

Model-based elicitation

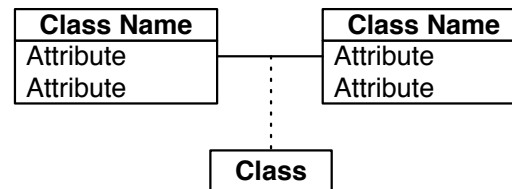
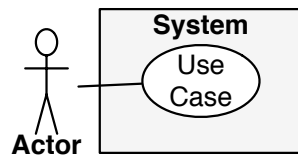
Idea: To re-express the requirements in a different language, which can raise new questions.

- Document studies
- Similar companies
- Norms
- Domain analysis
- Requirements taxonomies
- *Modelling* *Model-based*
- *Analysis patterns*
- *Mockups & prototyping*
- *Pilot experiments*
- Stakeholder analysis
- Questionnaires
- Interviews
- Observation
- Task Demo
- Ask suppliers
- Domain workshop
- Personas
- Systemic Thinking
- Brainstorm
- Creativity workshop

Models

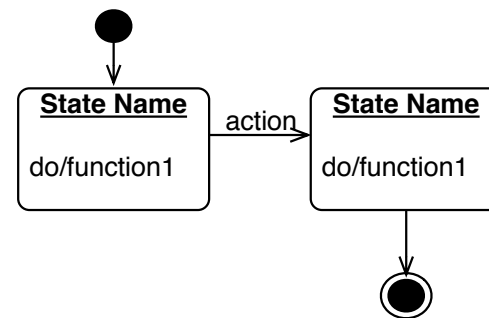
The act of re-expressing the owner's work or requirements as **models** in different languages often reveals “holes” in our understanding

- Ideally, models are simple enough that stakeholders are encouraged to modify them
- Models are useful in requirements documentation



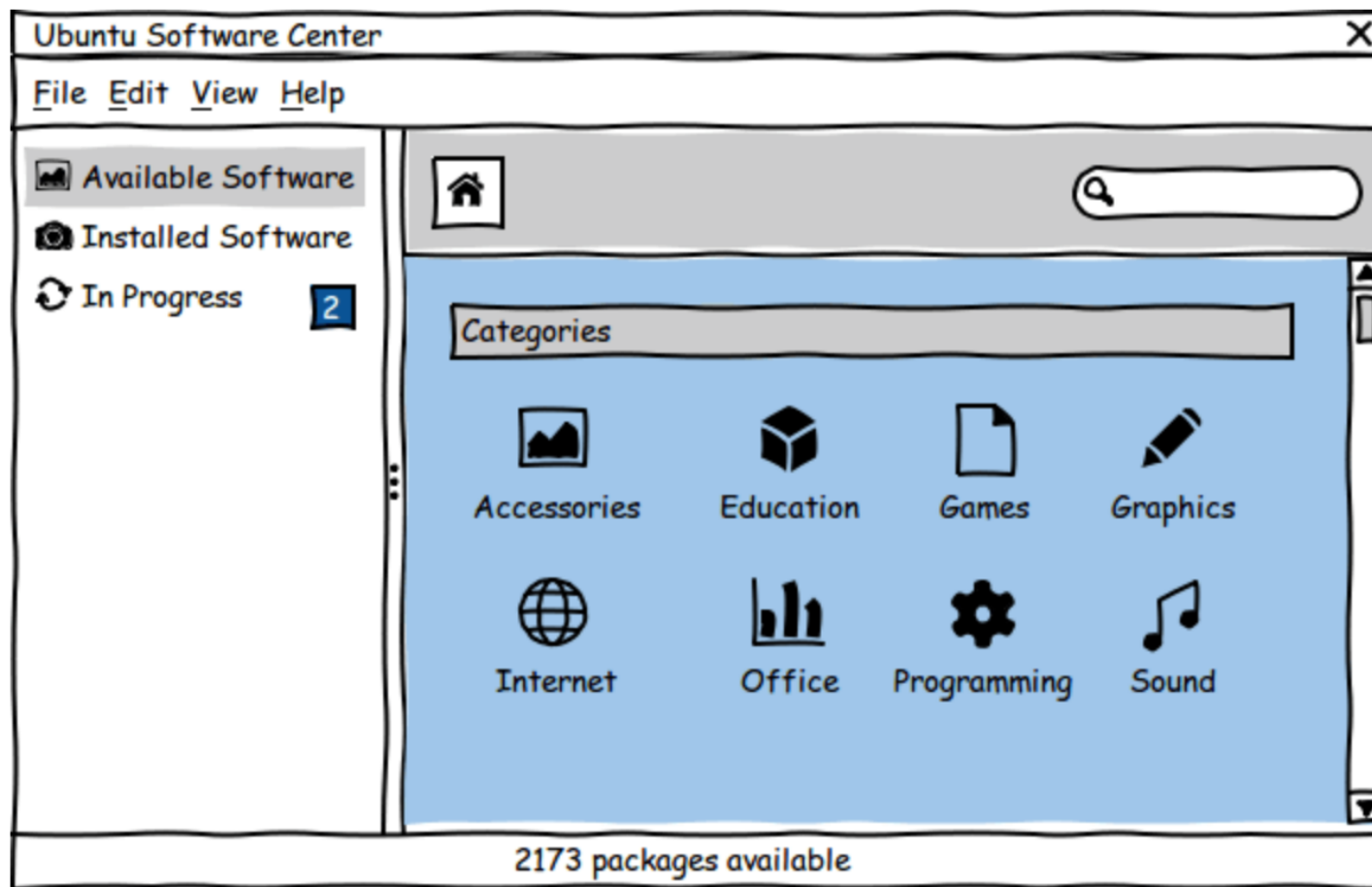
context Membership inv
self.transactions->collect(points)->sum = self.points

