

User requirements

Unit 3



Learning outcomes

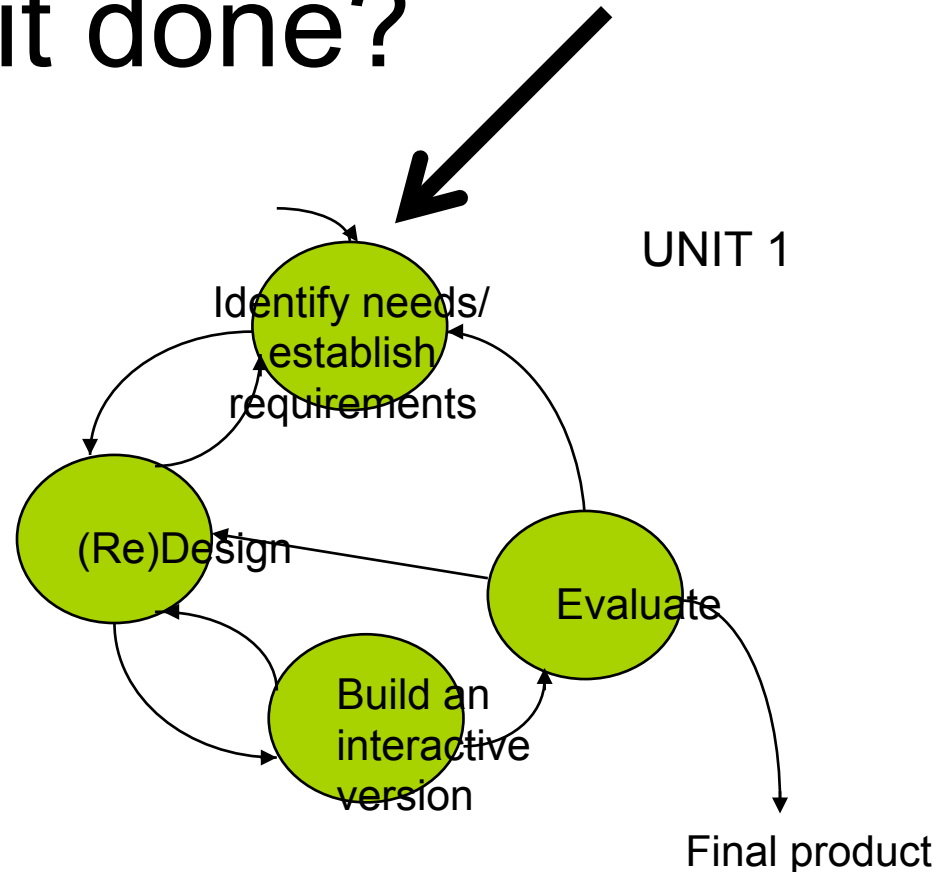
- Understand
 - The importance of requirements
 - Different types of requirements
- Learn how to gather data
- Review basic techniques for task descriptions
 - Scenarios
 - Task analysis

What is done?

- 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

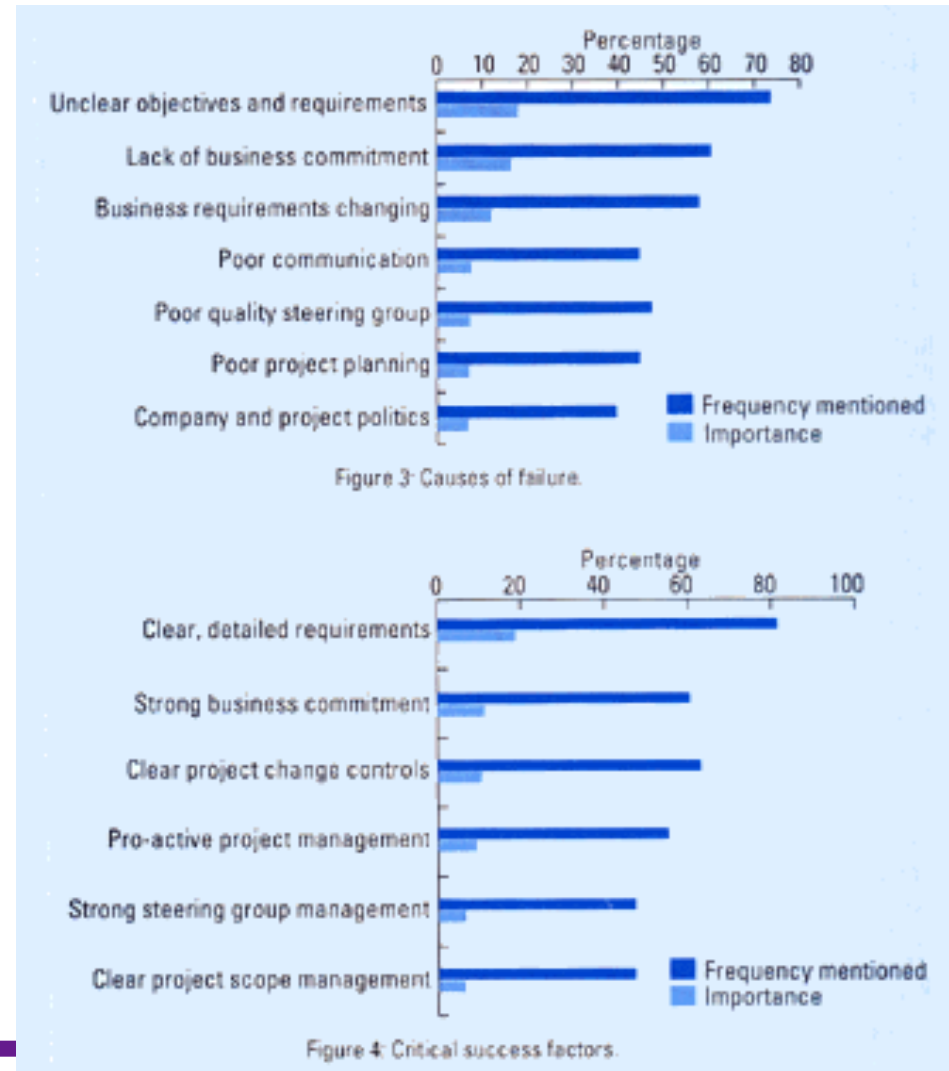
How is it done?

