Knowledge Management
and
Business Intelligence

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➢ Assessment and Evaluation Methods

Assessment and Evaluation Methods defined for the course	%	Description
Midterm Exam	20	
Final Exam	50	
Projects Presentation	20	Paper presentation
Assignments and Active participation in discussions	10	Effective participation in class discussions and answering to questions raised in class Attending the class on time and regularly.
Note		Students who exceed the allowed number of absences will be dealt with according to university regulations.

➢ Course Main References

1) Essentials to Knowledge Management: Brayan Bergeron

2) Knowledge Management in Modern Organizations: Murray E. Jennex

3) Introduction to Knowledge Management: Filemon A. Uriarte, Jr

4) Knowledge Management Tools and Techniques: Madanmohan Rao

➢ Course Objectives

- To familiarize the concepts of Knowledge Management

- Knowledge Management and its role in the new organizations

-To understand the challenges of Knowledge Based Organisations and the HR mechanisms to manage them effectively

➢ Introduction

-knowledge as the new source of wealth

-The most established paradigm is that knowledge is power.

-Knowledge is intangible, intellectual assets that must be managed.

-The key challenge of the knowledge-based economy is to foster innovation.

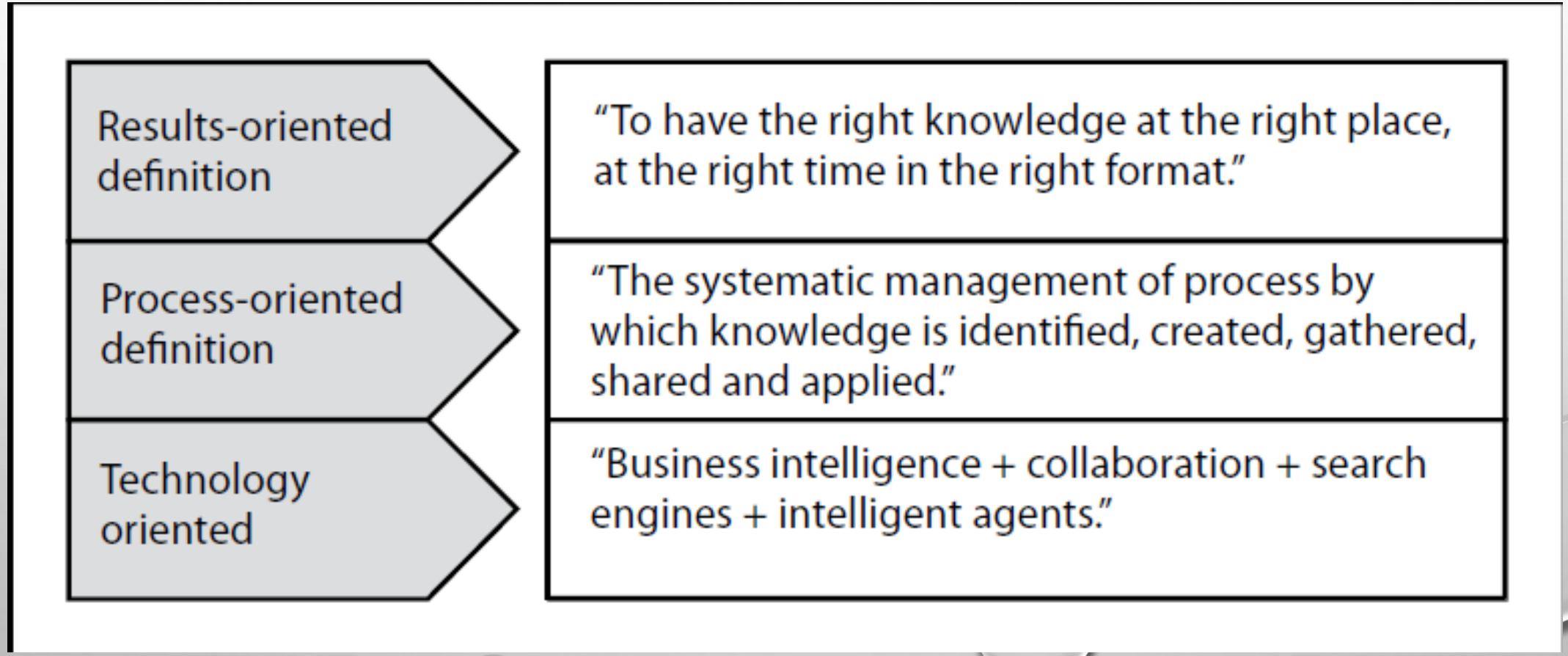
➢ Definitions of knowledge management

1- Knowledge management refers to identifying and leveraging the collective knowledge in an organization to help the organization to compete with their competitors.

2- Knowledge management (KM) is an effort to increase useful knowledge within the organization. Ways to do this include encouraging communication, offering opportunities to learn, and promoting the sharing of appropriate knowledge artifacts".

3- "Knowledge Management involves blending a company's internal and external information and turning it into actionable knowledge via a technology platform".

- Definitions of knowledge management



➢ What is knowledge management?

Knowledge management is based on the idea that an organisation's most valuable resource is the knowledge of its people. Therefore, the extent to which an organization performs well, will depend, among other things, on how effectively its people can create new knowledge, share knowledge around the organization, and use that knowledge to best effect.

➢ What is knowledge management?

Many of us simply do not think in terms of managing knowledge, but we all do it. Each of us is a personal store of knowledge with training, experiences, and informal networks of friends and colleagues, whom we seek out when we want to solve a problem or explore an opportunity. Essentially, we get things done and succeed by knowing an answer or knowing someone who does.

Fundamentally, knowledge management is about applying the collective knowledge of the entire workforce to achieve specific organisational goals. The aim of knowledge management is not necessarily to manage all knowledge, just the knowledge that is most important to the organization. It is about ensuring that people have the knowledge they need, where they need it, when they need it – the right knowledge, in the right place, at the right time.

➢ Reasons for Developing Knowledge Management

➢Nearly 60% of the job requirements need knowledge.

➢Knowledge based works have high demand.

➢The knowledge workers can do the job effectively than traditional workers.

➢Knowledge is power and it is very scarce.

➢ Nature of Knowledge Management

Knowledge management draws upon a vast number of diverse fields such as:

-Organizational science.

-Cognitive science.

-Linguistics and computational linguistics.

-Information technologies such as knowledge- based systems, document and information management, electronic performance support systems, and database technologies.

-Information and library science.

➢ Nature of Knowledge Management

-Technical writing and journalism.

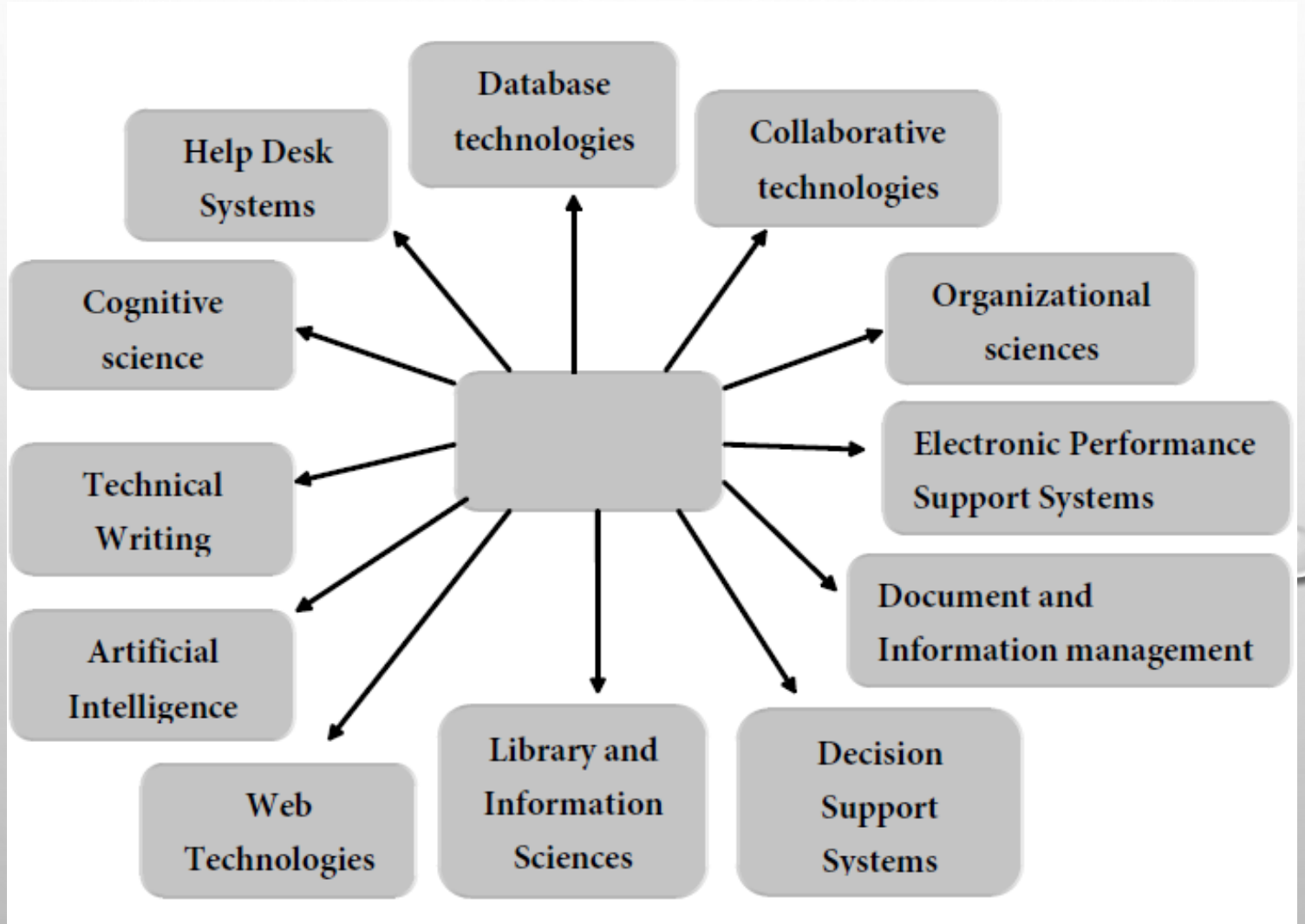
-Anthropology and sociology.

-Education and training.

-Storytelling and communication studies.

-Collaborative technologies such as computer supported collaborative work and groupware, as well as intranets, extranets, portals, and other web technologies.

