User requirements

Unit 4

Learning outcomes

- Understand
  - The importance of requirements
  - Different types of requirements
- Learn how to gather data
- Review basic techniques for task descriptions
  - Scenarios
  - Task analysis

What

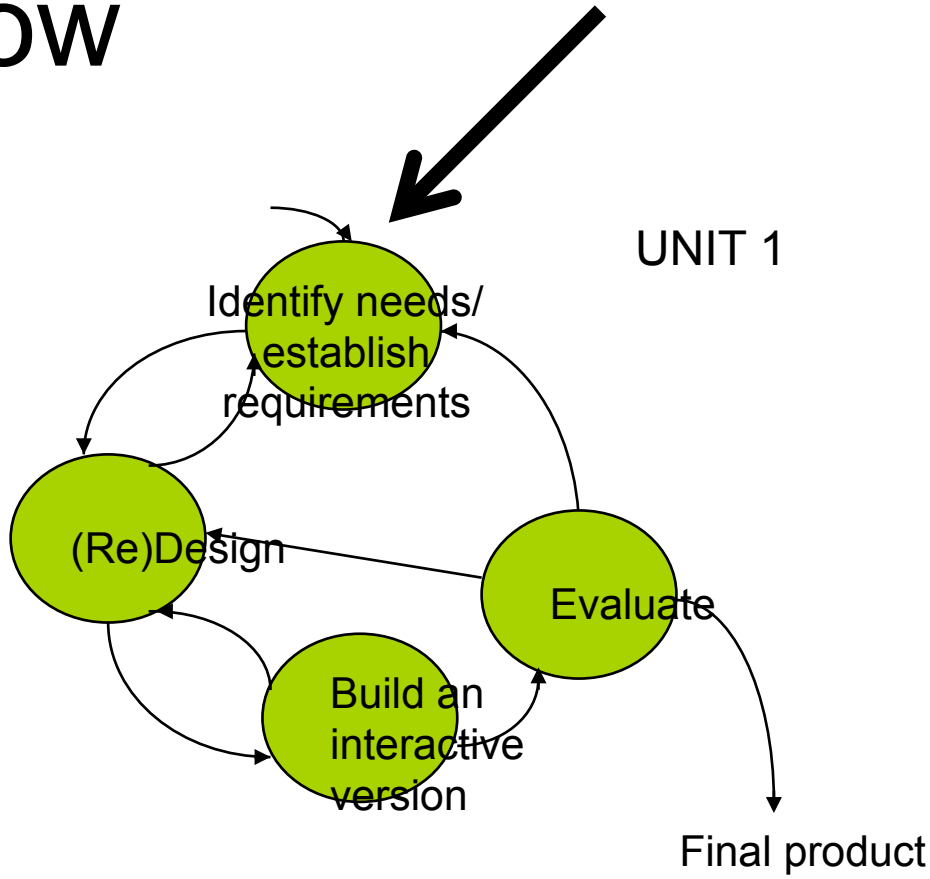
- Identifying needs
  - Understand as much as possible about the user, their work and the context of use
  - See PACT analysis (unit 1)
- Establish a set of ‘stable’ requirements
  - Requirements MUST be justified and related to data
  - Set up clear success metrics, usability, user experience requirements

