IT4120-Knowledge Management

Knowledge Capturing Techniques

Lecture 6

Jayantha Amararachchi
Senior Lecturer(HG)

Overview (capturing techniques)

- On-site Observation (*Action Protocol*)
- Brainstorming (*Conventional & Electronic*)
- Consensus Decision Making
- Nominal Group Technique
- Delphi Method
- Repertory Grid
- Concept Mapping
- Blackboarding

What is Knowledge Capture?

There are many definitions;

- The “transfer of problem-solving expertise from some knowledge source to a repository or a program”
- The “process in which Knowledge Management System developers discover the knowledge that company experts use to perform the task of interest”

But in this course, we define;

- Knowledge capture as “a process by which the expert’s thoughts and experiences are captured”. It is a sort of “mind automation”.

On-Site Observation

- Process of observing, interpreting, and recording expert's problem-solving behavior as it takes place
- Places the knowledge developer closer to the actual steps and procedures used by the experts
- Problems:
  - Some experts do not like to be observed
  - Accuracy or completeness of captured knowledge weakened by *time gap* between observation and recording

Brainstorming

- An unstructured, consensus-based approach to generating ideas about a problem
- Suitable for multiple experts
- All possible solutions considered equally
- Emphasis is on the frequency of responses during the session
- Conclude by idea evaluation

Role of Knowledge Developer in Brainstorming Session

- Introduce and coordinate the brainstorming session
- Give experts a problem to consider
- Prompt experts to generate ideas
- Watch for signs of convergence
- Call for a vote to reach agreement

Electronic Brainstorming

- **Computer-aided approach to brainstorming**
- Promote instant exchange of ideas between experts
- Require a pre-session plan to identify objectives and structure of the agenda
- Anonymity reduces effects of shyness, etc.
- Shorter meeting with concise recommendations

Consensus Decision Making

- **As a tool, it follows brainstorming**
- Experts are asked to vote on the alternate solutions they generated
- Procedure should ensure fairness in the way experts arrive at a consensus
- Round 1;each expert has 3 votes, 1 vote per option and max of 3 options. In round 2 only 2 votes and round 3 only 1 vote.
- Problems:
  - **Can be tedious and take hours**
  - **Every solution carries the same weight (rigidity of the process)**

Nominal Group Technique (NGT)

- An idea writing technique
- A link between brainstorming and consensus decision making
- A structured approach to clarify ideas and their meanings
- The end result is a written report
- Achieve group goals by writing rather than verbal discussion

NGT Steps

- Divide the people present into small groups of 5 or 6 members, preferably seated around a table.
- State an open-ended question (" What are some ways we could encourage participants to a car pool?").
- Have each Person spend several minutes in silence individually brainstorming all the possible ideas and jot these ideas down.
- Have the groups, collect the ideas by sharing them round-robin fashion (one response per person each time), while all are recorded in key term, No criticism is allowed, but clarification in response to questions is encouraged.
- Have each person evaluate the ideas individually and anonymously vote for the best ones.
- A group report is prepared, showing the ideas receiving the most points.
- Allow time for brief group presentations on their solutions

NGT Steps…

- Given a problem and the alternate solutions, each expert is asked to list their pros and cons
- A list of these pros and cons are compiled
- Given the list, each expert is asked to rank them on basis of their priorities
- Knowledge developer lead a discussion on the relative ranks in hope of achieving convergence
- Choose the “best” solution from the alternatives

NGT (Advantages)

- Effective in minimizing differences in status among multiple experts
- Each expert has an equal chance to express ideas in parallel with other experts in the group
- With discussion proceeds in a sequential order, which can be more efficient and productive

NGT (Drawbacks)

- Technique can be time consuming
- Could promote impatience among experts who must listen to discussions with other experts
- With multiple experts sharing expertise, a cause of difficulty in adopting the best solution

Delphi Method

- **A survey of experts**
- Allows experts to deal systematically with a complex problem or task
- A series of questionnaires developed to pool experts' responses in solving a difficult problem
- Each expert's contributions shared with rest of experts by using results of one questionnaire to construct the next questionnaire

Delphi Steps

1. Formation of a team to undertake and monitor a Delphi on a given subject.
2. Selection of one or more panels to participate in the exercise. normally, the panelists are experts in the area to be investigated.
3. Development of the first round Delphi questionnaire
4. Testing the questionnaire for proper wording (e.g., ambiguities, vagueness)
5. Transmission of the first questionnaires to the panelists
6. Analysis of the first-round responses
7. Preparation of the second-round questionnaires (and possible testing)
8. Transmission of the second-round questionnaires to the panelists
9. Analysis of the second-round responses (Steps 7 to 9 are reiterated if desired or necessary to achieve stability in the results.)
10. Preparation of a report by the analysis team to present the conclusions of the exercise

Delphi Method (Pros and Cons)

Pros

- Anonymous response
- Controlled feedback
- Statistical group response

Cons

- Poorly designed questionnaire can be ineffective in capturing the complexity of the problem domain

The Repertory Grid

- Essentially matrix-based although it is more complex than simply filling-in a matrix of elements
- An expert conceptualizes the problem using his or her own model
- Grid used to facilitate the capture and evaluation of the expert's model
- A representation of the experts' reasoning about a particular problem

What is a repertory grid

A repertory grid is a representation of a person's (or expert's) view of a particular problem. It is a two-way classification of a set of elements based on a set of constructs.