➢ Interdisciplinary Nature of Knowledge Management



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➢ What does knowledge management involve? Examples

That being said, there are of course a whole raft of options in terms of tools and techniques, many of which are not new. Many of the processes that currently fall under the banner of knowledge management have been around for a long time, but as part of functions such as training, human resources, internal communications, information technology, librarianship, records management and marketing to name a few. And some of those processes can be very simple, such as:

1- providing packs full of “know-how” to new staff;
2- conducting exit interviews when staff leave so that their knowledge is not lost to the organization;
3- creating databases of all publications produced by an organization so that staff can access them from their desk;

➢ What does knowledge management involve? Examples

4- providing ongoing learning so that people can constantly update their knowledge;
5- encouraging people with a common interest to network with each other;
6- creating electronic filing systems that can be searched in a number of ways, making the information much easier to find;
7- redesigning offices to be open plan so that staff and managers are more visible and talk to each other more;
8- putting staff directories online so that people can easily find out who does what and where they are;
9- creating intranets so that staff can access all kinds of organisational information and knowledge that might otherwise take a great deal of time and energy to find.

➢ Important Dimensions of Knowledge

1- Data: Flow of captured events or transactions.

Data is a number or word or letter without any context. For example, numbers like 5 or 100, without any context, are mere data. Without reference to either space or time, these numbers or data are meaningless points in space and time.

2- Information: Data organized into categories of understanding

3- Knowledge: Concepts, experience, and insight that provide a framework for creating, evaluating, and using information. Can be tacit (undocumented) or explicit (documented)

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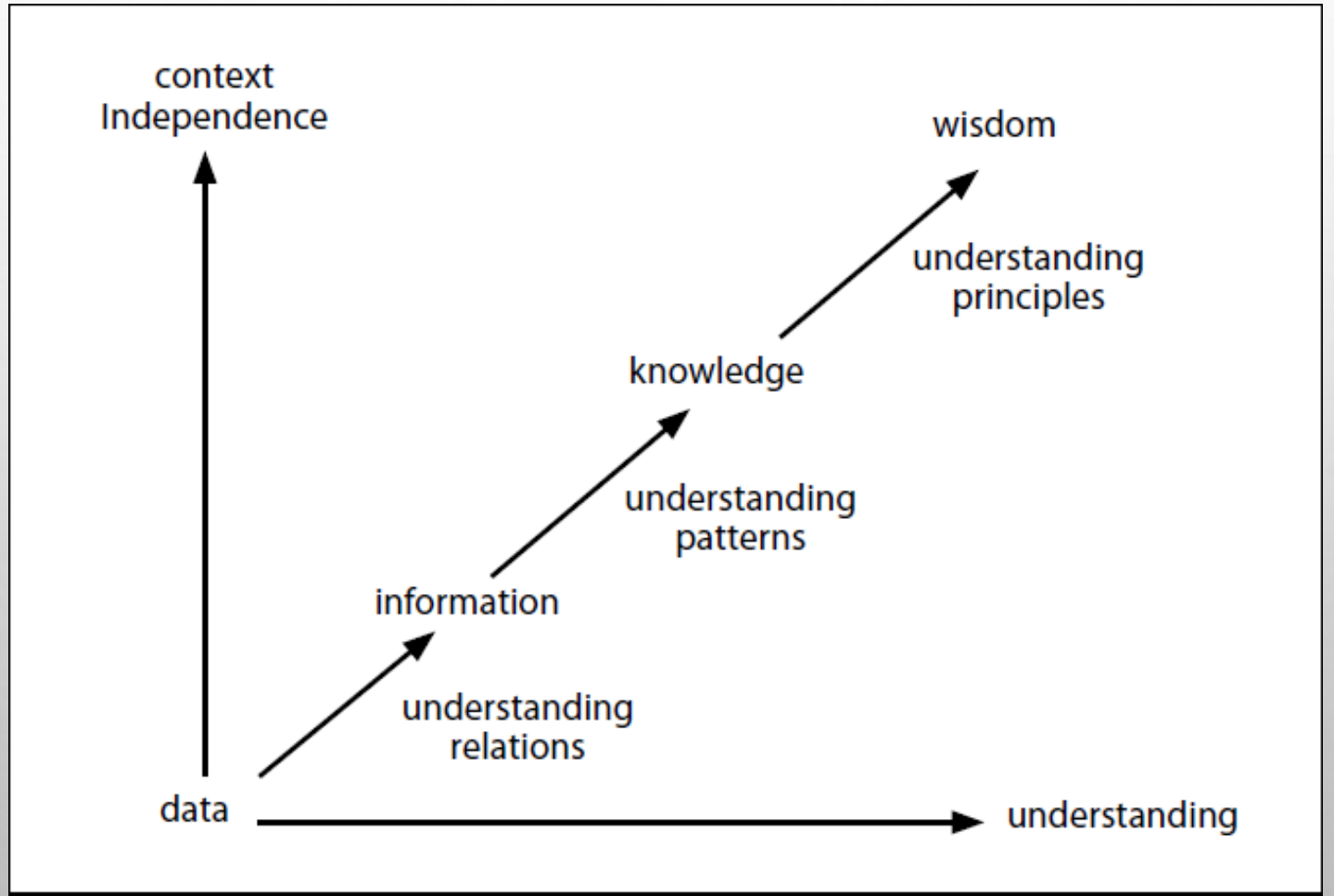
- Conceptual Progression from Data to Knowledge

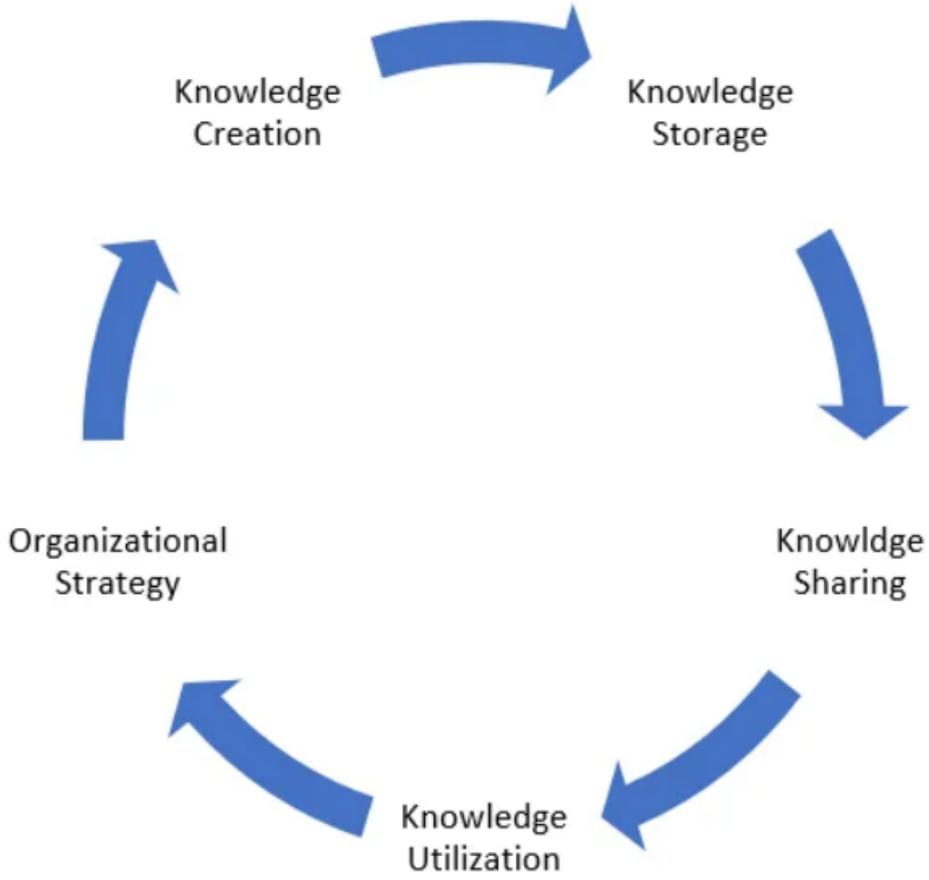


What is knowledge management?

- Wikipedia – KM from an organization's perspective - KM is the process of creating, sharing, using and managing the knowledge and information of an organization. It refers to a multidisciplinary approach to achieving organizational objectives by making the best use of knowledge.
- PMI – KM from a project perspective – KM is commonly split into "explicit" (knowledge that can be readily codified using words, pictures, numbers) and "tacit" (knowledge that is personal and difficult to express, such as insights, experience, "know-how"). KM is concerned with managing both for two purposes: reusing existing knowledge and creating new knowledge. The key activities that underpin both are knowledge sharing and knowledge integration.

knowledge management life cycle

1. **Knowledge Creation**: Knowledge is created either as explicit or tacit knowledge. Explicit knowledge is put in paper or electronic format. It is recorded and made accessible to others. Tacit knowledge is created in minds of people. This knowledge resides within individuals. This knowledge needs to be transformed into explicit knowledge so that it can recorded and shared with others in the organization.
2. **Knowledge Storage**: Knowledge is stored and organized in a repository. The decision on how and where lies with the organization. But the objective of this phase to enable organization to be able to contribute, organize and share knowledge with.
3. **Knowledge Sharing**: Knowledge is shared and accessed by people. They can either search or navigate to the knowledge items.
4. **Knowledge Utilization**: This is end goal of knowledge practice. The knowledge management does not have any value if knowledge created is not utilized to its potential. The more knowledge is created as knowledge is applied and utilized.



➢ Types of Knowledge

Tacit Knowledge

➢The word tacit means understood and implied without being stated.

➢The tacit knowledge is unique and it can’t explain clearly.

➢That is the knowledge which the people possess is difficult to express.

➢The cognitive skills of an employee are a classic example of tacit knowledge.

➢The tacit knowledge is personal and it varies depending upon the education, attitude and perception of the individual.

➢ Types of Knowledge

Tacit Knowledge

➢This is impossible to articulate because sometimes the tacit knowledge may be even unconscious.

➢This tacit knowledge is also subjective in character.

➢This knowledge is exhibited by the individual automatically.

➢They utilize this knowledge without even realizing it.

➢ Types of Knowledge

Explicit Knowledge

➢The word explicit means stated clearly and in detail without any room for confusion.

➢The explicit knowledge is easy to articulate and they are not subjective.

➢This is also not unique and it will not differ upon individuals.

➢It is impersonal.

➢The explicit knowledge is easy to share with others.

Ways with knowledge: collecting and connecting

Knowledge management programs tend to have both a “collecting” and a “connecting” dimension.

The collecting dimension involves linking people with information.