Volere Template

http://www.volere.co.uk/template.htm

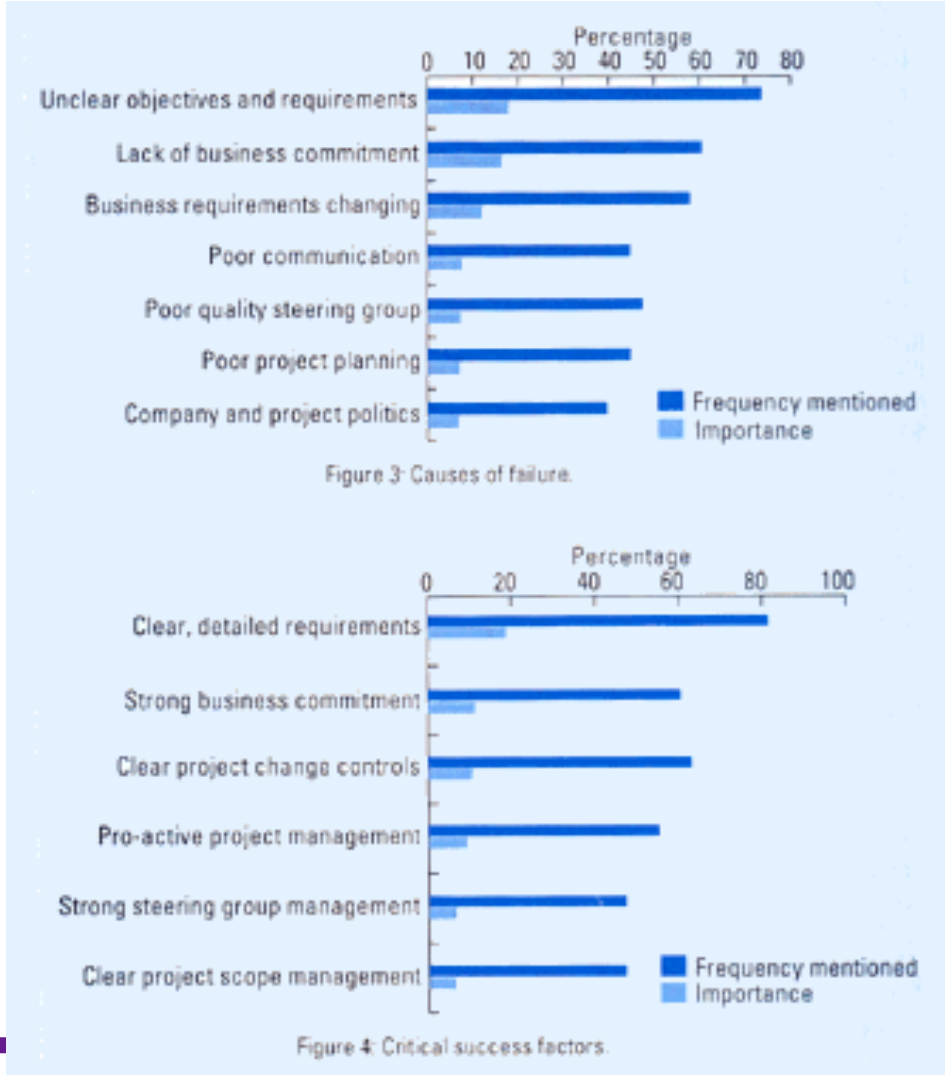
How

- Data gathering activities
- Data analysis activities
- Expression as ‘requirements’
- All of this is iterative



Why

- 38 members of the BCS, the Association of Project Managers and the Institute of Management
- 1,027 projects (half of which development)
- 12.7% successful
- only 2.3% of success were development projects, 18.2% maintenance projects and 79.5% data conversion
- Taylor, A. (2000)
- http://archive.bcs.org/BCS/Products/publishing/itnow/OnlineArchive/jan00/professionalpractice.htm



Requirements type

- Functional
  - Fundamental or essential subject matter of the product.
  - Describe what the product has to do or what processing actions it is to take
  - Historically the main focus of requirements activities

Example

- For a multifunction PDA
  - Phones function must be accessible while connected to the internet
- For a nuclear power control system
  - The system will be able to monitor the temperature of the reactors

Requirements type (2)

- Non functional
  - Properties that the functions must have
  - Describe the constraints that there are on the system and its development
  - Covers a number of aspects of design: image, usability, performance, maintainability, security, cultural acceptability, etc.
  - These requirements are as important as the functional requirements for the product's success.

Example

- For a multifunction PDA – Look and feel
  - The system must present an up-market, business like image -
- For a nuclear power control system - Usability
  - Warnings signals MUST be clear and unambiguous

Other kinds of requirements

- Data
  - Type volatility, size/amount persistence accuracy of data
- Environment or context of use
  - physical: dusty? noisy? vibration? light? heat? humidity? …. (e.g. 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

User requirements

- Users: Who are they?
  - 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

Usability requirements

- Usability:
  learnability, throughput, flexibility, attitude

User requirements and usability requirements refer to different things:

property of the object (usability) property of the user (user)

Exercise

Suggest one key functional, data, environmental, usability, and look and feel requirements for

- Self-service filling and payment system for a petrol (gas) station
- On-board ship data analysis system for geologists searching for oil
- Fashion clothes website

Data-gathering

- Studying documentations
- Researching similar products
- Interviews
- Questionnaires
- Observation

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
- Good for understanding legislation, and getting background information
- Not to be used in isolation
- No stakeholder time, which is a limiting factor on the other techniques

