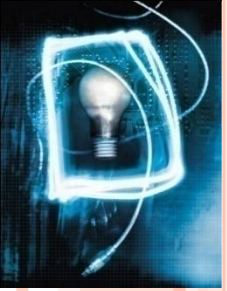
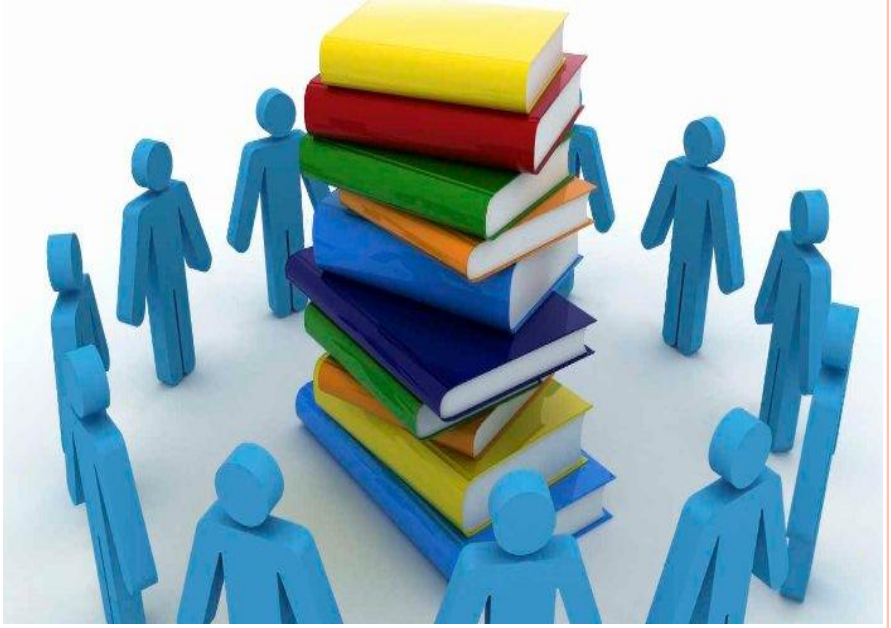
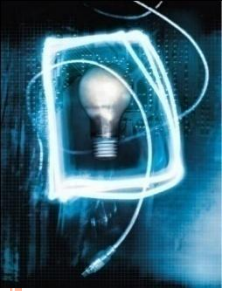




LECTURE-07

Knowledge Management

Presented By,
M.M. Rakibul Hasan
Faculty, CSE, IUBAT University

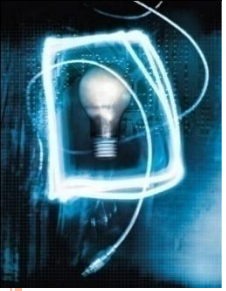


What is Data?

- Data comprises facts, observations, or perceptions
- Data represents raw numbers or assertions

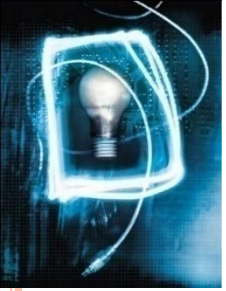
What is Information?

- Information is processed data
- Information is a subset of data, only including those data that possess context, relevance and purpose
- Information involves manipulation of raw data



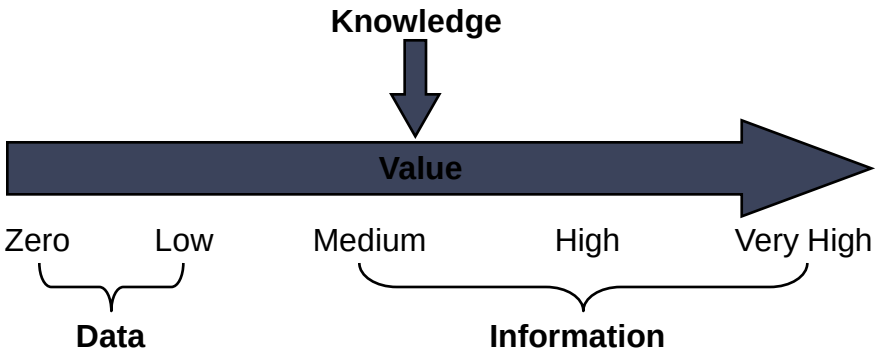
What is Knowledge?