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



Why is it done?

- 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 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 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.
 - As important as 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, 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
- 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
- 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

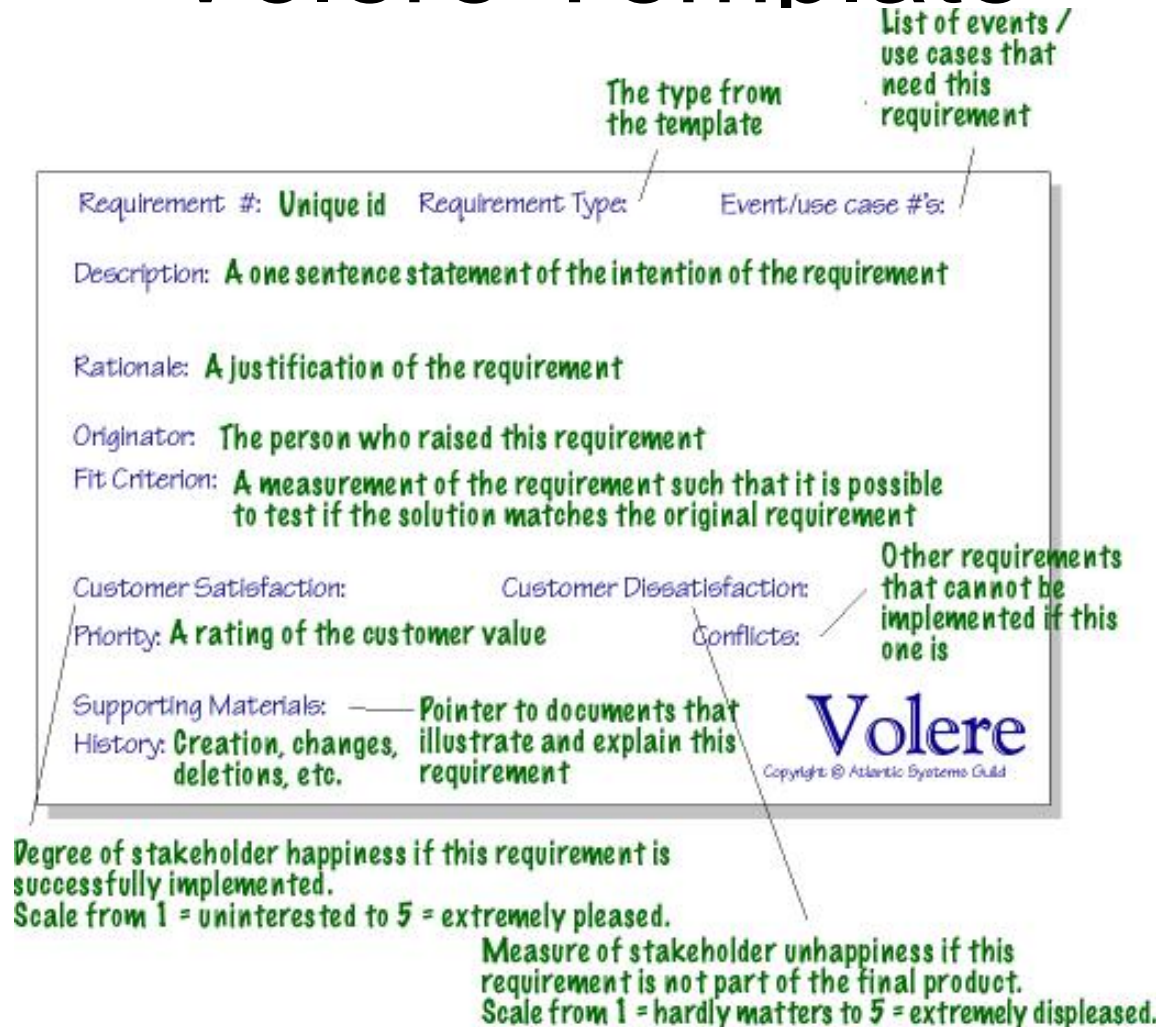
Which techniques to gather req?

