BIRZEIT UNIVERSITY

Chapter 10

Identifying Needs and Establishing Requirements

INTERACTION DESIGN

beyond human-computer interaction
4th Edition

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2018
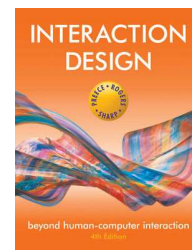
Overview

❖ The importance of requirements
❖ Different types of requirements
❖ Data gathering for requirements
❖ Data analysis and presentation
❖ Task descriptions:
  ▪ Scenarios
  ▪ Use Cases
  ▪ Essential use cases
❖ Task analysis:　　**HTA**

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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 as "requirements"
- All of this is **iterative**

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What, How and Why?

❖ **Why:**
Requirements
definition: the
stage where
failure occurs
most commonly.

❖ Getting
requirements
right is
important.

What the customer really
needed

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.

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Different Kinds of Requirements

❖ **Functional**:

▪ What the system should do.

▪ Historically the main focus of requirements activities.

❖ **Non-functional**: memory size, response time, security...

❖ **Data**:

▪ What kinds of data need to be stored?

▪ How will they be stored (e.g. database)?

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Different Kinds of Requirements

❖ **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, etc.

▪ **Organisational**: hierarchy, IT department's attitude and responsibility, user support, communications structure and infrastructure, availability of training.

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Different Kinds of Requirements

❖ **Users:** Who are they?

▪ **Characteristics**: ability, background, attitude to computers, etc.

▪ **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

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What are the Users' Capabilities?

❖ Humans vary in many dimensions:

- **Size** of hands may affect the size and positioning of input buttons.

- **Height** if designing a physical booth.

- **Strength** - a child's toy requires little strength to operate, but greater strength to change batteries.

- **Disabilities** (e.g. sight, hearing, motion).

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Personas

❖ Capture a set of user characteristics (user profile).

❖ Not real people, but created from real users.

❖ Should not be idealised.

❖ Bring them to life with a name, characteristics, goals, personal background.

❖ Develop a small set of personas with one primary.

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Example Persona

Data Gathering for Requirements

❖ **Interviews:**

- Props (دعم), e.g. sample scenarios of use, prototypes, can be used in interviews.
- Good for **exploring** issues.
- Development team members can connect with stakeholders.
- But are time consuming and may be infeasible to visit everyone.

❖ **Focus groups:**

- Group interviews.
- Good at gaining a agreement view and/or highlighting areas of conflict.
- But can be dominated by individuals.

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Data Gathering for Requirements

❖ **Questionnaires:**

- Often used in conjunction with other techniques.
- Can give **quantitative** or **qualitative** data.
- Good for answering specific questions from a large, dispersed (مشتت) group of people.

❖ **Researching similar products:**

- Good for prompting requirements

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Data Gathering for Requirements

❖ **Direct observation:**

- 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.

❖ **Indirect observation:**

- Not often used in requirements activity.
- Good for logging current tasks.

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Data Gathering for Requirements

❖ **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.

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Considerations for data gathering

❖ **Identifying and involving stakeholders**: users, managers, developers, customer reps?, union reps?, shareholders?

❖ **Involving stakeholders**: workshops, interviews, workplace studies, invite stakeholders onto the development team.

❖ **'Real' users, not managers**.

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Considerations for data gathering

❖ **Requirements management**: version control, ownership.
❖ **Communication between parties**:
  ▪ Within development team.
  ▪ With customer/user.
  ▪ Between users. different parts of an organisation use different terminology.
❖ **Availability of key people.**

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Considerations for data gathering

❖ Political problems within the organisation.

❖ Dominance of certain stakeholders.

❖ Economic and business environment changes.

❖ Balancing functional and usability demands.

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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.

❖ Support the process with props such as prototypes and task descriptions.

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Some Basic Guidelines

❖ 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 practical compromises, you need to know what you'd *really* like.