Display Available Numbers	ID: O12	Importance: D
Overview: Display all of the available phone numbers		
Inputs: requestor: Administrator		
Preconditions: requestor has authenticated, there is no data lock on phones (set of Phone)		
Modifies: NONE		
Postconditions: returns all num φ phones.phoneNumber; numbers are displayed in numerical order		
Exceptions: There is a data lock on phones, and error code "operation failed" is returned		
References: Meeting #3: R7		



Mockups and Prototypes

Sketch the essence of a solution, and use to bait stakeholders into providing new requirements details



Stakeholder-based elicitation

Idea: Acquire detailed information about the system-to-be that is problem specific or stakeholder specific.

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Stakeholder-based elicitation

“You have two ears and one mouth. I suggest that you use them in that proportion.”

—G. K. Chesterton

Analyze current users

- To understand the problem, analyze existing “system” if possible:
 - Questionnaires
 - Interviews
 - Observe current users/apprenticeship
- The goal is to find out:
 - What is used, what isn't, what's missing.
 - What works well, what doesn't.
 - How the system is used, how it was intended to be used, what new ways we want it to be used.

Questionnaires

Questionnaires are useful when information has to be gathered from a large number of people, particularly users.

- Closed questions (to gather opinions)
- Open questions (to gather suggestions)

Interviews

Interviews are useful for asking targeted, stakeholder-specific questions.

- Elicit stakeholder-specific ideas, opinions
- Elicit details that only the stakeholder can answer

Want to phrase questions as **open questions**, to elicit more details from the stakeholder

- who, what, when, where, ***why***

Good **listening skills** means focusing on what the stakeholder is actually saying; giving the stakeholder some time to articulate an answer

Interview Guidelines

- Set the interview in context
- Limit the duration of the interview (60-90 min) and stick to it
- Start with stakeholder background, goals
- Follow with use-case specific questions
 - Appropriate responses to business events
- Feedback your understanding of stakeholder's answers
 - Involve stakeholder in model building
 - Encourage stakeholder to change models
- Use the stakeholder's terminology
- Write down everything you are told
- Thank the stakeholders for their time