- 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 Template



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

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

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

Scenarios

- Key technique in interaction system design (Rosson and Carroll 2002)
- Iterative tools to be used throughout the design process
- User stories = informal narrative description which reports about user tasks and activities.
 - Short snippets which tend to focus on the user needs and motivations to perform a task rather than on the use of a technology.

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The summer term has just started and Fritz, a computer-science student at the Technische Universität Dresden, has decided to attend a course on "User Interface generation for Web Services". He logs in the University portal and accesses an overview of all lectures, sport and language courses. He tries to subscribe to the UI course but the system indicates a timetabling conflict with the course on 'Service-oriented Architecture' he previously registered to. Fritz sign in an Italian course, which is automatically displayed in his personal weekly calendar.

- Fritz wonders whether he should change his study plan to accommodate for the UI course. Thus he decides to ask other students' opinion. He joins a chat room, but nobody is there. Fritz waits for other students while working on an assignment using the library service.

ALAN



.53 years old

.In the past years, he has been working for different Universities and research centers in Europe and USA.

.He is very well known within the community and has strong and broad network of contacts.

.He likes attending to medium to large conferences (600 to 1500)

.Usually he doesn't prepare much before going to a conference. In most of the cases he is involved in the organization, so he knows the papers that are going to be presented and the people who will attend to the conference. Most of the times he is uncharged of chairing a session; in that case he doesn't have much freedom to decide where to attend. During the conference he likes speaking with people and finding out which are the new trends within the community. After the conference he usually doesn't have time to check the proceedings or download papers.

.He has a large network of contacts; however he is not much into social networks. He prefers meeting people face to face during conferences: during the coffee break, at social events, or gathering with people after the conference hours. Most of the times he gets the email address of these people in case he wants to contact them in the future.



MARTHA



.47 years old

. Professor, he has been working at the University for the last 20 years

.During her career she has developed a strong network of professionals. Most of her contacts work in similar topics.

.She likes attending to small and medium conferences (from 30 to 200 attendees) or workshops.

.She usually attends to conferences to obtain further knowledge, discuss with other researchers on topics related to her field, or establish new collaborations. Most of the times she knows the people she talks with, although sometimes she gets to know new people through his colleagues.

.Next week she is attending to a conference in Embedded systems. This week she will get some time to take a look to the proceedings, check who is presenting during the conference, and decide the interesting talks based on the content. She will also send an email to some of her closest colleagues working around the world to know if they are going to be there as well. When she is back from the conference she will take a look to the proceedings, download the most interesting papers, or research on papers' by an interesting author.

. Martha is not much into social networking, although sometimes she uses professional networks such as LinkedIn to update her profile, accept a new connection or track what her Master students are up to.



ROBERT

.31 years old.

.He finished his PhD two years ago and is currently working as a post doc at the University

.Usually, he attends to a conference when he has a paper to present.

.Before going to the conference, he researches on who is going to be there, which papers are going to be presented. Before getting to the conference place he has a clear idea of which presentations he wants to attend and which people he would like to talk with.

.During the conference he tries to socialize, get in contact with important people within the community, present them their work and obtain feedback on it. After the conference he checks the proceedings and sends emails to the people he has set contact with.

.Due to budget issues, he is not able to attend all the conferences he would like to. In the case he is not able to be at the conference, he checks the website and read the proceedings. Sometimes he might contact some of the authors for clarifications. He really appreciates when the conference organization upload the videos of the keynotes or plenary meetings.

.At this stage of his career, he has already started to build his social network. He has 2 or 3 key people that he follows and tries to be up to date on their work.

He uses social networks pretty often. Not only for professional use but also to catch up with his friends.

Obtaining Security Clearance

He received his MSc degree in Computer Science from the University of Toronto in November and is now looking for a position as programmer at a software company. He was invited to submit a CV and some examples of his work to a software company but he is having a difficult time to find material among the course-works, programs, sketches, produced in the past. He searches his hard disk, memory sticks and old laptops for files about which he has forgotten names and location. When he finds them, he often cannot open them because the applications with which they were created are old. He finds himself after two days of work with no materials and still needs to write a CV.

Problem setting: scenario

Carlo received his MSc degree in Computer Science from the University of Trento in November and is now looking for a job as programmer in Torino. He was invited to submit a CV and some examples of his work to an important software company but he is having a difficult time to find the material among the course-works, programs, sketches, produced in the last years. He searches his hard disk, memory sticks and old laptop for documents about which he has forgotten names and location. When he found them, he often cannot open them because the applications with which they were created are old. He finds himself after two days of work with little materials and still needs to write a CV.

Video-example



Example 6. Knowledge Navigator™ vision video for a future notebook computer [E6 Dubberly and Mitch '87].

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 and personas can be used to articulate existing and envisioned work practices.

Recommended reading

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