

# Requirements Elicitation Techniques

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Guest Lecture in  
SEng 330

# Outline

- Gathering requirements: importance and concerns
- Requirements elicitation techniques
- Advantages and disadvantages
- When to use each technique
  - Tell me a bit about your own projects and where you are with them

# Let's do some Design...

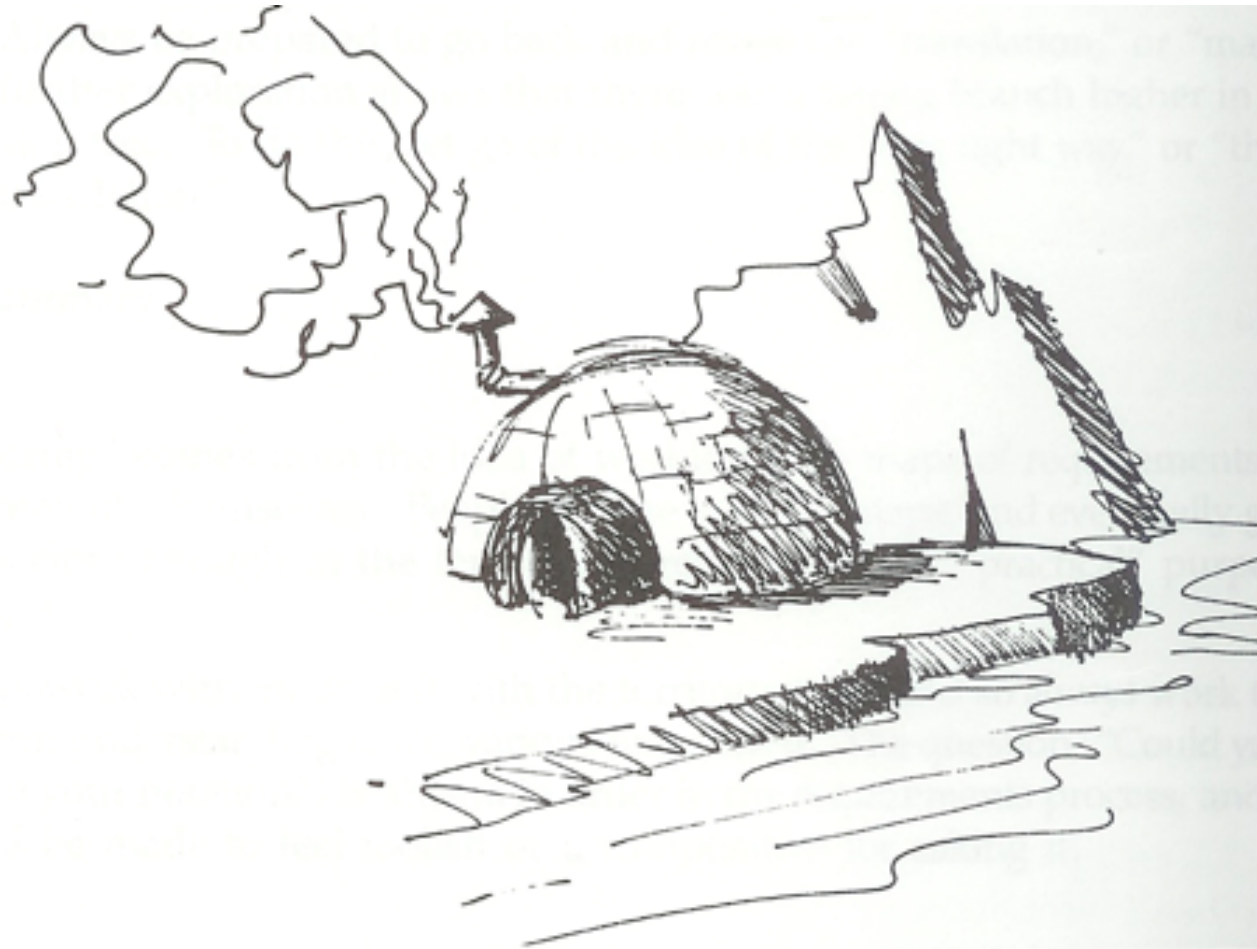
Requirement:

