User requirements

Unit 6

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Learning outcomes

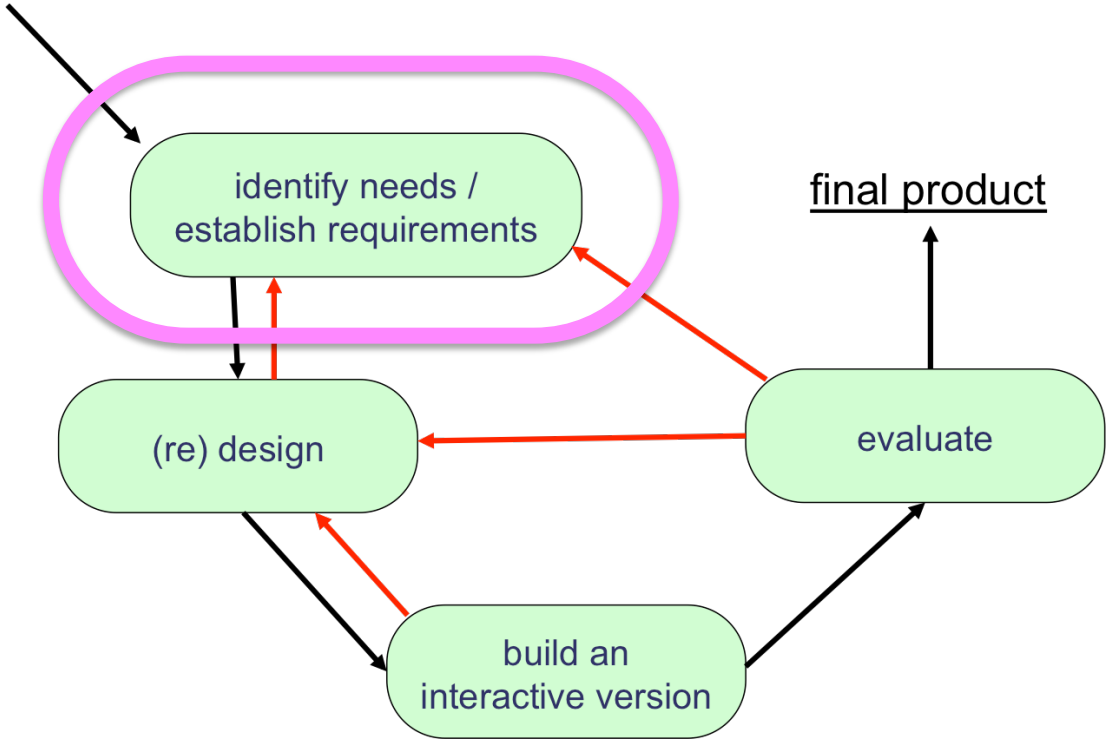
- The importance of requirements
- Different types of requirements
- Data gathering

WHAT

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

HOW

- Data gathering
- 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)
- 13% successful, only 2% of which were development projects (18% maintenance projects and 80% data conversion)
  - Taylor, A. (2000)

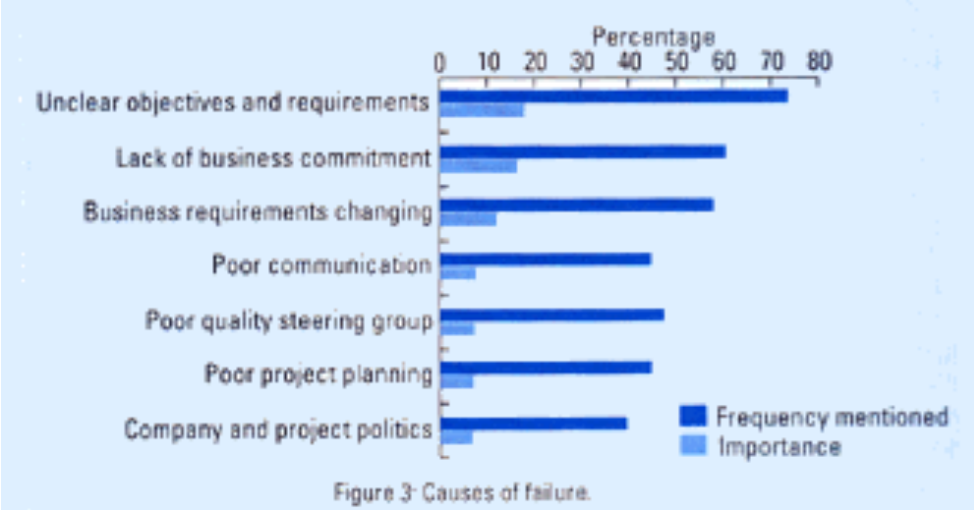


Figure 3 Causes of failure.

