User Experience Design I (Interaction Design)

Day 5 - (02.12.2021 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

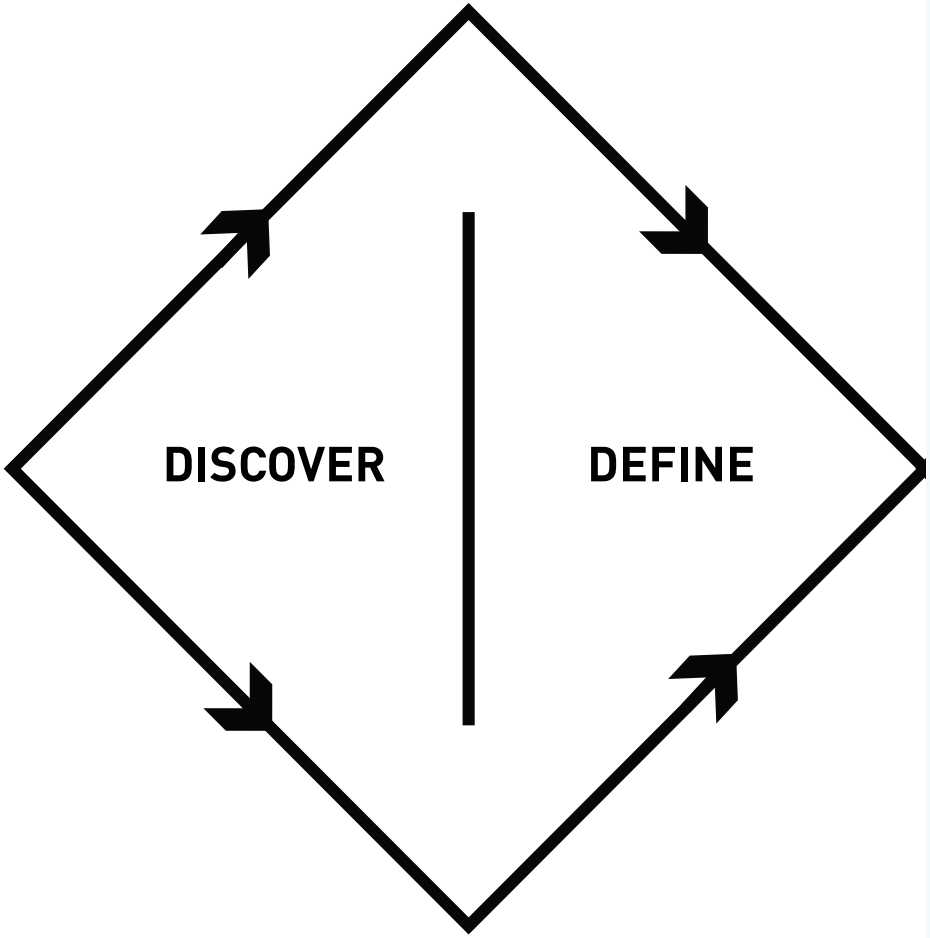
“Designers not
only tell a story,
they listen to one"

