

Capturing the Tacit Knowledge

Brainstorming

1) What is Brain storming?

- It is an unstructured approach towards generating ideas about creative solution of a problem which involves multiple experts in a session.
- In this case, questions can be raised for clarification, but no evaluations are done at the spot.
- Similarities (that emerge through opinions) are usually grouped together logically and evaluated by asking some questions like:
 - What benefits are to be gained if a particular idea is followed.
 - What specific problems that idea can possibly solve.
 - What new problems can arise through this.

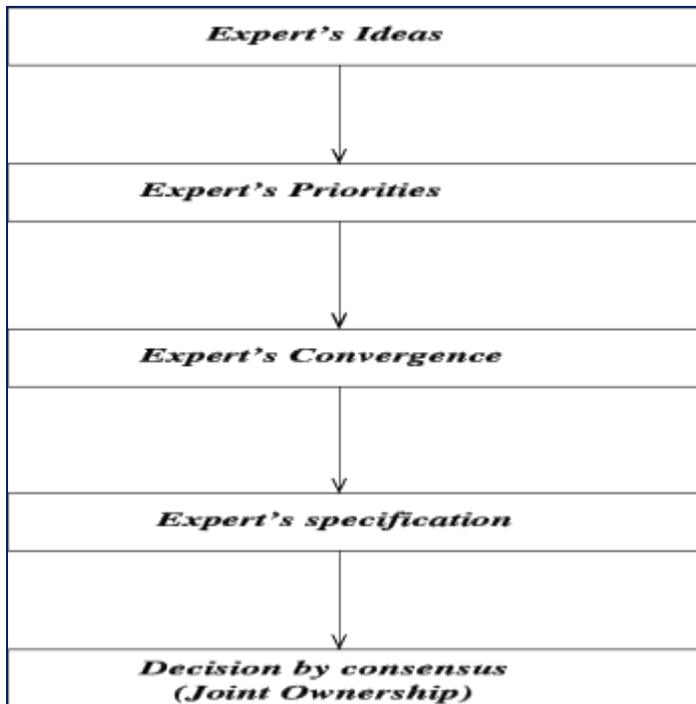
The general procedure for conducting a brainstorming session:

- Introducing the session.
- Presenting the problem to the experts.
- Prompting the experts to generate ideas.
- Looking for signs of possible convergence.
- If the experts are unable to agree on a specific solution, they knowledge developer may call for a vote/consensus.

Electronic Brainstorming

- Is is a computer-aided approach for dealing with multiple experts.
- It usually begins with a pre-session plan which identifies objectives and structures the agenda, which is then presented to the experts for approval.
- During the session, each expert sits on a PC and get themselves engaged in a predefined approach towards resolving an issue, and then generates ideas.
- This allows experts to present their opinions through their PC's without having to wait for their turn.
- Usually the comments/suggestions are displayed electronically on a large screen without identifying the source.
- This approach protects the introvert experts and prevents tagging comments to individuals.

- The benefit includes improved communication, effective discussion regarding sensitive issues, and closes the meeting with concise recommendations for necessary action (refer to Figure 5.1 for the sequence of steps).
- This eventually leads to convergence of ideas and helps to set final specifications.
- The result is usually the joint ownership of the solution.



Delphi Method

- It is a survey of experts where a series of questionnaires are used to pool the experts' responses for solving a specific problem.
- Each experts' contributions are shared with the rest of the experts by using the results from each questionnaire to construct the next questionnaire.

Concept Mapping

- It is a network of concepts consisting of nodes and links.
- A node represents a concept, and a link represents the relationship between concepts (refer to Figure 6.5 in page 172 of your textbook).

- Concept mapping is designed to transform new concepts/propositions into the existing cognitive structures related to knowledge capture.
- It is a structured conceptualization.
- It is an effective way for a group to function without losing their individuality.
- Concept mapping can be done for several reasons:
 - To design complex structures.
 - To generate ideas.
 - To communicate ideas.
 - To diagnose misunderstanding.
- Six-step procedure for using a concept map as a tool:
 - Preparation.
 - Idea generation.
 - Statement structuring.
 - Representation.
 - Interpretation
 - Utilization.
- Similar to concept mapping, a *semantic net* is a collection of nodes linked together to form a net.
 - A knowledge developer can graphically represent descriptive/declarative knowledge through a net.
 - Each idea of interest is usually represented by a node linked by lines (called *arcs*) which shows relationships between nodes.
 - Fundamentally it is a network of concepts and relationships (refer to page 173 of your textbook for example).

Blackboarding

- In this case, the experts work together to solve a specific problem using the blackboard as their workspace.
- Each expert gets equal opportunity to contribute to the solution via the blackboard.
- It is assumed that all participants are experts, but they might have acquired their individual expertise in situations different from those of the other experts in the group.
- The process of blackboarding continues till the solution has been reached.
- Characteristics of blackboard system:
 - Diverse approaches to problem-solving.
 - Common language for interaction.
 - Efficient storage of information
 - Flexible representation of information.
 - Iterative approach to problem-solving.

- Organized participation.
- Components of blackboard system:
 - The Knowledge Source (KS): Each KS is an independent expert observing the status of the blackboard and trying to contribute a higher level partial solution based on the knowledge it has and how well such knowledge applies to the current blackboard state.
 - The Blackboard : It is a global memory structure, a database, or a repository that can store all partial solutions and other necessary data that are presently in various stages of completion.
 - A Control Mechanism: It coordinates the pattern and flow of the problem solution.
- The inference engine and the knowledge base are part of the blackboard system.
- This approach is useful in case of situations involving multiple expertise, diverse knowledge representations, or situations involving uncertain knowledge representation.