Observation

- 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

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

Interviews & Focus Group

- Structured, unstructured or semi-structured
- Good for exploring issues
- Time consuming and may be infeasible to visit everyone
- Focus group
  - Group interviews
  - Good at gaining a consensus view and/or highlighting areas of conflict
- Props e.g. sample scenarios of use, prototypes, can be used in interviews

How to Interview

- Plan a set of central questions – what do you want to know?
  - a few good questions gets things started
    - avoid leading questions do not bias the interview
  - focuses the interview
  - could be based on results of user observations

- Let user responses lead follow-up questions
  - follow interesting leads
  - vary questions to suit the context
  - probe more deeply on interesting issues as they arise

Wording questions

- Start with an easy question then move into more sensitive ones
- Clearly phrased and easily understood
  - Start with what, how, why, when
  - Avoid questions which could be answered by yes or no or precise answers
- Use interview probes
  - Scenarios, pictures, contextual cues

Tricks

- Prompts
  - Remain silent
  - Repeat the last question
  - Repeat the last few words by the interviewee
- Probes
  - Verbal
    - ‘could you give me some examples of that’
    - ‘would an example of that be ……’
    - Could you give me a bit more details on ….
  - Design
    - Interfaces
    - Scenario, storyboard
- Checks
  - ‘If I can summarise what I think you’ve said…’
  - ‘What this means, then is that,…’
  - So let me check if I have understood you correctly’

Retrospective testing interviews

- Post-observation interview
  - perform an observational study
  - create a video record of it
  - have users view the video and comment on what they did
    - clarify events that occurred during system use
    - excellent for grounding a post-test interview
    - avoids erroneous reconstruction
    - users often offer concrete suggestions
    - Problem: prone to rationalization of events/thoughts by user

Transcribing

- Writing up the interviews / if needed
  - 5hours :1 hour (or more depending on typing speed and audio quality)
- Add informal notes (analysis – reflection)
- Think of level of richness needed
  - Emotion, false starts
- Labelling

Simple qualitative analysis

- Look for key events/patterns of behavior that drive the activity

- Recurring patterns or themes
  - Emergent from data, dependent on observation framework if used
- Categorizing data
  - Categorization scheme may be emergent or pre-specified
- Looking for critical incidents
  - Helps to focus in on key events

Analyzing Critical incidents

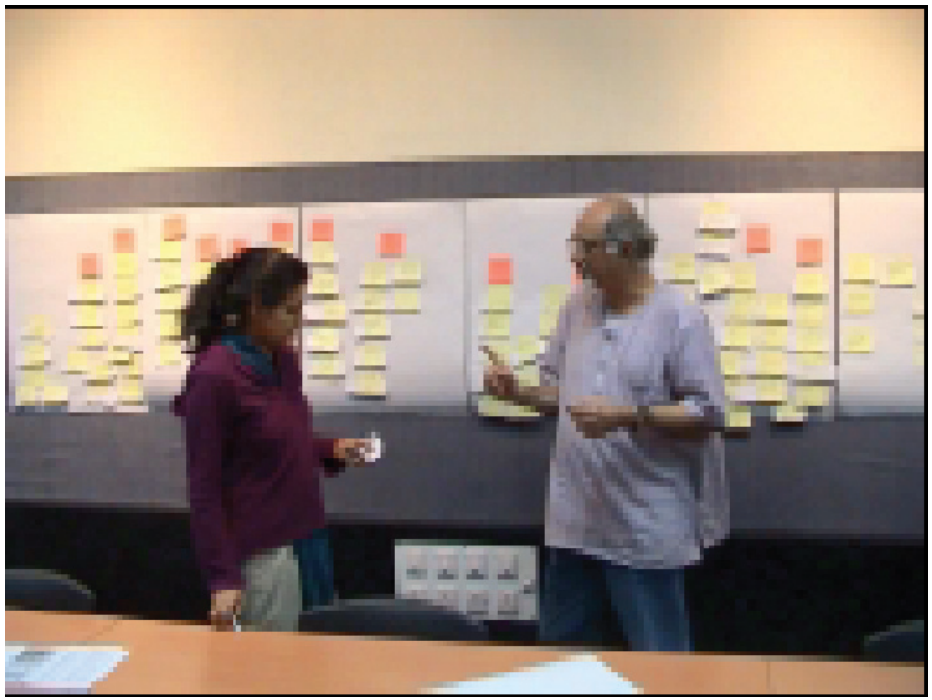
- People talk about incidents that stood out
  - usually discuss extremely annoying problems with fervor
  - not representative, but important to them
  - often raises issues not seen in lab tests

