

# **CS3205:**

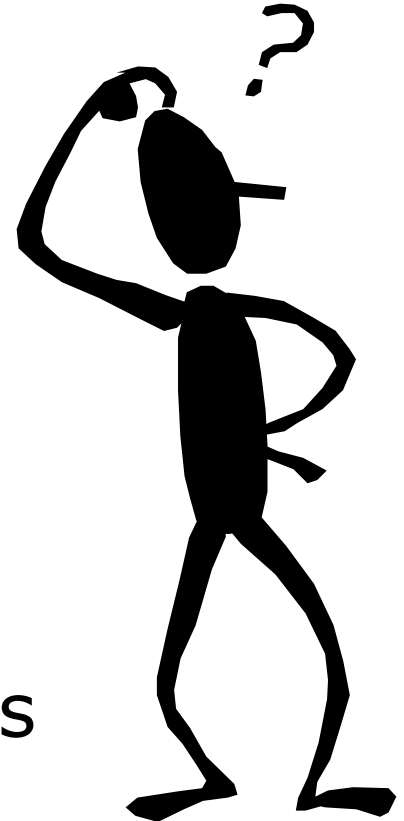
# **Identifying needs and establishing requirements**

## **Readings:**

- 1) ID-Book Chapter “Establishing Requirements,”  
Ch. 10 (Ch. 9 in course eBook)**
- 2) Chapter 2 from Task-Centered User  
Interface Design, <http://hcibib.org/tcuid/chap-2.html>**

# Overview

- The importance of requirements
- Different types of requirements
- Data gathering
- How to describe:
  - Scenarios
  - Use Cases
  - Essential use cases
  - HTA



# *What, how and why?*

- What

Two aims:

1. Understand as much as possible about users, task, context
2. Produce a stable set of requirements

- How:

Data gathering activities

Data analysis activities

Expression of 'requirements'

All of this is iterative

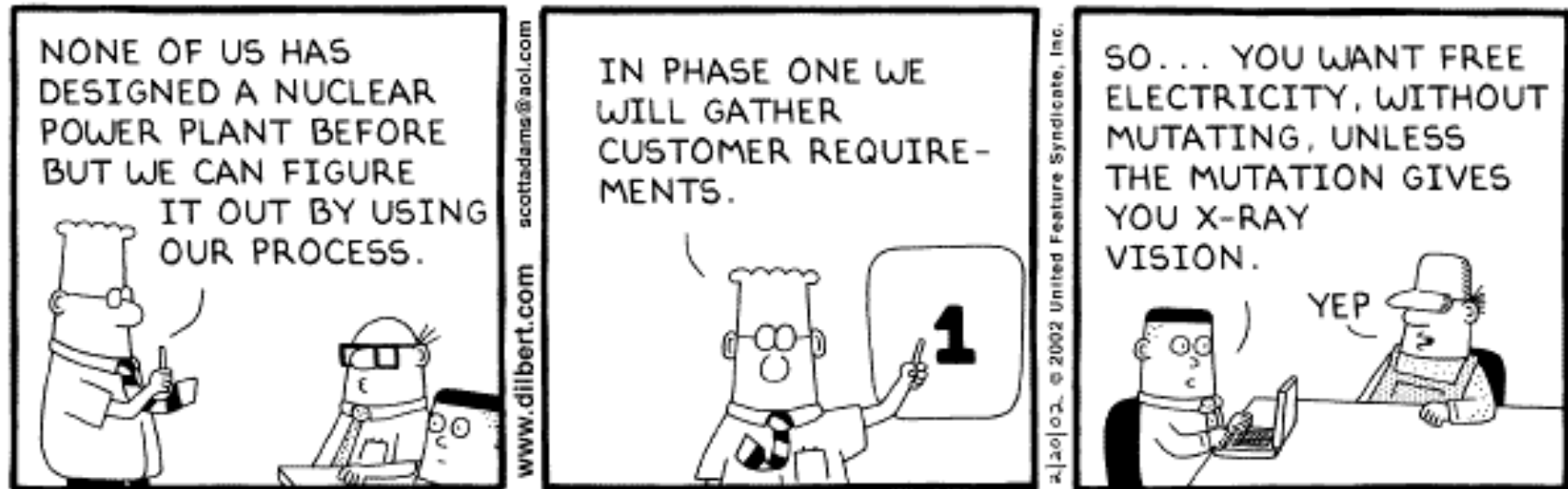
# *What, how and why?*

- Why:

Requirements definition: the stage where failure occurs most commonly

Getting requirements right is crucial

# But of course...



# *Establishing requirements*

- What do users want? What do users 'need'?  
Requirements need clarification, refinement, completion, re-scoping  
Input: requirements document (maybe)  
Output: stable requirements
- Why 'establish' ?  
Requirements arise from understanding users' needs  
Requirements can be justified & related to data

# Eliciting Requirements

- Another commonly used term:  
Requirements elicitation
- What's this mean to you?

# *Different kinds of requirements*

- Functional:
  - Operations that the system should do
  - Historically the main focus of requirements activities
- Non-functional:
  - memory size, response time...
  - Also usability!
- Data:
  - What kinds of data need to be stored?
  - How will they be stored (e.g. database)?



