User Experience Design I
(Interaction Design)
Day 5 - (10.12.2020 9-12 a.m.)

Conducting UX Design Research

• Field Studies
• Observation
• Interviews
• Questionnaires
• Analysis & Design Thinking
Applying UX Design

• What is UX Design Research and which method to choose?

• Conducting UX Design Research

• HCI-related and practical information for your own studies

• Interpretation of UX Data and presentation of results - Design Thinking
“Designers not only tell a story, they listen to one”

Bill Buxton
“Let’s get really mindful about the process. Be aware of what’s been hitherto fairly automatic. Let’s become more conscious.”

Jane Fulton Suri
Double Diamond

DISCOVER STAGE

- Consumer behaviour and preferences in relation to the product or service offered by the company
- New modes of communication
- New service needs that may emerge on the basis of social, economic or environmental changes

source: [2]
User Research
People

source: [8]
source: [8]
WE RECRUIT TEST USERS
For usability tests, focus groups, interviews, surveys and more.

- Test with people from our growing pool of 250,000+ individuals.
- Choose a date and time. We can deliver within 48 hours.
- Never a charge for no-shows. Free replacement.
- We pay all test-user incentives. No extra charges for your company.

Amount
5 participants

For what type of study?
User test

Calculate Price

View example

“TestingTime covers my back. Whether for Remote or In-House Testing.”
David Tschapnizky - Google

https://www.testingtime.com/en/
It is essential to the success of UX design that designers find a way to understand the perceptions, circumstances, habits, needs, and desires of the ultimate users.

Jane Fulton Suri
**Diagram: Methods of User Research**

- **Saying (Explicit opportunities and needs):**
  - **Statistical: Macro techniques (many people)**
  - **Focus Groups (few people) - Interpretive**

- **Doing (Latent opportunities and needs):**
  - **Video Ethnography**
  - **Observational Techniques**

**Source:** [8]
ANALYSIS
Definition of the system
What is the problem?

EVALUATION
Possible alternatives
What future do we want?

SYNTHESIS
Design of final solutions
What do we implement?

The designer is a ‘problem-scouter’
The designer is a ‘story-teller’
The designer is an ‘executor’

source: [4]
<table>
<thead>
<tr>
<th>subjects</th>
<th>truth</th>
<th>inspiration</th>
</tr>
</thead>
<tbody>
<tr>
<td>traditional market research</td>
<td></td>
<td>(?)</td>
</tr>
<tr>
<td>empathic research</td>
<td></td>
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</tbody>
</table>
Why Design Research?

(a) **Instrument of knowledge.** Any time we design for a specific domain we need to learn how things work in this domain. One way of doing it is to review existing literature and previous work (desk research). Another way, complementary to desk research, is to go to the field and look directly for the information we need.

(b) **Support for thinking.** User research tools are not formulas, but they help to overcome the subjective view of the designer.

(c) **Instrument to communicate and legitimate.** Everything we learn from user research has the great advantage of being “true” (although not in an absolute way), because it comes from the real world and from real experiences.

source: [4]
Design Research’ Roots

The importance of design with user needs in mind is not new. Since design has **roots in craft, customised solutions by craftsman** can be considered the first user-centred design.

Many methods employed in design research have their roots in cultural anthropology, social behavioural sciences and psychology (for example: experiments, questionnaires, interviews, observation), some have been adapted from marketing disciplines (e.g. focus group, workshops, telephone survey), while others have been developed specifically for user research and usability evaluation (e.g. cognitive walkthroughs, logging).
Applying UX Design

• What is UX Design Research and which method to choose?

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Design Research is mostly structured:

**Key Research** Planning

Do Field Research

Find Opportunity Spaces

source: [10]
IDEO Method Cards
FLOW ANALYSIS

How

Represent the flow of information or activity through all phases of a system or process.

Why

This is useful for identifying bottlenecks and opportunities for functional alternatives.

Example

Designing an online advice Web service, flow analysis helped the team to gain a clearer sense of how to make it easy to find your way around the site.
COGNITIVE TASK ANALYSIS

How
List and summarise all of a user’s sensory inputs, decision points, and actions.

Why
This is good for understanding users’ perceptual, attentional, and informational needs and for identifying bottlenecks where errors may occur.

Example
Logging the commands that would be involved in controlling a remotely operated camera helped the team establish priorities among them.
HISTORICAL ANALYSIS

How

Compare features of an industry, organisation, group, market segment or practice through various stages of development.

Why

This method helps to identify trends and cycles of product use and customer behaviour and to project those patterns into the future.

Example

A historical view of chair design helped to define a common language and reference points.
FLY ON THE WALL

How
Observe and record behaviour within its context, without interfering with people’s activities.