Common interviewing mistakes

- Not interviewing all of the right people.
- Asking direct questions too early.
- Interviewing one-at-a-time instead of in small groups.
- Assuming that stated needs are exactly correct.
- Letting one person dominate a group discussion

Ethnographic analysis

Ethnographic analysis is direct, first-hand observation of user behaviour

- An attempt to discover the social/human factors in a system.
- Studies have shown that work is often richer and more complex than suggested by simple system models derived by interviews alone.
- Can identify the used and critical existing features
- But focuses on existing solutions



© 2002 Michael Neugebauer

Apprenticeship

- **Apprenticing** is based on the idea of masters and apprentices
- The apprentice sits with the master craftsman (the user) to learn the job
 - By observation, asking questions, doing some of the job under the master's supervision.
- While working that the user can:
 - describe the task precisely
 - explain why the task is done this way
 - list the exceptions that can occur



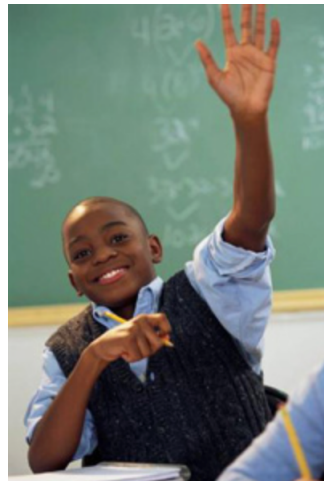
© 1940 Walt Disney

Personas

Personas are useful when real users are not available or are too numerous to interview them all.

- Important class of user, with unique needs and characteristics
- Include enough details (including a name!) to make the persona seem real to the team

Ken
(the keener)



Dudley
(the distracted)



Creativity-based elicitation

Idea: To **invent** undreamed-of requirements that bring about innovative change and gives competitive advantage.

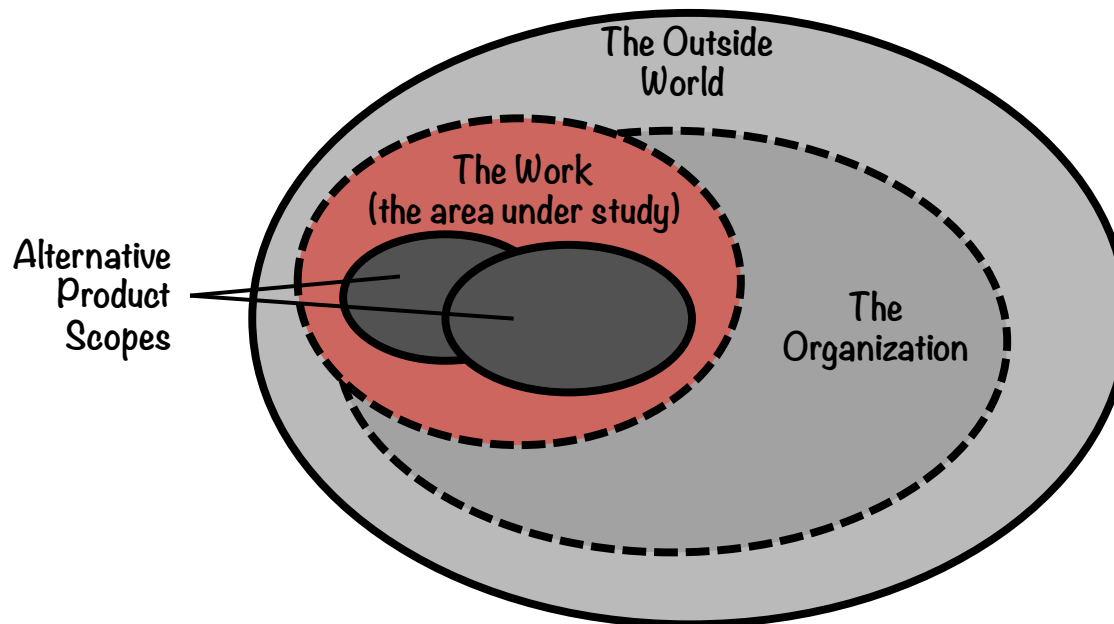
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Innovation

“Our job is to give the client, on time and on cost, not what he wants, but what he never dreamed he wanted; and when he gets it, he recognizes it as something that he wanted all the time.”

—Denys Lasdun, architect

Systemic Thinking



Robertson, Robertson, Mastering the Requirements Process, 2012, Figure 3.3.

Thinking systemically about the Work (and not just the future system)

Brainstorming

Brainstorming is a group creativity technique designed to generate a large number of **new** ideas

Goals:

- Want to hear ideas from everyone, especially unconventional ideas.
- Creativity to be encouraged

Part I — Idea Generation

- Goal is to generate as many ideas as possible.
 - **Quantity**, not quality, is goal at this stage
 - Look to combine or vary ideas already suggested
- Scribe writes down all ideas so that all can see them
e.g., whiteboard, paper taped to wall

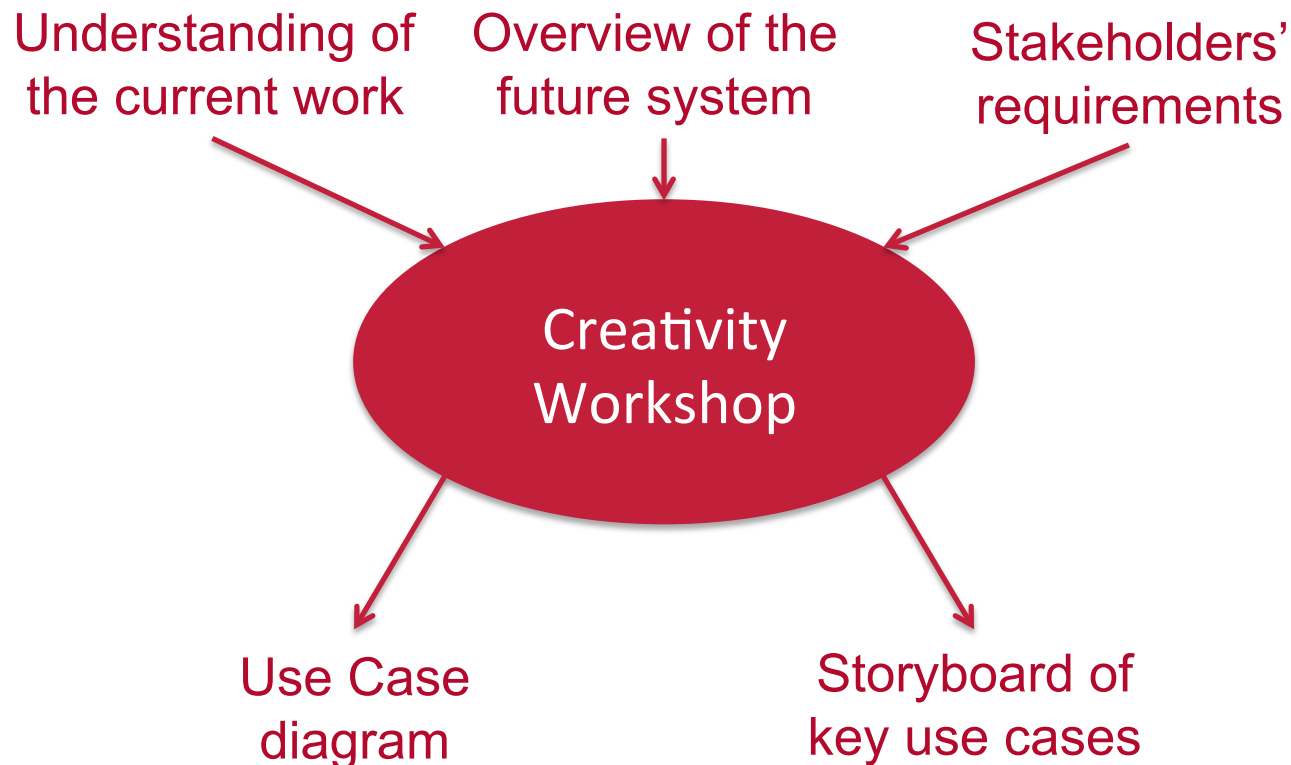
Part II — Assessment

As a separate activity, possibly involving a different set of stakeholders...

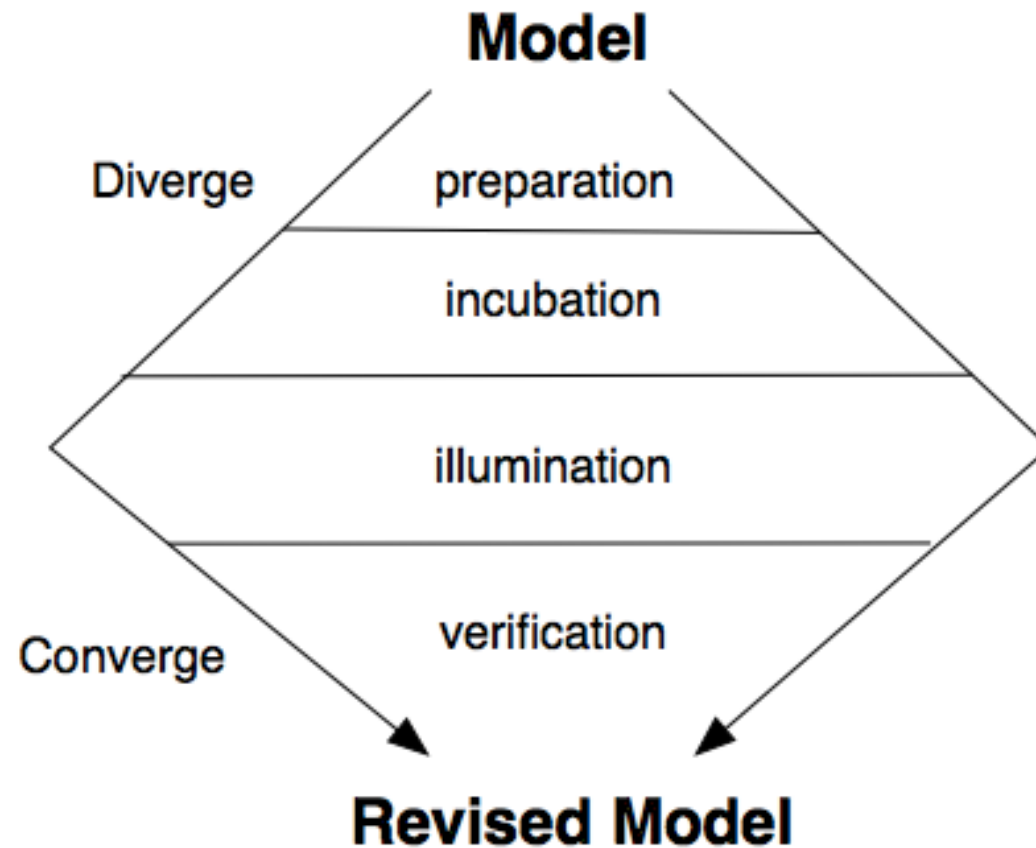
- Go over the list and explain ideas more carefully
 - Review, consolidate, combine, clarify, expand.
- Rank ideas and choose winners
- Be careful about time
 - Creative / technical meetings tend to lose focus after 90 min.
 - Take breaks or reconvene later.

Creativity Workshops

A risk-free space for creating and inventing news ideas – over and above the stakeholders' expressed requirements.