The connecting dimension involves linking people with people – specifically people who need to know with those who do know.

Ways with knowledge: people, processes and technology

People : Getting an organisation's culture (including values and behaviours) "right" for knowledge management is typically the most important and yet often the most difficult challenge. Knowledge management is first and foremost a people issue.

Does the culture of your organization support ongoing learning and knowledge sharing?

Are people motivated and rewarded for creating, sharing and using knowledge?

Is there a culture of openness and mutual respect and support?

Ways with knowledge: people, processes and technology

Is your organization very hierarchical where “knowledge is power” and so people are reluctant to share?

Are people under constant pressure to act, with no time for knowledge-seeking or reflection?

Do they feel inspired to innovate and learn from mistakes, or is there a strong “blame and shame” culture?

Ways with knowledge: people, processes and technology

Processes : In order to improve knowledge sharing, organizations often need to make changes to the way their internal processes are structured, and sometimes even the organisational structure itself. For example, if an organization is structured in such a way that different parts of it are competing for resources, then this will most likely be a barrier to knowledge sharing. Looking at the many aspects of “how things are done around here” in your organization, which processes constitute either barriers to, or enablers of knowledge management? How can these processes be adapted, or what new processes can be introduced, to support people in creating, sharing and using knowledge?

Ways with knowledge: people, processes and technology

Technology : A common misconception is that knowledge management is mainly about technology – getting an intranet, linking people by e-mail, compiling information databases etc. Technology is often a crucial enabler of knowledge management – it can help connect people with information, and people with each other, but it is not the solution. And, it is vital that any technology used “fits” the organisation’s people and processes – otherwise it will simply not be used.

Aspects of Knowledge Management

There are two main aspects of knowledge management, namely, information management and people management. Viewed from this perspective, knowledge management is about information, on one hand, and people, on the other.

Both aspects of knowledge management embody two immediate concerns:
(a) to make organizational knowledge more productive; and
(b) to produce benefits that are significantly greater than those envisioned.

Pillars of Knowledge Management

In order to more fully define and understand knowledge management, it is useful to consider knowledge management as having four pillars. These pillars are:

(a) management and organization;
(b) infrastructure;
(c) people and culture;
(d) content management systems.

Pillars of Knowledge Management

(a) Management and organization

The first and most important pillar of knowledge management is the commitment at the highest levels of management. This commitment is absolutely essential to the success of any knowledge management initiative.

Without such commitment, knowledge management initiatives are bound to fail.

Sustained efforts to manage knowledge must permeate the entire organization, from the head of the organization down to the rank and file.

It is also essential that managers promote appropriate behaviors among employees by setting the example.

Pillars of Knowledge Management

Management and organization-continued

The commitment from top management can come in two ways.

Firstly, the managers at the highest levels should serve as role models by sharing and using knowledge themselves. The best way to promote knowledge management and demonstrate its strategic importance is for top management to provide adequate examples of ideal behavior and communicate clearly with all levels in the organization.

Secondly, a structure to support knowledge management should be implemented, including financial, technological and human resources.

Pillars of Knowledge Management

(b) Infrastructure

All knowledge management systems require a certain level of technology and infrastructure support to be effective. As business processes become increasingly complex, knowledge management can be fully implemented only when appropriate information and communication technologies are available.

An adequate ICT infrastructure is needed in order to better create, organize, share and apply knowledge.

Pillars of Knowledge Management

Table: Technology Appropriate to Knowledge Management Approach

REPOSITORY MODEL	• Internet, HTML, XML • Full text search engines • Document management systems
COMMUNITIES OF PRACTICE	• Web conferencing • Threaded discussion groups • Automated workflow • Expert Directories
CONTINUOUS LEARNING	• Learning management systems • Electronic performance support systems (EPSS) • Performance management
BUSINESS INTELLIGENCE	• Databases • Data Mining Tools • Enterprise Databases • Decision Support Tools

Pillars of Knowledge Management

(c) People and culture

There is ongoing debate on what is the most important enabler for knowledge management. A number of management analysts contend that technology is the most important. Others consider people to be the most important in knowledge management and argue that knowledge management initiatives that focus mainly on technology can and do often fail.

Both are, of course, important to the success of any knowledge management system. But the success of a knowledge management system depends on many factors, and among the most important is the efficient management of people and culture within the organization.

Pillars of Knowledge Management

(c) People and culture - continued

People are the bearers of tacit knowledge. And the sharing of tacit knowledge is crucial to the success of knowledge management.

People and culture as an enabler of knowledge management requires three important elements. These are:

(a) the redefinition of organizational structure,

(b) the corresponding human resource practices, and

(c) a consistent organizational culture.

Pillars of Knowledge Management

(d) Content management systems

Content management systems include information assets both internal and external and systems that support the creation and administration of digital information. To ensure the proper functioning of the knowledge management system, programs for managing the content of web sites should be developed and implemented.

At the same time, the roles and responsibilities for maintaining and updating content should be clearly delineated. There should also be a way to allow “authors” or “contributors” to provide new content in the form of articles.

Measuring Knowledge Management

To fully understand what knowledge management really is, it is useful to briefly consider and discuss the measurement of the results of a knowledge management system. Any such system of measurement must take into consideration the value of knowledge assets and the magnitude of knowledge sharing. Admittedly, such measurement is a difficult task since knowledge is generated by human beings and is both tacit and dynamic. Since the management of knowledge involves the coordination of individuals who create, share, organize and apply knowledge, measuring this management involves the tracing and documentation of the causal relationships between the application of knowledge and its creation and sharing.

Measuring Knowledge Management

One of the most difficult challenges in measuring the results of knowledge management is the assessment of the real value of knowledge assets, in particular tacit knowledge. Since tacit knowledge is usually time-specific as well as context-specific, the value of individual knowledge and intellectual capital is most difficult to assess.

In general, the most successful way to measure knowledge sharing is to trace the flow of knowledge among employees. The number of ideas generated in the online system and frequency of access are easy to measure.

Similarly, customer satisfaction levels can be measured through surveys and feedback mechanisms.

Elements of Knowledge Management

A complete knowledge management system must contain four elements. These are:

(a) knowledge creation and capture,
(b) knowledge sharing and enrichment,
(c) information storage and retrieval, and
(d) knowledge dissemination.

Elements of Knowledge Management

(a) knowledge creation and capture

The first element of knowledge management is knowledge creation and capture. Knowledge is continually being created in any group, corporation or organization since the very interaction among people generates knowledge.

One of the primary aims of knowledge management is to capture the knowledge that is produced during such interactions. As a consequence of the highly competitive nature of today's markets, there is increasing need within corporations and organizations to create new knowledge, generate novel ideas and concepts, and to capture these knowledge, ideas and concepts.

Elements of Knowledge Management

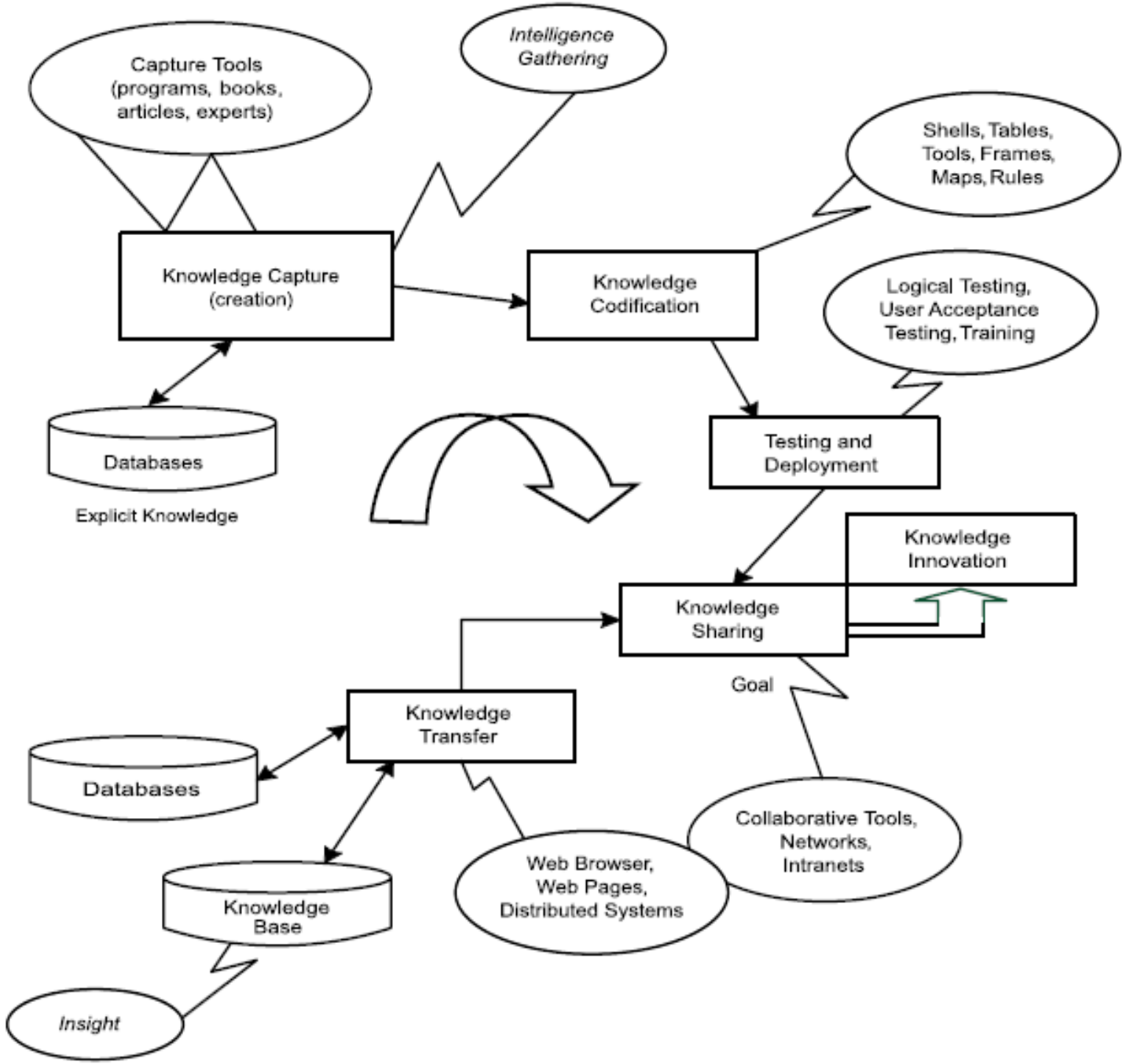
(a) knowledge creation and capture

The very survival of a corporation sometimes depends largely on how much new and advanced knowledge it can generate, capture and utilize in order to produce a more competitive or attractive product or service. For this reason, two factors have become of utmost importance in determining competitiveness – creativity and innovation.

The creation of new knowledge will not be possible without creativity and innovation. These are the two most important traits or skills needed to make the organization more productive and competitive. For this reason, creativity and innovation require proper management.

Elements of Knowledge Management

(a) knowledge creation and capture



Elements of Knowledge Management

(a) knowledge creation and capture – continued

Brainstorming is one of the most common methodologies used to bring out creativity and innovation from individuals. Different individuals have different levels of knowledge about some things as well as different ways of looking at the same thing. The process of brainstorming makes possible the sharing of views and ideas and mental models commonly used by individuals.
It is also through this process that such ideas, views and mental models can be challenged and defended and further elaborated or modified. Through brainstorming it becomes possible to bring out the diversity of perspectives and mental sets that exits in the brains of the participants. By properly managing such brainstorming sessions, it is possible to produce a composite perspective on a common problem. This composite perspective could lead to innovation and new knowledge.

Elements of Knowledge Management

(a) knowledge creation and capture – continued

Knowledge can be captured in various ways. Knowledge from outside the organization can be captured by accessing different sources such as publications, websites, emails and the Internet.

Explicit knowledge from within and outside of the organization can be captured in various forms such as printed reports, record of meetings, copies of memos and the like.

Elements of Knowledge Management

(b) Knowledge Sharing and Enrichment – continued

The second element of knowledge management is knowledge sharing and enrichment. This element is probably the most crucial among the four. It is during the process of sharing that knowledge is usually refined and enriched. Knowledge can be shared by the organization with its employees (e.g., through memos and instructions) and sharing of knowledge can occur between employees of the organization (e.g., through group discussions and internal meetings) as well as with people outside of the organization (e.g., through attending seminars and workshops).

Elements of Knowledge Management

(b) Knowledge Sharing and Enrichment – continued

The competitive advantage of many organizations is generally determined by the magnitude of knowledge sharing that takes place within the organization. But knowledge sharing does not automatically take place.

It must be encouraged and nurtured. In general, it is necessary to facilitate communication and nurture the right culture within the organization in order for proper sharing of knowledge to take place.

Elements of Knowledge Management

(b) Knowledge Sharing and Enrichment – continued

worker with specialized knowledge in one area might ask, “If my knowledge is a valuable resource that makes me an essential asset of the company, why should I share it and create a competition?” On the other hand, a worker confident of his or her expertise in one field might ask, “Why should I use the knowledge of others when it might put to risk the quality of the work that I am doing?”

Elements of Knowledge Management

(b) Knowledge Sharing and Enrichment – continued

Knowledge sharing can be enhanced through the implementation of appropriate technologies, operations and systems that stimulate collaboration, facilitate the process of sharing, and reward those individuals that share the most knowledge as well as the individuals that actually utilize knowledge that have been shared. Organizations are generally able to make decisions with impact when knowledge is efficiently shared. They are able to make and execute decisions rapidly when individuals throughout the organization can gain access to important strategic ideas.

Elements of Knowledge Management

(b) Knowledge Sharing and Enrichment – continued

Communities of practice

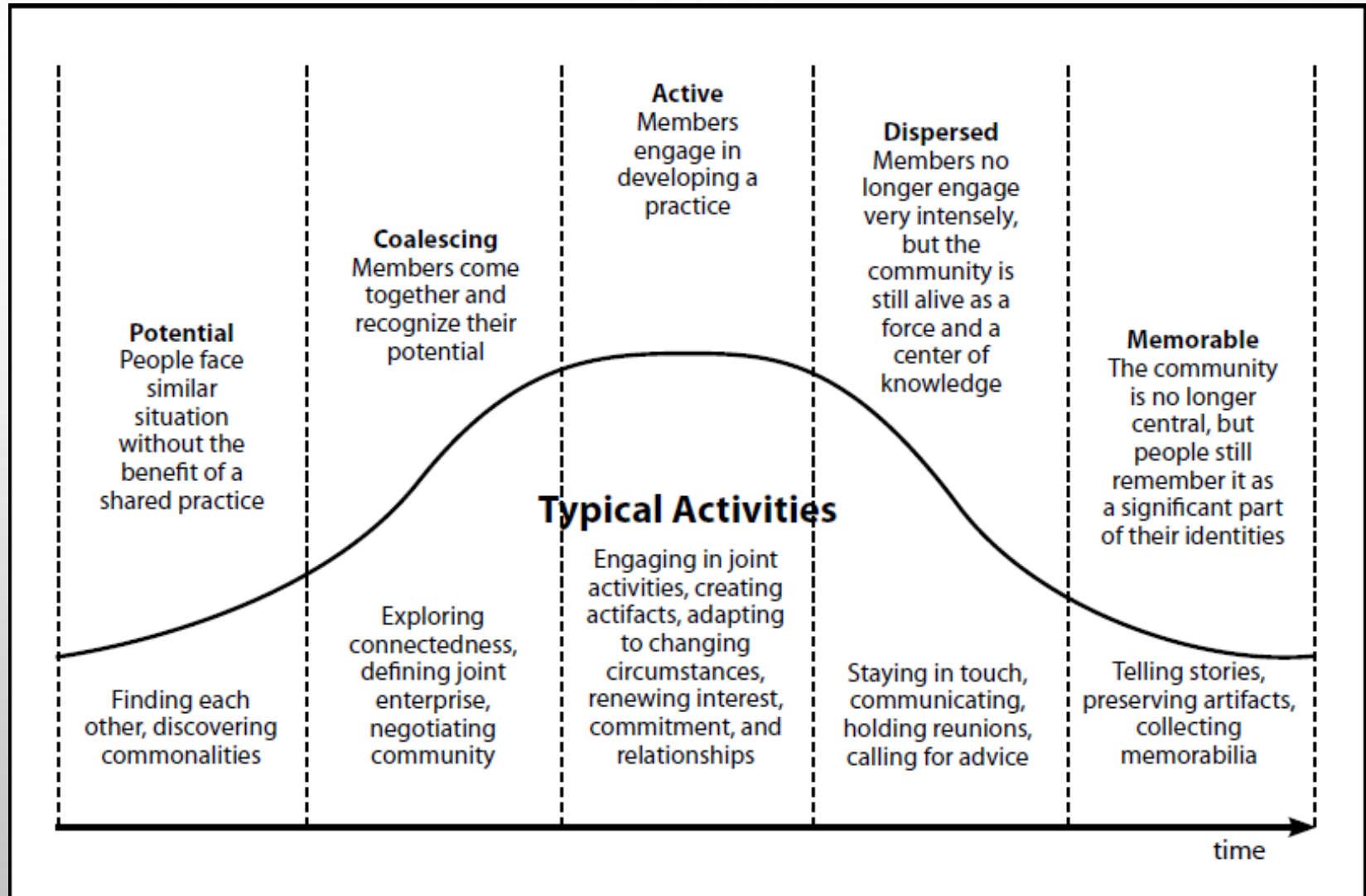
Communities of practice have been proven to be excellent means to hare knowledge among people who have a common interest. These comprise groups of people who share knowledge, concerns or interest in a given area.

As a result of their continuing interaction with one another, generally through the use and application of information and communication technologies, the members of the community enrich their knowledge and expertise in that particular area. Communities of practice provide their members with very powerful cooperative tools for further developing their expertise and abilities. These groups are an effective and flexible means to examine some knowledge issues and gain further insights into specific knowledge domains.

Elements of Knowledge Management

Communities of practice

Figure: Stages of Development of Communities of Practice



Elements of Knowledge Management

b) Knowledge Sharing and Enrichment – continued

Communities of practice

Communities of practice are not synonymous to teams or task forces that are formed for a specific purpose for a certain period of time. Rather, they are peers that form groups to learn from one another and improve their understanding of a particular subject of common interest. What binds them is their common desire to improve their knowledge and their respective need to know what the other knows. In other words, a community of practice is where members share “work stories”.

In many organizations, communities of practice are informal groupings that are separate from but are not in conflict with the formal organizational structure or hierarchy.

Elements of Knowledge Management

b) Knowledge Sharing and Enrichment – continued

Incentive schemes

In order to encourage knowledge sharing, certain incentive schemes will have to be provided. In many cases, a worker may feel threatened to introduce or share knowledge into a system while another may feel reluctant to actively search out knowledge that others introduce. Many may also find the process of sharing and searching as requiring considerable amount of time and effort. In practice, the fact that knowledge is available does not necessarily mean that others will use it. Nevertheless, the knowledge manager of any organization should create an overall situation in which knowledge is shared and reused spontaneously. In other words, the principle of knowledge sharing and reuse must permeate through the entire organization.

Elements of Knowledge Management

b) Knowledge Sharing and Enrichment – continued

Incentive schemes

Some organizations are beginning to evaluate and reward personnel who share and use knowledge. One example of this is IBM Lotus Development, which assigns 25 per cent of the total performance evaluation of its customer support employees to knowledge sharing. Another example is Buckman Laboratories, which applauds the work of its top hundred knowledge sharers and honors them with an annual conference at a resort. Similarly, ABB evaluates some managers based not only on the impact of their decisions, but also on the information they use in the decision-making process.

Elements of Knowledge Management

c) Information Storage and Retrieval

The third element of knowledge management is information storage and retrieval. The organization should ensure that acquired or shared knowledge is readily accessible to others. This can be done by storing information in a centralized location with sufficient provisions for easy retrieval.

For example, reports, statistical data on economic, social and environmental areas can be stored in databases while official documents, once approved, should be categorized and stored electronically in suitable file systems. The documents and information in databases could then be retrieved through the Internet or the organization's intranet websites.

Elements of Knowledge Management

c) Information Storage and Retrieval – continued

There are some main options for storing the information that are captured or shared:

(a) file system storage (local and network directories and folders);
(b) databases;
(c) e-mail; and
(d) websites (intranet and external).

Elements of Knowledge Management

c) Information Storage and Retrieval – continued

In most organizations, the bulk of information is likely to be in relatively unstructured formats. These can be in the form of typical business or office documents such as reports, memos, spreadsheets or emails.

These documents normally contain valuable information but they are not easily searched and found. For a knowledge management system to be effective, it must provide for search engines that can deal with such unstructured information.

Elements of Knowledge Management

d) Knowledge Dissemination

The fourth element of knowledge management is knowledge dissemination. Unless knowledge is effectively disseminated, the development impact of knowledge will remain limited. For an effective knowledge dissemination, it will require the transformation of highly individualized tacit knowledge into explicit knowledge that can be more widely shared. In an organization where there is fear of the management or hierarchy, the employees will have a tendency to keep their knowledge to themselves and share it with others only cautiously. In cases such as this, management must take the lead in creating an environment of understanding, cooperation and learning. It should also encourage knowledge sharing, even if the positive results of doing so are not readily apparent. Such results can best be measured in the long term.

Elements of Knowledge Management

d) Knowledge Dissemination

Publications, presentations, websites and libraries are the most obvious forms of dissemination of knowledge. Participation in external networks, establishing partnerships with other organizations, and creation of knowledge centers are also effective means to disseminate knowledge. The Asian Development Bank, for example, participates in over 300 networks with professional and other organizations throughout the world, which serve as forums for information exchange and sharing. Through these networks, the Bank is able to disseminate best practices and lessons learned, among many others.

Assessing the Value of Knowledge Management

Before embarking on a Knowledge Management initiative, senior management should have a good idea of its potential value to their organization. In other words, what's wrong with the current model of conducting business? The key questions to ask are:

- How would a KM initiative change the day-to-day operation and management of the organization? For comparative purposes, the operations in companies that make use of KM techniques.
- How would employees react to the overhead of a KM system?
- What technologies are available for Knowledge Management, and what are the benefits and limitations?

Assessing the Value of Knowledge Management

- What are the KM solutions offered by vendors, from consulting to hardware and software tools?
- What is the likely return on investment (ROI) of implementing a viable KM program?
- What is a reasonable approach to implementing Knowledge Management in the organization?

Assessing the Value of Knowledge Management

Importance of Measuring KM ROI

Measuring KM ROI is crucial for several reasons:

Justifying Investments: Demonstrating the value of KM initiatives helps secure funding and support from stakeholders.
Evaluating Effectiveness: Assessing ROI helps determine the effectiveness of KM strategies and identify areas for improvement.
Strategic Decision-Making: ROI metrics provide insights that inform strategic decisions and resource allocation.

Assessing the Value of Knowledge Management

Importance of Measuring KM ROI – continued

Key Metrics for Measuring Knowledge Management (KM) ROI

To measure the ROI of your knowledge management initiatives, it's essential to track relevant metrics. Here are some key metrics to consider:

Employee Productivity

Time Saved: Measure the reduction in time spent searching for information.

Task Efficiency: Assess improvements in task completion times and accuracy.

Collaboration and Engagement

Knowledge Sharing: Track the frequency and quality of knowledge sharing among employees.

Collaboration Metrics: Measure the number of collaborative projects and their outcomes.

Assessing the Value of Knowledge Management

Importance of Measuring KM ROI – continued

Decision-Making Effectiveness

Decision Quality: Evaluate the quality and impact of decisions made using KM resources.

Time to Decision: Measure the reduction in time required to make informed decisions.

Cost Reduction

Operational Costs: Track reductions in operational costs due to *improved efficiency*.

Error Reduction: Measure the decrease in errors and associated costs.

Innovation and Growth

New Ideas Generated: Track the number of new ideas and innovations resulting from KM initiatives.

Business Growth: Measure revenue growth and market share improvements attributable to KM.

Knowledge Management Tools

All organizations deal with knowledge in their daily operation. However, only a few have a systematic and formal way of dealing with knowledge. The majority of organizations rely on individuals and ad hoc processes. The consequence of this is that when people leave the organization, they take their knowledge with them resulting in the loss of valuable organizational assets and resources.

Knowledge Management Tools

There are a number of factors that can motivate an organization to establish a formal and systematic management of knowledge. These include the desire or need to:

(a) get a better insight on how the organization works;
(b) reduce the time and effort in searching for information and documents;
(c) avoid repetition of errors and unnecessary duplication of work;
(d) reduce the response time to questions that are asked frequently; and
(e) improve the quality and speed of making important decisions.

Knowledge Management Tools

In order to fully implement a knowledge management system and derive the maximum benefits there is need to provide two elements:
One, a technological infrastructure composed of computers, networks and databases; and
Two, software applications installed in distributed environments.

These two elements are usually referred to as knowledge management tools. These tools are designed and built to enable easier and faster use of important functionalities, such as document management, collaborative online workshops, superior search engines and the like, that are essential for the management, safeguarding and harnessing of knowledge.

Knowledge Management Tools

There are a great variety of knowledge management tools available in the market comprising many different features that are suitable for a number of different applications. Some of the typical tools that are used in knowledge management solutions will be discussed here. These include:

(a) document management system;
(b) enterprise portal;
(c) knowledge map and skills management;
(d) information database and lessons learned system;
(e) collaboration tool; and
(f) communities of practice.

Knowledge Management Tools

Document Management

Documents are the most common repository of information and knowledge in any organization. Documents are produced for almost everything: a project proposal, a contract or agreement, a technical report, a scientific paper, and others. Because of the great variety of the types and lengths of documents that an organization can produce, the systematic and organized management of these documents can save the organization considerable effort and money. And for many organizations such an effort to systematize and organize document management is the starting point of knowledge management. However, knowledge management actually involves much more.

Knowledge Management Tools

Document Management – continued

Document management has two key functions:
first, it provides content; and
second, it facilitates content management and access.

These two functions have significant positive impacts on the efficiency of the organization. Depending on the nature and size of the organization, the inefficiencies related to document accessibility can cost the enterprise a lot annually as employees waste many hours just looking for the needed information.

Knowledge Management Tools

Document Management – continued

Document management has four basic elements:

First, it records discussions and emails and archives documents;
Second, it organizes these electronic documents in a hierarchical or network framework;
Third, it provides search engines for the retrieval of the desired documents; and
Fourth, it enhances content security by allocating appropriate levels of access to each document.

Knowledge Management Tools

Enterprise Portal

Portals can be defined as single points of access that provide easy and timely access to knowledge. Portals are important tools for knowledge management since they make it easier to share knowledge in an organization. In essence, knowledge portals serve as the central point for sharing knowledge. Through this portal, users can contribute information to the corporate pool of knowledge, access information, and collaborate with other experts and their peers. Since one of the goals of portals is to enhance corporate performance, it is essential to populate the portal with information of the highest quality in order to ensure its successful use in a knowledge management system.

Knowledge Management Tools

Enterprise Portal

The concept of an enterprise portal encompasses the various tools, technologies and practices that make knowledge available to all the staff of the organization and other authorized outside users. They serve to support the collaborative work of groups of knowledge workers in communities of practice and can serve various purposes including academic, business, non-governmental and government-based organizations. Portals are frequently Web-based, allowing creation of distributed documents and making possible to search online information.

Knowledge Management Tools

Key Enterprise Portal Basic Functions

- Single sign-on, profile
- Structure, navigation, and personalization
- Community, share and collaborate
- Work flow
- Capture, store and publish
- Categorize and classify
- Search and retrieve
- Notification
- Integration with business applications
- Maintenance

Knowledge Management Tools

Knowledge Map and Skills Management

Knowledge management tools deal not only with documents but, also, with information about living experts who provide advice and share their expertise with colleagues. The system is an efficient way of making the “localization of experts” easy and quick.

Knowledge Management Tools

Knowledge Map and Skills Management – continued

In an organization where people are the most important assets, managing their skills, capabilities, interests and experience is critical. A skills management system is a web-based tool that supports this in a distributed way, spreading the workload over the whole organization. All employees can update their own skills (adding new skills or changing skill levels) and interests, and use the tool to locate people with particular skills. Such tools include a back office tool where the HRM department (or equivalent) can define skills and their levels, i.e., what does it mean to have level 4 (or 5) on skill ‘web servers’, as well as profiles, e.g., what are the skills required for a senior programmer or a junior business consultant.

Knowledge Management Tools

Knowledge Map and Skills Management – continued

Available software such as Skillman includes a matching function, which enables people (or HRM, depending on permissions) to see how close they are to a particular profile, e.g., a person needs one more year of experience to be a senior consultant.

Having stored all skills along with their history, the system can generate a knowledge map of the company, which gives insight in the strong and weak points of the company, as well as in emerging trends. A knowledge map helps navigate through documents, versions, authors, experts and external users of information, which could be partners, customers, suppliers and competitors.

Knowledge Management Tools

Information Database and Lessons Learned

In each organization people learn everyday and improve their work constantly based on the experiences gained. Apart from the fact that this is positive for the employee (who is incrementing his knowledge and skills) it is also beneficial for the company as a whole in the sense that individuals perform better, and thus the organization as a whole. However, the organization can also learn on itself by capturing relevant experiences and distributing them through the organization. This ensures that the appropriate persons consult the right knowledge at the right time.

Knowledge Management Tools

Information Database and Lessons Learned – continued

The Lessons Learned knowledge base forms the memory of the company. At the same time the Lessons Learned system supports the process of capturing and diffusing the knowledge. Lessons Learned systems are very important in organizations where mistakes can be very costly and avoiding them in the future provides significant savings. These systems are also extremely useful in organizations where best practices need to be repeated and disseminated as much as possible.

for example, among technology consultancy companies that are project-based or among development banks that provide funds for projects since during the execution of the projects many lessons are learned.

Knowledge Management Tools

Collaboration Tool

Along with document management, collaboration is one of the most important aspects of knowledge management tools. Collaboration resembles a large meeting room in which colleagues work together, even over long distances or at different times of day. They share opinions, calendars and projects. A collaborative environment enables people to work in secure online workspaces, in which they use e-mail, Internet web browser and desktop applications in order to share knowledge, build closer organizational relationships and streamline work processes. Such an environment also encourages employees to share information in open discussion forums, thereby providing access to tacit knowledge. Moreover, collaboration tools offer better user interface for internal and external users, thus providing the link between the organization and its partners and customers.

Knowledge Management Tools

Collaboration Tool – continued

Groupware and workflow management are also collaborative functionalities. Groupware brings together virtually all employees involved in a certain task or project. The use of groupware products, such as Microsoft Exchange or Lotus Notes, is often described as artifact-based collaboration because the collaborative activity involves one artifact, such as an e-mail text or shared document authored by many people, for example a sales order or an individual file in a government agency. Groupware technologies include other ICT applications for organizing meetings and supporting group interaction and decision-making.

Knowledge Management Tools

Collaboration Tool – continued

Workflows describe interactions among employees by defining paths, time and individuals involved in certain procedures. Once described, the system can automatically manage the procedures, improving the quality of collaboration. Workflows are predominantly effective in distributive environments in which employees are frequently inaccessible or not permanently located in the same physical workplace. In such cases, the organization designs document exchange and collaboration between individuals involved in the same process. For example, when an employee completes work on a document, the system might be programmed to send it to a list of supervisors, who would automatically be notified via e-mail, and request a review.

Knowledge Management Tools

Collaboration Tool – continued

Virtual rooms open a series of possibilities. The ideal knowledge management tool has virtual meeting rooms operating in real time, simultaneously and instantly for all employees, who might be distributed over different locations yet remain connected and thus able to exchange information at once. Various possibilities are available, such as chats, videoconferences, forums, email and web pages.

Knowledge Management Tools

Communities of Practice

Communities of practice are described extensively in the previous sessions as an excellent means to share knowledge among people who have common interest. Here they will be described again briefly from the perspective of being used as a tool in the implementation of a knowledge management system within an organization. The fact that communities of practice can be viewed as an important enabler for the sharing and enrichment of knowledge as well as a useful tool for the implementation of a knowledge management system lends credence to the claim of many knowledge management practitioners regarding its great importance.

Knowledge Management Tools

Communities of Practice – continued

It is common sense that people working together on a project perform better as a team if they often communicate. However, in modern organizations team members often work at different physical or departmental locations. Communities of practice provide a virtual place where those people can exchange knowledge and experiences.

Implementation of Knowledge Management

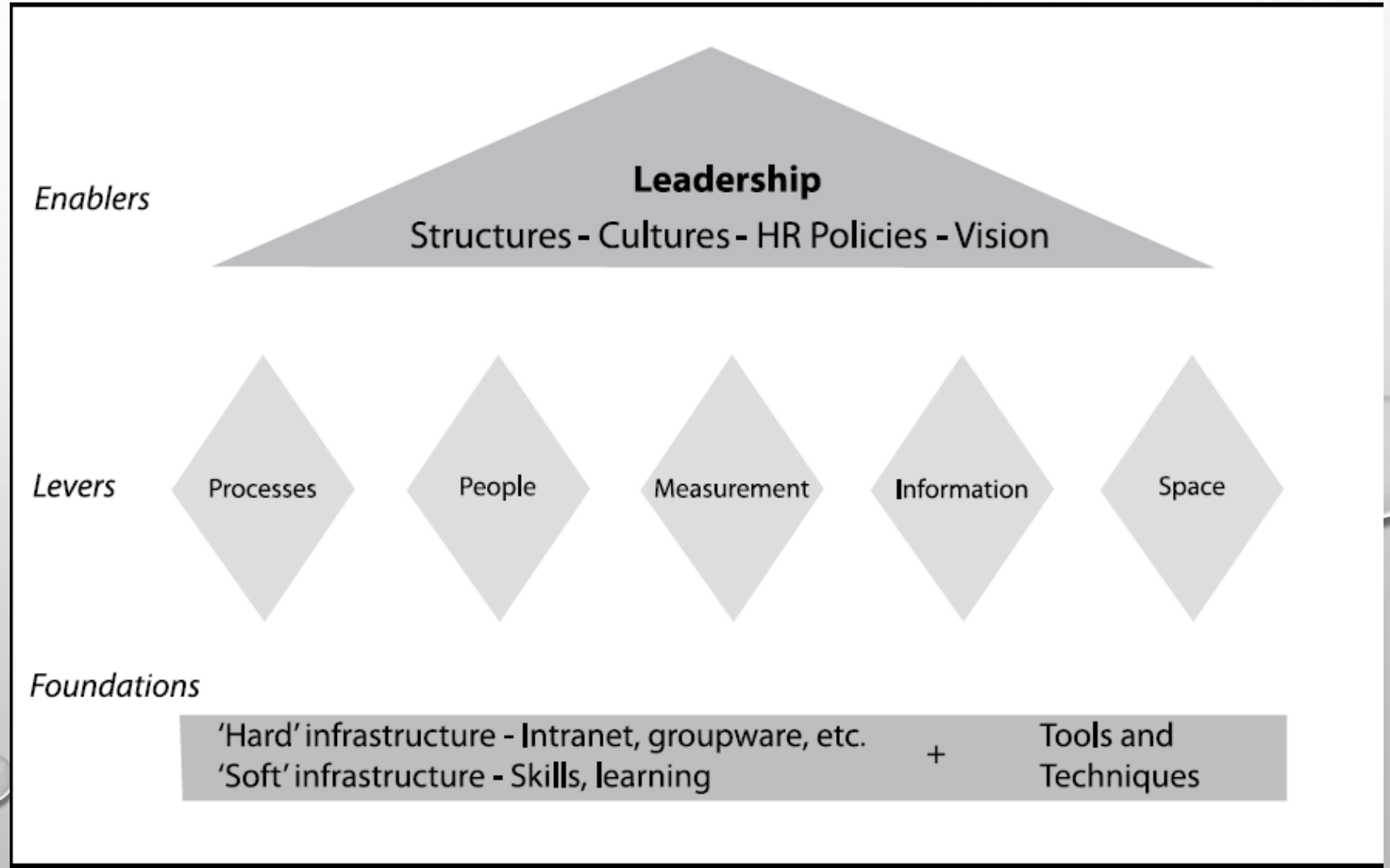
Knowledge management is based on the fundamental concept that one of the most valuable assets of an organization is the experience and expertise that reside in the heads of its officers, managers and employees. In order to derive the maximum benefit from this intellectual capital, ways and means must be devised to manage this knowledge, capture it and share it with others, particularly the coworkers. If executed and implemented in a proper manner, knowledge management is expected to create a more collaborative environment, cut down on duplication of effort and encourage knowledge sharing.

Implementation of Knowledge Management

However, in most organizations, employees are reluctant to share their knowledge freely. In fact they feel that their special knowledge is the very reason why they are important to the company and why the company keeps them employed. By keeping the knowledge to themselves, they become valuable to the company resulting in employment security. But such an attitude of hoarding knowledge leads to duplication of work, turf wars, inefficiencies and high costs.

Implementation of Knowledge Management

Figure: A Framework for Implementing Knowledge Management



Implementation of Knowledge Management

A Framework for Implementing Knowledge Management

At the top layer of the framework are the enablers. The key factor here is organizational leadership. There is a senior knowledge champion. The senior management team understands that knowledge is strategic and clearly articulates its contribution to the organization's "bottom line". The organization's structure, culture and environment encourage knowledge development and sharing. Without these enablers most knowledge initiatives drift or stall.

Implementation of Knowledge Management

A Framework for Implementing Knowledge Management – continued

The second layer of the framework comprises a set of levers that amplify the contribution of knowledge. These include processes that facilitate knowledge flows, the effective handling of information, and measurement systems (e.g., for intellectual capital). An important point here is the distinction between explicit and tacit knowledge, since their management is quite distinctive.

Implementation of Knowledge Management

A Framework for Implementing Knowledge Management – continued

Thirdly, the foundation layer provides the capacity and capability that embeds knowledge into the organization's infrastructure. It comprises two complementary strands - a 'hard' information and communications infrastructure that supports knowledge collaboration, and a 'soft' human and organization infrastructure that develops knowledge enhancing roles, skills and behaviors. In this layer, the fast moving world of technology is providing an ever increasing number of useful tools for knowledge capture, organizing and sharing. There are now knowledge management suites, such as Open Text's Live links, that combines document management facilities with functions that help create 'communities of practice', whereby people in different departments who are pursuing similar interests can be connected into electronic conversations.

Implementation of Knowledge Management

However, the actual implementation of a knowledge management system in an organization may generally involve five distinct stages:

Stage 1: Advocate and learn
Stage 2: Develop strategy
Stage 3: Design and launch KM initiatives
Stage 4: Expand and support initiatives
Stage 5: Institutionalize knowledge management

An examination of many knowledge management initiatives of large organizations shows the presence of these five stages of implementation.

Implementation of Knowledge Management

Stage 1: Advocate and Learn

The first stage in the development of a knowledge management system comprises the following elements: (a) introducing knowledge management; (b) identifying the KM team and focal points; (c) learning about the experiences of other organizations; (d) identifying advocates of knowledge management; and (e) promoting wide-ranging support to the KM initiative.

Implementation of Knowledge Management

Stage 1: Advocate and Learn

The introduction of knowledge management may be initiated at the highest level, for example, the organization's chief executive officer or it may be an initiative of the human resources department or the IT department. Regardless of where the initiative comes from, the organization is more likely to be ready to get started in knowledge management when one or more of the following situations are present: (a) knowledge management has emerged as a topic of interest; (b) at least a few employees have explored the benefits of KM for the organization; (c) someone has had a personal stake in developing interest in KM; (d) some members of the organization have learned about KM through participation in conferences; (e) the organization has created a high-level rationale or vision for pursuing KM.

Implementation of Knowledge Management

Stage 1: Advocate and Learn

Advocacy is the very first task to define KM, make it known to others in the organization, and develop an initial small group of KM supporters. Opportunities should be provided to the staff to learn more about KM through activities such as in-house seminars and workshops and to share stories of how KM helped other successful organizations. It is also important to make everyone realize how KM could be aligned with other current initiatives of the organizations. During the advocacy and learning stage it is essential to make the concepts of KM real for others in the organization. This means that the advocates should create a clear, tangible picture of the benefits of KM as they relate to goals in the organization. To make KM attractive to a wider audience, it is important to use simple definitions and simple language to explore real problems, opportunities, and the potential value that KM addresses.

Implementation of Knowledge Management

Stage 1: Advocate and Learn

The second step is to identify the members of the KM team and focal points that will support the development of KM and serve as advocates of knowledge management. To help identify these people, one should look around the organization for activities that might already be related to KM. In addition, there might already be small groups or communities that are sharing knowledge in some way either formally or informally. It is important to make connections with these people and recruit them as possible focal points or members of the KM team. Finally, the KM team should report to as high in the management as possible in order to get top management support. And recruiting well-respected, influential people within the organization is always a good idea.

Implementation of Knowledge Management

Stage 1: Advocate and Learn

The third step is to learn from the experiences of other organizations and constantly look for windows of opportunity to introduce the benefits of knowledge management. In pursuing this, there is need to capitalize on the Internet and seek the assistance of the IT department to provide the necessary tools. Efforts should be exerted to find out what KM possibilities are available with existing and available technology and where KM would be most valued.
By talking to people involved with strategic initiatives, it might be possible to translate some of the experiences of other organizations into concrete policies and actions that could prevent repeating earlier mistakes.

Implementation of Knowledge Management

Stage 1: Advocate and Learn

The final two steps involve finding advocates of knowledge management and getting wider support to the KM initiative. These are crucial steps and the probability of success is enhanced by making the proper choices. For example, the people from the IT department are potential advocates and catalyst for emerging KM support technologies since they are already familiar with the technology aspect of knowledge management. Wide-ranging support may be obtained if the KM team can clearly and convincingly explain to the staff what the KM objectives are, what issues are being addressed, how KM can help the organization meet its objectives, and how it will benefit the staff and help them perform their work more efficiently and effectively.

Implementation of Knowledge Management

Stage 1: Advocate and Learn

There are a number of challenges and possible roadblocks to success at this stage. These include:

(a) ignoring the current practices and existing corporate culture and history;
(b) overlooking and not addressing issues that might delay the acceptance and hinder implementation of the KM system;
(c) creating too much unnecessary hype and attempting to sell an enterprise wide approach without first building confidence; and
(d) asking for an unreasonably large budget before creating a convincing proposition that can create value for the organization.

Implementation of Knowledge Management

Stage 2: Develop Strategy

During the second stage of the knowledge management roadmap, there are four activities that should be implemented. These are:

(a) identify and characterize the knowledge assets of the organization;
(b) develop an overall KM framework with clear goals and objectives;
(c) conceptualize and prepare preliminary design of some strategic KM pilot projects; and
(d) prepare an indicative budget and find the resources to support the selected KM pilot projects.

Implementation of Knowledge Management

Stage 2: Develop Strategy

As in the first stage of implementation, there are some indicators that could help decide if the initiative is ready or not to proceed to the next stage. For example, if several or all of the following conditions exist, then the organization is ready to proceed to the second stage of knowledge management implementation:

- The organization has established a KM exploratory group or steering committee for KM and it has successfully met a few times;
- An executive sponsor or champion, high enough in the hierarchy of the organization, supports further exploration of KM;

Implementation of Knowledge Management

Stage 2: Develop Strategy

- A group, a section or a division within the organization is looking for successful, internal grassroots efforts related to KM that are already underway;
- The IT section or division of the organization is interested in actively supporting the KM initiatives;
- There are stories or records of how knowledge sharing has helped the organization in the past;
- Some pilots have been identified allowing the demonstration of how KM will benefit the organization; and
- Ownership of the proposed pilots has been identified and their possible funding has been secured.

Implementation of Knowledge Management

Stage 2: Develop Strategy

The overall objective of this stage of implementation is to formulate a KM strategy that fits the organization's business model. From this KM strategy, business opportunities can be identified and initialized as pilot initiatives. A task force should then be established to take charge of these activities on behalf of the organization.

Implementation of Knowledge Management

Stage 3: Design and Launch KM Initiatives

At this point of project implementation, the task forces have been formed, pilot projects have been identified and designed, and manpower and financial resources have been allocated. The project is now entering the third stage, which involves the successful launching of pilots and gathering of initial results. With the KM pilot projects provided with adequate funding for full implementation, it is necessary, at this stage, to develop methodologies that can be replicated and implement measures to capture and share the lessons learned.

Implementation of Knowledge Management

Stage 3: Design and Launch KM Initiatives

As in the earlier stages, it is important to take note of the presence of certain indicators. If one or more of the following elements or activities are present or underway, then the organization is ready to proceed to the third stage of KM implementation:

- The pilot projects have been fully conceptualized and designed, including the detailed implementation strategies and procedures.
- Communities of practice have been organized and launched or an interactive KM intranet site or other KM-related initiative is operational.
- The task force team leaders have been enlisted and pilot facilitators and implementers have been trained.

Implementation of Knowledge Management

Stage 3: Design and Launch KM Initiatives

• Pilot measures and indicators have been established and a system for tracking and reporting results has been developed.

• Policies and strategies for learning from the KM initiatives have been created and disseminated to all relevant players.

• Strategies and procedures for expanding the pilot initiatives have been mapped out and desired outcomes from the pilots have been clearly described.

Implementation of Knowledge Management

Stage 3: Design and Launch KM Initiatives

At this third stage the benefits of capturing, sharing, and using information and knowledge have begun to take definite form. This is the time to harness the momentum from the first two stages and focus on details, such as a formal budget. Leadership now needs to see the potential for measurable gains and ROI from successful pilots.

The overall objectives of this stage are to conduct successful pilots, provide tangible evidence of the business value of the knowledge management initiative, and capture lessons learned. To attain these objectives, specific actions will have to be implemented as listed below.

Implementation of Knowledge Management

Stage 3: Design and Launch KM Initiatives

The first action is to release the money to fund the pilot projects and to assign a KM oversight group, such as a steering committee, to reallocate organizational resources, such as money and time, for KM initiatives. The formation of this oversight group must take into consideration the membership of the KM task force formed during the earlier stage of implementation. Nearly all successful KM initiatives, including those at the World Bank, Chevron, HP Consulting, Xerox, and Siemens, reported having formed a KM oversight group and/or task force to provide supervision and support for the reallocation of organizational resources.

Implementation of Knowledge Management

Stage 3: Design and Launch KM Initiatives

The second action is to develop methodologies that can be replicated and to avoid building knowledge collections without an active community to contribute to the effort. There will be need to combine knowledge providers and knowledge users in a seamless community of practitioners and allow these active communities to form voluntarily from natural groupings that span boundaries. It is important to encourage active participation of the entire organization in the KM process with face-to-face networking and community driven websites. However, as contributions to the KM system proliferate, it is necessary to establish a process for screening, filtering, and validating shared knowledge from the sites before presenting it as organizational knowledge.

Implementation of Knowledge Management

Stage 3: Design and Launch KM Initiatives

The third action is to capture and record lessons learned. The oversight group must discuss lessons learned at regular meetings and provide a common space for sharing the results. To complete this most crucial last step, adequate answers should be provided to questions such as:

What made the pilots most successful?
Are the results worth investing in for expansion?
How can the pilots be expanded?

Implementation of Knowledge Management

Stage 4: Expand and Support

By the time the fourth stage is reached, which could take a few years, the organization would have gained quite a bit of expertise on managing knowledge. At this point, the pilots would have been launched and results gathered, some important lessons would have been learned and captured, and the further continuation of the KM journey would have been already decided. Stage 4 will involve expanding and supporting the KM initiatives throughout the organization. Again it will be necessary to examine the presence of indicators. If some of the following elements are present, then the organization can proceed to launch stage 4 of the KM implementation:

Implementation of Knowledge Management

Stage 4: Expand and Support

- Other departments in the organization are expressing a desire to actively participate in the KM system as a result of successful pilots.
- The promotion and marketing of KM throughout the entire organization has started to show positive results.
- The entire organization has been made aware of the existence of the KM initiative and the results of the pilot activities.
- An expansion strategy for the KM initiatives is in place, supported by a number of top executives in the organization.
- Adequate resources have been identified for expanding the KM efforts and the finance and budget departments are supportive of these efforts.

Implementation of Knowledge Management

Stage 4: Expand and Support

To help ensure that the implementation of the KM initiative will remain successful throughout stage 4, it is recommended that the following steps should be taken:

- Establish a central cross-functional KM group that will be tasked to create an expansion strategy; identify the required manpower, financial and material resources; and address any confusion that may arise from rapid growth.
- Obtain or develop from other units of the organization the resources that will be needed to successfully support the expansion of KM initiatives.
- Communicate the KM strategy and the successful results of the pilot projects throughout the organization using vigorous promotional and marketing methods.

Implementation of Knowledge Management

Stage 5: Institutionalize Knowledge Management

The final stage involves making knowledge management an integral part of the organizational processes. At this stage, the organization has to redefine its strategies, review its organizational structure, and revisit its performance assessments. Once again, it will be necessary to look for indicators. If one or more of the following conditions exist in the organization, then it is ready to embark on the fifth and final stage of KM implementation:

Implementation of Knowledge Management

Stage 5: Institutionalize Knowledge Management

- The KM system is now directly linked to the business model.
- A number of KM initiatives are widely deployed throughout the organization.
- All executives, managers and employees are trained to use KM tools and technologies.
- The KM strategy is methodically assessed, gaps are being identified, and methods to close the gaps are available.
- A formal support structure is in place to maintain the operation of the KM system.
- An employee compensation and rewards program is in place and aligned with the KM strategy.
- Sharing knowledge is now the norm in the organization and communities of practice are actively operating.

Implementation of Knowledge Management

Stage 5: Institutionalize Knowledge Management

At this final stage of KM implementation, the organization is already aware that KM is a business strategy and not just an elaborate database. It is already convinced that KM must be an integral part of the business model and that it is a necessary organizational competency with unlimited potential to benefit every unit in the organization. In order to fully institutionalize knowledge management the following actions will need to be undertaken.

1- The first action is to embed KM in the business model. This action is necessary to obtain CEO and senior executive support.

2- The second action is to realign the organization's structure and budget in accordance with the KM strategy.

Implementation of Knowledge Management

Stage 5: Institutionalize Knowledge Management

3- The third action is to constantly monitor and evaluate the health of the KM system.

4- The fourth action is to align performance evaluation and rewards system with the KM strategy.

5- The fifth action is to balance the organizational KM framework with local control.

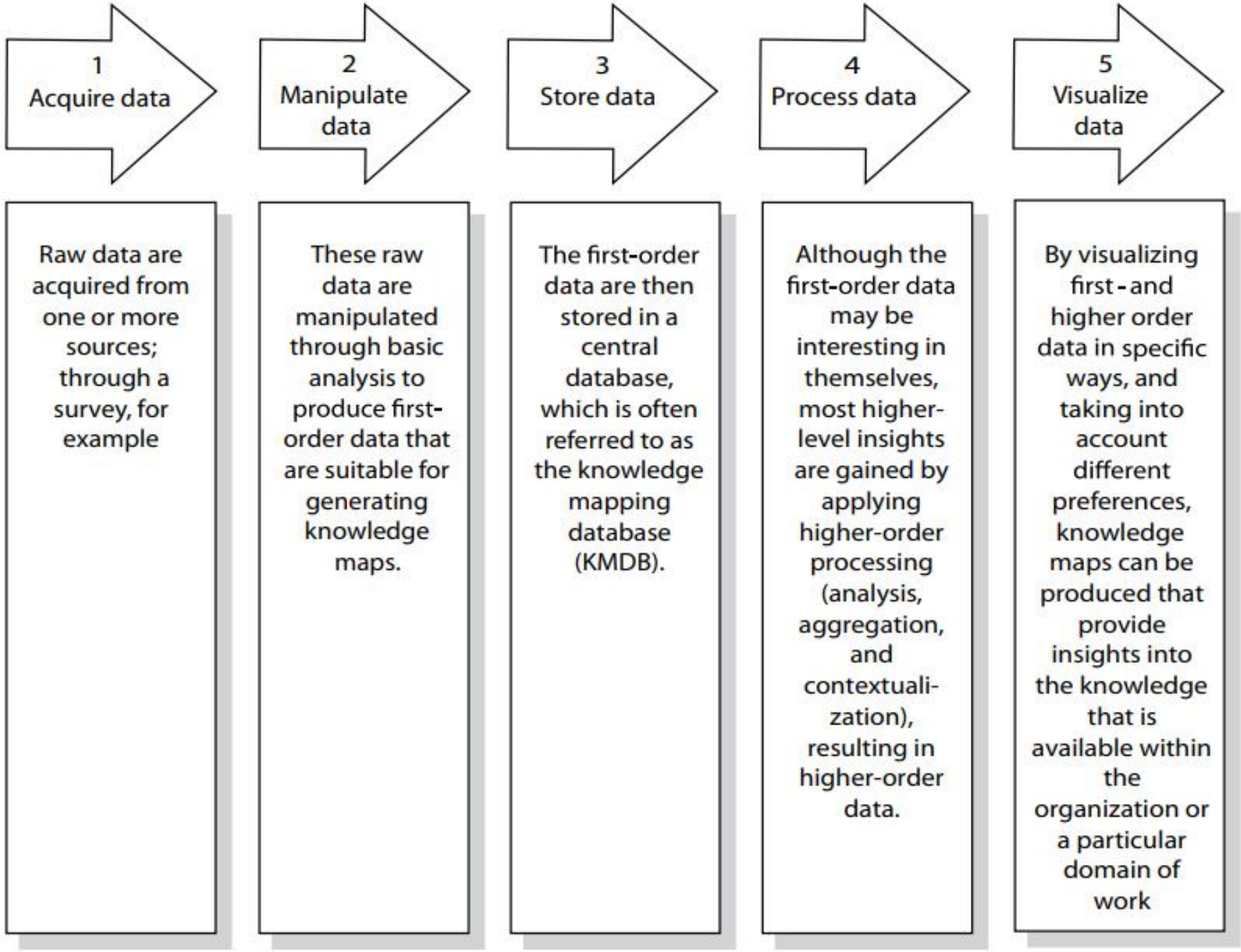
6- The sixth and final action is to continue the KM journey. As the organization becomes a true knowledge-sharing enterprise, the demand for knowledge processes will continue to increase.

Overview of Knowledge Mapping

A knowledge map is “an association of items of information (e.g., process, network, policy, geography, etc.) preferably visual, where the association itself creates new, actionable information”.

Knowledge mapping is the process of creating a knowledge map. This process consists of five steps, as shown in the following Figure. The purpose of this figure is to depict the manipulation or transformation which occurs during the process; it could be applied to information or knowledge instead of data, depending on the association of items of information the process is looking at.

Overview of Knowledge Mapping



Business Intelligence

Meaning of Business Intelligence

Definitions:

Business Intelligence (BI) is a set of ideas, methodologies, processes, architectures, and technologies that change raw data into significant and useful data for business purpose. Business Intelligence can handle large amounts of data to help identify and evolve new opportunities for the business. Making use of these new opportunities and applying a productive scheme on it can provide a comparable market benefit and long-term stability.

BI (Business Intelligence) refers to set of techniques which assist in spotting, digging out and investigating best data from the large amount of data to improve conclusion making. Let us understand the concept better with help of an example.

Meaning of Business Intelligence

Example:

Suppose we have chronicled data of a Shopping Mart of 3-6 months. Here, in the data we have different products with their respective specifications. Let us select one of the products-say Candles. We have three kinds of Candles in this class say Candle A, Candle B, Candle C. On studying of these data we come to know that sale of Candle C was at peak out of these three classes. Now on afresh and deep study into these data we got the outcome that the sale of this Candle C was maximum between the time intervals of 9 am to 11 am. On further deeper analysis, we came to the conclusion that this specific Candle is the one used in place of worship.

Meaning of Business Intelligence

Now, let’s apply Business Intelligence for this analysis. What an enterprise firm or the organization can do is, get other material that can be used in church and place them nearby those candles. Now the customers approaching the Shopping Mart to purchase the candles for place of worship can also have a look on the other material and may be tempted to purchase them as well. Now this will surely enhance the sales and hence the income of Shopping Mart.

Supply chain business intelligence

Understanding Business Intelligence in Supply Chain Management

Business Intelligence refers to the collection, analysis, and transformation of raw data into actionable insights that drive informed decision-making. In the context of supply chain management, BI involves the integration of data from various sources within the supply chain, including suppliers, manufacturers, distributors, and retailers. By harnessing BI tools, organizations gain real-time visibility, predictive analytics, and process automation, enabling them to streamline their supply chain operations.

Supply chain business intelligence

What value does it bring?

Business intelligence tools, when applied in the supply chain management process, bring in a number of tangible values including:

1- Removing guesswork from business decisions

2- Visualization of each stage of the supply chain

3- Challenges in supply chain management solved by business intelligence

supply chain data analytics aims to counteract all kinds of undesirable events that can disrupt logistics operations. Its task isn’t to merely inform you of what’s happened but more so to help you foresee and understand what may happen through data analysis, so that you can take the necessary steps and remain ready.

Supply chain challenges

Some challenges a supply chain may be facing, solved by business intelligence, include:

1- Black swan events (extremely negative event or occurrence)

Black swan events are rare and usually severe occurrences that can disrupt the supply chain in multiple ways and negatively affect a company's operations. Examples of these hard-to-predict events include natural disasters, pandemics, cyber-attacks, and geopolitical conflicts.

2- Material scarcity

With BI for supply chain management you can prevent material scarcity by getting real-time insights into inventory levels, supplier performance, and demand forecasts.

Supply chain business intelligence

3- Higher freight prices

Freight prices are subject to fluctuations based on market demand and supply chain disruptions, leading to increased costs for companies. However, business intelligence in the supply chain can help you identify any emerging trends so that you can mitigate these risks.

4- Unpredictable demand

The way you respond to a changing demand has the potential to either bury or elevate your business. Supply chain analytics can help you anticipate variations in demand patterns and respond accordingly, thereby optimizing supply chain operations.

Table: Key functionalities of BI tools that assist in decision making (Mathrani and Mathrani 2013).

Purpose	
Business Reporting	• Provide ability to drill down through layers of data, and do the analysis in any form (spreadsheet, charts, hyperlinks) without burdening user with technical details. • Assist in setting up of data filters, crosstabs, and user-friendly queries to answer specific questions. • Extend standard ES reports (e.g., aging analysis or order intake reports) to optimize capacity planning and improve productivity. The underpinning information and functional areas are not mutually exclusive.
Reduce information overload	• Aggregate/distil meaningful information, to help managers know more about their business and start looking for correlations with specific questions, since ES implementations can be overwhelming causing information overload. • Data from heterogeneous environments can be mined and presented to users on a regular basis.

Table: Key functionalities of BI tools that assist in decision making (Mathrani and Mathrani 2013).

Purpose	
Support management performance evaluation	• Balanced scorecards are used in conjunction with data mining to aggregate databases for performance evaluation expanding managerial analytical capabilities. • Help business managers create relevant data views to make knowledgeable decisions bringing clarity on critical information elements.
Business process simulation and scenario planning	• The built-in integrated reporting and dynamic query generation function allows users to extract intermediate data and assess different possible simulated outcomes. • Analytical processing can be applied to scenarios by adding experience, context, and interpretation. • Provide a point-in-time multi-view of the current progress of new initiatives, which can then be exploited to improve performance.
Add-on Features	• Enable organizations to identify a baseline against which standards could be defined and the information presented as a report, scorecard, or KPI, since many firms do not even know what they want to measure. • Customization with add-on features (e.g., a dashboard could provide more contextual information that helps in insightful decision making).

How to implement business intelligence for supply chain management

- Identify your main concerns and problems

Start with proper groundwork. Before you implement a business intelligence solution, take time to understand the concerns and problems your supply chain is facing.

At this stage you'll have to determine the types of data you're going to collect and analyze that'll be useful in making informed decisions and improving your operations.

- Define your key metrics, KPIs, and data sources

Once you have identified your main pain points, move on to establishing the key metrics, KPIs, and data sources. This step will help you determine which data points to collect and analyze in order to keep track of your performance against your goals.

How to implement business intelligence for supply chain management

- Define your IT project scope

Defining the scope of your project is crucial to ensure that you have a clear vision of what you want to achieve and what resources are needed to accomplish your goals. Here you should focus on the timeline, budget, and resources needed to implement your business intelligence solution.

- Prepare a PoC

It's time to pick up the pace a bit. Before you proceed with the development of a custom BI solution or integration of a third-party tool, however, it's a good idea to have a proof of concept (PoC) to make sure that the solution will work as intended.

This step will help you avoid any potential issues or challenges down the line and make adjustments, should the need be.

How to implement business intelligence for supply chain management

- Proceed to develop your custom BI solution

Based on the results of your PoC, go ahead and proceed with the development of your own BI solution or integration of a third-party tool. If it's the second option for you, make sure to choose a platform that properly aligns with what you're trying to achieve.

BI Challenges

• **Organizational and cultural differences:** Cultural and organizational issues can be attributed to the fact that supply chain processes are distributed among many internal and external organizational groups that tend to operate individually.

• **Metrics:** Existing metrics do not capture how the overall supply chain has performed because they are primarily internally focused financial metrics. The supply chain paradigm requires new metrics. The central place in the metrics system is taken by the Key Performance Indicators (KPI).

• **Data quality:** One of the surveys showed that 75% of the organizations experienced financial pain from defective data. Poor data quality costs them money in terms of lost productivity and faulty business decisions.

BI Challenges

• **Data security:** Security is one of the main IT concerns, since the information BI provides is the organization's most valuable asset. Fine-grained authorization and authentication, along with encryption are the requirements.

• **Plenitude of data sources:** Most of the organizations have huge volumes of structured data housed in different data sources such as mainframes and databases, and also unstructured data sets. Providing the supply chain, integrating data from such a variety of sources is prerequisite for effective BI.

BI Challenges

• **Lack of expertise:** Experts knowledgeable in both SCM and data warehousing/BI are rare. Also, training is required for the business analyst and information workers in order to yield most benefits from SCI systems.

• **End-user access:** The key to having a successful SCI system is having an interface that is simple to operate and offers personalization, customization, ad-hoc queries and collaboration through web portals.