- A justified true belief (Nonaka and Takeuchi)
- It is different from data & information
- Knowledge is at the highest level in a hierarchy with information at the middle level, and data to be at the lowest level
- It is the richest, deepest & most valuable of the three
- Information with direction
- **Concepts, experience, and insight that provide a framework for creating, evaluating, and using information.**



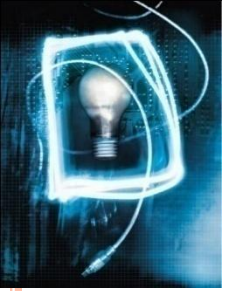
Important Dimensions of Knowledge

- **Wisdom:** The collective and individual experience of applying knowledge to the solution of problem; knowing when, where, and how to apply knowledge

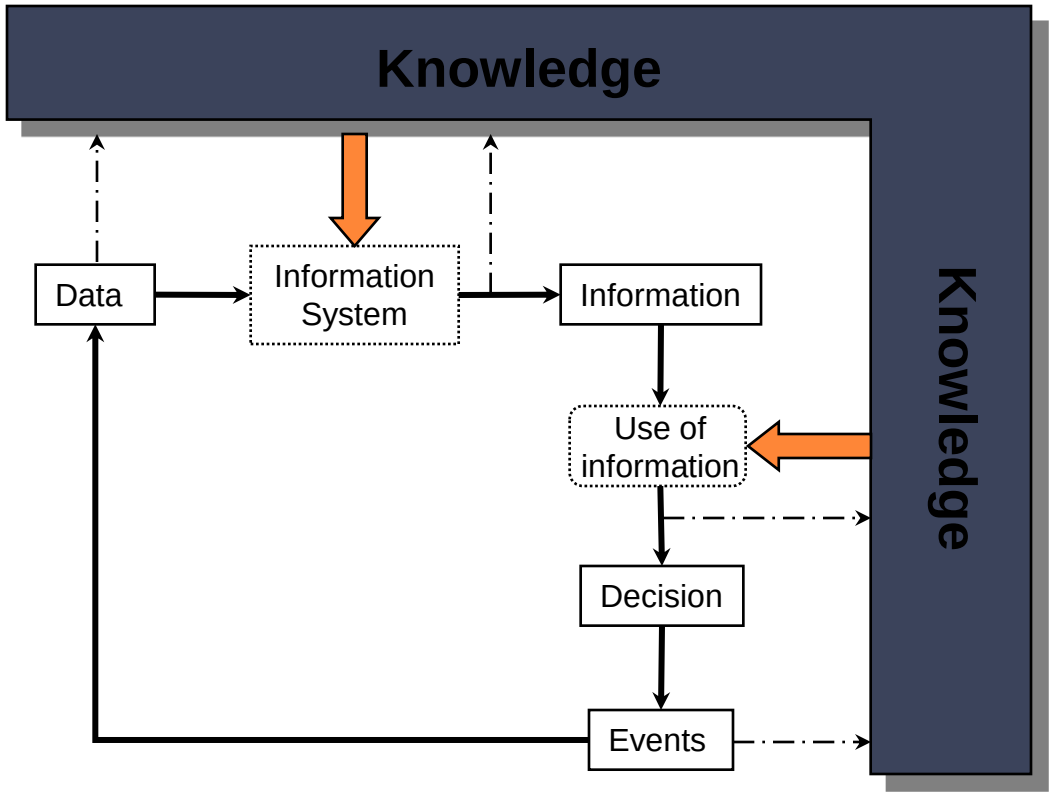


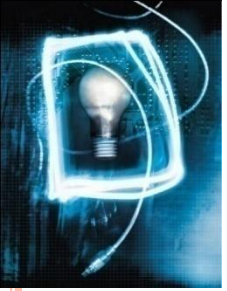
Knowledge is a Firm Asset:

- Intangible asset
- Requires organizational resources
- Value increases as more people share it



Data, Information, Knowledge and Events

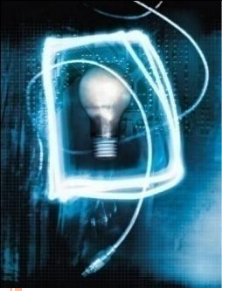




Sources of Knowledge

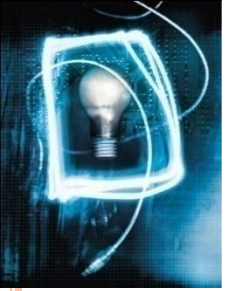
- Sources will Includes books, films, computer databases, pictures, maps, flow diagrams, stories, case studies or observed behaviour.

