Requirements Elicitation Techniques

Based on presentations by G. Mussbacher, G.V Bochmann, N. Niu, with material from: Lethbridge & Laganière, Chapter 7; Bruegge & Dutoit, Chapter 4; I. Alexander; Amyot 2008-2009; Somé 2008
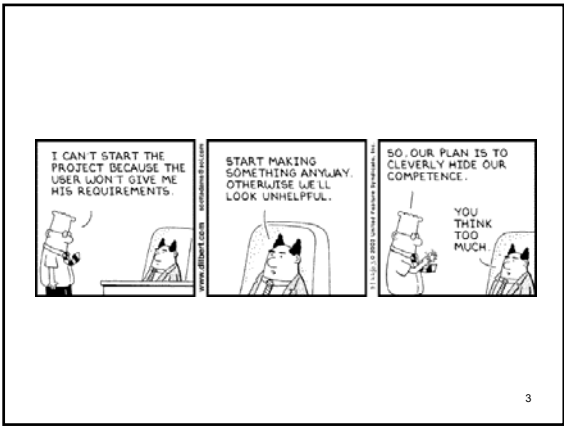
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Overview

Elicitation Techniques
- Analysis of Existing Systems
  - Documentation, Observation, and Ethnography
- Interviews
- Brainstorming
- Joint Application Design (JAD)
- Prototyping
- Use Cases

- When people talk, listen completely. Most people never listen.[1]

[1] Ernest Miller Hemingway (1899-1961)

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Elicitation Techniques

Elicitation techniques
- Stakeholder analysis
- Analysis of existing systems or documentation, background reading
- Discourse analysis
- Task observation, ethnography
- Questionnaires
- Interviewing
- Brainstorming
- Joint Application Design (JAD)
- Prototyping
- Pilot system
- Use cases and scenarios
- Risk analysis

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Comparison of Data-Gathering Techniques[1]

Technique	Good for	Kind of data	Plus	Minus
Questionnaires	Answering specific questions	Quantitative and qualitative data	Can reach many people with low resource	The design is crucial. Response rate may be low. Responses may not be what you want
Interviews	Exploring issues	Some quantitative but mostly qualitative data	Interviewer can guide interviewee. Encourages contact between developers and users	Time consuming. Artificial environment may intimidate interviewee
Focus groups and workshops	Collecting multiple viewpoints	Some quantitative but mostly qualitative data	Highlights areas of consensus and conflict. Encourages contact between developers and users	Possibility of dominant characters
Naturalistic observation	Understanding context of user activity	Qualitative	Observing actual work gives insight that other techniques cannot give	Very time consuming. Huge amounts of data
Studying documentation	Learning about procedures, regulations, and standards	Quantitative	No time commitment from users required	Day-to-day work will differ from documented procedures

[1] Preece, Rogers, and Sharp "Interaction Design: Beyond human-computer interaction", p214

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Analysis of Existing Systems

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Analysis of Existing Systems (1)

- Useful when building a new improved version of an existing system
- Important to know:
  - What is used, not used, or missing
  - What works well, what does not work
  - How the system is used (with frequency and importance) and it was supposed to be used, and how we would like to use it

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Analysis of Existing Systems (2)

Why analyze an existing system?
- Users may become disillusioned with new system or do not like the new system if it is too different or does not do what they want (risk of nostalgia for old system)
- To appropriately take into account real usage patterns, human issues, common activities, relative importance of tasks/features
- To catch obvious possible improvements (features that are missing or do not currently work well)
- To find out which "legacy" features can/cannot be left out

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Review Available Documentation

- Start with reading available documentation
  - User documents (manual, guides…)
  - Development documents
  - Requirements documents
  - Internal memos
  - Change histories
  - …
- Of course, often these are out of date, poorly written, wrong, etc., but it's a good starting point
- Discourse analysis
  - Use of words and phrases is examined in written or spoken language

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Observation and Related Techniques (1)

- Observation
  - Get into the trenches and observe specialists "in the wild"
  - Shadow important potential users as they do their work
  - Initially observe silently (otherwise you may get biased information)
  - Ask user to explain everything he or she is doing
  - Session videotaping
- Ethnography also attempts to discover social, human, and political factors, which may also impact requirements

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Observation and Related Techniques (2)

- Can be supplemented later with questionnaires
  - Based on what you know now – the results of observation
  - To answer questions that need comparison or corroboration (confirmation)
  - To obtain some statistics from a large number of users (look for statistical significance!), e.g.:
    - *How often do you use feature X?*
    - *What are the three features you would most like to see?*
- Can be supplemented later with interviews
  - After getting a better idea of what is to be done, probably some questions require more detailed answers
  - You will not be wasting other people's time or your own
  - This is very labour intensive!

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Ethnography – Overview (1)

- Comes from anthropology, literally means "writing the culture"
- Essentially seeks to explore the human factors and social organization of activities → understand work
  - Studies have shown that work is often richer and more complex than is suggested by simple models derived from interviews
- Social scientists are trained in observation and work analysis
- Discoveries are made by observation and analysis, workers are not asked to explain what they do
  - Collect what is ordinary/what is it that people do (aim at making the implicit explicit)
  - Study the context of work and watch work being done

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Ethnography – Overview (2)

- Useful to discover for example
  - What does a nuclear technician do during the day?
  - What does his workspace look like?

- Less useful to explore political factors
  - Workers are aware of the presence of an outside observer

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Ethnography – Example (1)

- Sommerville et al. were involved in a project where they had to elicit the requirements of an air traffic control system
- They observed the air traffic controllers in action with the existing system
- Surprising observations
  - Controllers often put aircrafts on potentially conflicting headings with the intention of fixing them later
  - System generates an audible alarm when there is a possible conflict
  - The controllers close the alarms because they are annoyed by the constant warnings
- Incorrect conclusion
  - The controllers do not like audible alarms because they close them
- More accurate observation
  - The controllers do not like being treated like idiots

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Ethnography – Example (2)

- Dealers at a stock exchange write tickets to record deals with old-fashioned paper/pencil method
- It was suggested to replace this with touch screens and headphones for efficiency and to eliminate distracting noise
- Study found that the observation of other dealers is crucial to the way deals are done
  - Market position was affected if deals were not continuously monitored
  - Even if only peripheral monitoring takes place
- "Improvements" would have destroyed the very means of communication among dealers

Source: Preece, Rogers, and Sharp "Interaction Design: Beyond human-computer interaction"

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