Creativity Workshops



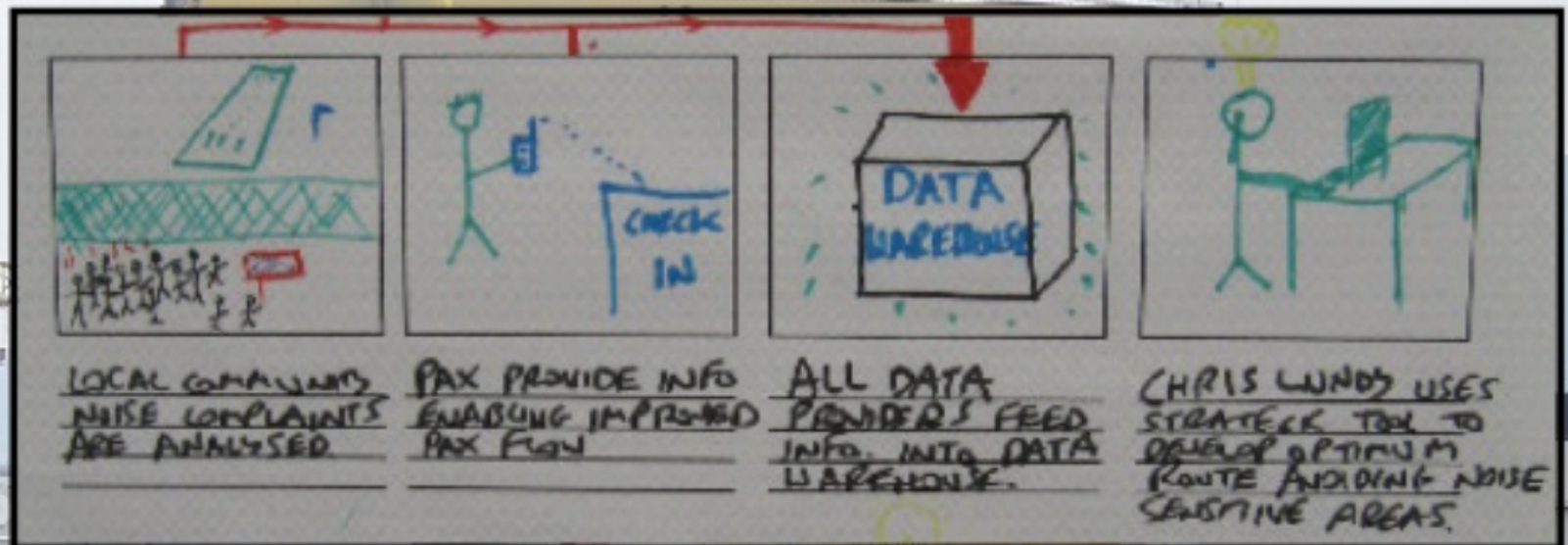
Adapted from N. Maiden and S. Robertson, "Integrating Creativity into Requirements Processes", International Requirements Engineering Conference, 2005.



A Real-World Example

Removed key constraint: weather variability

Steam catapults; glided approaches; weather-adapted approach routes



.. not what they wanted, but what they never dreamed they wanted..

Creativity Workshops

Creativity-based elicitation techniques include

- Open brainstorming
- Analogical reasoning: exploring analogies to a related problem
- Combining ideas
- Exploring new possibilities that result from relaxing identified constraints

Managing Expectations

Apple

- **Pixel Perfect Mockups**
- **10 to 3 to 1.** Apple designers start with 10 mockups for any product or feature, which they whittle to 3, refine those into one design
- **Paired Design Meetings.** Designers have two meetings each week.
 - *Crazy brainstorming*, where they let their imaginations run wild, with no constraints
 - *Production meeting*, work out how a crazy idea from the first meeting might work.
- **Designers have complete freedom.**

Summary

Elicitation is hard

- It's common to use a physically violent metaphor for elicitation, like **extracting** a painful tooth or **trawling** for tuna.
- It is through the acts of *discussing, analyzing, modelling, reviewing, negotiating over, inventing, synthesizing*, and *explicitly documenting* that the various stakeholders come to a mutual understanding and agreement about what the real requirements are (and are not).