that's common
- Norms that are shared
- Recognition of individual knowledge areas
- The specialized knowledge that is common across individuals sharing knowledge

Common knowledge helps to bind and enhance an individual knowledge domain by integrating it with knowledge belonging to others.

Knowledge Management Infrastructure

As per the opinion of Lattemann et al. (2007), KM infrastructure is necessary to manage a usefully explicit and implicit knowledge network that facilitates the transfer of knowledge. As has already been dwelt upon earlier, KM infrastructure consists of culture, structure, technology, and human resource that promotes the right ambiance to sustain the competitive edge in organizations.

KM Infrastructure can be viewed as a combination of different elements that blends culture, people, structure, and organizational hierarchy. As per Lee and CHoi (2003), KM infrastructure is the foundation for knowledge creation and there exist major dimensions like IT, people, structure, and culture that act as process enablers of KM.

Organizational culture as a component or dimension of KM infrastructure is an important cog in the wheel of knowledge management. Besides this, IT support and human personnel are also key elements. Cooperative culture nurtures knowledge sharing while individualistic culture breeds date hoarding. Culture indicators can be listed as - innovation, visionary approach, cohesiveness, and expertise recognition. The three major subdivisions of culture are - collaboration, learning, and trust.

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Collaboration in the organizational context is about directing collective efforts towards developing a cohesive environment, where colleagues help each other and there is a free exchange of ideas. Organizations of the current era focus and encourage an interactive and collaborative culture with the aim of boosting mutual sharing and greater communications among employees of the organization. Thus, in the words of O'Dell and Garyson (1999), collaboration is a key determinant for creating and transferring knowledge. Various other scholars like Sveiby and Simons (2002), and others have reiterated the importance of Collaborative culture in knowledge creation. Another important point in this regard made by Lee (2001), is that without trust there can be no knowledge sharing so, trust is a prerequisite for collaborative knowledge creation.

If the concept of collaboration has to be summed up then it can be stated that - Collaborative culture influences the creation of knowledge through both formal and informal channels and it helps in accelerating the flow of knowledge within networks and thus provides an impetus to knowledge exchange practices.

Organization structures refer to the hierarchical arrangement of personnel of the organization based on their functions. As per Collison and Parcell (2004), organizational structures include work designs, managerial policies, incentive systems and rules, regulations, and policies that have a direct bearing on learning and leadership.

Formalization and Centralization are two subsets of the organizational structures. While Centralization is about the extent to which the decision-making ability is concerted, formalization refers to the degree to which decisions and work procedures are based on and guided by standard policies and rules. When an organization has a flexible structure it greatly helps in knowledge sharing to happen; different functional levels collaborate and corroborate to facilitate the exchange of knowledge.

Guidelines and rules act as a guiding force in facilitating and simplifying the process of KM implementation. Managing and executing activities in an orderly fashion helps to boost morale and team spirit and at the same time helps to reduce points of friction among team members.

KM Infrastructure also encompasses human resource dimensions. Human resources are considered to be the most important assets among the available assets- tangible and intangible. People are the pivot around which all activities in an organization are run. It is therefore imperative that personnel in an organization are well versed with the organizational culture, contexts, and problems. People apply their knowledge in accordance with these factors.

Knowledge resides within individuals and it is stored in the form of patterns that get activated when faced with specific situations and is expressed in the form of thoughts. Knowledge systems enhance the performance of individuals and individuals in turn help to assimilate such knowledge and embed it in the knowledge ecosystem of the organization.

The technology consists of hardware, software, databases, network systems along with all the other components of the technological structure. Information technology is very closely associated with KM because it is the best tool for

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extracting and disseminating structural knowledge. It is also the most potent tool for accessing and utilizing information. The implementation of KM with IT is therefore an obvious decision for the purpose of achieving predetermined targets. Application of technological equipment powered by superior technology helps KM to gain impetus for gradually progressing to higher levels of performance. IT is considered to be one of the prime movers for transferring knowledge.

Conclusion

The study of KM infrastructure provides us with the conviction that cultural KM infrastructures have a very positive effect on job satisfaction. Technology has been the game-changer in the sense that it has facilitated the process of linking information and communications to help eliminate hindrances to communication among the various parts of the organization. Equipping and empowering employees with such tools makes their tasks much easier and this, in turn, translates to job satisfaction.

