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# Knowledge Management



# Objectives

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- Define knowledge and describe the different types of knowledge.
- Describe the activities involved in knowledge management.
- Describe different approaches to knowledge management.
- Describe the issues associated with implementing knowledge management in organizations.
- Describe the technologies that can be utilized in a knowledge management system.
- Describe the tasks of the chief knowledge officer (CKO) and other personnel involved in knowledge management process.
- Describe benefits as well as obstacles to knowledge management initiatives

# Knowledge Management

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**Knowledge management (KM) is a process that helps organizations identify, select, organize, disseminate, and transfer important information and expertise that are part of the organization's memory.**

- **Structuring of knowledge enables**
  - effective and efficient problem solving
  - dynamic learning
  - strategic planning
  - decision making.
- **Knowledge management initiatives focus on**
  - identifying knowledge
  - how it can be shared in a formal manner
  - leveraging its value through reuse.
- **Knowledge management can**
  - promote organizational learning
  - help solve problems

# Knowledge

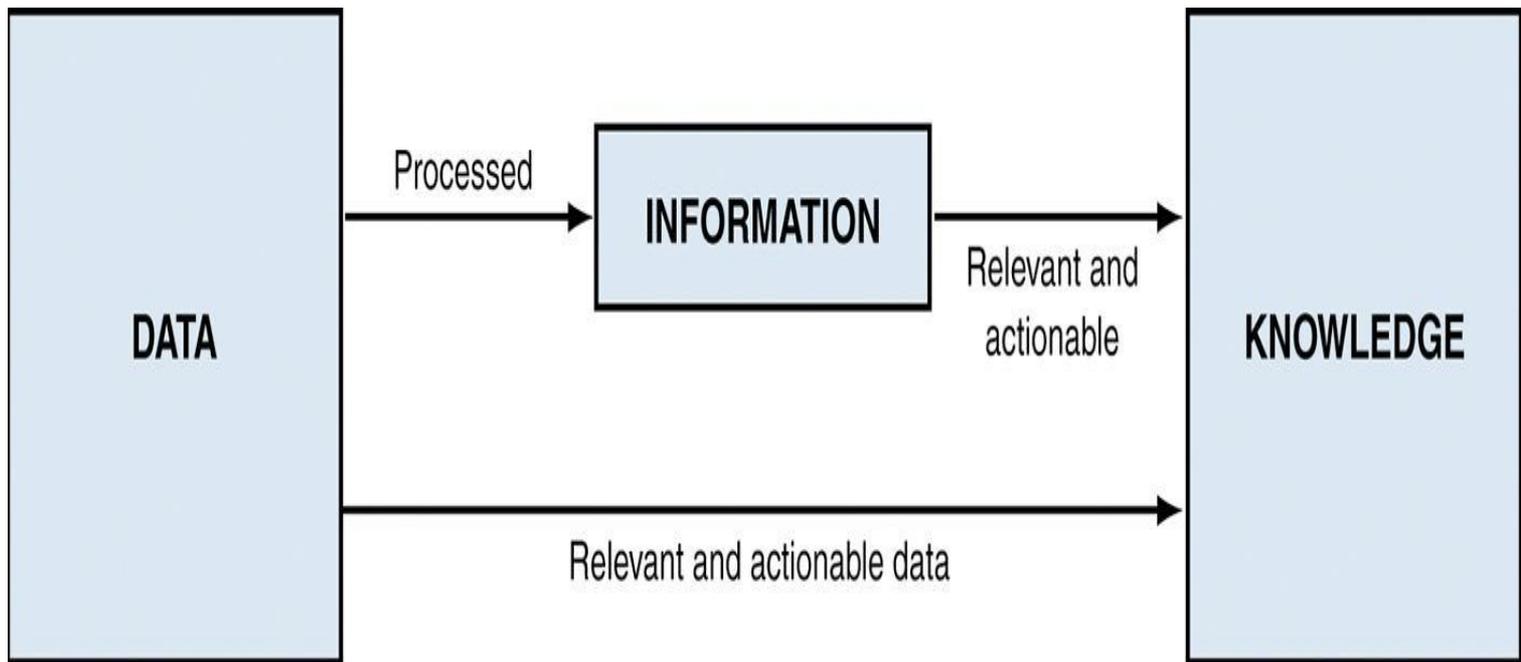
Knowledge is very distinct from data and information and provides a higher level of meaning about that data and information. The *ability to act* is an integral part of being knowledgeable.

