Selecting Creativity Techniques for Innovative Requirements Engineering

Per Pascal Grube, Klaus Schmid

{grube,schmid}@sse.uni-hildesheim.de

# Selecting Creativity Techniques for Innovative RE

Outline

- Why Requirements Engineering needs to be creative

- Availability of creativity techniques

- Giving the techniques a structure

- Using this structure for a selection

- Future work

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Motivation – Do we need creativity techniques in RE?

Ideal World	Real World	Off -the-shelf

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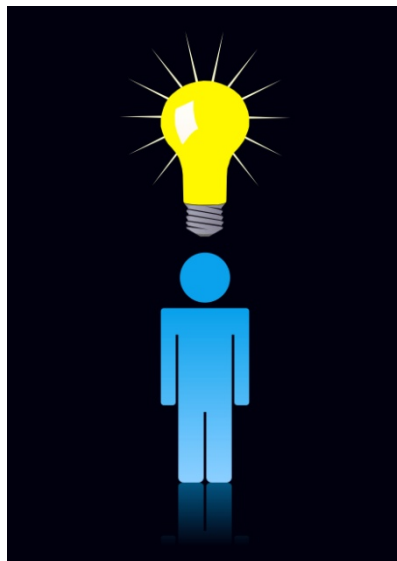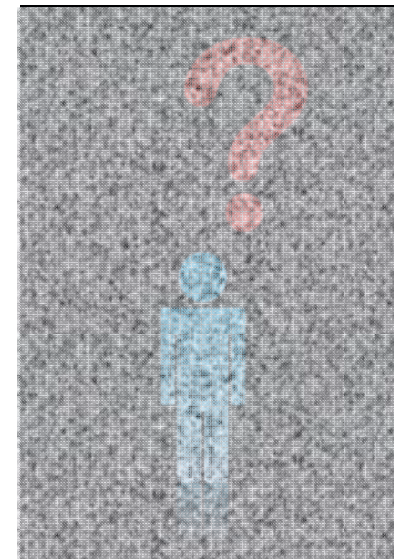
Creativity Techniques

Creativity Technique

- Developed since 1950's (Brainstorming)

