Expertise Management

an human-oriented, brain-inspired approach

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Introduction

Knowledge Management (KM) comprises a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences.


Know how: Expert skill, information, or body of knowledge that (1) imparts an ability to cause a desired result, (2) is not readily available, and is (3) outside the public domain.

Source: BusinessDictionary.com: know how

The "purpose" of human memory is to use past events to guide future actions: the basic idea of the Memory Prediction Framework

Short term/working memory
- Reasoning, decision making, 7 ± 2 slots

Long term memory
- Explicit/declarative memory (knowing what)
  - Semantic memory (concepts & facts), episodic memory
- Implicit memory (knowing how)
  - Skills, tasks, conditioning

We want to capture both knowing what and knowing how knowledge
Managing expertise

Soft System Methodology
• System theory
• Action research

Basic philosophy
• We are living in a complex society with “messy” situations that can be improved somehow
• People want to act purposefully according to their worldviews
• Approach
  • First, explicate these individual worldviews
  • Next, discuss and debate
  • Finally, take action to improve a situation

Expertise Management Method
• In search of (not yet discovered) good and bad practices, by valuing and sharing insights
• In essence, this is a group learning process
Expertise Management Ontology (EM\textsubscript{ont})

- Mimicking long-term memory
- It is no expert system:
  - it is up to the users to reason about the captured knowledge (working and short term memory functions)
  - The process of sharing and valuating expertise – i.e., group learning – is grounded in SSM (transferring expertise to long term memory)

- Features:
  - Capturing both “knowing that” and “knowing how” knowledge
  - Flexible building block approach
  - Making use of standards:
    - User Requirement Notation (URN)
    - Simple Knowledge Organization System (SKOS)
Conceptual model: CTF blocks

- **Control (C)**: metacognition/reflection
  - controlling and managing the difference between goal and outcome
- **Transformation (T)**: added value
  - resource: secondary process
- **Facilitation (F)**: output
  - Goal
    - Subgoal
    - Subgoal
    - Subgoal
  - contributes
- **Input**: declarative knowledge (knowing that)
- **Output**: procedural knowledge (knowing how)
- **Resources**: men & machines

Goal contributes to controlling and managing the difference between goal and outcome.
Contexts
(based on User Requirement Notation)

- Knowledge is context-dependent
- What is in a context?
  - The worldview of an actor
  - Beliefs (starting conditions)
  - Goals
  - Activities for achieving goals
  - Relationships: contributes, depends, decomposes.
Cognitive coherence

• Thagard proposes that many cognitive functions, including perception, analogy, explanation, decision-making, planning etc., can be understood as a form of (maximum) coherence computation.

• The model posits that coherence operates over a set of representational elements (e.g., beliefs, goals, emotions, etc.) which can either fit together (cohere) or resist fitting together (incohere)
Practices and experiences

From practice to experience: reducing the degrees of freedom
Concept maps

- A concept map is a diagram showing the relationships among concepts. It is a graphical tool for organizing and representing knowledge:
  - Provides insight in a domain (very useful in education)
  - First step in formalizing a domain (ontology building)
- Visual Understanding Environment (VUE) (vue.tufts.edu)
Semantic Wiki

- Wiki’s are well suited for dissemination
  - User generated, moderated articles
  - Articles are connected through static links
  - Easy to use

- Wiki’s are great, but it can be even greater: semantic Wiki:
  - Articles annotated with properties
  - Other articles may contain query's based on properties: dynamic links, always up-to-date
  - Querying the semantic-web with Sparql

→ A semantic Wiki makes information and expertise accessible in a structured way

- Take a look at: [www.zeeweringenwiki.nl](http://www.zeeweringenwiki.nl)