- **Data are a collection of:**
  - Facts
  - Measurements
  - Statistics
- **Information is organized or processed data that are:**
  - Timely
  - Accurate
- **Knowledge is information that is:**
  - Contextual
  - Relevant and actionable

Having **knowledge** implies that it can be exercised to solve a problem, whereas having **information** does not.

# Transformation process : Data – information- knowledge

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# Knowledge is a Corporate Asset

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Knowledge has the following characteristics that differentiates it from an organization's other assets

- **Extraordinary leverage and increasing returns.** Knowledge is not subject to diminishing returns. When it is used, it is not consumed. Its consumers can add to it, thus increasing its value.
- **Fragmentation, leakage, and the need to refresh.** As knowledge grows, it branches and fragments. Knowledge is dynamic; it is information in action. Thus, an organization must continually refresh its knowledge repository to maintain it as a source of competitive advantage.
- **Uncertain value.** It is difficult to estimate the impact of an investment in knowledge. There are too many intangible aspects.
- **Uncertain value of sharing.** Similarly, it is difficult to estimate the value of sharing the knowledge, or even who will benefit most.
- **Expired in time**

**Knowledge is a part of Intellectual capital or Intellectual assets**

# Knowledge : Explicit knowledge

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**Explicit knowledge has been codified** (documented) in a form that can be distributed to others or transformed into a process or strategy without requiring interpersonal interaction.

- **Explicit knowledge (or leaky knowledge)** deals with objective, rational, and technical knowledge :
  - Data
  - Policies
  - Procedures
  - Software
  - Documents
  - Products
  - Strategies
  - Goals
  - Mission
  - Core competencies , etc.

**The more than knowledge is made explicit, the more economically it can be transferred.**

# Knowledge : Tacit knowledge

**Tacit knowledge** is usually in the domain of subjective, cognitive, and experiential learning; it is highly personal and difficult to formalize. It is also referred to as **embedded knowledge** since it is usually either localized within the brain of an individual or embedded in the team interactions within a department or business unit.

- **Tacit knowledge is the cumulative store :**
  - of the corporate experiences
  - Mental maps
  - Insights
  - business acumen
  - Expertise
  - Know-how
  - Trade secrets
  - Skill sets
  - Learning of an organization
  - The organizational culture