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

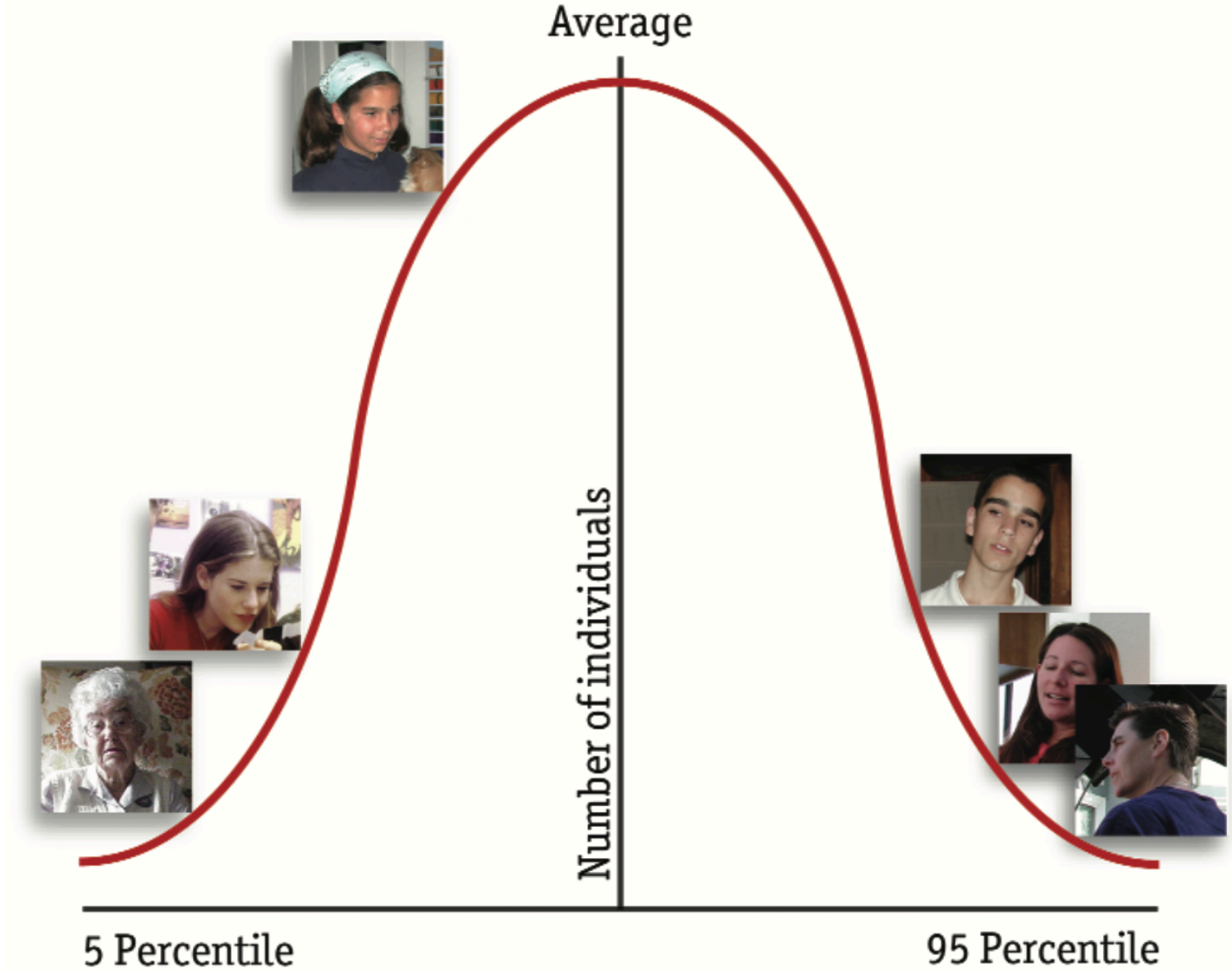
- Consumer behaviour and preferences in relation to the product or service offered by the company
- New modes of communication
- New service needs that may emerge on the basis of social, economic or environmental changes

source: [2]

