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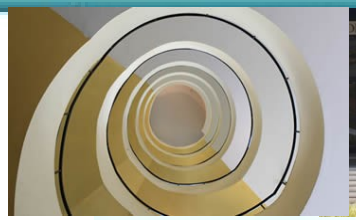




Chapter 2

Understanding Knowledge

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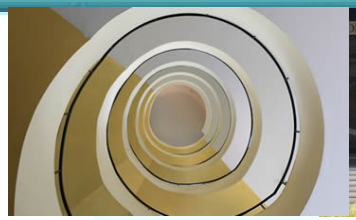
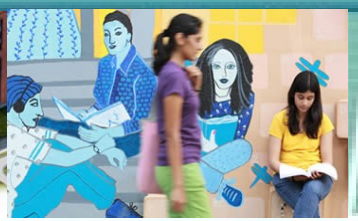




Overview

- Definitions
- Cognition
- Expert Knowledge
- Human Thinking and Learning
- Implications for Management

Definitions

- Knowledge : Understanding gained through experience or study “know-how”
- Intelligence : Capacity to acquire and apply knowledge; thinking and reasoning; ability to understand and use language
- Memory : Ability to store and retrieve relevant experience at will; part of intelligence

Definitions

- Learning: Knowledge acquired by instruction or study; consequence of intelligent problem solving
- Experience : Relates to what we've done and to knowledge; experience leads to expertise
- Common Sense: Unreflective opinions of ordinary people
- Heuristic : A rule of thumb based on years of experience

Cognition

- The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses.

Data, Information and Knowledge

- Data: Unorganized and unprocessed facts; static; a set of discrete facts about events
- Information: Aggregation of data that makes decision making easier
- Knowledge is derived from information in the same way information is derived from data; it is a person's range of information

Data, Information and Knowledge

- **Data** is a set of discrete facts about events
- **Information** becomes knowledge with questions like “what implications does this information have for my final decision?”
- **Knowledge** is understanding of information based on its perceived importance
- **Knowledge**, not information, can lead to a competitive advantage in business

Types of Knowledge

- Shallow and deep
  - Shallow knowledge indicates minimal understanding of the problem area
  - Deep knowledge is the complete understanding of the problem area
- Explicit and tacit
- Procedural versus Episodical
- Chunking knowledge
  - Knowledge is stored in an expert's long-range memory as chunks.
  - Knowledge chunking enables experts to optimize their memory capacity and process information quickly

Knowledge as Know-How

- Know-how distinguishes an expert from a novice
- Experts represent their know-how in terms of heuristics, based on experience
  - Heuristics – rules of thumb based on experience – empirical knowledge
- Know-how is not book knowledge; it is practical experience

Reasoning and Heuristics

Humans reason in a variety of ways:

- *Reasoning by Analogy*: relating one concept to another
- *Formal Reasoning*: using deductive or inductive methods
- *Case-based Reasoning*: reasoning from relevant past cases. A case is knowledge at an operational level.

Deductive and inductive reasoning

- *Deductive reasoning:*
  - Exact reasoning. It deals with exact facts and exact conclusions
  - Takes known principles and applies them to instances
  - Generate new knowledge from previously specified knowledge.

- *Inductive reasoning:*
  - Reasoning from a set of facts or individual cases to a general conclusion – from specific examples to general rules

Common Sense as Knowledge

- Another type of knowledge that all human beings possess in varying forms and varying amounts
- Collection of personal experiences and facts acquired over time
- A knowledge form that is taken for granted
- Extensively used by a human expert

From Procedural to Episodic Knowledge

- Shallow
- Deep

- Knowledge

Procedural Knowledge

Knowledge of how to do a task that is essentially motor in nature; the same knowledge is used over and over again.

Declarative Knowledge

Surface-type information that is available in short-term memory and easily verbalized; useful in early stages of knowledge capture but less so in later stages.