**Tacit knowledge is generally slow and costly to transfer**

# Knowledge : Knowledge Management System

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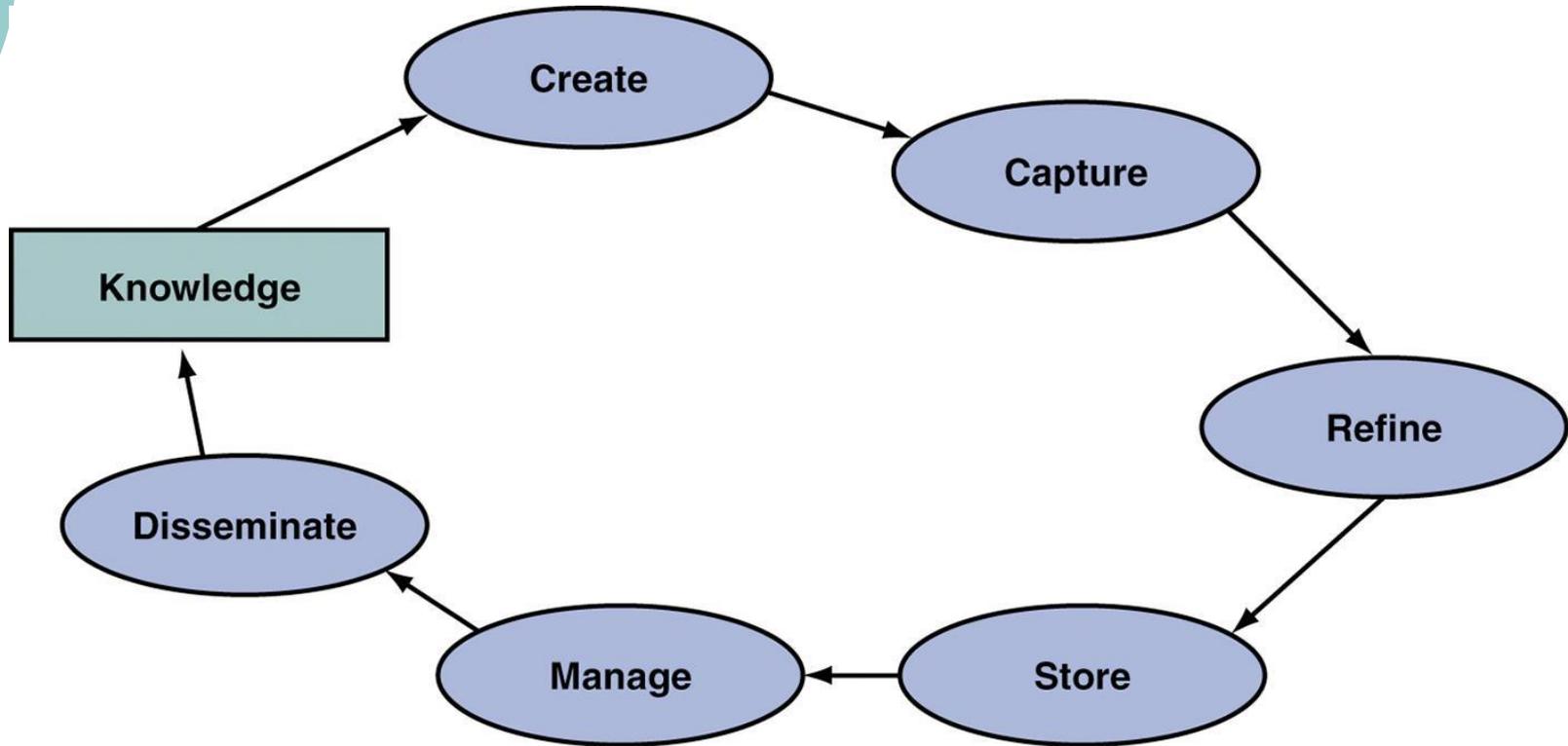
The goal of knowledge management is for an organization to be aware of individual and collective knowledge so that it may make the most effective use of the knowledge it has. Firms recognize the need to integrate both explicit and tacit knowledge into a formal information systems - **Knowledge Management System (KMS)**

- A functioning knowledge management system follows **six steps in a cycle dynamically refining information over time** :
  1. Create knowledge.
  2. Capture knowledge.
  3. Refine knowledge.
  4. Store knowledge.
  5. Manage knowledge.
  6. Disseminate knowledge.

**As knowledge is disseminated, individuals develop, create, and identify new knowledge or update old knowledge, which they add into the system.**

# Knowledge Management Circle

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# Knowledge Management Initiatives