NN/g
User Research

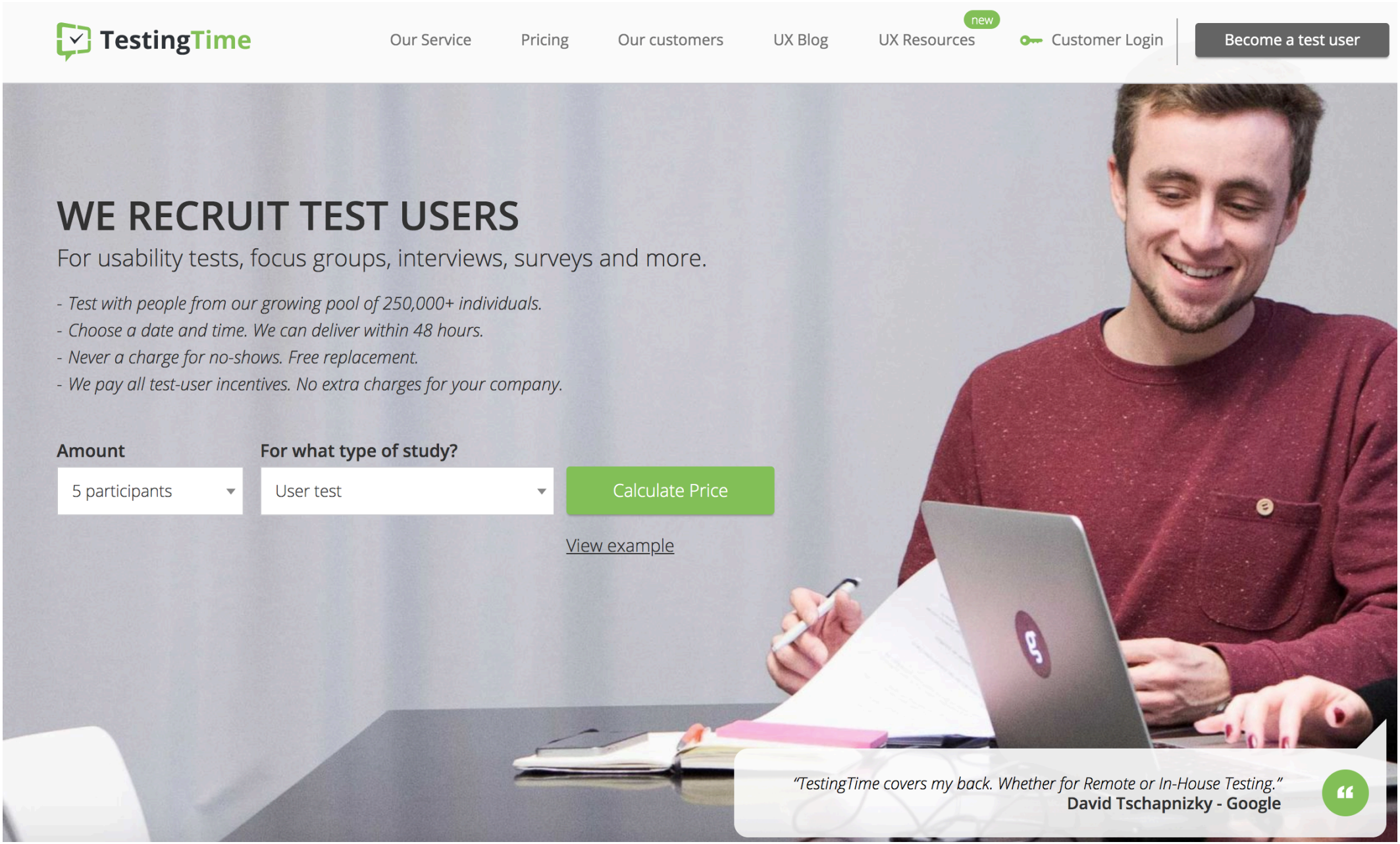
People

source: [8]



source: [8]

Example:

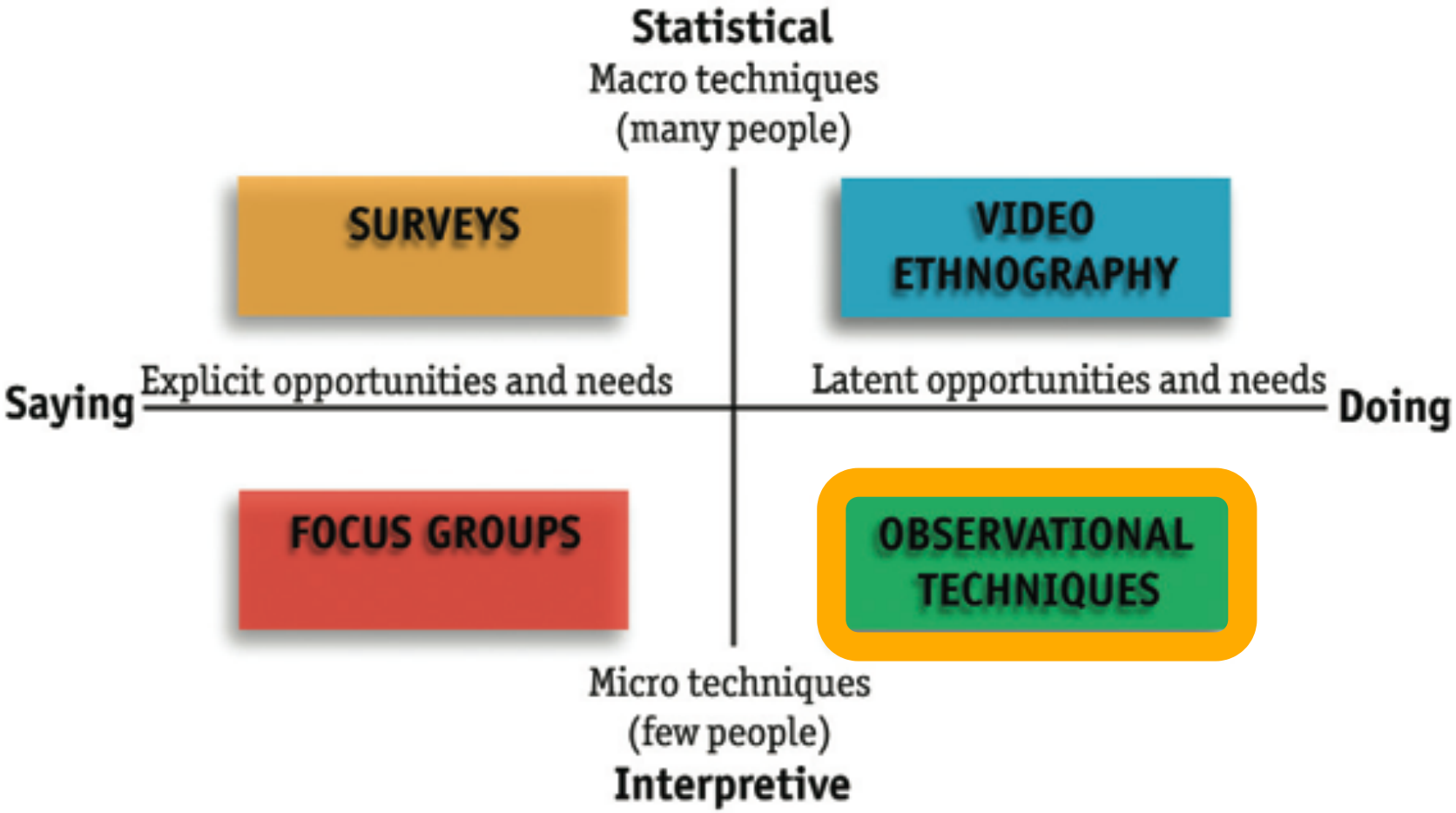


https://www.testingtime.com/en/

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

source: [8]


Statistical
Macro techniques
(many people)
SURVEYS
VIDEO ETHNOGRAPHY
Saying
Explicit opportunities and needs
Latent opportunities and needs
Doing
FOCUS GROUPS
OBSERVATIONAL TECHNIQUES
Micro techniques
(few people)
Interpretive

source: [8]

ANALYSIS

Definition of the system

What is the problem?

EVALUATION

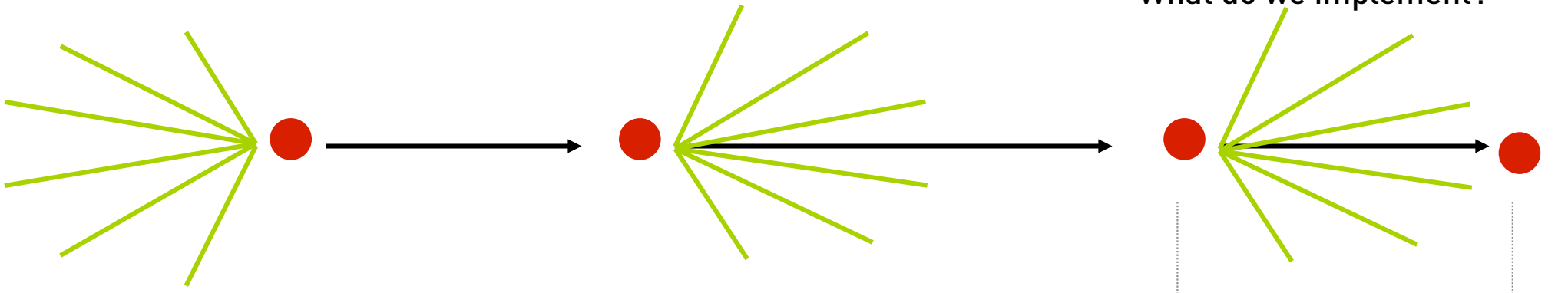
Possible alternatives

What future do we want?

SYNTHESIS

Design of final solutions

What do we implement?