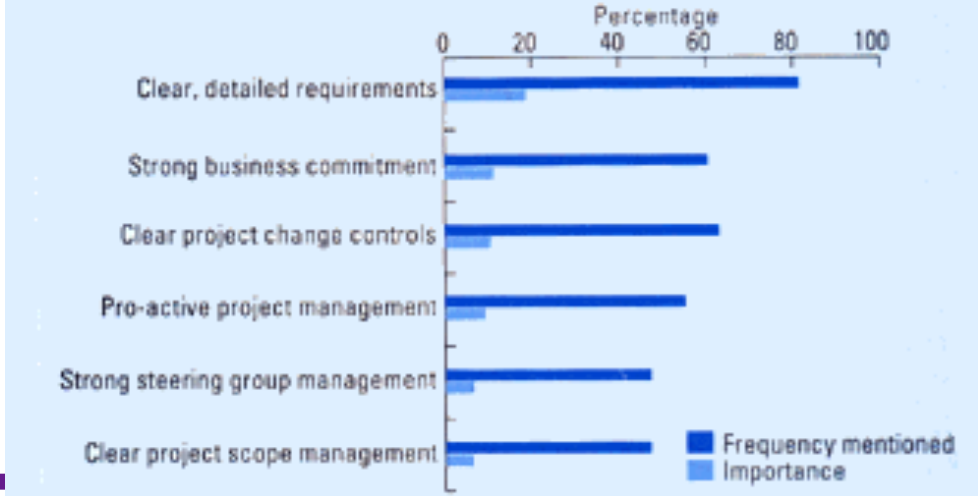


Figure 4 Critical success factors.

Mistakes

The underestimation of complexity:

Failure to see those complexities leads to the underestimation of schedule, budget, …

http://www.cheatsheet.com/entertainment/5-of-the-biggest-video-game-kickstarter-failures-of-all-time.html/?a=viewall

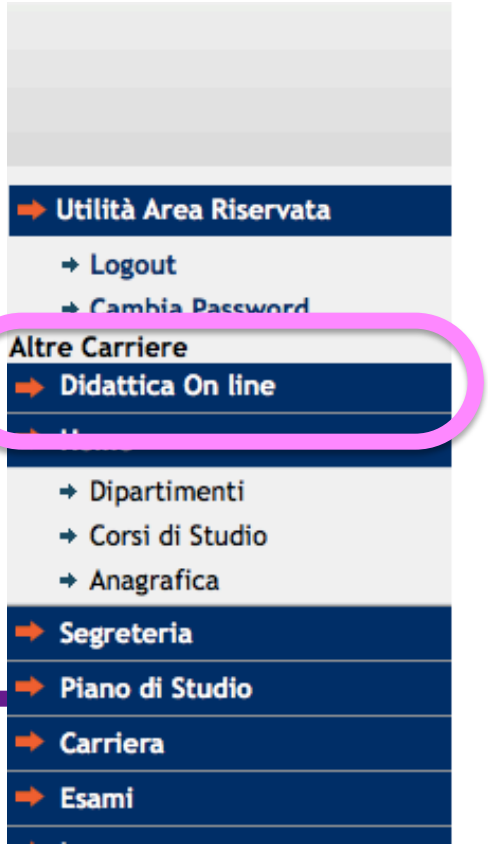
Mistakes

No appropriate control over requirements:
Changing requirements is a reoccurring theme

Mistakes

Failure to engage stakeholders

Stakeholders need to provide key input to the critical decisions made in the project



Sei un utente di:

Comunità
Computational complexity (MASSACCI)
Linguaggi di programmazione semantica (PRIAMI)
Security Engineering (MASSACCI)

Altre comunità da libretto:

Comunità
Economics and Management (BONIFACIO)
Linguaggi di programmazione semantica (PRIAMI)

Mistakes

Failure to address culture change issues

Although technology is the focus of many projects, addressing culture change could be essential

- Is there a change?
- Am I trying to change?

Requirements type

- Functional
  - Fundamental or essential characteristics 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 smartphone
  - Phones function must be accessible while connected to the internet
- For a nuclear power control system
  - The system should be able to monitor the temperature of the reactors
  - Emergency shut down of the nuclear reactor

Requirements type (2)

- Non functional
  - Properties of the functions
  - 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.
  - As important as functional requirements for the product's success.