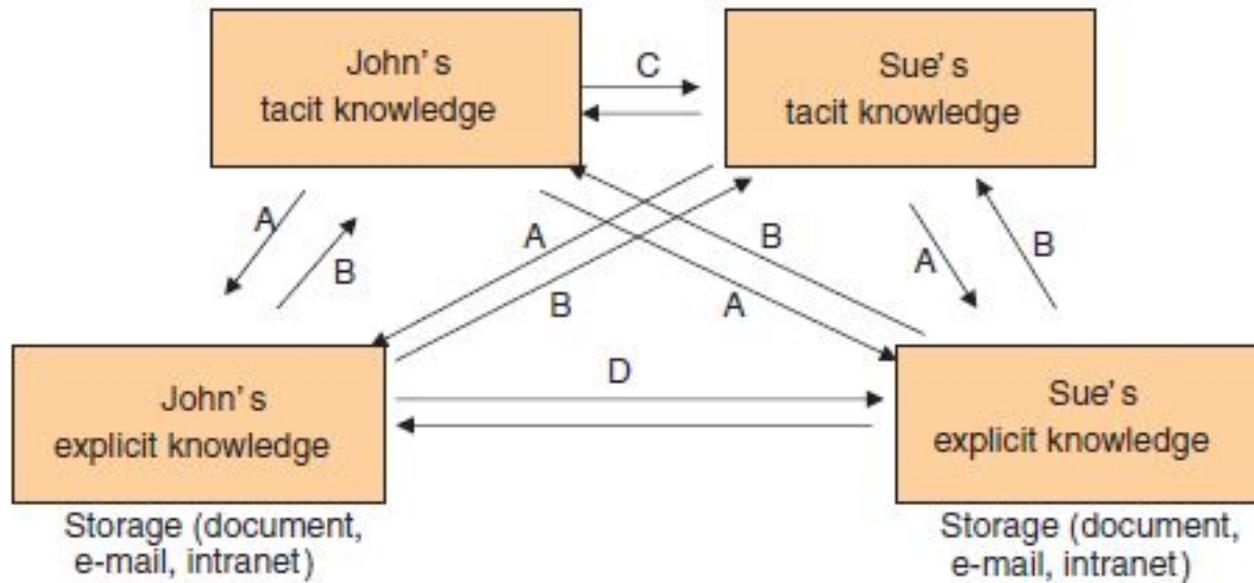
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- Knowledge management initiatives have one of three aims:
  - **to make knowledge visible** mainly through
    - **Maps**
    - **yellow pages**
    - **hypertext**
  - **to develop a knowledge-intensive culture,**
  - **to build a knowledge infrastructure**
- There are several activities or processes that surround the management of knowledge.
  - **Knowledge Creation**
  - **Knowledge Sharing**
  - **Knowledge Seeking**

# Knowledge Management Continued

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- **Knowledge creation** or **knowledge acquisition** is the generation of new insights, ideas, or routines.
  - **Socialization mode** refers to the conversion of tacit knowledge to new tacit knowledge through social interactions and shared experience.
  - **Combination mode** refers to the creation of new explicit knowledge by merging, categorizing, reclassifying, and synthesizing existing explicit knowledge
  - **Externalization** refers to converting tacit knowledge to new explicit knowledge
  - **Internalization** refers to the creation of new tacit knowledge from explicit knowledge.
- **Knowledge sharing** is the exchange of ideas, insights, solutions, experiences to another individuals via knowledge transfer computer systems or other non-IS methods.
- **Knowledge seeking** is the search for and use of internal organizational knowledge.



Legend: Each arrow represents a form of knowledge creation:  
 A-Externalization; B-Internalization; C-Socialization;  
 D-Combination

# Knowledge Management Approaches

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There are two fundamental approaches to knowledge management: a **process approach** and a **practice approach**. Since the two are not mutually exclusive a knowledge management initiative will probably involve both approaches.

- **The process approach** attempts to codify organizational knowledge through formalized controls, processes, and technologies frequently through the use of information technologies to enhance the quality and speed of knowledge creation and distribution. These technologies include:
  - Intranets
  - Data warehousing
  - Knowledge repositories
  - Decision support tools
  - Groupware
- **The practice approach** is favored by firms that sell relatively standardized products since the knowledge in these firms is fairly explicit because of the nature of the products and services.