Why
It is useful to see what people do in real contexts and time frames, rather than accept what they say they did after the fact.

Example
By spending time in the operating room, the designers were able to observe and understand the information that the surgical team needed.
Choosing a UX Research Method
Case Study(s)
UX Field Research in the Food Service Domain
**A DAY IN THE LIFE**

**How**
Catalog the activities and contexts that users experience for an entire day.

**Why**
This is a useful way to reveal unanticipated issues inherent in the routines and circumstances people experience daily.

**Example**
For the design of a portable communication device, the design team followed people throughout the day, observing moments at which they would like to be able to access information.

source: [7]
SHADOWING

How
Tag along with people to observe and understand their day-to-day routines, interactions, and contexts.

Why
This is a valuable way to reveal design opportunities and show how a product might affect or complement user’s behaviour.

Example
The team accompanied truckers on their routes in order to understand how they might be affected by a device capable of detecting drowsiness.

source: [7]
PERSONAL INVENTORY

How
Document the things that people identify as important to them as a way of cataloging evidence of their lifestyles.

Why
This method is useful for revealing people’s activities, perceptions, and values as well as patterns among them.

Example
For a project to design a handheld electronic device, people were asked to show the contents of their purses and briefcases and explain how they use the objects that they carry around everyday.

source: [7]
Personal Inventory
Summary Observation

• Direct observation in the field
  – Structuring frameworks
  – Degree of participation (insider or outsider)
  – Ethnography

• Indirect observation: tracking users’ activities
  – Diaries
  – Interaction logging

source: [8]
Ethnography

- Ethnography is a philosophy with a set of techniques that include participant observation and interviews
- Debate about differences between participant observation and ethnography
- **Ethnographers immerse themselves** in the culture that they study
- A researcher’s degree of participation can vary along a scale from ‘outside’ to ‘inside’
- Analysing video and data logs can be **time-consuming**
- Collections of comments, incidents, and artefacts are made
Applying UX Design

• What is UX Design Research and which method to choose?
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• Interpretation of UX Data and presentation of results - Design Thinking
Four key issues

• **Setting goals**
  – Decide how to analyse data once collected

• **Relationship with participants**
  – Clear and professional
  – Informed consent when appropriate

• **Triangulation**
  – Use more than one approach

• **Pilot studies**
  – Small trial of main study
  – Verify that the setup “works”
  – Ensure timely execution
  – Provide an outlook of the “outcome”

source: [2]
Data recording

- Notes, audio, video, photographs
- Notes plus photographs
- Audio plus photographs
- Video
Standard Observation Tools:
Standard Observation Tools:
Interviews

Unstructured - are not directed by a script. Rich but not replicable.

Structured - are tightly scripted, often like a questionnaire. Replicable but may lack richness.

Semi-structured - guided by a script but interesting issues can be explored in more depth. Can provide a good balance between richness and replicability.

source: [8]
Interview questions

Two types:
• ‘closed questions’ have a predetermined answer format, e.g., ‘yes’ or ‘no’
• ‘open questions’ do not have a predetermined format
• Closed questions are easier to analyse

Avoid:
• Long questions
• Compound sentences - split them into two
• Jargon and language that the interviewee may not understand
• Leading questions that make assumptions e.g., why do you like …?
• Unconscious biases e.g., gender stereotypes

source: [8]
Example (Open Ended Response Format)

“Don't you think that this would be better if it was also available on a smartphone?”
- Assuming that there is an interest from the person asking
- Interviewee is pointed towards a direction
- Closed Question

vs.

"If this feature were available tomorrow on a smartphone, would you use it?”
- More objective
- Can result in any possible answer
- Directly addresses “usefulness”
- Closed Question

vs.

"Is there any other way you'd like to use a feature like this?"
- Open question
- Can lead to other (interesting) topics and covers all possibilities

source: [11]
Running the interview

• **Introduction** – introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, present any informed consent form.

• **Warm-up** – make first questions easy and non-threatening.

• **Main body** – present questions in a logical order

• **A cool-off period** – include a few easy questions to defuse tension at the end

• **Closure** – thank interviewee, signal the end, e.g., switch recorder off.

source: [8]
Enriching the interview process

Props - devices for prompting interviewee, e.g., a prototype, scenario
Artefacts or props can play a significant role in the process by
(1) staying focused and structured on the topic and
(2) making a complex technology or system explainable within a short timeframe (sketch, props, 3D artefacts)
Low Fidelity Artefacts
Low Fidelity Artefacts
User Experience Design I
(Interaction Design)
Day 6 - (17.12.2020 9-12 a.m.)

Conducting UX Design Research
• Questionnaires
• Analysis and presentation
• Design Thinking - d.school
“Let’s get really mindful about the process. Be aware of what’s been hitherto fairly automatic. Let’s become more conscious.”