Categorising the data

- Different levels of details (general themes, word to word analysis)
- Based on theory or exploratory
- Orthogonal category
- Reliability (inter-rater reliability: percentage of agreement)
- Example from book

Affinity analysis

- Organise individual ideas and insights into a hierarchy showing common structure and theme
- Notes are grouped together because they are similar in some fashion
- The groups are not pre-defined but emerge from the data



Type of analysis

- Content analysis
  - Studying the frequency of occurrence of categories
- Discourse analysis
  - Focus on dialogue, meaning of words

Data-gathering

- Studying documentations
- Researching similar products
- Interviews
- Questionnaires
- Observation

Which techniques to gather req?

- Depends on:
- Amount of time, level of detail and risk associated with the findings
- Knowledge of the analyst
- 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?

Requirements templates

- Standard format, or template, for specifying requirements
  - Unique reference number specifying whether the requirement is functional or not
  - A one sentence summary
  - The source(s) of the requirement
  - The rationale for it

Problems with data gathering - stakeholders

- Identifying and involving the right people:
  - users, managers, developers, customer reps?, union reps?, shareholders?
- Involving stakeholders
  - workshops, interviews, workplace studies, participatory design
- 'Real' users, not managers
  - traditionally a problem in software engineering, but better now
  - Availability of key people

Problems with data gathering (2)

- Requirements management: 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

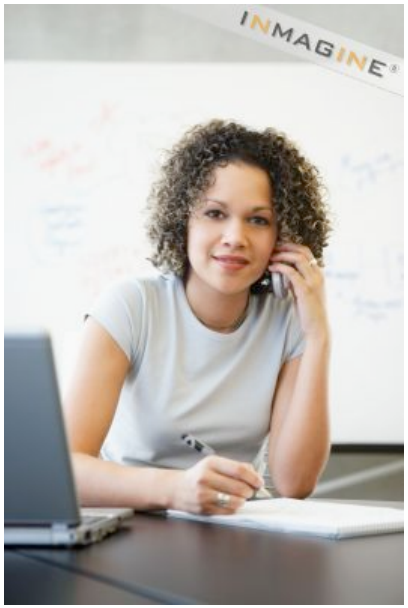
Guideliness

- Involve all the stakeholder groups
- Involve more than one representative from each stakeholder group
- Use a combination of data gathering techniques
- Support the process with props such as prototypes and task descriptions
- Run a pilot session
- Consider carefully how to record the data

Personas

- **A persona is a fictional user, with a made-up life**
- Capture user characteristics
- Not real people, but synthesised from real user characteristics
- Should not be idealised
- Bring them to life with a name, characteristics, goals, personal background
- Develop multiple personas

Sarah Red is 24 years old and works as a web-designer at Zurich Insurance. Sarah has a BA in three dimensional design from Middlesex University and an M.A. in computer related design from the Royal College of Art in London. She has worked for Zurich for the past two years and quite openly dislikes it.



Sarah is a talented designer who likes to experience the latest technology and has won several prises for her design. Yet, in her job she has to be very conservative. She prepares forms for on-line quotes and provides general information about the company to their web-customer.

Sarah dreams of joining a designer studio in London where she could fulfil her talent. The current position, although boring, offers a good salary and the possibility of living in London where she can search for her dream job.

Sarah works in the web-development team. Her new boss is Elisabeth, a software engineer who does not understand the user experience and is more concerned with technical details than with design. Sarah is reasonably free in her job, as nobody seems to care.

Sarah's been told that the company has adopted edgeConnect and that her group will start using it by next month. Sarah is worried about this decision: she thinks it is going to kill creativity and to make her job even more boring. She has been told that she will be in charge of designing a template layout for the car sector, and she wished she could use flash. She welcomes anyway the idea of a change and a training course sounds interesting.

Summary

- There are different kinds of requirement, each is significant for interaction design
- The most commonly-used techniques for data gathering are: questionnaires, interviews, focus groups and workshops, naturalistic observation, studying documentation
- Scenarios can be used to articulate existing and envisioned work practices.

Recommended reading

- Chapter 7 1st Edition
- Chapter 10 2nd Edition