# Knowledge Management Approaches Continued

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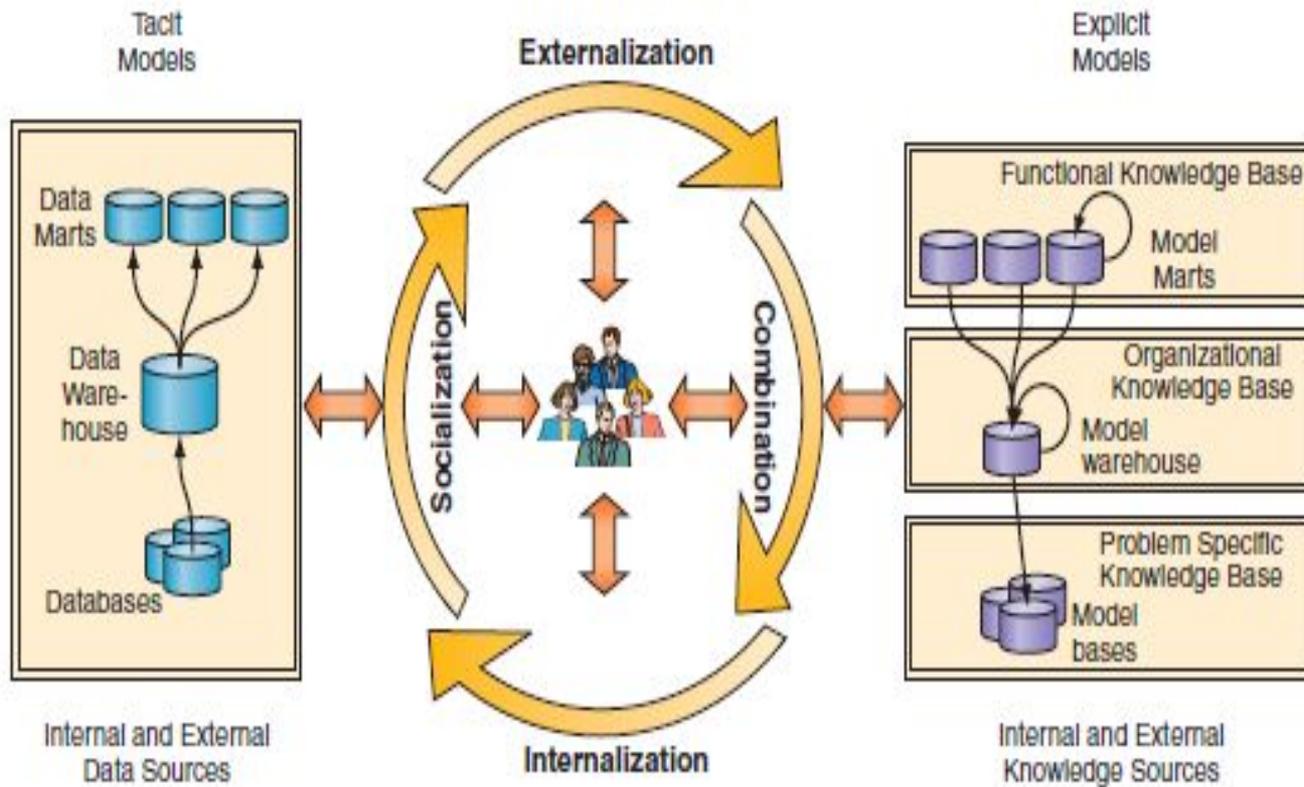
- **The practice approach** to knowledge management assumes that organizational knowledge is tacit in nature and formal controls, processes, and technologies are not suitable for transmitting this type of understanding.
- Rather than building formal systems to manage knowledge, this approach builds social environments or communities to facilitate the sharing of tacit understanding.
- **The practice approach** is typically adopted by companies that provide highly customized solutions to unique problems. The valuable knowledge for these firms is tacit in nature, which is difficult to express, capture, and manage.

# Knowledge Management – Information Technology

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Knowledge management is more than a technology or product, it is a methodology applied to business practices. However, information technology is critical to the success of knowledge management systems.

- **Components of Knowledge Management Systems:**
  - **Communication technologies** - allow users to access needed knowledge and to communicate with each other.
  - **Collaboration technologies** - provide the means to perform group work.
  - **Storage and retrieval technologies** (*database management systems*) - to store and manage knowledge.



# Knowledge Management - Supporting Technologies

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Technologies enable advanced functionality in knowledge management systems and form the base for future innovations.

- **Artificial Intelligence** (AI methods: expert systems, neural networks, fuzzy logic, genetic algorithms, etc.)
  - Assist in identifying expertise
  - Elicit knowledge automatically and semi-automatically
  - Provide interfacing through natural language processors
  - Enable intelligent searches through intelligent agents.
- **Intelligent agents** are software systems that learn how users work and provide assistance in their daily tasks.
- **Knowledge Discovery in Databases (KDD)** is a process used to search for and extract useful information from volumes of documents and data. It includes tasks such as:
  - knowledge extraction
  - data archaeology
  - data exploration
  - data pattern processing
  - information harvesting

# Knowledge Management – Supporting Technologies

Continued

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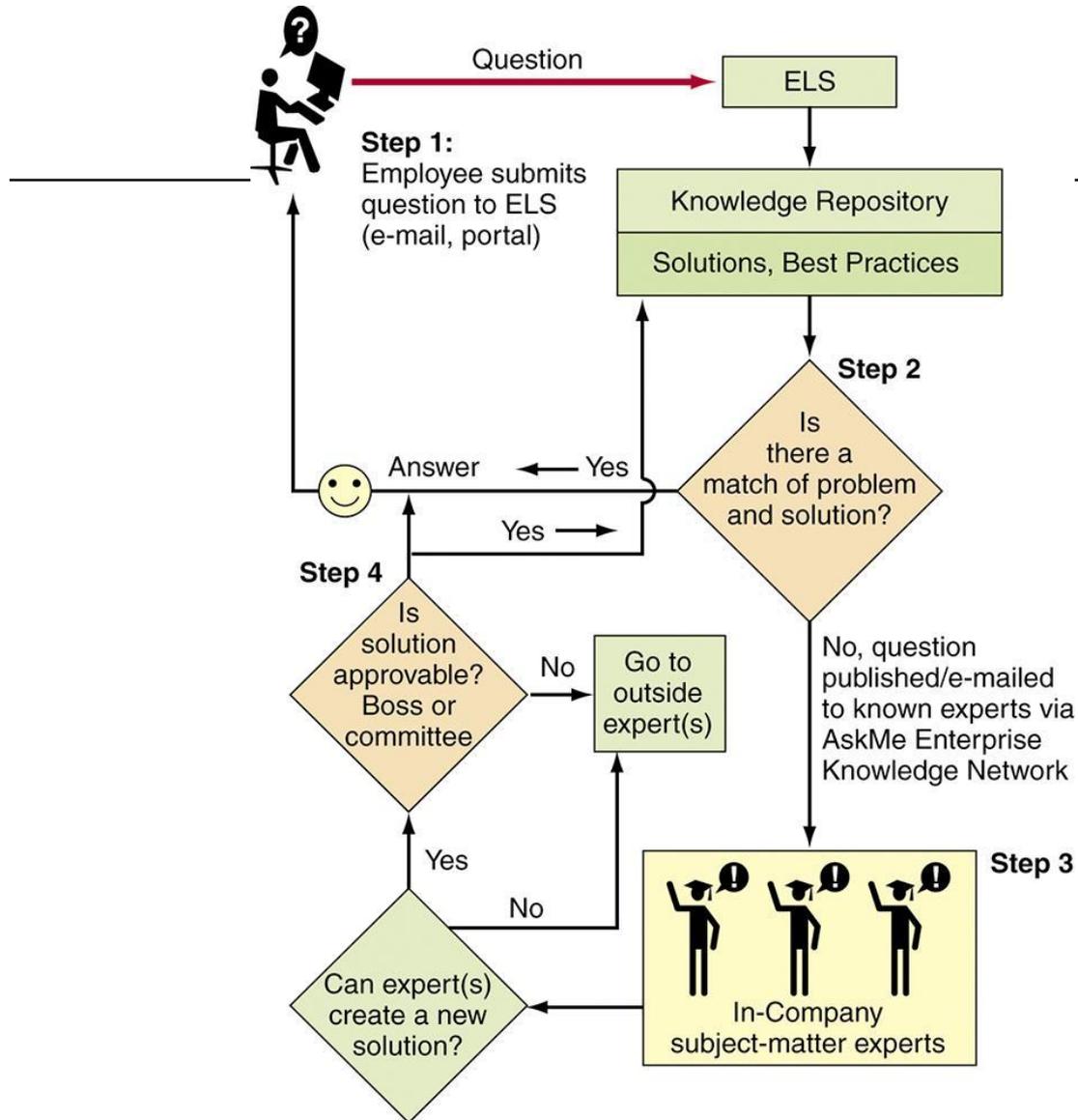
- **Data mining** the process of searching for previously unknown information or relationships in large databases, is ideal for extracting knowledge from databases, documents, e-mail, etc.
- **Model warehouses & model marts** extend the role of data mining and knowledge discovery by acting as repositories of knowledge created from prior knowledge-discovery operations
- **eXtensible Markup Language (XML)** enables standardized representations of data structures, so that data can be processed appropriately by heterogeneous systems without case-by-case programming.



# Knowledge Management : IT Products

Technology tools that support knowledge management are called **knowware**.

- Most knowledge management software packages include one or more of the following tools:
  - collaborative computing tools
  - knowledge servers
  - enterprise knowledge portals
  - electronic document management systems
  - knowledge harvesting tools
  - search engines
  - knowledge management suites.



**Expertize by Expert Location System (type of KMS )**

# Knowledge Management – IT Services

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- **IT Consulting Firms provide assistance**
  - in establishing knowledge management systems
  - measuring their effectiveness
  - Support for vertical market software
- **Application service providers (ASPs)** have evolved as a form of **KMS outsourcing on the Web**. They offering a complete knowledge management solution, including a **KM suite** and the consulting to set it up.

# Knowledge Management – Integration Issues

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**Knowledge management systems** are enterprise-wide and must be integrated with other information systems in an organization :

- **Decision Support Systems (DSS)**
- **Artificial Intelligence**
- **Customer Relationship Management Systems (CRM)**
- **Supply Chain Management Systems (SCM)**
- **Corporate Intranets**
- **Extranets**

# Knowledge Management – People

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Managing a KMS requires great effort. Many issues related to management, people, and culture must be considered to make the system a success. Some of those issues concern implementation and effective use of the system.

- **Chief knowledge officer's (CKO)** role are to maximize the firm's knowledge assets, design and implement knowledge management strategies, effectively exchange knowledge assets internally and externally, and promote system use.
- **Chief executive officer's (CEO)** is responsible for championing the KM effort.
- **Chief financial officer (CFO)** must ensure that the financial resources are available.
- **Chief operating officer (COO)** must ensure that people begin to embed knowledge management practices into their daily work processes
- **Chief information officer (CIO)** is responsible for the IT vision of the organization and the IT architecture, including databases, application software, etc.
- **KMS developers** are the individuals who actually develop the system
- **KMS staff** catalogue and manage the knowledge, train users

# Knowledge Management – Metrics

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Organizations can gain several benefits from **implementing a knowledge management strategy**. This valuation can be based upon an asset-based approach or one that links knowledge to its applications and business benefits.

- **Asset-based approach** starts with the identification of intellectual assets and then focuses management's attention on increasing their value.
- The second uses variants of a **balanced scorecard**, where financial measures are balanced against customer, process, and innovation measures.
- **Financial Metrics (tangible benefits)**
- **Non-Financial Metrics (intangible benefits)**

# MANAGERIAL ISSUES

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- **Organizational culture change.** This issue is how can we change organizational culture so that people are willing both to contribute knowledge to and use knowledge from a KMS? There must be strong executive leadership, clearly expressed goals, user involvement in the system, and deployment of an easy-to-use system that provides real value to employees. A viable reward structure for contributing and using knowledge must also be developed.
- **How to store tacit knowledge.** This is extremely difficult. Most KMSs (based on the network storage model) store explicit knowledge about the tacit knowledge that people possess. When the knowledgeable people leave an organization, they take their knowledge with them. Since knowledge requires active use by the recipient, it is important for the person generating knowledge to articulate it in a way that another, appropriately educated person can understand it.
- **How to measure the tangible and intangible benefits of KMS.** There are a number of ways to measure the value of intellectual assets and of providing them to the organization.
- **Determining the roles of the various personnel in a KM effort.**

# MANAGERIAL ISSUES Continued

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- **The lasting importance of knowledge management.** Knowledge management is extremely important. It is not another management fad. If it is correctly done, it can have massive impact by leveraging know-how throughout the organization. If it is not done, or is not correctly done, the company will not be able to effectively compete against another major player in the industry that does KM correctly.
- **Implementation in the face of quickly changing technology.** This is an important issue to address regarding the development of many IT systems. Technology has to be carefully examined, and experiments done, to determine what makes sense. By starting now, an organization can get past the managerial and behavioral issues, which have greater impact on the eventual success (or not) of a KMS. As better and cheaper technology is developed, the KMS can be migrated over to it, just as legacy systems have migrated to the PC.



# Questions ?