Jane Fulton Suri
Designing Questionnaires

Schildern Sie kurz ihr Erlebnis, waren Sie furchtbar (würde nicht Display schreiben) einfach/schwierig ist die Benutzbarkeit.

Log braucht man nicht unbedingt.
What is it we are trying to understand?

- set **Goals**!

...and write a **short abstract**
(helps to stay focused and ask precise questions directly addressed to the goals of the study)
Advice on Questions to Ask:

- **finding Cause(s)**: What is causing the problem?

- **finding Solution(s)**: Ideas on how to solve a problem or initiate a business opportunity

- ask questions on **only one dimension**!
  (e.g., “Were you satisfied with the quality of our food and service?” (counter example))

source: [10]
### Questionnaires

- Questions can be **closed or open**

- Closed questions are **easier to analyse**, and may be done by computer

- Can be administered to large populations

- Paper, email and the web used for dissemination

- Sampling can be a problem when the size of a population is unknown as is common online

source: [8]
Questionnaire design

• The impact of a question can be influenced by question order.

• Do you need different versions of the questionnaire for different populations?

• Provide clear instructions on how to complete the questionnaire.

• Strike a balance between using white space and keeping the questionnaire compact.

• Decide on whether phrases will all be positive, all negative or mixed.

source: [8]
Question and response format

• ‘Yes’ and ‘No’ checkboxes

• Checkboxes that offer many options

• Rating scales

• Likert scales (Rensis Likert)

• Semantic scales

• 3, 5, 7 or more points?

• Open-ended responses

source: [8]

https://www.fieldboom.com/blog/wp-content/uploads/2017/01/6-point-Likert-scale-even-survey.png
### NASA Task Load Index

Hart and Staveland's NASA Task Load Index (TLX) method assesses work load on five 7 point scales. Increments of high, medium and low estimates for each point result in 21 gradations on the scales.

<table>
<thead>
<tr>
<th>Name</th>
<th>Task</th>
<th>Date</th>
</tr>
</thead>
</table>

**Mental Demand**

How mentally demanding was the task?

<table>
<thead>
<tr>
<th>Very Low</th>
<th>Very High</th>
</tr>
</thead>
</table>

**Physical Demand**

How physically demanding was the task?

<table>
<thead>
<tr>
<th>Very Low</th>
<th>Very High</th>
</tr>
</thead>
</table>

**Temporal Demand**

How hurried or rushed was the pace of the task?

<table>
<thead>
<tr>
<th>Very Low</th>
<th>Very High</th>
</tr>
</thead>
</table>

**Performance**

How successful were you in accomplishing what you were asked to do?

<table>
<thead>
<tr>
<th>Perfect</th>
<th>Failure</th>
</tr>
</thead>
</table>

**Effort**

How hard did you have to work to accomplish your level of performance?

<table>
<thead>
<tr>
<th>Very Low</th>
<th>Very High</th>
</tr>
</thead>
</table>

**Frustration**

How insecure, discouraged, irritated, stressed, and annoyed were you?

<table>
<thead>
<tr>
<th>Very Low</th>
<th>Very High</th>
</tr>
</thead>
</table>
Questionnaires should accommodate all possible answers:

e.g., consider the question:

What brand of computer do you own?
A. IBM PC
B. Apple

What’s the issue here?
Questionnaires should accommodate all possible answers:

e.g., consider the question:

What brand of computer do you own?
A. IBM PC
B. Apple

What’s the issue here?

What brand of computer do you own?
..... Do not own a computer
..... IBM PC
..... Apple
..... Other

source: [10]
Summary Creating a Good Questionnaire:

• Keep your questionnaire **short**. In fact, the shorter the better.

• Use **simple and direct language**. The questions must be clearly understood by the respondent.

• Begin with a few **non-threatening** and interesting items.

• Place the **most important items in the first half** of the questionnaire.

• Leave **adequate space for respondents** to make comments.

• Perform **iterative pre-tests** and eliminate or replace questions that are hard to understand or lead to useless / unsatisfying results.

• Accommodate **all answers**

source: [10]
Encouraging a good response

• Make sure purpose of study is clear
• Promise anonymity
• Ensure questionnaire is well designed
• Offer a short version for those who do not have time to complete a long questionnaire
• If mailed, include a stamped addressed envelope
• Follow-up with emails, phone calls, letters
• Provide an incentive
• 40% response rate is high, 20% is often acceptable

source: [8]
Structuring frameworks to guide observation

- The person. Who?
- The place. Where?
- The thing. What?