❖ Consider carefully how to record the data.

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Data Interpretation and Analysis

❖ Start soon after data gathering session
❖ Initial interpretation before deeper analysis.
❖ Different approaches emphasize different elements e.g. class diagrams for object-oriented systems, entity-relationship diagrams for data intensive systems.

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Task Descriptions

❖ **Scenarios**
  ▪ An informal narrative story, simple, 'natural', personal, not generalizable.
❖ **Use cases**
  ▪ Assume interaction with a system.
  ▪ Assume detailed understanding of the interaction.
❖ **Essential use cases**
  ▪ Abstract away from the details.
  ▪ Does not have the same assumptions as use cases.

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Task Analysis

❖ **Task descriptions** are often used to **imagine** new systems or devices.

❖ **Task analysis** is used mainly to **investigate** an existing situation.

❖ It is important not to focus on shallow activities

- What are people trying to achieve?
- Why are they trying to achieve it?
- How are they going about it?

❖ Many techniques, the most popular is **H**ierarchical **T**ask **A**nalysis (**HTA**)

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HTA

❖ Involves breaking a task down into subtasks, then sub-sub-tasks and so on. These are grouped as plans which specify how the tasks might be performed in practice.

❖ **HTA** focuses on physical and observable actions, and includes looking at actions not related to software or an interaction device.

❖ Start with a user goal which is examined and the main tasks for achieving it are identified.
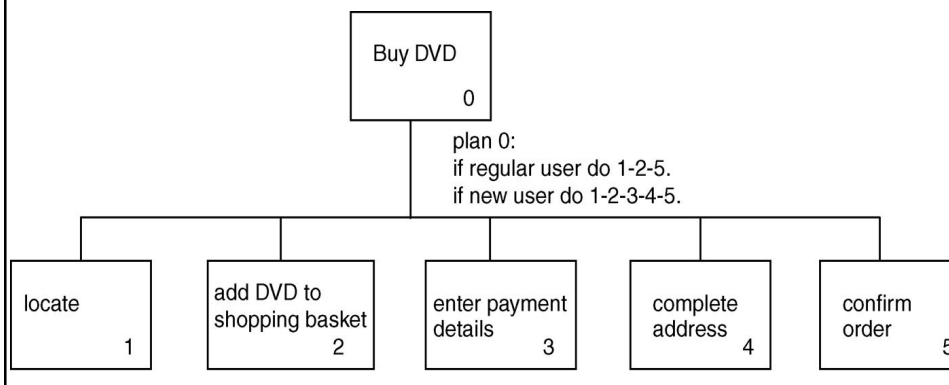
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Example: HTA

0. In order to buy a DVD
1. locate DVD
2. add DVD to shopping basket
3. enter payment details
4. complete address
5. confirm order

Plan 0:   If regular user do   1→2→5.
               If new user do   1→2→3→4→5.

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Example HTA (graphical)

```
                    ┌──────────┐
                    │ Buy DVD  │
                    │          │
                    │    0     │
                    └────┬─────┘
                         │ plan 0:
                         │ if regular user do 1-2-5.
                         │ if new user do 1-2-3-4-5.
   ┌─────────┬──────────┼──────────┬──────────┐
┌──────┐ ┌──────────┐ ┌────────┐ ┌────────┐ ┌────────┐
│locate│ │add DVD to│ │enter   │ │complete│ │confirm │
│      │ │shopping  │ │payment │ │address │ │order   │
│      │ │basket    │ │details │ │        │ │        │
│   1  │ │       2  │ │     3  │ │     4  │ │     5  │
└──────┘ └──────────┘ └────────┘ └────────┘ └────────┘
```

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Summary

❖ Getting requirements right is important.

❖ 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**, **direct observation**, **studying documentation** and **researching similar products.**

❖ Scenarios, use cases and essential use cases can be used to articulate existing and future work practices.

❖ Task analysis techniques such as HTA help to investigate existing systems and practices.

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