Check Your Progress

3. Define common knowledge.
4. List the components of knowledge management.

5.5 KM IMPLEMENTATIONS

Organizations looking ahead to become knowledge enabled, start off their initiative by becoming a learning organization. The first actions that companies frequently carry out in their immediate need to become a 'learning organization', is to buy and attempt to deploy state-of-the-art KM tools and/or Learning Management Systems (LMS). However, they end up being confronted by a myriad of problems regarding deployment, usage and adaptability to a learning culture. One of the reasons for this is that, in the cut-throat world of today, people view knowledge as a source of organizational advantage and do not easily part with it. Commencement of a KM initiative by focusing first on technology could prove to be a big mistake, with the perceived imposition of technology alienating organizational employees. It has been proved time and time again that complete and relevant user involvement from the very beginning is vital to the success of any KM initiative. A KM team must include people with first hand business knowledge of what is needed and how conceptually that need can be addressed. It is not sufficient to rely on an analyst's or consultant's experience. Participation has to come directly from the mainstream of the business. For these reasons, it is often advisable to use an external KM professional services company to facilitate and mentor staff during the first phase of a KM initiative (pre-implementation phase).

The development of a KM system starts with understanding the organizational need and objective along with a high level of commitment from the top management and awareness among the lower layers, plus an organizational culture that is conducive to its implementation and sustenance. The information and knowledge gaps within an organization and its effect on achieving organizational goals need to be uncovered and would form the basis of adopting an deployment strategy that is

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division or department specific rather than organization wide deployment. This would be followed by the analysis of the organization's infrastructure, including the technical infrastructure, before identifying concrete steps that could be undertaken to leverage and build a KM system. Once the system backbone has been laid, knowledge maps that fill the information/knowledge gaps, mentioned earlier, as well as uncover and create new knowledge should be created and deployed using the system developed. These knowledge maps could be used to create a high-level strategic link between business strategy and KM. This link can then be used to develop, an appropriate KM strategy and system in alignment with the business performance and objectives. An organization can adopt the following four phased implementation strategy to design, develop and deploy an effective KM system.

1. Awakening phase (Pre-implementation phase)
2. Actionable phase (Design & development phase)
3. Implementation phase (Deployment phase)
4. Maintenance & measurement phase (Post-implementation phase)

These have been discussed in detail below:

1. Awakening Phase (Pre-implementation phase)

(i) The Awakening phase involves the following steps

Review of organizational mission/vision statements For any KM initiatives to succeed, it has to be synchronized with the organizational vision. Hence, it is a recommended practice to flag off the KM initiative by reviewing the organizational mission/vision and understand how a KM initiative can help the organization realize its objectives. The associated implementation scope can also be gauged. In case an organization cannot establish a strong case for commencing a KM initiative, the plan should be outright abandoned.

Organizational mission statement: The mission statement declares 'why' an organization exists, and is the only foundation upon which a long-range strategic plan (the blueprint for carrying out the organization's 'business') can be developed.

The long-range strategic plan, with its clearly stated and defensible programmatic initiatives and their respective costs, allows for the creation of the financing plan. This serves as the basis for specific fund-raising campaigns to secure annual, capital, endowment, sponsorship, and underwriting funds besides providing indicators of the expected revenue streams, and thus determining the organizational profitability, or the justification for its existence. An effective mission statement must be in resonance with the people working in and for the organization, as well as with the different components of the external environment that the organization hopes to affect. The mission statement must be symbolic of the organization's purpose and should inspire commitment as well as innovation. It should include the following:

- The opportunities or needs that justify the organization's existence or its purpose.
- The methods to be adopted to address these needs (the business of the organization).

- The core organizational principles or beliefs or the values of the organization.

Organizational vision statement: The vision statement presents a vivid description of the organization, as it effectively carries out its day to day operations. The vision depicts a compelling description of the state and function of the organization once it has implemented the strategic plan. Developing a vision statement can be culture-specific, with methods ranging from highly analytical and rational to highly creative and divergent being employed. The vision statement also serves as a motivational tool for the organizational employees.

Organizational value statement: Values represent the core priorities in the organization's culture, including what drives member's priorities and how they truly act in the organization. Values are increasingly important in strategic planning and they often drive the intent and direction within an organization. It is a recommended practice to establish four to six core values from which the organization would like to operate. This should include the values of customers, shareholders, employees, and the community. Any differences between the organization's preferred values and its true values are actually reflected by members' behaviors in the organization.