- Currently ~200 different techniques

- Focused on different types of problems

    – New Ideas

    – Modify Ideas

    – Evaluate Ideas

- Focused on different users/groups

    – Place

    – Time

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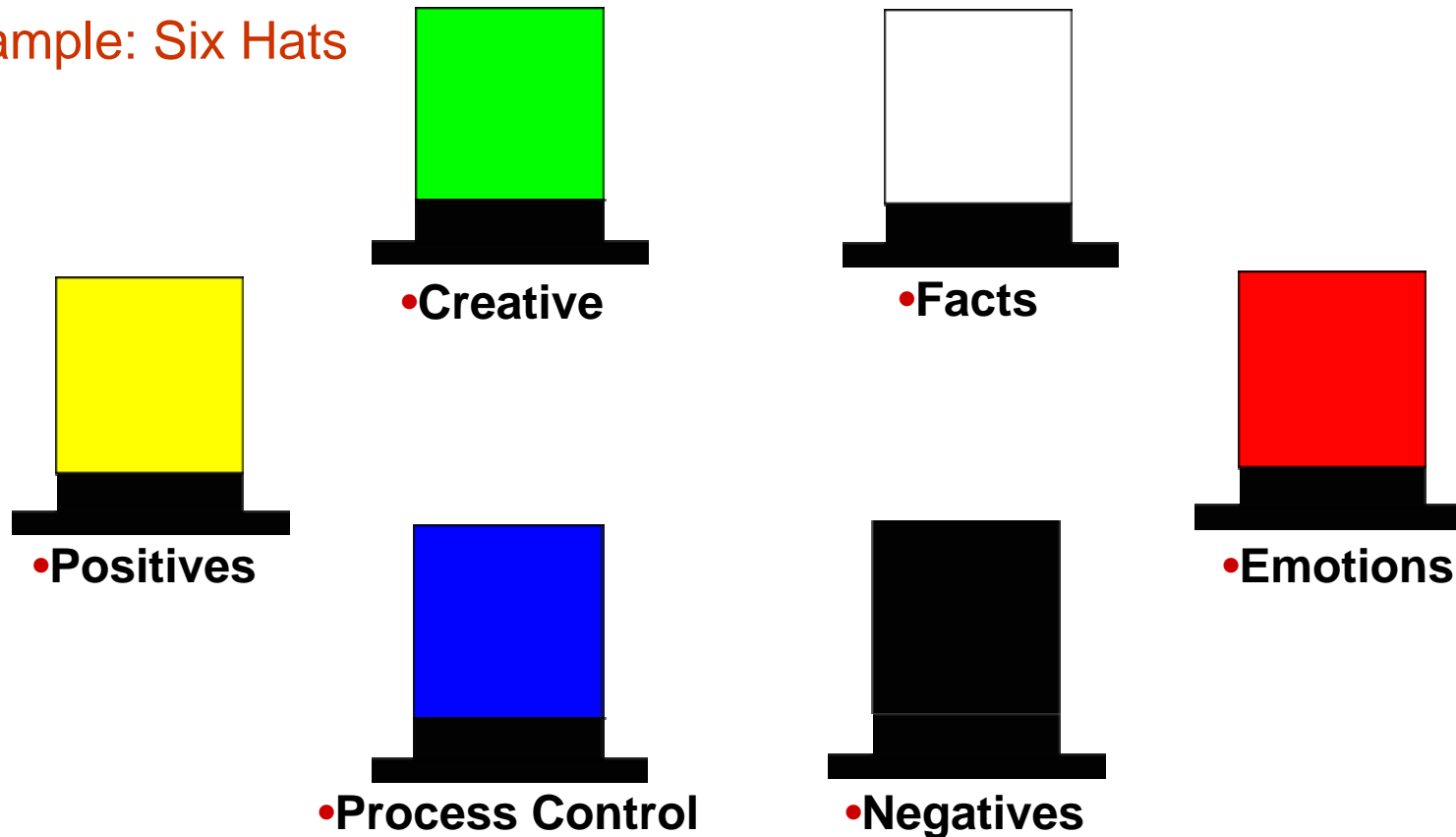
Creativity Techniques

Available Techniques

Advantages, Limitations and Unique Qualities /Algorithm of Inventive Problems Solving /Alternative Scenarios /Analogies /Analysis of Interactive Decision Areas (AIDA) Anonymous Voting Assumption Busting Assumption Surfacing Attribute Listing Backward Forward Planning Boundary Examination Boundary Relaxation Brain Sketching Brainstorming Brainwriting Brainwriting 6-3-5 Brainwriting Game Brainwriting Pool Browsing Brutethink Bug Listing Bullet Proofing Bunches of Bananas Card Story Boards Cartoon Story Board CATWOE Causal Mapping Charrette Cherry Split Chunking Circle of Opportunity Clarification Classic Brainstorming Collective Notebook (CNB) Comparison Tables Component Detailing Concepts Fan Consensus Mapping Constrained Brainwriting Contradiction Analysis Controlling Imagery Crawford Slip Writing Creative Problem Solving (CPS) Criteria for Idea-finding Potential Critical Path Diagrams (CPD) Decision Seminar Delphi Dialectical approaches Dimensional Analysis Disney Creativity Strategy DO IT Drawing Escape Thinking Essay Writing Estimate-Discuss-Estimate Exaggeration Excursions F-R-E-E-Writing Factors in Selling Ideas False Faces Fishbone Diagram Five W's and H Flow Charts Focus Groups Focusing Force-Field Analysis Force-Fit Game Free Association Fresh Eye Gallery Methode Gap Analysis Goal Orientation Greeting Cards Help-Hinder Heuristic Ideation Technique Hexagon Modeling Highlighting Idea Advocate Idea Box Idea Card Writing - Brainwriting Idea Final Result Imagery for Answering Questions Imagery Manipulation Imaginary Brainstorming Implementation Checklist Improved Nominal Group Technique Interpretive Structural Modeling Keep a Dream Diary Kepner and Trego Method KJ-Method Laddering Lateral Thinking Listing Listing Pros and Cons Metaplan Information Market Mind Mapping Morphological Analysis Morphological Forced Connections Multiple Redefinition NAF Negative Brainstorming NLP Nominal Group Technique Nominal-Interacting Technique Notebook Observer and Merged Viewpoints Osborn's Checklist Others Peoples Definition Others Peoples Viewpoints Paired Comparison Panel Consensus Paraphrasing Keywords Personal Balance-Sheet Phases of Integrated Problem Solving Pictures as Idea Triggers Pin Cards PMI(Plus, Minus, Interaction) Plan Do Check Act Plusses, Potentials and Concerns Potential-Problem Analysis (PPA) Preliminary Questions Problem-Centred Leadership Problem Inventory Analysis Problem Reversal Productive Thinking Model Progressive Hurdles Progression Revelation Provocation Q-Sort Quality Circles Random Stimuli Rawlinson Brainstorming Receptivity to Ideas Reframing Values Relational Words Relaxation Reversals Rolestorming SCAMMPERR SCAMPER Sculptures Search Conference Sequential-Attribute Matrix Seven-Step Model Similarities and Differences Simple Rating Methods Simplex Six Thinking Hats Slice and Dice Snowball Technique Soft Systems Method Stakeholders Analysis Sticking Dots Stimulus Analysis Story Writing Strategic Assumption Testing Strategic Choice Approach Strategic Management Process Strategic Options Development and Analysis (SODA) Successive Element Integration Super Group Super Heroes SWOT Analysis Synetics Systematic Inventive Thinking Systematized Direct Induction (SDI) Talking Pictures Technology Monitoring Think Tank Thrill TILMAG Transactional Planning Trigger Method Trigger Session TRIZ Tug of War Using Crazy Ideas Using Experts Value Brainstorming Value Engineering Visual Brainstorming Visualizing a Goal Who are you? Why Why Why Whishing Working with Dreams and Images

➤ Need to select appropriate ones

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Example: Six Hats

- **Creative**

- **Facts**

- **Positives**

- **Emotions**

- **Process Control**

- **Negatives**

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Techniques

Categorizing Techniques

Categorization to support creative process

- 3 main characteristics
  - Context
  - Operation Type
  - Activities

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Techniques

Context Factors

Characterization according to context factors

- Single/Group

- Data/Technique

- Physical Interaction

- Emotions

- Time

- Webusable

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Techniques

Operation type

Techniques support different operations

- Exploration

- Transformation

- Combination

- Validation

- Techniques can support multiple operations

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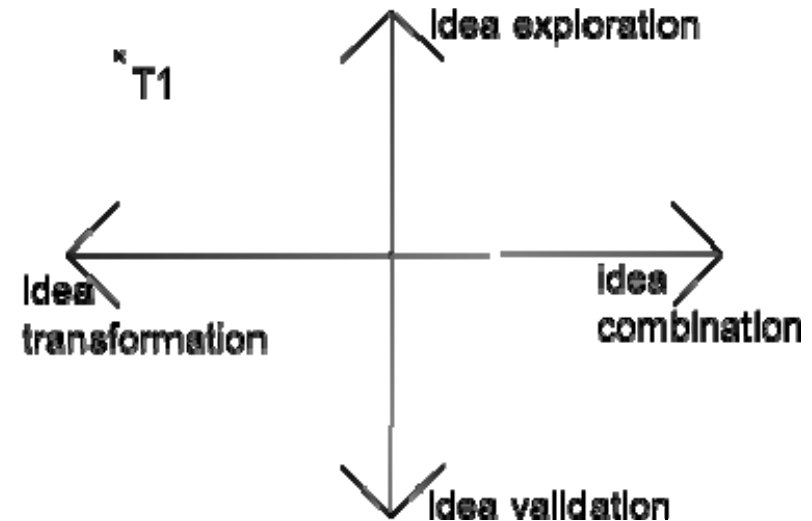
Techniques

Activities

Grouping techniques by their activities

- 6 groups
  - Brainstorming
  - Checklists
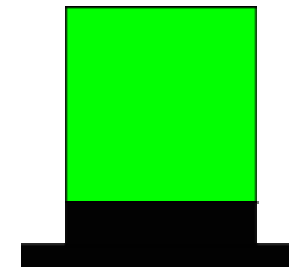 - Different Views
  - Structuring
  - Experts
  - Random Input

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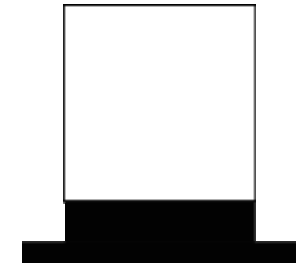
Techniques

Example: Six Hats

- Operation Type:
  - Exploration
  - Combination
  - Validation
- Activities
  - Differnt Views
- Context Factors
  - Physical: no
  - Webusable: yes
  - Time: no
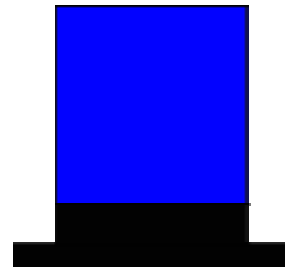 - Single/Group: sg
  - Data/Technique: d
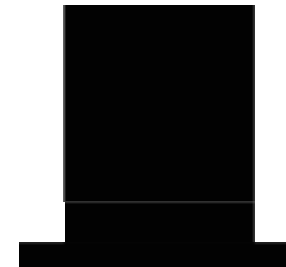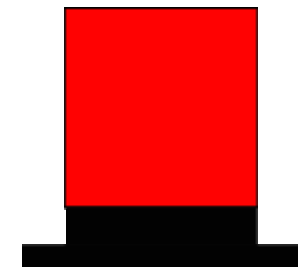 - Emotion: n
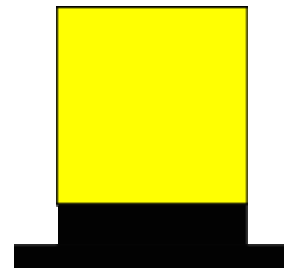
• **Positivesq**

• **Creative**

• **Facts**

• **Process Control**

• **Negatives**

• **Emotions**

Selecting Techniques

The need to select techniques

- List gives information, but
  - Still requires knowledge
  - Not very handy

- Automatic selection

- 2 Steps
  - Screen techniques
  - Select combinations

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Selecting techniques

Screening techniques

Filter out techniques which are unusable, because of

- The group of users
    - Individual/Group
    - Homogeneity Cultural background
    - Domain (bank, engineering, health care)
- Trust
- Distributed Geographic Location

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idSpace

Example: Screening techniques for idSpace

A webplatform for

- cooperative,

- distributed product innovation

- Techniques need to be webusable
  - 136 / 186 usable
  - 9 / 186 usable with reservations
- Techniques that support single and group use
  - 84 / 136 usable
- ➢ Removed 55% of the techniques

Selecting Techniques

Providing Subsets

Need to combine techniques to usable combinations

- Screening leaves to many techniques
- Creative process needs a combination that
  - Supports every operation type
  - Works together
  - Fits in time & place
  - Provides proper results
- Needs to be evaluated

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Current State

Work so far

- Characterization of Techniques

- Possibility to define subsets

- Providing scenarios to evelute the subsets

Future Work

Next steps to be done

- Integration of the data into the idSpace platform

- Evaluation of the selection methods