The Goetz and LeCompte (1984) framework:
- Who is present?
- What is their role?
- What is happening?
- When does the activity occur?
- Where is it happening?
- Why is it happening?
- How is the activity organised?
Choosing and combining techniques

• Depends on
  • The **focus** of the study
  • The **participants** involved
  • The **nature** of the technique
  • The **resources** available
Scheduling and Time Planning

1. Goal clarification
2. Overall study design
3. Selecting the Sample
4. Designing the Questionnaire
5. Conduct Pilot Test
6. Revise Questionnaire
7. Printing Time
8. Locating the sample
9. Mail & Response Time
10. Attempts to get non-responders
11. Editing Data
12. Analyzing Data
13. Preparing Report
14. Printing and distribution

Duration

source: [10]
Summary

- Three main data gathering methods: interviews, questionnaires, observation
- Four key issues of data gathering: goals, triangulation, participant relationship, pilot
- Interviews may be structured, semi-structured or unstructured
- Observation may be direct or indirect, in the field or in controlled setting
- Techniques can be combined depending on study focus, participants, nature of technique and available resources

source: [8]
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Miro Board Template

Interviews

Step 3. Document the results of the interviews conducted. Put down the conclusions you deem relevant for your team to know. Add interviewee’s role, use case, personal description, and their workflow. Add Google docs, audio or video recordings of the interviews. Use colour-coordinated sticky notes for different aspects of user-product interaction. To not forget the context of the original idea, write clearly and name views that purpose, use tags.

Notes

Problems

Ideas

Quotes

Lisa, Product Manager
Use case: plan/work on strategy

Website

No apparent user case

No obvious case

The video makes it clear what to expect

We should scan?
I am not familiar with the product yet

Android, Product Manager,
Online Coach
Use case: brainstorming and organizing ideas

Website

Can’t find developer notes

Can’t separate here

Can’t categorize here

Can’t combine here’s settings in multi-tasking

Clues are not easy to the user right away, feeling it
all about the extra controls

Add a comment function here

This is just misleading

I like what I see so far!

I love what I see so far!

We are almost done
We can’t finish this
We are almost done

More video options for notes

Movie icon

Hera

Hera

Notice there site

Register

Sign-up

Login

Forgot password

Click here for more users

Check boxes for new users

We are almost done
We can’t finish

And I won’t have to do it

We are almost done

And I won’t have to do it

We are almost done

And I won’t have to do it

We are almost done

And I won’t have to do it

We are almost done

And I won’t have to do it

We are almost done

And I won’t have to do it

We are almost done

And I won’t have to do it

We are almost done

And I won’t have to do it
AFFINITY DIAGRAMS

How
Cluster design elements according to intuitive relationships, such as similarity, dependence, proximity, and so forth.

Why
This method is a useful way to identify connections among issues and to reveal opportunities for innovation.

Example
An affinity diagram shows what’s involved in transporting young children, and helps to identify the opportunities to improve the design of a stroller.
UX Data Analysis Workshop
UX Report contains:

- Study Design
- User Profiles
- Questionnaire Results
- Affinity Diagrams
- Interview Quotes
- Summarised Findings
- Design Recommendations
Stanford d.school Design Thinking Process

**Empathize**
- Interviews
- Shadowing
- Seek to understand
- Non-judgmental

**Define**
- Personas
- Role objectives
- Decisions
- Challenges
- Pain Points

**Ideate**
- Share ideas
- All ideas worthy
- Diverge/Converge
- “Yes and” thinking
- Prioritize

**Prototype**
- Mockups
- Storyboards
- Keep it simple
- Fail fast
- Iterate quickly

**Test**
- Understand impediments
- What works?
- Role play
- Iterate quickly

https://dschool.stanford.edu
Vision Workshop

In the initial workshop we aim at producing a large quantity of ideas that we systematically filter with our selected design thinking tools. Opportunity seeking and decision making are two recurring activities we perform several times throughout the workshop day.
The canvas analyses and maps out customer jobs, pains and gains. In a second step these topics are clustered and filtered into feasible solution ideas that drive business value.

The focus is constantly on creating value and benefit for the customer.
Value Proposition Canvas

GAINS
What benefit does the customer want to achieve?

PAINS
What problems the customer has to deal with?

GAIN CREATORS
How can the customer’s expectations be met?

PRODUCTS AND SERVICES
Resulting products and solutions

COSTUMER JOBS
What tasks does the customer face?
UX Blueprinting

The value of blueprinting is to see at-a-glance the combination of the user perspective and front- and backend processes that need a supportive digital infrastructure. This allows a holistic design thinking perspective on individual use-cases and quick evaluation.
Vision - Use Cases

We visualize IoT use cases for each stakeholder. Each UX Blueprint contains a specific use case that shows the interaction from the user perspective and its touchpoints. The goal of this task is to identify use cases for the next level of exploration.
References: