

Design & Evaluation of User Interfaces - notes

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UX - User experience

The effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in particular environments.

Effectiveness: the accuracy and completeness with which specified users can achieve specified goals in particular environments

Efficiency: the resources expended in relation to the accuracy and completeness of goals achieved

Satisfaction: the comfort and acceptability of the work system to its users and other people affected by its use

PACT

People

Physiological differences

- Disabilities
- Anthropometrics (Body)
- Ergonomic knowledge about capacities of a person (Dexterity etc.)

Psychological differences

- Spatial abilities
- Attention
- Memory
- Emotional disorders (depression)
- Personality types

Mental models

- An understanding of how a system works.

- Incomplete (Not all parts of a system is known)

Social differences

- Motivation
- Novice/expert (different experience)
- Homogeneous groups
- Heterogeneous groups

Activities

Context

Technology

Chapter 1

Requirement Analysis

*"What is a **requirement**"*

Something the product must do or a quality that the product must have.

Functional requirement, what the system must do.

Non-functional requirement, qualities that the system must have. Characteristics and/or parameters. Think qualitative.

Requirements needs to be testable

- What people do
- What people want to do
- How people do what they do

1.1 Terms used for activity

Requirement gathering, pre-existing specifications:

- Laws/legislation
- Documents from customer/user

Requirement generation, build from various sources.

Requirement solicitation, going deeper than user request.

Requirement engineering, active role, building the requirements.

requirements table

ID	Priority	Summary	Source(s)	Dependencies/conflicts	Satisfaction criteria	Change history
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...						

Figure 1.1: Requirements table

Prioritizing requirements, can be done using MoSCoW model.

Chapter 2

Data collection methods

Methods for Gaining an Understanding

Gather stories from stakeholders - examples of their work, struggles, processes, etc.

Interviews

Structured interview, with predetermined order and questions.

Semi-structured, loose understanding of questions, but more so following the flow of conversations.

Unstructured, loose understanding of questions, but more focused understanding general concern of customer.

Contextual Inquiry

Understand the actual work they are doing. Understanding their expertise of their needs and work. Abstraction, find commonalities and describe for the general user, not just the individual interviewed. Find the right granularity of the interview and understanding to not lose focus or getting overdetailed in descriptions.

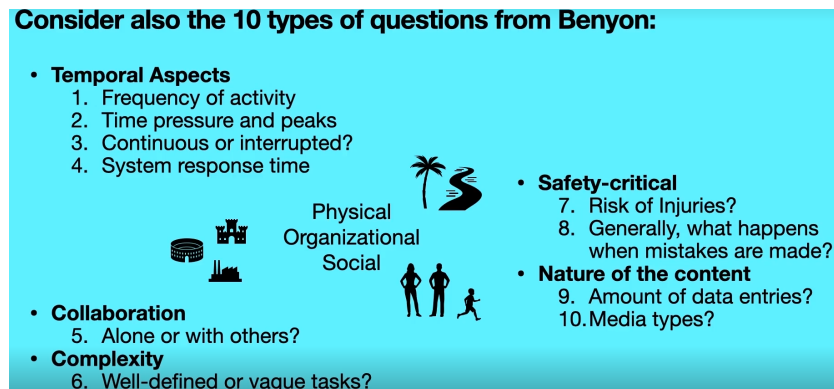


Figure 2.1: Benyons 10 questions

Quantifiable data

Usually a questionnaires. These can be first implemented into the development team to test, before sending to a customer. Keep it short. Preferably use a validated questions. Allows for comparing multiple users experience and wants for the potential system. Questionnaires can be found on pages like Google Scholar.

	Strongly disagree					Strongly agree
1. I think that I would like to use this system frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
2. I found the system unnecessarily complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
3. I thought the system was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
4. I think that I would need the support of a technical person to be able to use this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
5. I found the various functions in this system were well integrated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
6. I thought there was too much inconsistency in this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
7. I would imagine that most people would learn to use this system very quickly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
8. I found the system very cumbersome to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
9. I felt very confident using the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
10. I needed to learn a lot of things before I could get going with this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	

Figure 2.2: Usability scale (SUS) - validated questionnaires

Cultural Propes

Gather information in a given activity, by letting user do activity without the designer being present. Where the user collects the data in their home or workplace. This allows the user to collect important information for them, whereas the design would have to guess.

Field Observations

It's difficult for users to express all details in interviews and surveys. Using field observations, common behaviour that is not thought about like keyboard shortcut can be

found. Usually done after interview to know what to look for. Being unobtrusive is important as to not distract or impeding them.

Chapter 3

Appendix

3.1 Lecture 2 exercise

3.1.1 Requirements

In reference to: Requirement analysis

Exercise 3.1.1.1: What types of requirements exist?

Functional requirement, what the system must do.

Non-functional requirement, qualities that the system must have. Characteristics and/or parameters. Think qualitative.

Exercise 3.1.1.2: What characterizes the different types of requirements?

Functional requirement, what the system must do.

Non-functional requirement, qualities that the system must have. Characteristics and/or parameters. Think qualitative.

Exercise 3.1.1.3: How can requirements be represented in a requirements specification? (would you use a table and what would that look like?)

Yoinked from video, but describes the table:

requirements table

ID	Priority	Summary	Source(s)	Dependencies/conflicts	Satisfaction criteria	Change history
C4.1	1	View list of assignments, their status and type for the geographical area where the inspector is responsible.	Interview 3b.	None identified.	All assignments of the geographical area are shown. Only inspectors from the particular area can see these.	02-10-2007: Interview 3b -> Constraint on who can see the assignments.
...						

Figure 3.1: Requirements table

Exercise 3.1.1.4: What characterizes a "good" requirement? How should a good requirement be phrased?

A good requirement needs to be testable. Ambiguity should be avoided, while keeping it simple to understand and short in length. It should be something a product must do or a quality it must have.

Exercise 3.1.1.5: How can requirements be prioritized?**MoSCoW model:**

ID	Requirement	Must have	Should have	Could have	Won't have
1	Simple login	x			
2	Time-registering	x			
3	Time approval	x			
4	Export to CSV	x			
5	Project creation		x		
6	Role system		x		
7	Filtered CSV			x	
8	Auto holiday			x	
9	Calculate salary				x

Exercise 3.1.1.6: Who decides which priority to give the requirements? And how is this decided?

Requirements should be prioritized by reviewing them with customer/clients, this should also take the available resources into consideration, as no project has an unlimited budget.

3.1.2 Data collection

In reference to: Data collection methods

Exercise 3.1.2.1: Which of the following are considered qualitative data collection methods? Why?

- Interviews ✓
- Questionnaires
- Cultural probes ✓
- Observation ✓

Qualitative data collection is by definition non-numerical, so it cannot be ranked and easily compared. It focuses more on experience and opinions.

Exercise 3.1.2.2: Which of the following are considered quantitative data collection methods? Why?

- Interviews
- Questionnaires ✓
- Cultural probes
- Observation

Quantative data should be expressed as a quantity, there by making it easily comparable. Questionnaires are the only real quantative data collection of the 4, as it's unambiguous and easy to analyze.

Exercise 3.1.2.3: Which of the following can be considered both quantitative and qualitative data collection methods? Why?

- Interviews ✓
- Questionnaires
- Cultural probes
- Observation ✓

Observations could potentially be quantative depending on the data that is selected to be collected, but most likely qualitative. Structured interviews can be quantative, due too their rigidity in possible answers.

Exercise 3.1.2.4: What would be the best data collection method for gathering data in this situation: Your informants are part of a different community than your own. You want to get an understanding of their everyday lives and habits in using technologies at home. Which method of data collection techniques would be most suitable?

- Interviews
- Questionnaires
- Cultural probes ✓
- Observation

Cultural probing lends itself very much to this type of data collection, as it's specifically made to understanding peoples lives in a normal setting such as their home.

Exercise 3.1.2.5: How many forms of interviews are there and how would you describe these?

- Structured interview, with predetermined order and questions.
- Semi-structured, loose understanding of questions, but more so following the flow of conversations.
- Unstructured, loose understanding of questions, but more focused understanding general concerns of customer.

Exercise 3.1.2.6: What are the benefits and drawbacks of the different interview forms?

Structured Quantifiable, but limits to more restricted answers.

Semi-structured Allows to explore new appropriate topics, while still keeping the general conversations structured and to the point.

Unstructured Avoids preconceptions, but interviewer has very limited knowledge, meaning keeping the interview on track can be harder.

What are some considerations you should take into account in terms of the language of interview questions, i.e. formulating questions?

It should be a mixture of open and closed questions.

Closed questions to create a baseline and general understanding.

Open questions, so the interviewee can share their experience, knowledge etc. in detail.

What are some benefits of observations compared to interviews?

In interviews certain information and commonalities can easily be forgotten when explaining. By using observations this will be captured. It will also show the actual working environment and frustrations points in reality.

In which situations would it be most suitable to use questionnaires over interviews?

Allows collection from a distance, and with larger amount of participants. It's not as specific as an interview, but will allow to get a more general understanding, as it can be quantified.

3.1.3 Data Collection - Case 1: Data gathering in a hospital ward

Imagine the following use context for a software system: Nurses and doctors work together in a hospital ward where children with serious illnesses (e.g. acute respiratory symptoms) are being treated. The ward is filled with technical equipment. The children come in with their parents, and the staff need to both treat the childrens' health conditions and consult and update their systems with information while also calming the children and informing their parents about the procedures.

You need to design a mobile app which shows a dashboard overview of data from various sensors (such as an electrocardiogram for monitoring heart rate). This is used to monitor the health of the children and warn staff about a change in physical conditions of the children in this use context.

1. Conduct a PACT-analysis of this scenario.

People The main actors would be the staff, that being the nurses and doctors in the hospital. As the staff is very busy, the dashboard needs to easily accessible and should allow quickly understand the information about each patient. Furthermore should probably include a notification system, to minimize the amount of time spent looking the app.

Activities The activity is to allow staff to see a complete overview of all sensor data for specific patients in a dashboard.

Contexts Inside a medical ward, that houses seriously ill children. Its need to consider collaboration between staff within the ward. It's primary objective is collection of medical data.

Technologies It needs to be a mobile app, that limits need for a lot of interaction. Include a notification system for the previous point. A central database so all members can have access to multiple patients.

2. Which of the following data collection techniques would you find suitable for gaining an understanding of the use context?

In situ observations to see how the staff works, and what conditions the app is used in.

Artefact collection Equipment in the current work environment works and the their interfaces, to tailor the solution to.

Interviews with the staff to understand the importance of different types of information displayed, their technological expertise. General understanding of their workflow.

Usability evaluation to ensure its easability in use, and a satisfactory display of information.

3. **Why did you choose these data collection techniques? (strengths/weaknesses?)**

Explanation is in the above answer.

4. **Who would you include in the data collection and in what activities?**

Explanation is in the above answer.

5. **Are there any of the techniques that you would not use in this context and why not?**

Cultural probes would not be necessary, as it could really give an understanding of peoples technological abilities in this context. It's more important to make use of usability testing in this case, and tailor it to the actual users.

6. **If you choose to conduct observations, which ethical issues would you consider in this specific situation?**

GDPR issue first of all, as medical information is very sensitive. Also not to disturb parents and children currently within the ward. Distraction of doctors

7. **If you choose to conduct artefact collection, which ethical issues would you consider in this specific situation?**

See above questions ^.

8. **If you choose to interview a doctor, what practical considerations would you take into account?**

Focus on the context of their work, their technical abilities and the importance of certain information. Also not to go deep into the actual medical detail, as the important part is input data and the display of said data.

9. **If you choose to interview a child, what practical considerations would you take into account?**

I didn't, as this app is not made for the children.

3.2 Lecture 2 exercise

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