Example of a repertory grid for staff appraisal:

intelligent	L1	1	1	4	5	3	3	5	2	3	R1	dim
willing	L2	1	2	4	5	1	1	4	3	1	R2	unwilling
new boy	L3	1	2	3	5	4	4	4	1	4	R3	old sweats
little supervision reqd	L4	3	1	4	5	2	1	5	2	2	R4	need supervisio
motivated	L5	1	1	4	5	2	2	5	3	3	R5	less motivated
reliable	L6	3	2	2	5	1	1	5	1	2	R6	not so reliable
mild	L7	3	4	5	2	2	3	1	5	4	R7	abrasive
ideas men	L8	1	1	5	4	2	3	1	3	4	R8	staid
		Dick	Liz	Bob	Paul	Ann	Don	Mary	Ruth	Rob		

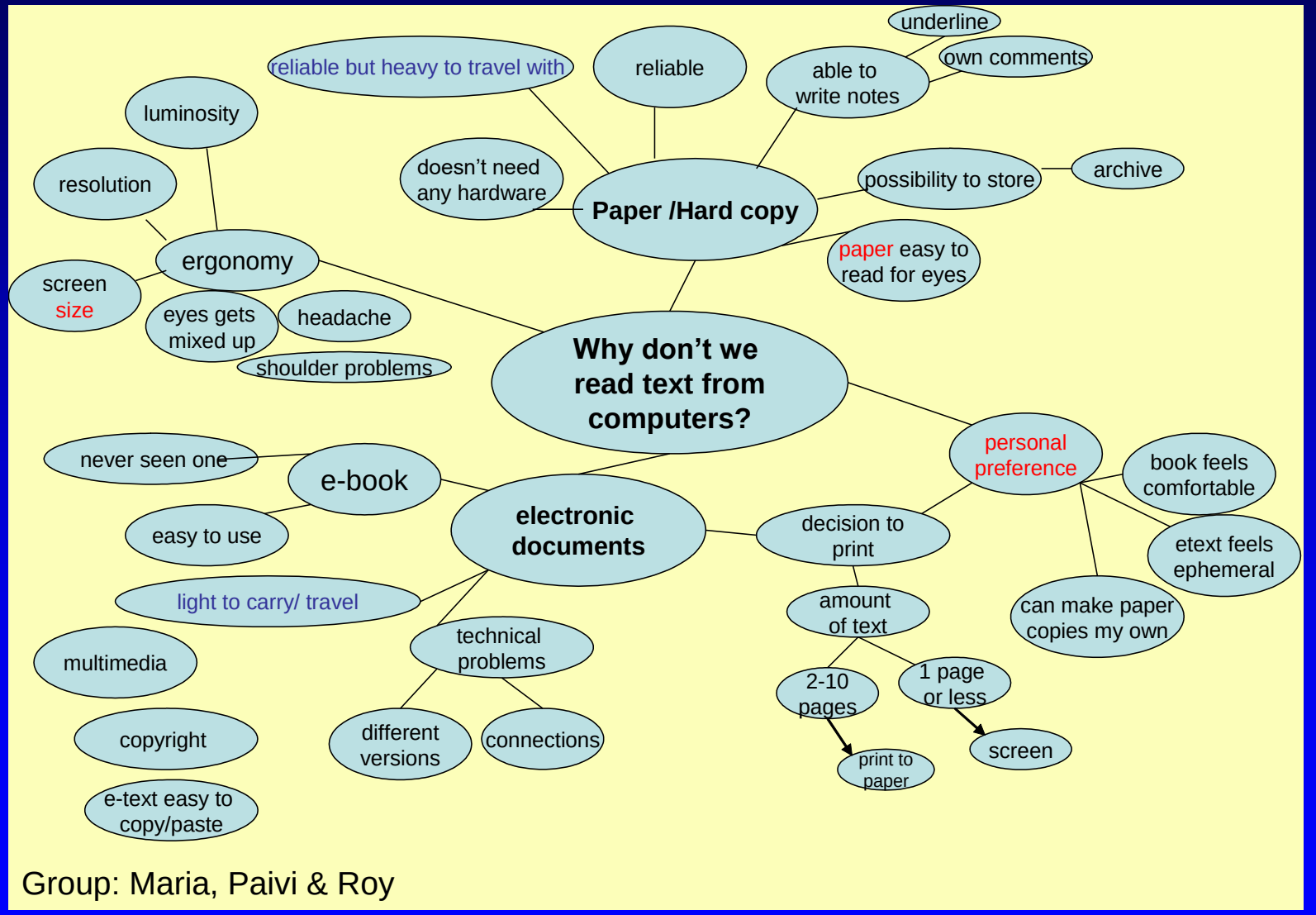
The Repertory Grid (Pros and Cons)

- Benefit: may prompt the expert to think more concretely about the problem and how to solve it.
- Drawback: difficult to manage when large grids are accompanied by complex details
- Because of complexity and manageability, the tool is normally used in the early stages of knowledge capture

Concept Mapping

- A network of concepts, consisting of nodes and links
- *concept mapping is a structured process, focused on a topic or construct of interest, involving input from one or more participants, that produces an interpretable pictorial view (concept map) of their ideas, concepts and how these are interrelated*
- A node represents a concept and a link represents the relationship between concepts.
- An effective approach for:
  - design a complex structure (like Web sites)
  - generate or communicate ideas (e.g., during brainstorming)
  - diagnose

Concept map example



Group: Maria, Paivi & Roy

Black boarding (Groupware)

- Participants are assumed experts with unique experience
- Each expert has equal chance to contribute to the solution via the blackboard
- Process continues until the problem has been solved

Black boarding (Characteristics)

- Participants share a common protocol for interaction
- Organized participation
- Iterative approach to problem solving
- Flexible representation of information
- Efficient storage and location of information

Summary

- Knowledge Capture is the process of recording our knowledge. It is also called "knowledge representation". It includes both structured and unstructured knowledge.
- To capture quality knowledge, you need to: determine best sources, elicit heuristics, represent, store the results and test their validity.