KM & Business Strategy — Linkage

As discussed above, it is imperative that knowledge strategies need to be linked with the organization's business strategy. Business strategy is usually decided at a high level and matches the goals and the mission of the organization as listed below. System development always happens at a low level and requires features as opposed to abstractions, visions or business ideas. It requires the elevation of the KM system design to the level of business strategy and bringing strategy down to the level of systems design. This reflects an organizational shift from strategic programming to strategic planning and heralds the onset of critical decision making within the organization based on the knowledge available internally as well as that available externally within the organization (external environment). It also calls for the identification of knowledge gaps within the organization by performing a SWOT (Strength, Weakness, Opportunities and Threats) analysis. The proposed system design should also take care of instantaneous needs of the organization in terms of knowledge availability to take instantaneous decisions. The association of the business strategy with the KM design along with the implementation strategy will ensure that the objectives of the implementation are met and ensure the successful completion of the project while increasing the capital of the organization, both intellectual and financial.

Automatic pruning refers to the next stage after goal identification, that is, constraint recognition. For example, if the big question for the organization is "How do we increase profits?" knowing the constraints will help trim it down. Identifying the objective i.e. the need to show an increase in profits within six months would help the organization narrow the focus of its efforts. This would also help to take into account other factors. For example, the decision by the senior management not to recruit new staff or to reduce existing levels by 40% or the fact that the organization already has cornered 90 percent of the target customers in the market

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as their clients. Combining these facts automatically prunes the goals and the original question. It now becomes "How do we increase profits within six months without hiring any new people or trying to get new customers?"

Infrastructural evaluation: Infrastructural evaluation facilitates the understanding of the various components that constitute the KM framework. Taking stock of organization's resources facilitates the analysis and the subsequent identification of the critical information and knowledge gaps within the existing infrastructure. This would enable the designers and developers to build upon the existing infrastructure. The components of the existing infrastructure that would form a part of the KM system need to be accurately identified and fixed. Leveraging the existing infrastructure is logically, scientifically, rationally, theoretically, and financially the right approach. It would also facilitate the development of a system much faster and would also have better support from the management and the employees and would also enable a higher ROI.

Summarization and review: The most important step before flagging off the KM effort is to summarize and review the information collected in the preceding stages and list down the major milestones and requirements as well as make a strong financial justification for the initiatives (expected investments versus returns). The following would be the list of some of the major considerations:

- Listing down specific areas of improvement
- Finalize the scope of implementation
- Organizational
- Divisional/Departmental
- Investments required
- Expected ROI (including time period)
- Team Composition/Size

2. Actionable Phase (Design & Development)

The ideas or the thoughts generated in the first phase are given shape or substance during the second phase or the actionable phase. The second phase of KM implementation involves analysis, design, and development of the KM system. The five steps that constitute the phase are:

Organizational K-audit (Knowledge audit): A KM initiative should commence with an audit of the inherent organizational knowledge. The need for a knowledge audit must be clearly understood before beginning of knowledge analysis and audit. This has to be followed by the assembling of an audit team representing the various organizational units. This team performs a preliminary assessment of knowledge assets within the organization to identify those that are both critical and the weakest. This would involve the following processes:

- Identification of existing KM processes
- Appropriate audit method selection
- Organizational intrinsic knowledge audit and analysis
- Uncovering the organizational K-spot (knowledge gaps).
- Positioning K-system in tune with the K-spot

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Team formulation: The KM team would be responsible for designing, building, implementing, and deploying the organizations KM system. The successful design of an effective KM team requires the identification of key stakeholders, both within and outside the organization, and the identification of sources of expertise that are needed to successfully design, build, and deploy systems while balancing the technical and managerial requirements. The team has to manage diverse and often divergent stakeholder expectations and apply techniques for both identifying and avoiding critical failure points in such teams. To ensure optimal usage of resources as well as ensure effective implementation, an organization should formulate a team which is roughly ten percent of the organizational size with involvement of the top management. The following are some of the key considerations:

- Identify key personnel within the organization i.e. stakeholders, management, and end users and understand and manage their expectations.
- Identify sources of requisite expertise and knowledge.
- Identify critical points of failure in terms of unsatisfied requirements, control, management or end users.
- The team should be balanced strategically and technologically to ensure optimal ROI.
- The technical and managerial expertise within the team should be well balanced with senior members contributing around 30 percent of the team size.
- Understand the role of a Chief Knowledge Officer (CKO) and decide whether the organization, irrespective of the size, requires a CKO. This decision further requires an understanding of how a CKO relates to the Chief Excutive Officer (CIO), Chief Financial Officer (CFO) and (CEO). In case the organization does not appoint a CKO, then an alternate person to handle the functions need to be identified.
- Categorize the responsibilities of the CKO or the knowledge manager, taking into account their backgrounds into consideration as well as the technological and organizational functions and their backgrounds.