Semantic Knowledge

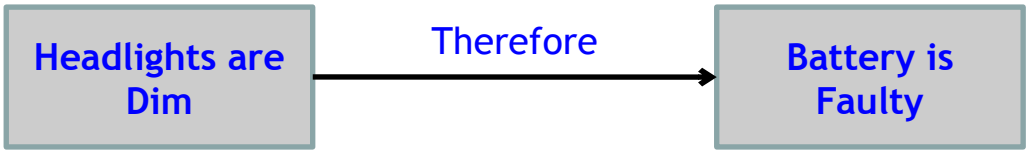
Hierarchically organized knowledge of concepts, facts, and relationships among facts.

Episodic Knowledge

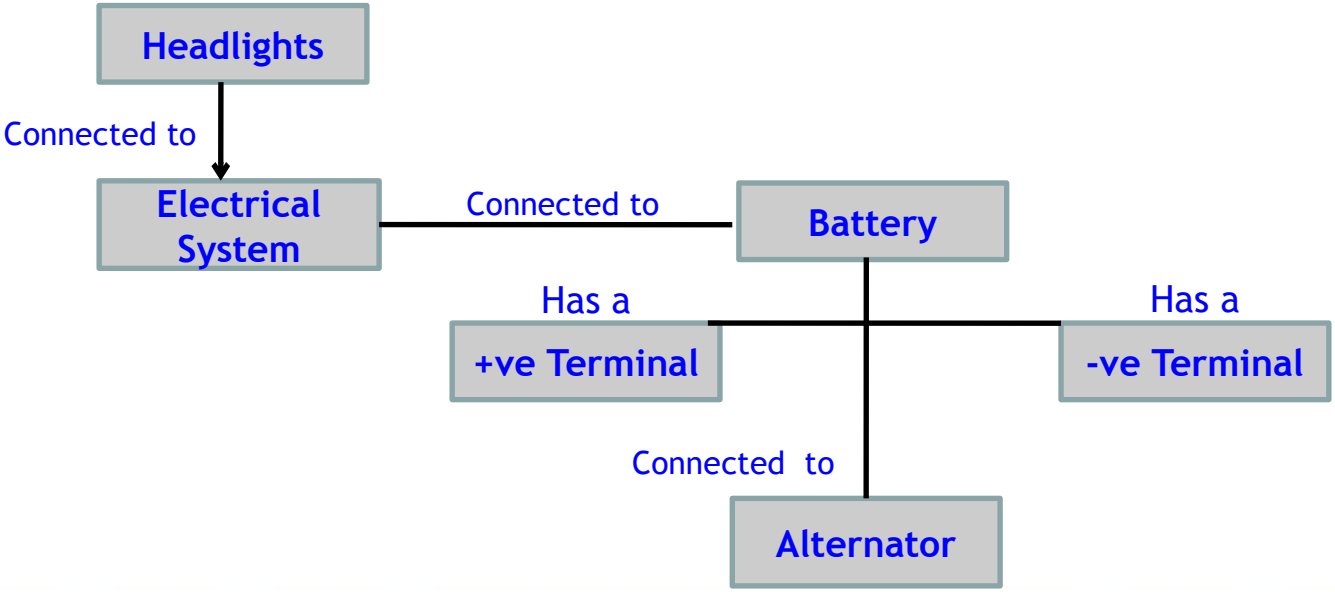
Knowledge that is organized by temporal spatial means, not by concepts or relations; experiential information that is chunked by episodes. This knowledge is highly compiled and autobiographical and is not easy to extract or capture.

Types of Knowledge : Examples

Declarative Knowledge



Semantic Knowledge



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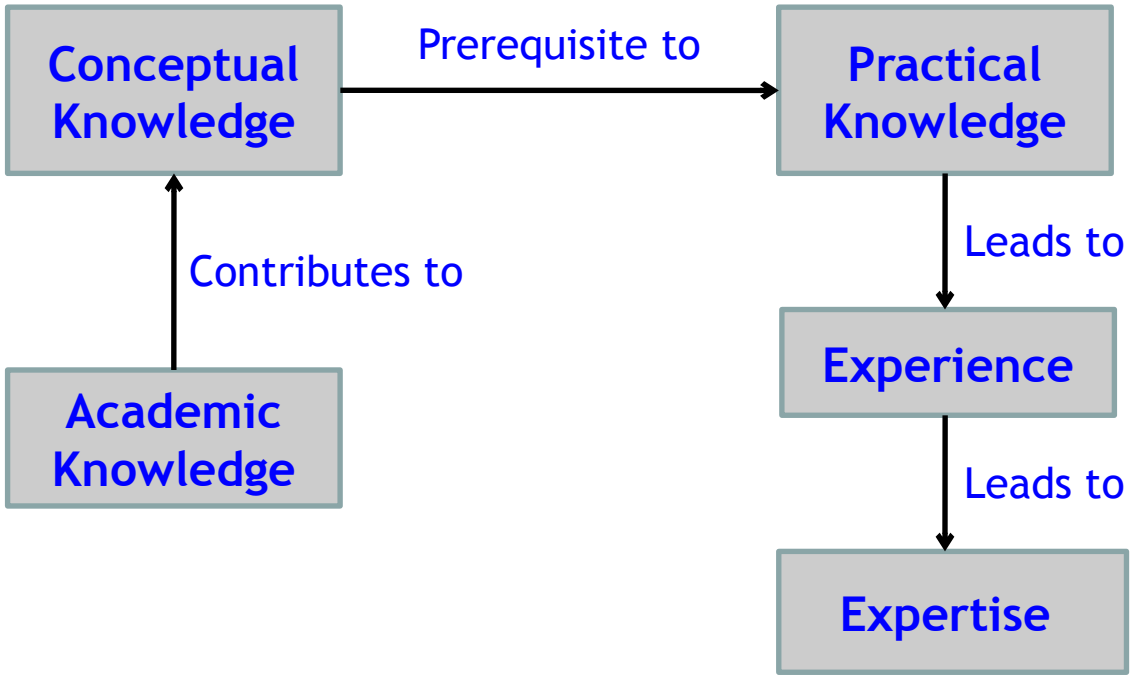
Explicit and Tacit Knowledge

- ***Explicit*** knowledge: knowledge codified and digitized in books, documents, reports, memos, etc.
- ***Tacit*** knowledge: knowledge embedded in the human mind through experience and jobs
- Tacit and explicit knowledge have been expressed in terms of knowing-how and knowing-that, respectively
- Understanding what knowledge is makes it easier to understand that knowledge hoarding is basic to human nature

Knowledge As An Attribute of Expertise

- An expert in a specialized area masters the requisite knowledge
- The unique performance of a knowledgeable expert is clearly noticeable in decision-making quality
- Knowledgeable experts are more selective in the information they acquire
- Experts are beneficiaries of the knowledge that comes from experience
- Academic knowledge contributes to conceptual knowledge - a prerequisite for practical knowledge

Knowledge As An Attribute of Expertise



Human Learning

Learning occurs in one of three ways:

- Learning by experience: a function of time and talent
- Learning by example: more efficient than learning by experience
- Learning by discovery: undirected approach in which humans explore a problem area with no advance knowledge of what their objective is.

Question for discussion

- What type of knowledge is used in each of these activities?
  - tying a shoelace
  - debugging a computer program
  - baking a pie
  - replacing a car's flat tire
  - negotiating peace with a hostile country
  - driving in congested traffic

Question for discussion

- What type of knowledge is used in each of these activities?
  - tying a shoelace – **procedural**
  - debugging a computer program - **semantic**
  - baking a pie - **procedural**
  - replacing a car's flat tire - **procedural**
  - negotiating peace with a hostile country - **Semantic**
  - driving in congested traffic - **Episodic**

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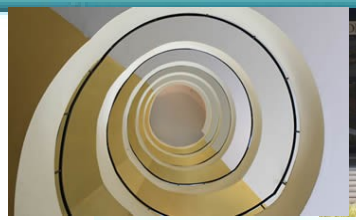




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