- Divided into 2:
  - **Documented:** books, flow diagrams etc
  - **Undocumented:** Resides in people mind



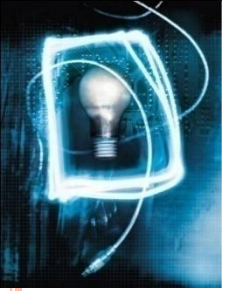
Levels of Knowledge

- Shallow knowledge:
  - Representation of only surface level information that can be used to deal with very specific situations.
- Deep Knowledge
  - Human problem solving is based on deep knowledge of a situation. It that can be applied to different tasks and different situations.



Categories of Knowledge

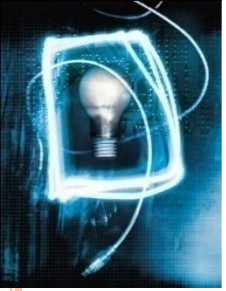
- Procedural Knowledge
- Declarative Knowledge
- Meta Knowledge
- Heuristic Knowledge
- Structural Knowledge



Categories of Knowledge

- Procedural knowledge
  - Describe how to solve a problem.
  - Provides direction on how to do something.
  - May include explanation and how to make inference.

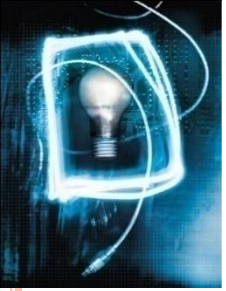
- Declarative knowledge:
  - Describe what is known about a problem. It tells us facts-what things are. Express in factual statement such as 'Smoking can cause cancer', 'Don't drink and drive'.



Categories of Knowledge

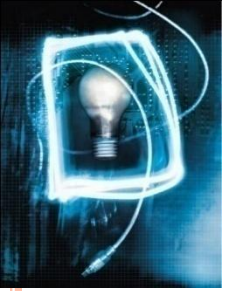
- Meta-Knowledge
  - Describe knowledge about another knowledge.
  - Used to pick other knowledge that is best suited for a solving a problem.

- Heuristics Knowledge
  - Describe rules of thumb that guides the reasoning process.
  - Often called shallow knowledge compile through experience.



Categories of Knowledge

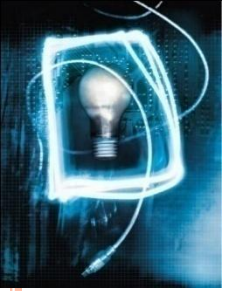
- Structural Knowledge
  - Describe overall mental model of the problem.
  - The mental model of concepts, sub-concepts, and objects; and are they related.



KNOWLEDGE HAS DIFFERENT FORMS

Tacit and Explicit Knowledge:

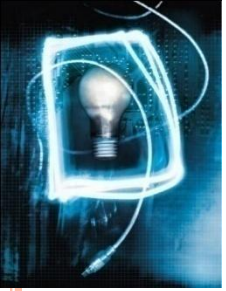
- Tacit knowledge includes insights, intuitions, and hunches
- Explicit knowledge refers to knowledge that has been expressed into words and numbers
- We can convert explicit knowledge to tacit knowledge



Knowledge has Different Forms

General and Specific Knowledge:

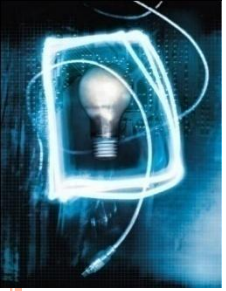
- General knowledge is possessed by a large number of individuals and can be transferred easily across individuals
- Specific knowledge, or "idiosyncratic knowledge," is possessed by a very limited number of individuals, and is expensive to transfer
- Idiosyncratic: particular way of thinking



Knowledge has Different Forms

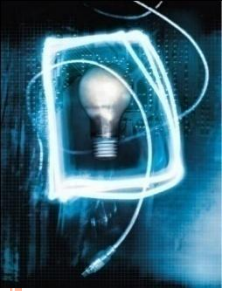
Technically and Contextually Specific Knowledge:

- Technically specific knowledge is deep knowledge about a specific area.
- Contextually specific knowledge refers to the knowledge of particular circumstances of time and place in which work is to be performed.



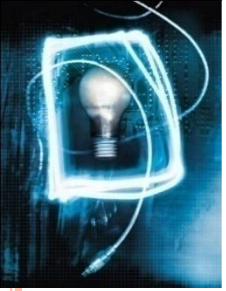
Knowledge and Expertise

- Expertise can be defined as knowledge of higher quality
- An “expert” is one who is able to perform a task much better than others



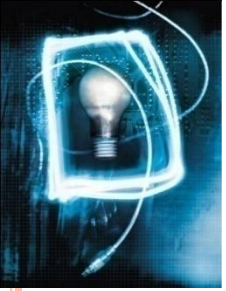
Characteristics of an Expert

- Peers regard the expert decisions as good decisions.
- Whenever problem arises, people consult the expert.
- The expert admits not knowing that answer to a problem. This honesty indicates self-confidence and a realistic view of limitations.
- The expert avoids information that is irrelevant to the domain and instead sticks to the facts and works with a focus.
- The expert is not arrogant about personal credentials, years of experience, or strong ties with people in power.



Types of Expertise

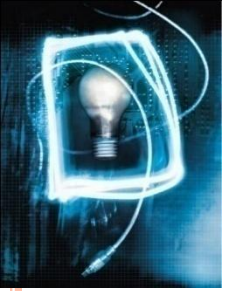
- Associational Expertise
- Motor Skills Expertise
- Theoretical (Deep) Expertise



Associational Expertise

In most fields: desirable for experts to have detailed understanding of underlying theory

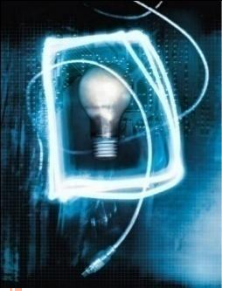
- But not always necessary!
  - e.g., TV repairman
  - can fix nearly all common problems
  - but does not understand transistor theory or CRT/LCD/plasma display theory
  - based on experience, rather than analysis
- May not understand the inner workings of the device
  - may not know how to proceed when encountering a new, previously unseen problem
  - may not be able to invent or design new devices well



Motor Skills Expertise

Motor skill knowledge is predominantly physical rather than cognitive

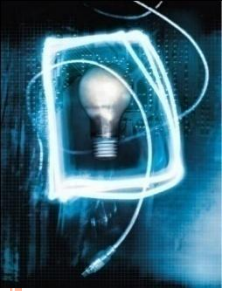
- Humans learn this type of knowledge via repeated performance (practice)
- E.g.,
  - Riding a bicycle
  - Kicking a football



Theoretical (Deep) Expertise

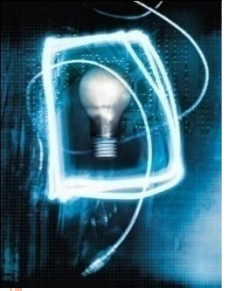
Finding solutions to technical problems often requires going beyond a superficial understanding of the domain

- Must apply creative ingenuity
- Based on theoretical knowledge of the domain
- Cannot be solved via associational expertise
- Acquired via formal training and hands-on problem solving
- Very easily forgotten unless continually used, due to theoretical and often abstract nature
- E.g., engineers and scientists

