数字媒体与网络技术

Human Computer Interaction

Identifying needs and establishing requirements

1

Overview

- The importance of requirements
- Different types of requirements
- Data gathering, interpretation and analysis
- Task descriptions: Scenarios
  Use Cases
  Essential use cases
- Task analysis: HTA

2

What, how and why?

- What are we trying to achieve in this design activity?

Two aims:
1. identifying needs
2. Establishing requirements

3

What, how and why?

- Identifying needs
  -- Understand as much as possible about the users, their work, and the context of that work, so that the system under development can support them in achieving their goals.

4

What, how and why?

- Identifying needs
  -- Understand as much as possible about the users, their work, and the context of that work, so that the system under development can support them in achieving their goals.

Task

5

What, how and why?

- Establishing requirements
  -- Produce a stable set of requirements that form a sound basis to move forward into thinking about design.
  -- Not necessarily a major document nor a set of rigid prescriptions, but you need to be sure that it will not change radically in the time it takes to do some design and get feedback on the ideas.

6

What, how and why?

•How can we achieve this?
Beginning: we know that we have a lot to find out and to clarify.
Middle?

End: have a set of stable requirements.

7

What, how and why?

•How can we achieve this?
Beginning: we know that we have a lot to find out and to clarify.
Middle?

– Data gathering activities
– Data analysis activities
– Expression as 'requirements'
- capturing the finding in a form that can be expressed as requirement

End: have a set of stable requirements.

8

What, how and why?

•How can we achieve this?
The requirements activity is iterative.
- the activities progress in a sequential manner. (broadly speaking)
- the subactivities inform and refine one another.
- Does not last for a set number of weeks or months and then finish.
- requirements evolve and develop as the stakeholders interact with designs and see what is possible and how certain facilities can help them. (in practice)

9

What, how and why?

•How can we achieve this?
The requirements activity is iterative.
- the activities progress in a sequential manner. (broadly speaking)
- the subactivities inform and refine one another.
- Does not last for a set number of weeks or months and then finish.
- requirements evolve and develop as the stakeholders interact with designs and see what is possible and how certain facilities can help them. (in practice)

10

What, how and why?

•Why bother?
Requirements definition: the stage where failure occurs most commonly
-- causes of failure: unclear objectives and requirements
-- critical success factors: clear, detailed requirements
Getting requirements right is crucial
-- What if the requirements are wrong?
Ans: at best, be ignored; at worst; be despised.
- UCD is one solution.
hear the user's voices and needs clearly and take them into account.

11

What, how and why?

•Why bother?
- UCD is one solution.
hear the user's voices and needs clearly and take them into account.

12

Establishing requirements

- Requirements need clarification, refinement, completion, re-scoping various labels
  - requirements gathering & requirements capturing (exist out there→pick up)
  - requirements elicitation (导出) (others know → ask)
  - requirements analysis (activity of investigating and analyzing an initial set of requirements that have been gathered, elicited, or captured.)
  - requirements engineering (iterative process of evolution and negotiation)
- Why 'establish'?
  - arise from understanding users' needs
  - can be justified by & related back to the data collected.

What are requirements

- A requirement is a statement about an intended product that specifies what it should do or how it should perform.
- Should be specific, unambiguous, and clear.
  - —E.g. time to download any complete page is less than 5 seconds.
  - —Teenage girls should find the site appealing.

Requirements in Software Engineering

- Functional:
  - —What the system should do
  - —Word processor: should support a variety of formatting styles.
- Non-functional:
  - —What constraints there are on the system and its development
  - —Must be able to run on a variety of platforms
  - —Function on a computer with 8GB Ram.
  - —Must be delivered in six months' time.

Different kinds of requirements

- Functional requirements
  - —What the product should do (e.g. smart fridge)
  - —Understanding the functional requirements for an interactive product is crucial.
  - —Historically the main focus of requirements activities

Different kinds of requirements

- Data requirements
  - —Capture the type, size/amount, persistence, accuracy, and value of the amounts of the required data.
  - —What kinds of data need to be stored?
  - —How will they be stored (e.g. database)?
  - —Share-dealing: up-to-date and accurate, likely to change many times a day.
  - —Personal banking: accurate, persist over many months and probably years, very valuable, ...

Different kinds of requirements

Environmental requirements or context of use

- refer to the circumstances in which the interactive product will be expected to operate.
  - —Physical
  - —Social
  - —Organisational
  - —Technical

Different kinds of requirements

Environmental requirements or context of use

—Physical environment

— How much lighting, noise, and dust is expected?

—Will users need to wear protective clothing?

—How crowded?

—Might affect the choice of interaction paradigm (e.g. ATM in very public physical environment. speech?)

19 数字媒体与网络技术

Different kinds of requirements

Environmental requirements or context of use

—Social environment

—collaboration and coordination

— sharing of files, of displays, (Synchronous vs. asynchronous)

—across great distances

—work individually

—privacy for clients

20 数字媒体与网络技术

Different kinds of requirements

Environmental requirements or context of use

—Organisational environment

— hierarchical management

— IT department's attitude and remit(宽恕，免除，缓和，汇出，传送)

— user support---good? Easily obtained?

— communications infrastructure---stable?

— availability of training

21 数字媒体与网络技术

Different kinds of requirements

Environmental requirements or context of use

—Technical environment

— What technologies will the product run on and need to be compatible with

—What technological limitations might be relevant?

22 数字媒体与网络技术

Different kinds of requirements

•User requirements: capture the characteristics of the intended user group.

•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

—The collection of attributes for a 'typical user' is called a user profile. Any one device may have a number of different user profiles.

23 数字媒体与网络技术

Different kinds of requirements

• Usability requirements

—capture the usability goals and associate measures for a particular product.

—learnability, throughput(生产量), flexibility, attitude

—Related to other kinds of requirement we must establish, such as the kinds of users expected to interact with the product.

effectiveness, efficiency, safety, utility learnability, memorability

24 数字媒体与网络技术

Summary: Different Kinds of Requirements

- Functional requirements
- Data requirements
- Environmental requirements
  - ✓ Physical requirements
  - ✓ Social requirements
  - ✓ Organizational requirements
  - ✓ Technical requirements
- User requirements
- Usability requirements

25

数字媒体与网络技术

Kinds of requirements

What factors (environmental, user, usability) would affect the following systems?

- 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

26

数字媒体与网络技术