Architectural design: Prior to deploying KM, the infrastructural components that constitute the system architecture must be identified. In tune with the trends in system design methodologies, the system development should follow a layered approach. The existing infrastructural components within the organization should be seamlessly linked with the proposed layers. The system should be based on open standards to provide for portability as well as cross-platform compatibility. Profiling mechanisms for push and pull based knowledge delivery must be created while balancing the cost versus value added for each additional enabling component.

Organizational K-print: The organizational K-print or the blueprint provides a plan for building and incrementally improving a KM system. The layered architecture as discussed above must be specifically designed in the context of the organization's requirement and should be optimized for performance and provide scalability as well

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as high levels of interoperability. The components required by the organization: integrative repositories, content centers, knowledge aggregation and mining tools, the collaborative platform, knowledge directories, the user interface options, push delivery mechanisms, and integrative elements should be well understood before taking a decision on their usage. This step integrates work from all preceding steps so that it culminates in a strategically oriented KM system design.

System development: Once a blueprint for the KM system has been created, the next step involves the assembling of the working system. The choice of the internet rather than a proprietary collaborative platform can enable the organization intranet to function as a front end for the KM system. Web-friendly document standards such as DMA (Document Management Alliance) and Web DMA allow the building of collaborative document systems that match industry standards. The KM system at the backend will force a reorientation from client/ server architecture to an agent computing architecture. An organization may vastly benefit from the deployment of Enterprise Knowledge Repositories (EKR). This is discussed in the subsequent section.

3. Implementation Phase (Deployment Phase)

The third phase involves the process of deploying the KM system that was designed in the preceding stages. This phase generally involves two primary stages. The first stage involves the deployment of the system with a result driven incremental technique, more commonly known as the RDI method. This step also involves the selection and implementation of a pilot project to precede the introduction of a full-fledged KM system. The next stages involve bringing about a cultural change; revised reward structures to create awareness and ensure commitment from the employees and ensure the desired ROI. This forms one of the key steps, that are critical to the acceptance, and the consequent success of a KM system in any company. A KM system must take into account the actual needs of its users. The flaws that might have crept into the system on account of human errors or misinterpretation of data or information assimilated as a part of the design can only be uncovered through a pilot deployment which would provide the ultimate reality check.

Knowledge sharing cannot be mandated, the sharing culture needs to be encouraged within the organization along with the employees support. This also requires the integration of business processes with KM system and necessitates the use of a new reward structures that motivate employees to use the system and contribute to its infusion, growth and training. It requires enthusiastic leadership that sets an example to follow.

4. Maintenance and Measurement Phase (Post-Implementation Phase)

Once the system has been tested and deployed, the crucial process of measuring the returns of the effort as well as the process of measuring the business impact of KM needs to be taken up using a set of appropriate metrics. This includes metrics to facilitate the calculation of Returns on Investment (ROI) for the KM investments as well as the usage of benchmarking techniques for deriving comparative knowledge metrics for the Organization. Balanced Score Card (BSC) or Quality Function Deployment (QFD) techniques may be employed for creating strategic knowledge metrics after the due process of review. Organizations have resorted to ill-suited and

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easily misused approaches, such as cost-benefit analysis, Net Present Value (NPV) evaluation and vague ROI measures. The measurement system must account for both financial and competitive impacts of KM on the organization's business.

Most of the organizations do not have an estimate of the knowledge that they possess for accomplishing work processes. Bohn's framework, adapted from and primarily built upon academic research literature, provides an excellent starting point for figuring out the current knowledge possessed by an organization. This framework applies strictly to the type of knowledge used to produce goods and services but does cover almost all types of industries that are candidates for KM ranging from consulting (production of services based on knowledge) to software (production of information products based on knowledge), to hard-goods production (physical goods) and publishing (services and production).