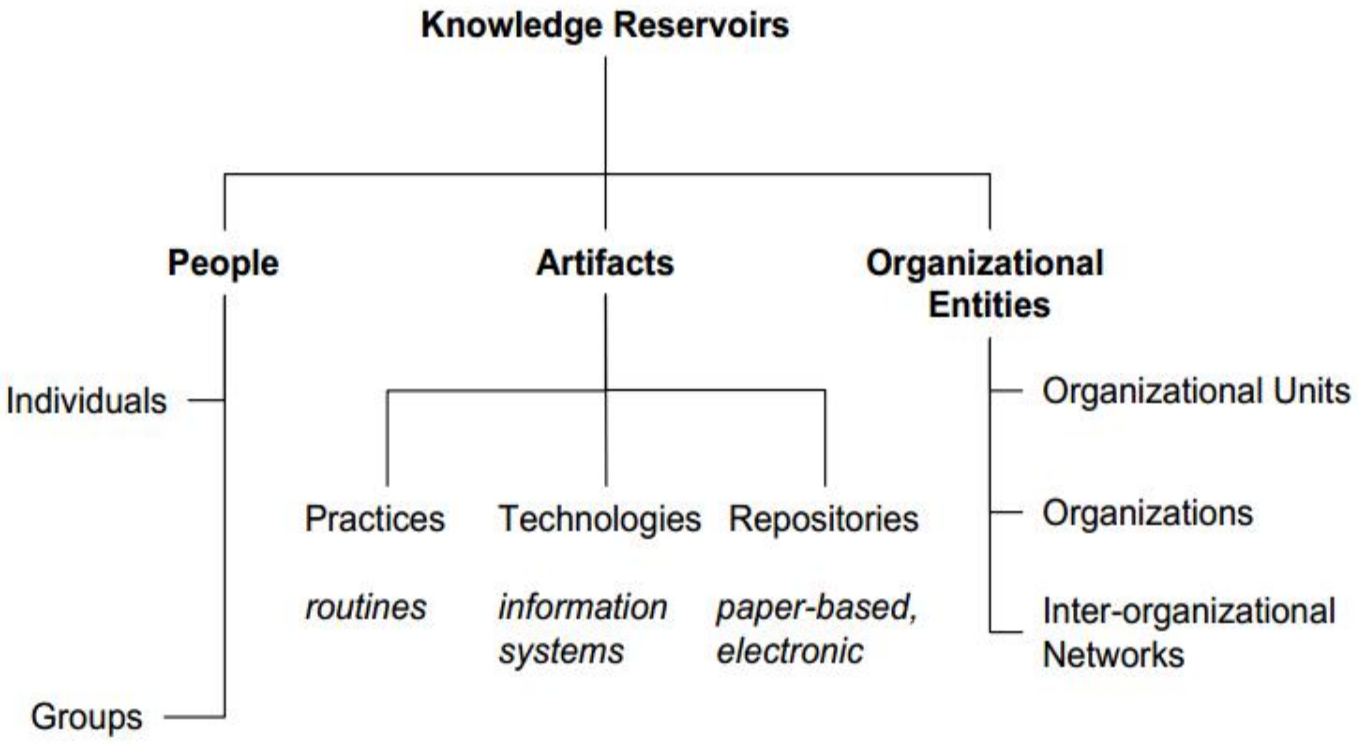


Types of Knowledge

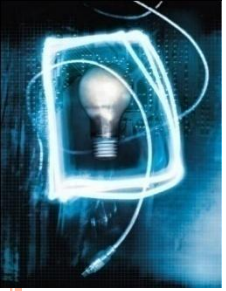
- Simple knowledge focuses on one basic area.
- Complex knowledge draws upon multiple distinct areas of expertise.
- Support knowledge relates to organizational infrastructure and facilitates day-to-day operations.
- Tactical knowledge pertains to the short-term positioning of the organization relative to its markets, competitors, and suppliers.
- Strategic knowledge pertains to the long-term positioning of the organization in terms of its corporate vision and strategies for achieving that vision.



Reservoirs of Knowledge(Location)



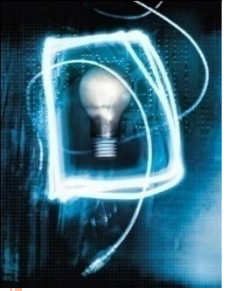
CoP (Communities of Practice)



Characteristics of Knowledge

- Explicitness
  - Explicitness refers to the extent to which knowledge exists in an explicit form (as opposed to a tacit form).

- Codifiability
  - Codifiability reflects the extent to which knowledge can be articulated or codified (i.e., made explicit) …
    - even if the resulting codified (explicit) knowledge might be difficult to teach to another individual …
    - e.g., it's hard to teach the explicit knowledge of how to fix PC problems.

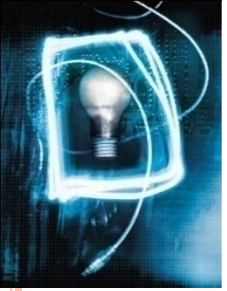


Characteristics of Knowledge

- Teachability
  - Teachability reflects the extent to which the knowledge can be taught to other individuals (e.g., through training…)
  - even if the taught knowledge might remain in tacit form …

  e.g., it's relatively feasible to teach the tacit knowledge of how to play basketball.

- Knowledge Specificity
  - Specificity refers to the extent to which knowledge is specific (as opposed to general)



Illustrations of the Different Types of Knowledge

		General	Contextually Specific	Technically Specific
Declarative	Explicit	A book describing factors to consider when deciding whether to buy a company's stock. This may include price to earnings ratio, dividends	A company document identifying the circumstances under which a consultant team's manager should consider replacing a team member who is having problems with the project.	A manual describing the factors to consider in configuring a computer so as to achieve performance specifications
	Tacit	Knowledge of the major factors to consider when deciding whether to buy a company's stock.	A human relations manager's knowledge of factors to consider in motivating an employee in a particular company.	A technician's knowledge of symptoms to look for in trying to repair a faulty television set.
Procedural	Explicit	A book describing steps to take in deciding whether to buy a company's stock.	A company document identifying the sequence of actions a consultant team's manager should take when requesting senior management to replace a team member having problems with the project.	A manual describing how to change the operating system setting on a computer so as to achieve desired performance changes.
	Tacit	Basic knowledge of the steps to take in deciding whether to buy a company's stock.	A human relations manager's knowledge of steps to take in motivating an employee in a particular company.	A technician's knowledge of the sequence of steps to perform in repairing a television set.