“create a means for protecting a small group of human beings from the hostile elements of their environment”

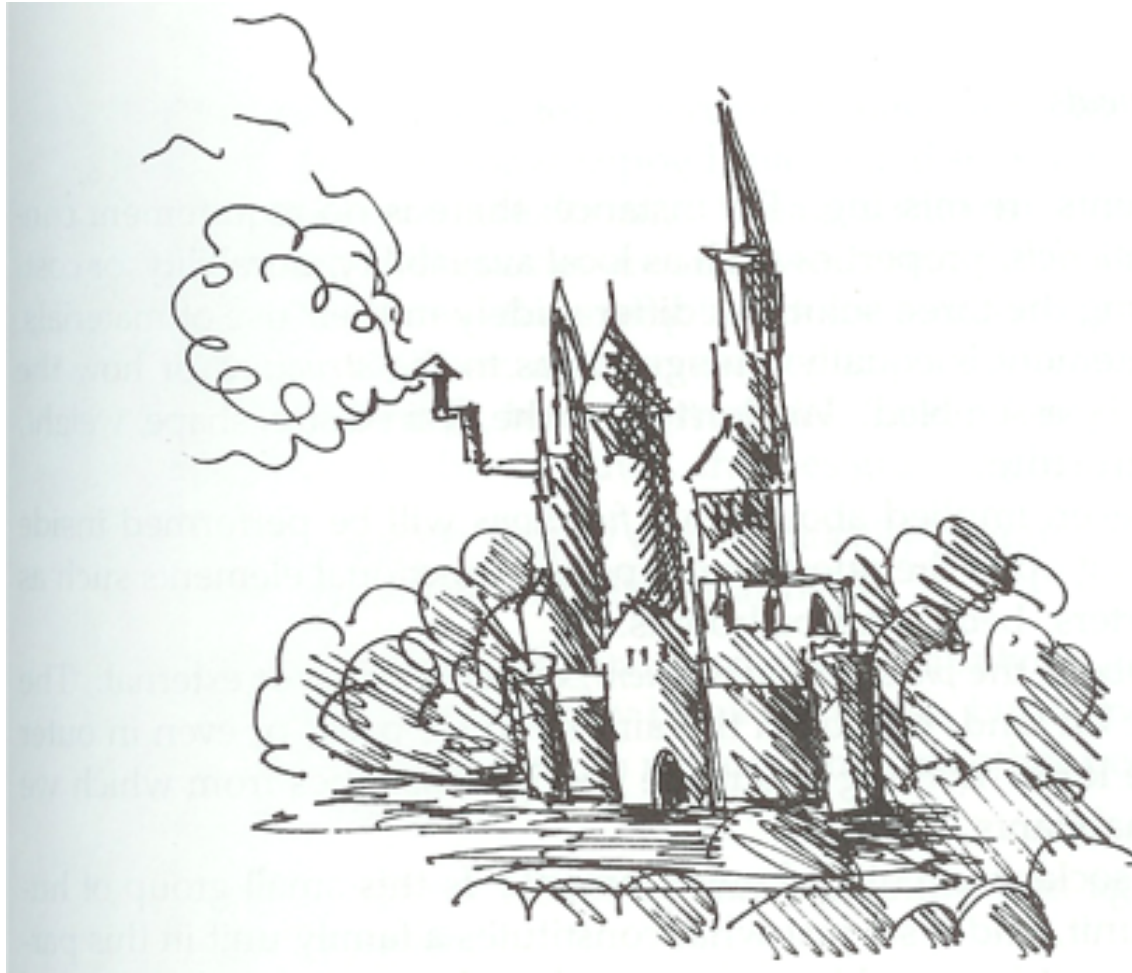
Possible solutions...

[Gause and Weinberg, 1989: Exploring requirements:  
quality before design]

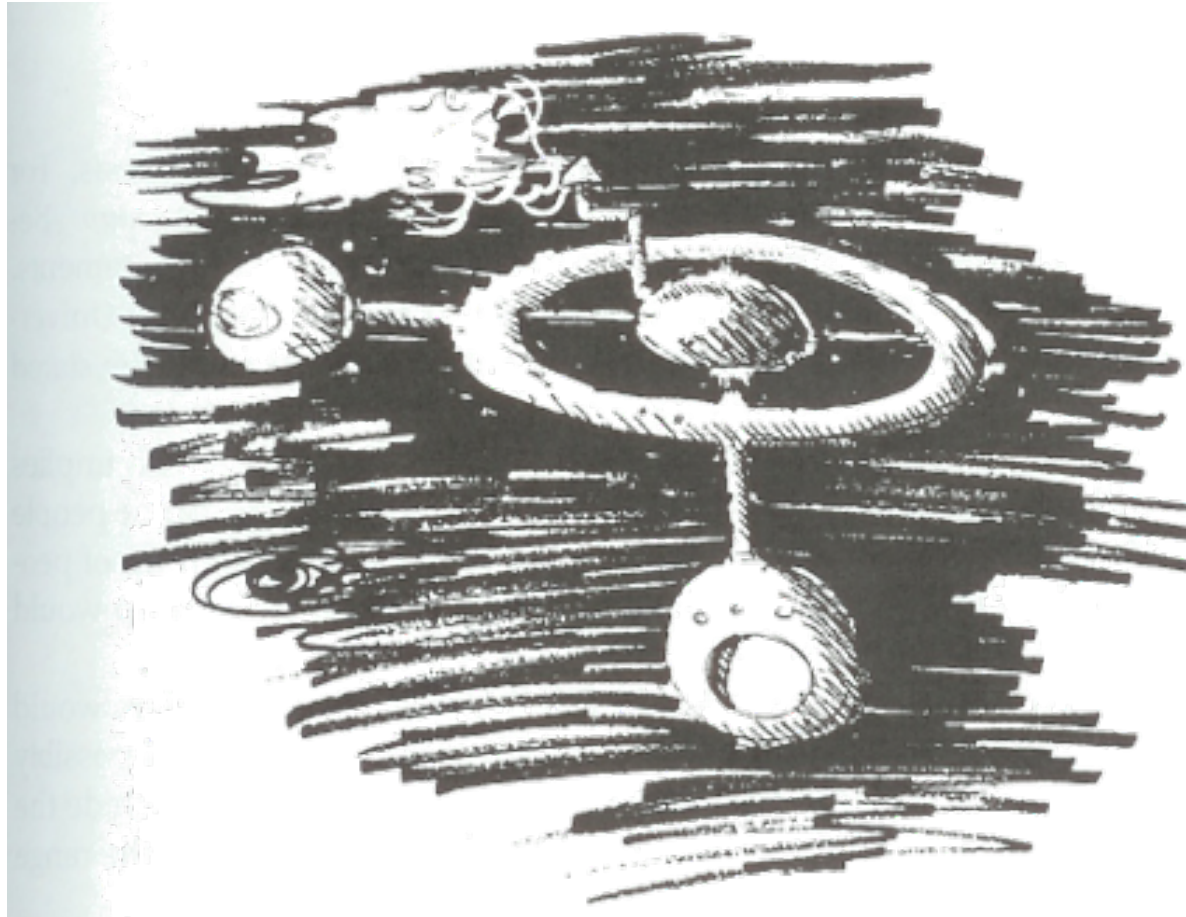
# Igloo – an indigenous home constructed of local building materials ...



# Bavarian castle – a home constructed to impress the neighbors



# Space station – a mobile home with a view



# Requirements elicitation

- One of the very difficult activities in RE
- Gathering information from stakeholders is hard
  - Availability of stakeholders
  - Bias in communicating requirements
  - Conflictual situations among stakeholders
  - Tacit/situated knowledge

# Main Elicitation techniques

- Background reading/inspection of documents
- Interviews (open ended or structured)
- Questionnaires
- Observations
- Group techniques (JAD, Participatory design, focus groups)
- Contextual Design
- Newer methods:
  - StakeSource,
  - Data mining (DM) techniques in eliciting from large groups or
  - DM for requirements discovery at runtime



# Elicitation techniques

## Interviews

- Most widely used technique in requirements engineering
- Analysts interview future users of the system individually to find out
  - what the present system does and
  - what changes are needed
- The information gathered during the interviews enables the analysts to design a new system that will eliminate the shortcomings of the current one.

# Elicitation techniques

## Interviews

### Advantages

- Access to individual stakeholders and their opinions
- Rich collection of information
- Ability to adapt questions to particular situations



### Disadvantages

- Information from multiple sources, hard to analyze
- Difficult to be a skilled interviewer
- May intimidate the interviewee

# Elicitation techniques

## Interviews

Types of interviews:

- structured
- unstructured

Five steps of an interview:

**Preparing** for the interview

**Planning** and scheduling the interview

**Opening and closing** the interview

**Conducting** the interview

**Following up** for clarification

# Elicitation techniques

## Structured Interviews

### Advantages

1. Forces an **organization** on the interview
2. Very **goal-directed**
3. Attempts to **remove distortion** from interviewees subjectively
4. Allows better **integration** of material after the interview
5. Forces the interviewee to be **systematic**
6. Requirements engineer **identifies gaps** in the knowledge which acts as a basis for questions
7. **Purpose** of session is clear to interviewee

### Disadvantages

1. Needs **more preparation** by the requirements engineer
2. Needs to **study background** material extensively
3. May **overconstrain the interviewee**, preventing discovery of requirements
4. May **intimidate** the interviewee

# Elicitation techniques

## Unstructured Interviews

### Advantages

1. Appropriate when the RE wants to **explore** an issue
2. Facilitates description of domain in a way that is **easy for the interviewee**
3. **Goal** is to establish rapport and to get a broad view

### Disadvantages

1. Data acquired is often **unrelated and difficult** to integrate
2. Often exhibits **lack of structure**
3. Does not allow gathering of **specific knowledge**
4. Takes time and **training** to do well
5. **Similar questions** asked in future sessions may annoy interviewee

# Elicitation techniques

## Questionnaires

Gathering of information by means of a survey

### Advantages

- Ability to reach a large pool of people
- Uniformity of questions
- Geographical distribution of stakeholders not an issue

### Disadvantages

- Difficult to collect contextual information
- Difficult to design well (leading questions, ambiguity in questions, misinterpretation, sample population)

# Elicitation techniques

## Observations

Takes the analyst in the working context

### Advantages

- Ability to collect contextual information
- Reveals details of tacit knowledge

### Disadvantages

- Often difficult to obtain access to the customer site
- Time consuming
- Does not collect information on personal opinions
- Easy to “go native”

# Group techniques in RE

- Recognition of the need for a high degree of user involvement in system design





# Elicitation techniques

## Group techniques

### Advantages

- Bring stakeholders together!
- More informal interaction than interviews

### Disadvantages

- More difficult to deal with groups, needs a trained facilitator
- Risk of groupthink

# Group techniques for elicitation

- Focus groups
- Brainstorming
- JAD (Joint Application Design)
- Also referred to as Requirements Workshops

## Characteristics

- Communication between group members
- Sharing of information
- Sharing of workspace
- Coordination and control of shared objects
- Decision making
- Common understanding of the work process
- **Facilitation**

# Elicitation techniques

## JAD (Joint Application Design)

- Originated at IBM in late 1970s
- A **structured** workshop where people come together to plan projects, design computer systems, or make business decisions
- Involves a **detailed agenda**, **visual aids**, a **facilitator** who moderates the session, and a **scribe** who records the agreed-upon requirements
- Culminates with a **final document** containing all the decisions made by the group
- Used to elicit or negotiate specifications with clients

# Workshops and facilitation

“Facilitation is the art of leading people through processes toward agreed-upon objectives in a manner that encourages participation, ownership, and productivity from all involved”

[David Silbert, Effective facilitation, 1994]

- Balances the needs of content, process and people

# Elicitation techniques

## JAD as a requirements elicitation session

The stakeholders agree on:

- Business requirements
- User requirements
- Software requirements

# Elicitation techniques

## Contextual inquiry

A **field interviewing technique** aimed at revealing work structure. It studies a few carefully selected individuals in depth to arrive at a fuller understanding of the work practice across all customers.

### Principles

- **Context** -- go to the customers' workplace and watch them do their own work
- **Partnership** -- talk to them about their work
- **Interpretation** -- develop a shared understanding with the customer about the aspects of work that matter
- **Focus** -- direct the inquiry from a clear understanding of your own purpose.