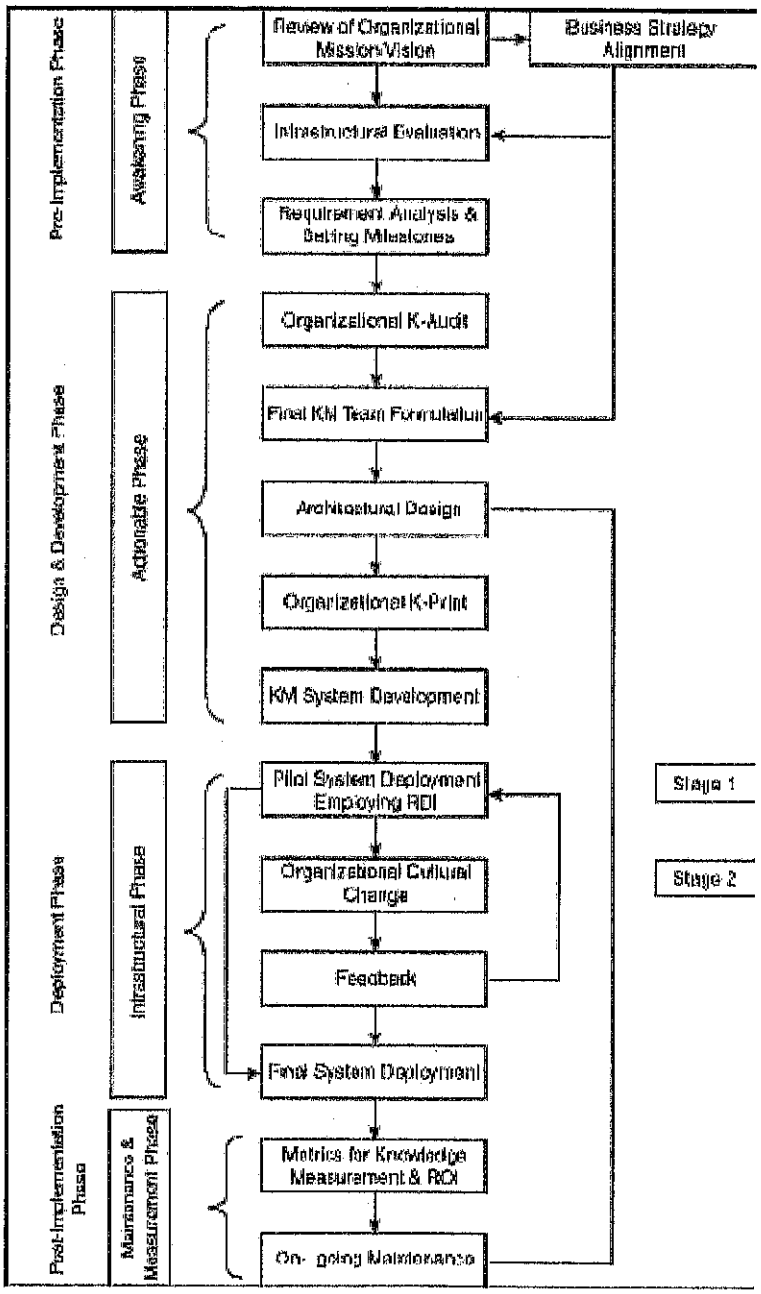

Fig. 5.6 KMS Deployment Phases

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This phase also includes the activities related to the maintenance of the various components of the KM system, including the backbone network architecture, operating systems, database services, warehouse and analytical services, mining rules and algorithms, updation of knowledge maps, directory services, process improvements and most importantly the physical as well as logical organizational knowledge repositories or the organizational knowledge base.

The maintenance phase also includes the planning as well as conduct of periodic knowledge audits to uncover fresh k-spots as well as ensure the proper and effective functioning of the system. An organization, by virtue of having implemented a KM system, learns not to repeat mistakes and do things better in certain ways. In a KM audit, one must concentrate on all the intangible assets and knowledge assets that exist within the organization including its rituals, processes, structure, communities, and people. The findings must then be documented. Knowledge of knowledge assets is critical to the proper planning of a KM system and is a rich source of information about the strengths of the organization. The knowledge audit provides value to the organization when it is involved in the following activities.

Figure 5.6 summarizes the phases of designing, developing, and deploying a KM system within an organization.

Check Your Progress

5. How does the development of a KM system start?
6. What are the two stages of the deployment of a KM system?

5.6 ANSWERS TO 'CHECK YOUR PROGRESS'

1. KMS software can be classified into the five KM categories, as listed below:
   (i) Knowledge gathering
   (ii) Knowledge storage
   (iii) Knowledge communication
   (iv) Knowledge dissemination
   (v) Knowledge synthesis
2. Concept mapping is being increasingly employed in educational institutions as well as educational material to summarize understandings acquired by participants after the completion of a unit, chapter, module or semester. They can be also employed in organizations to evaluate the learning levels at the end of a training session or a workshop as well as evaluate the on-the-job skills of employees.
3. Common knowledge, as the name signifies, brings commonality or unity to the organization and it includes-
   - Language and vocabulary that's common
   - Norms that are shared

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- Recognition of individual knowledge areas
- The specialized knowledge that is common across individuals sharing knowledge

4. Knowledge management infrastructure refers to the basic foundations of knowledge management. This foundation rests on five major components. These components are as follows:
   (i) Organization Culture
   (ii) Organization Structure
   (iii) Organization's information technology setup
   (iv) Common knowledge
   (v) The Physical Environment
5. The development of a KM system starts with understanding the organizational need and objective along with a high level of commitment from the top management and awareness among the lower layers, plus an organizational culture that is conducive to its implementation and sustenance.
6. The deployment of a KM system generally involves two primary stages. The first stage involves the deployment of the system with a result driven incremental technique, more commonly known as the RDI method. This step also involves the selection and implementation of a pilot project to precede the introduction of a full-fledged KM system. The next stages involve bringing about a cultural change; revised reward structures to create awareness and ensure commitment from the employees and ensure the desired ROI.

5.7 SUMMARY

- The knowledge acquisition, modelling and representation communities have developed a wide range of tools relevant to the development and management of large-scale knowledge-based systems, but the majority of these tools run on individual workstations and use specialist data formats making system integration and knowledge interchange very problematic.
- The wealth of opportunities presented by technology tools has resulted in divergent methods for their application within organizations, especially businesses, in order to increase value.
- New knowledge so acquired is appended to the organizational knowledge base and obsolete knowledge is deleted. The process mentioned above is cyclic and self sustaining and is explained in detail in the following sections.
- In simple terms, Knowledge Technologies are information technology that facilitates knowledge management.
- The perceived overlap is intentional and the objective is to present the core processes and the subtle differences between them.
- Concepts are represented in a hierarchical fashion with the most inclusive, most general concepts at the top of the map and the more specific, less general concepts arranged hierarchically below.

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- Knowledge ecology is an interdisciplinary field of management practice, emerging from the confluence of management strategy, communities of practice, adaptive systems and knowledge management.
- An information portal is often defined as the path to information to facilitate the users to have one or more simple ways of finding the needed information. But, the knowledge portal is quite different from this.
- Guidelines and rules act as a guiding force in facilitating and simplifying the process of KM implementation.
- Commencement of a KM initiative by focusing first on technology could prove to be a big mistake, with the perceived imposition of technology alienating organizational employees.
- Knowledge sharing cannot be mandated, the sharing culture needs to be encouraged within the organization along with the employees support.
- An organization, by virtue of having implemented a KM system, learns not to repeat mistakes and do things better in certain ways.

5.8 KEY TERMS

- **World Wide Web (WWW):** It is a distributed hypermedia system available internationally through the Internet. It provides general-purpose client-server technology which supports interaction through documents with embedded graphic user interfaces.
- **Knowledge Management System:** It can be described as, "A system for managing, organizing, filtering, analyzing, and disseminating knowledge in all of its forms within an organization."
- **Automatic pruning:** It refers to the next stage after goal identification, that is, constraint recognition.

5.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short-Answer Queastions

1. What are the five common categories KMS software can be grouped into to represent the market?
2. Define knowledge engineering.
3. List the four phased implementation strategy to design, develop and deploy an effective KM system.

Long-Answer Queastions

1. Describe the notion of knowledge mapping.
2. Examine the benefits of knowledge technologies.
3. Discuss the key considerations to form a team which is roughly ten percent of the organizational size with involvement of the top management

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5.10 FURTHER READING

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