Example

- For an ultrabook: **Look and feel**
  - Present an up-market, business like image
- For a nuclear power control system: **Usability**
  - Warnings signals MUST be clear and unambiguous
  - Emergency shut down button MUST be clear and unambiguous

Other kinds of requirements

- Data
  - Type, size/amount, accuracy
- 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, e.g., wizard prompting
  - Expert: flexibility, access power
  - Frequent: short cuts
  - Casual/infrequent: clear instructions, e.g., menu paths

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
- 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
- Advantage: No stakeholders time

Observation

- Naturalistic observation:
  - Spend time with stakeholders in their day-to-day tasks, observing their activities
- Gain insights into stakeholders' tasks
- Good for understanding the nature and context of the tasks
- It requires time and commitment from a member of the design team, and 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 between pre-set 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

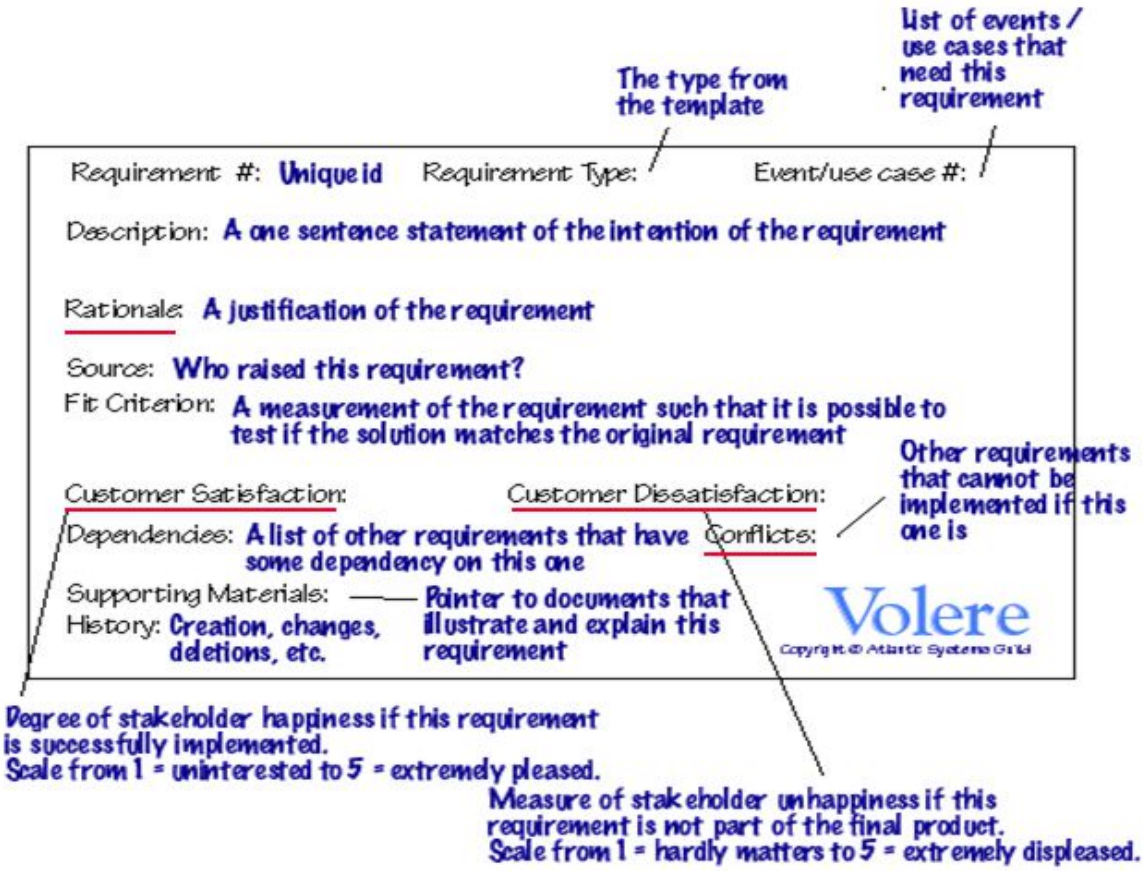
Which techniques to gather req?

- 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

Volere requirement shell



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

Problems with data gathering - stakeholders

- Identifying 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

Guidelines

- 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

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

Recommended reading

Sharp et al.

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