# *Different kinds of requirements*

- Environment or context of use:
  - physical: dusty? noisy? vibration? light? heat? humidity? .... (e.g. jet fighter cockpit, ATM)
  - social: sharing of files, of displays, in paper, across great distances, work individually, privacy for clients
  - organisational: hierarchy, IT department's attitude and remit, user support, communications structure and infrastructure, availability of training

# *Different kinds of requirements*

- User requirements: Who are the users?
  - Characteristics: ability, background, attitude to computers
  - System use: novice, expert, casual, frequent
  - Novice: step-by-step (prompted), constrained, clear information
  - Expert: flexibility, access/power
  - Frequent: short cuts
  - Casual/infrequent: clear instructions, e.g. menu paths

# *Different kinds of requirements*

- Usability requirements:  
learnability, efficiency, flexibility,  
aesthetics, satisfaction, ...

Note that user requirements and usability requirements refer to different things

# User Persona

- Prepare a user persona for each user role
  - From Alan Cooper's book, *The Inmates Are Running the Asylum*
- A description of a archetypical, hypothetical, imaginary user
  - Description should focus on the behaviors and goals related to the specific domain of a product
    - What is this person's end goals for using the product?
- See Example in ID-book (p. 484-485)

# Persona Example

Patricia is an English professor who has written several books of poetry. She has been using computers for word-processing since 1980, although the only two programs she's used are Nota Bene and Microsoft Word. She doesn't want to spend time learning details of how a computer works, and tends to store all her files in whatever directory they'd go in if you didn't know about directories. (From Spolsky.)

# How Personas Can Be Useful

- Descriptions should help identify
  - workflow and behavior patterns
  - goals
  - environment
  - attitudes

*From multiple user points of view!*

- Can help in
  - conceptual models
  - defining usability requirements
  - prioritizing (or cutting) features
  - evaluating alternatives
- Will make engineers more user-focused

# How To “Get” Requirements

- Where do they come from?
- How do you get them from stakeholders? Future/potential users?
- Following slides: ideas on “data gathering” techniques

# *Data gathering techniques (1)*

- Questionnaires:
  - A series of questions designed to elicit specific information
  - Questions may require different kinds of answers:
    - simple YES/NO; choice of pre-supplied answers; comment
  - Often used in conjunction with other techniques
  - Can give quantitative or qualitative data
  - Good for answering specific questions from a large, dispersed group of people



# *Data gathering techniques (2)*

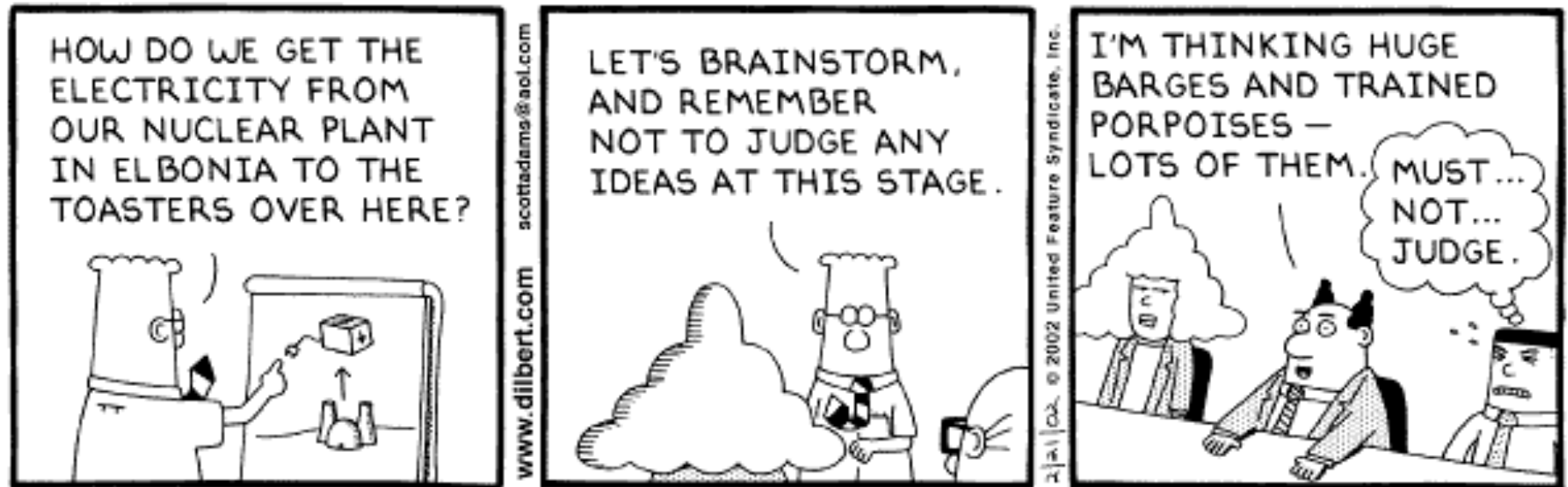
- Interviews:

- Forum for talking to people
- Structured, unstructured or semi-structured
- Props, e.g. sample scenarios of use, prototypes, can be used in interviews
- Good for exploring issues
- But are time consuming and may be infeasible to visit everyone

# *Data gathering techniques (3)*

- Workshops or focus groups:
  - Group interviews
  - Good at gaining a consensus view and/or highlighting areas of conflict

# But of course...



# *Data gathering techniques (4)*

- Naturalistic observation:
  - Spend time with stakeholders in their day-to-day tasks, observing work as it happens
  - Gain insights into stakeholders' tasks
  - Good for understanding the nature and context of the tasks
  - But, it requires time and commitment from a member of the design team, and it can result in a huge amount of data
  - Ethnography is one form

# *Data gathering techniques (5)*

- Studying documentation:
  - Procedures and rules are often written down in manuals
  - Good source of data about the steps involved in an activity, and any regulations governing a task
  - Not to be used in isolation
  - Good for understanding legislation, and getting background information
  - No stakeholder time, which is a limiting factor on the other techniques

# *Choosing between techniques*

Data gathering techniques differ in two ways:

1. Amount of time, level of detail and risk associated with the findings
2. Knowledge the analyst requires

The choice of technique is also affected by the kind of task to be studied:

- Sequential steps or overlapping series of subtasks?
- High or low, complex or simple information?
- Task for a layman or a skilled practitioner?

# *Problems with data gathering (1)*

- Identifying and involving stakeholders: users, managers, developers, customer reps?, union reps?, shareholders?
- Involving stakeholders: workshops, interviews, workplace studies, co-opt stakeholders onto the development team
- 'Real' users, not managers: traditionally a problem in software engineering, but better now

# *Problems with data gathering (2)*

- Requirements management: version control, ownership
- Communication between parties:
  - within development team
  - with customer/user
  - between users... different parts of an organisation use different terminology
- Domain knowledge distributed and implicit:
  - difficult to dig up and understand
  - knowledge articulation: how do you walk?
- Availability of key people



# *Problems with data gathering (3)*

- Political problems within the organisation
- Dominance of certain stakeholders
- Economic and business environment changes
- Balancing functional and usability demands

# *Some basic guidelines*

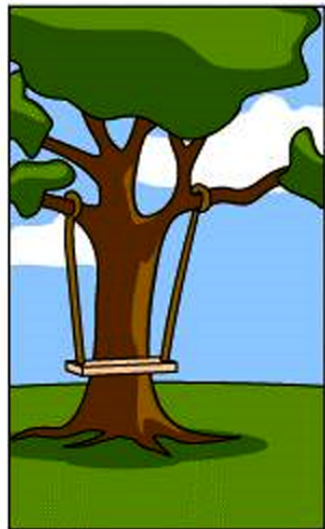
- Focus on identifying the stakeholders' needs
- Involve all the stakeholder groups
- Involve more than one representative from each stakeholder group
- Use a combination of data gathering techniques

# *Some basic guidelines*

- Support the process with props such as prototypes and task descriptions
- Run a pilot session
- You will need to compromise on the data you collect and the analysis to be done, but before you can make sensible compromises, you need to know what you'd *really* like
- Consider carefully how to record the data



How the customer explained it



How the Project Leader understood it



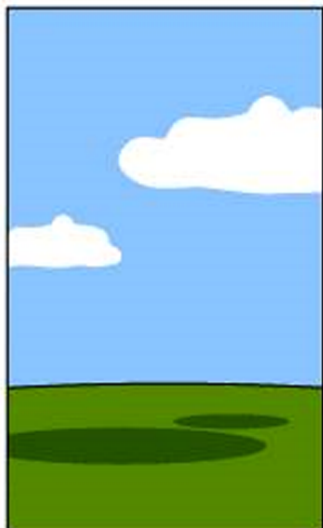
How the Analyst designed it



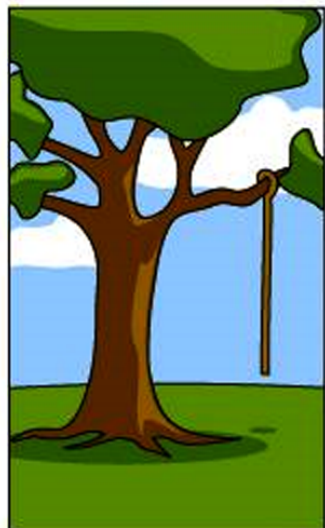
How the Programmer wrote it



How the Business Consultant described it



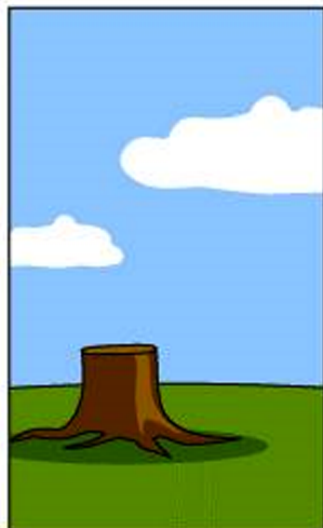
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

# Summary

- In these slides:
  - Types of requirements
  - Personas
  - How to get information
- Coming next:
  - Task analysis
  - Describing Tasks