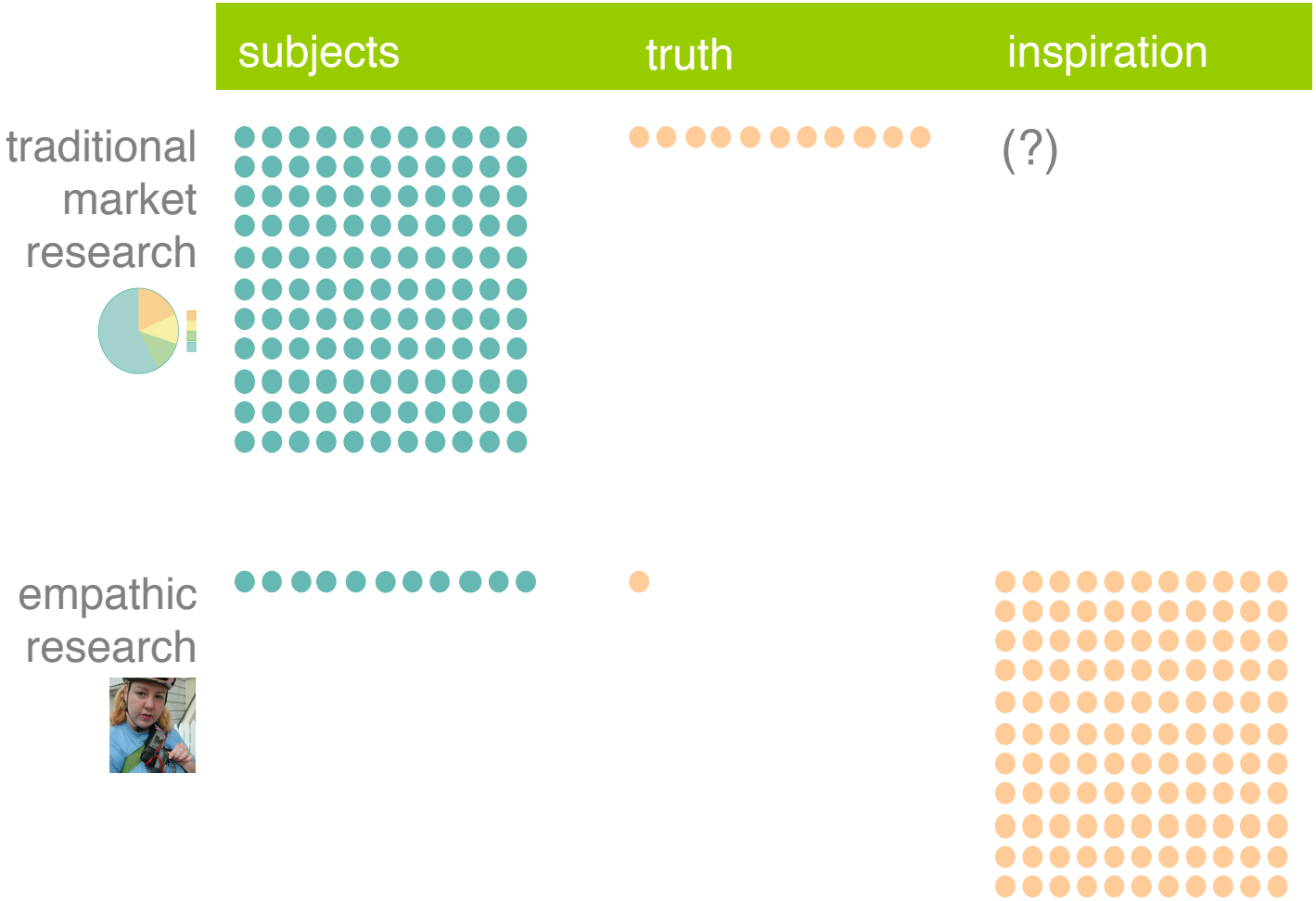


The designer is a ‘problem-scouter’

The designer is a ‘story-teller’

The designer is an ‘executor’

source: [4]


subjects
truth
inspiration
traditional market research
(?)
empathic research

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).

source: [4]

User Experience Design I (Interaction Design)

Day 6 - (09.12.2021 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 ?
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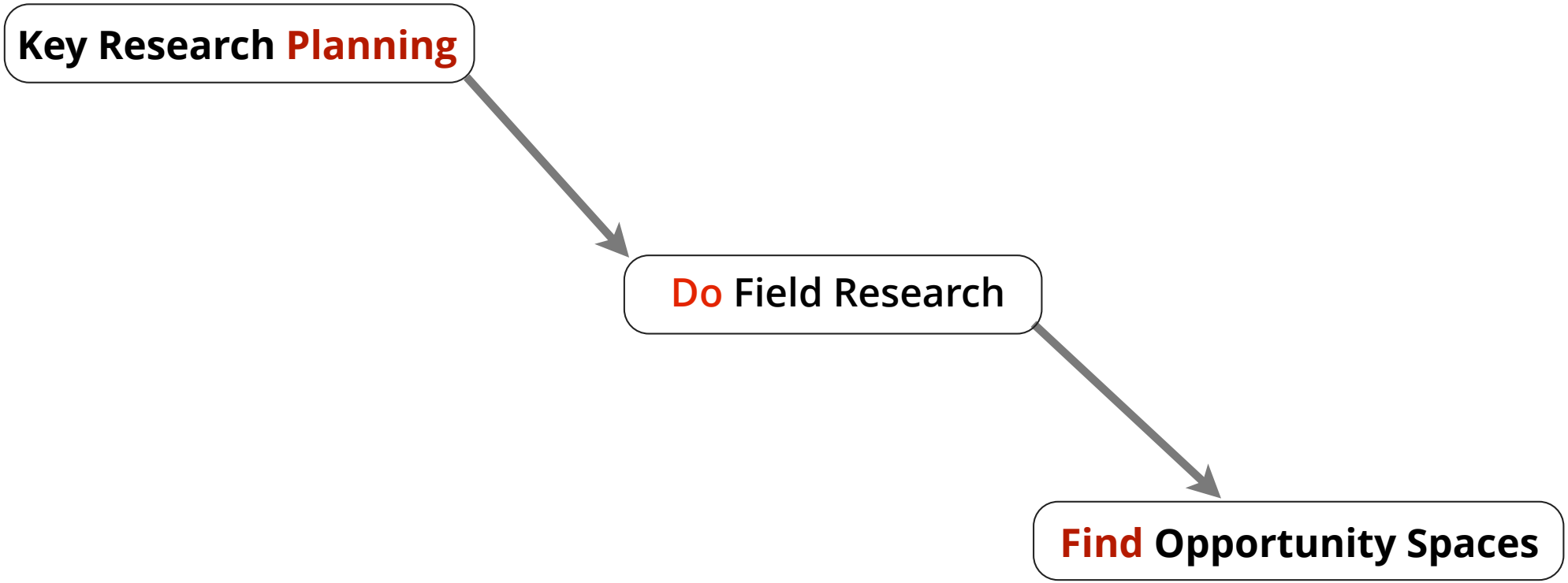
Design Research is mostly structured:



source: [10]

IDEO Method Cards

http://www.ideo.com/images/uploads/work/slides/IDEO_MethodCards_hero_626px.jpg

FLOW ANALYSIS

How

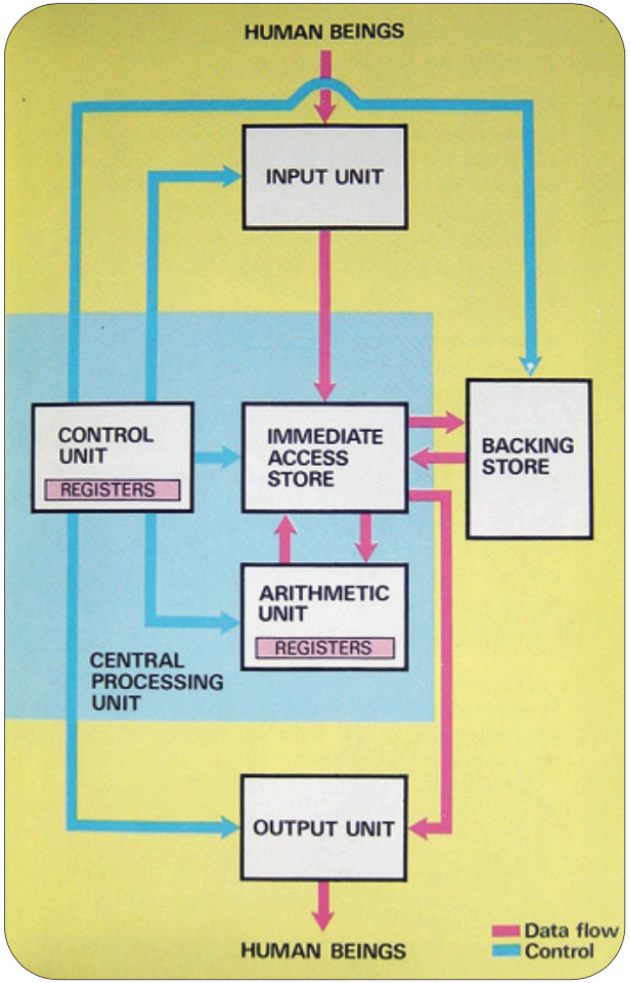
Represent the flow of information or activity through all phases of a system or process.

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.



FLOW ANALYSIS

http://www.ideo.com/images/uploads/work/slides/IDEO_MethodCards_hero_626px.jpg

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.

COGNITIVE TASK ANALYSIS

http://www.ideo.com/images/uploads/work/slides/IDEO_MethodCards_hero_626px.jpg

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

http://www.ideo.com/images/uploads/work/slides/IDEO_MethodCards_hero_626px.jpg

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.

FLY ON THE WALL

source: [7]

NN/g
Choosing a UX
Research Method

Case Study(s)

FILTER
LANGUAGE
2:30
CURL
/PC
1:30
onion
STRG
2:15
O
rings
2:45
MOZ/
JAL
5:00
FISH

UX Field Research in the Food Service Domain

IMAGO DESIGN Manitowoc Foodservice

source: [7]

START
STOP
FRENCH FRIES
350°F
START
COOKING CYCLE LEFT
14
12
10
8
6
4
2
1
CURLY FRIES
350°F
START
FRENCH FRIES
CURLY FRIES
FRENCH FRIES
CURLY FRIES
START
STOP
Frymaster

source: [7]

Choose Preset
Start Surgery
Amelie Rosenstern
Devan McDonald
Default Cranial
Default Glow 800
Default Glow 400
Default Spine
DEFAULT

PROVEO 8
SONY
BALANCE

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.

A DAY IN THE LIFE

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.

SHADOWING

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

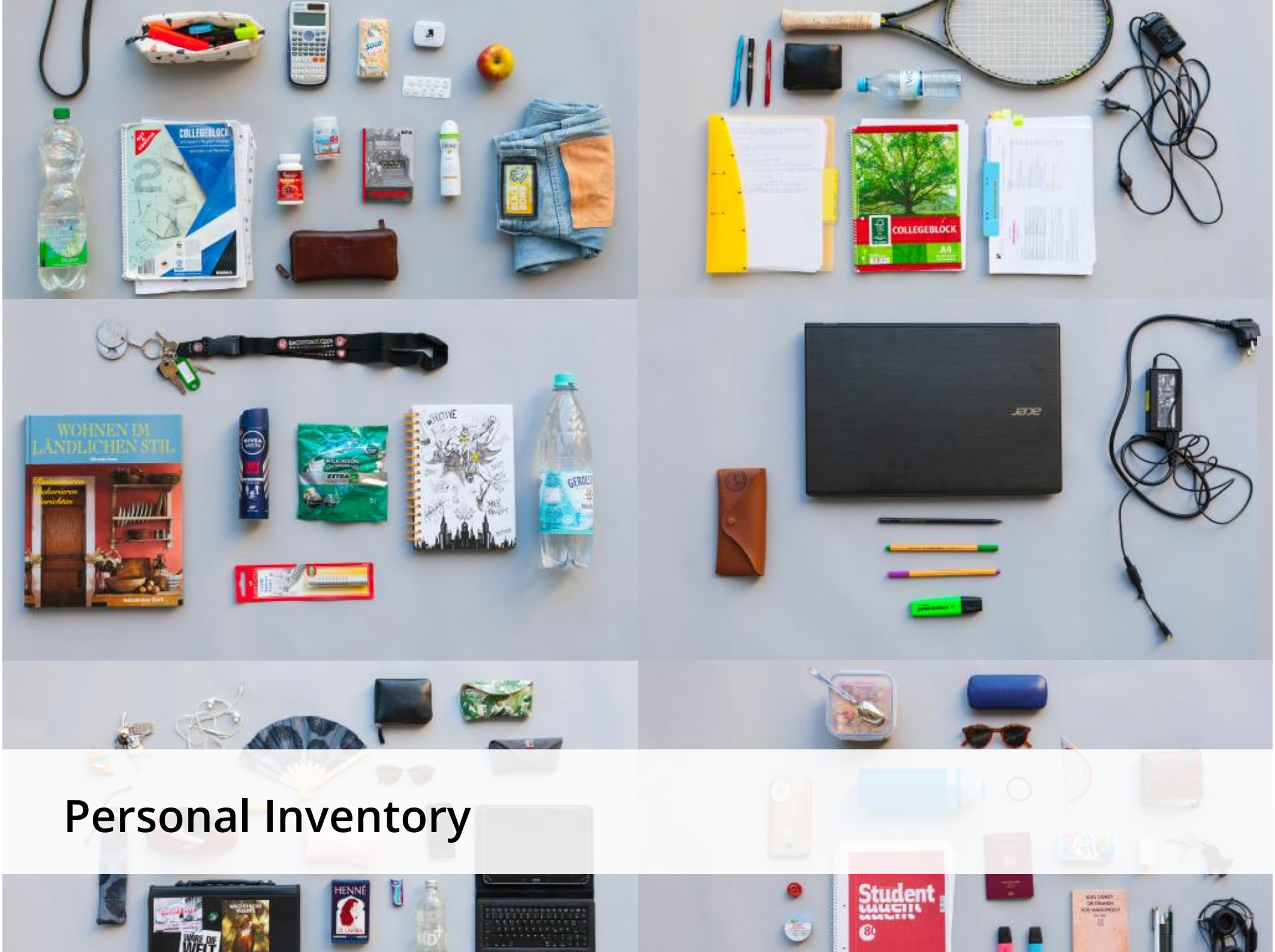
This method is useful for revealing people's activities, perceptions, and
values as well as patterns among them.

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.

PERSONAL INVENTORY

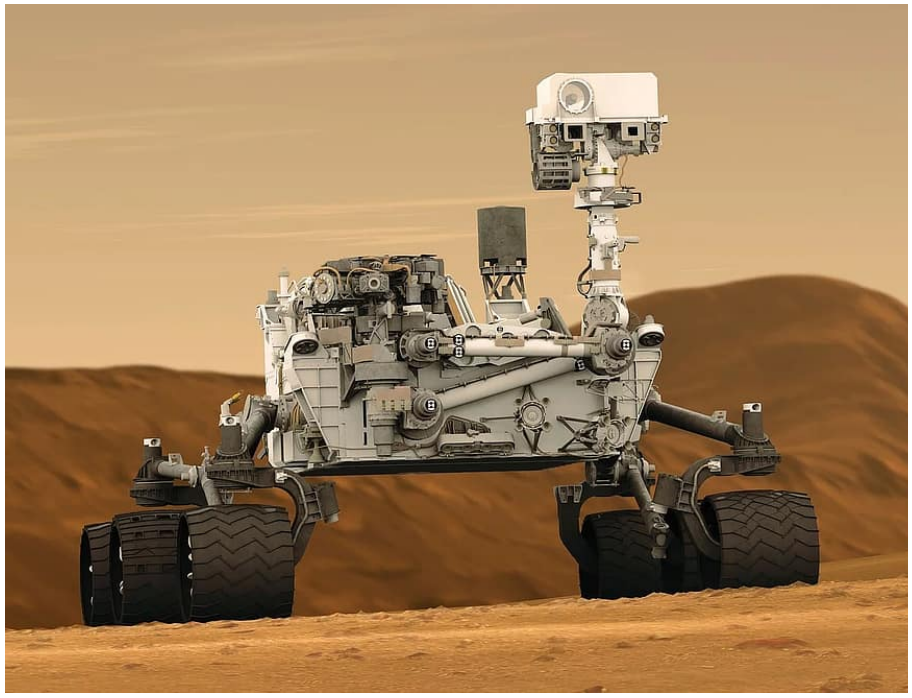
source: [7]



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 ?
- Conducting UX Design Research
- HCI-related and practical information for your own studies
- 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

source: [8]

Standard Observation Tools:

Markus Winkler creative commons

Standard Observation Tools:

Pexels creative commons

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

source: [8]

Props in the Design Research Process:

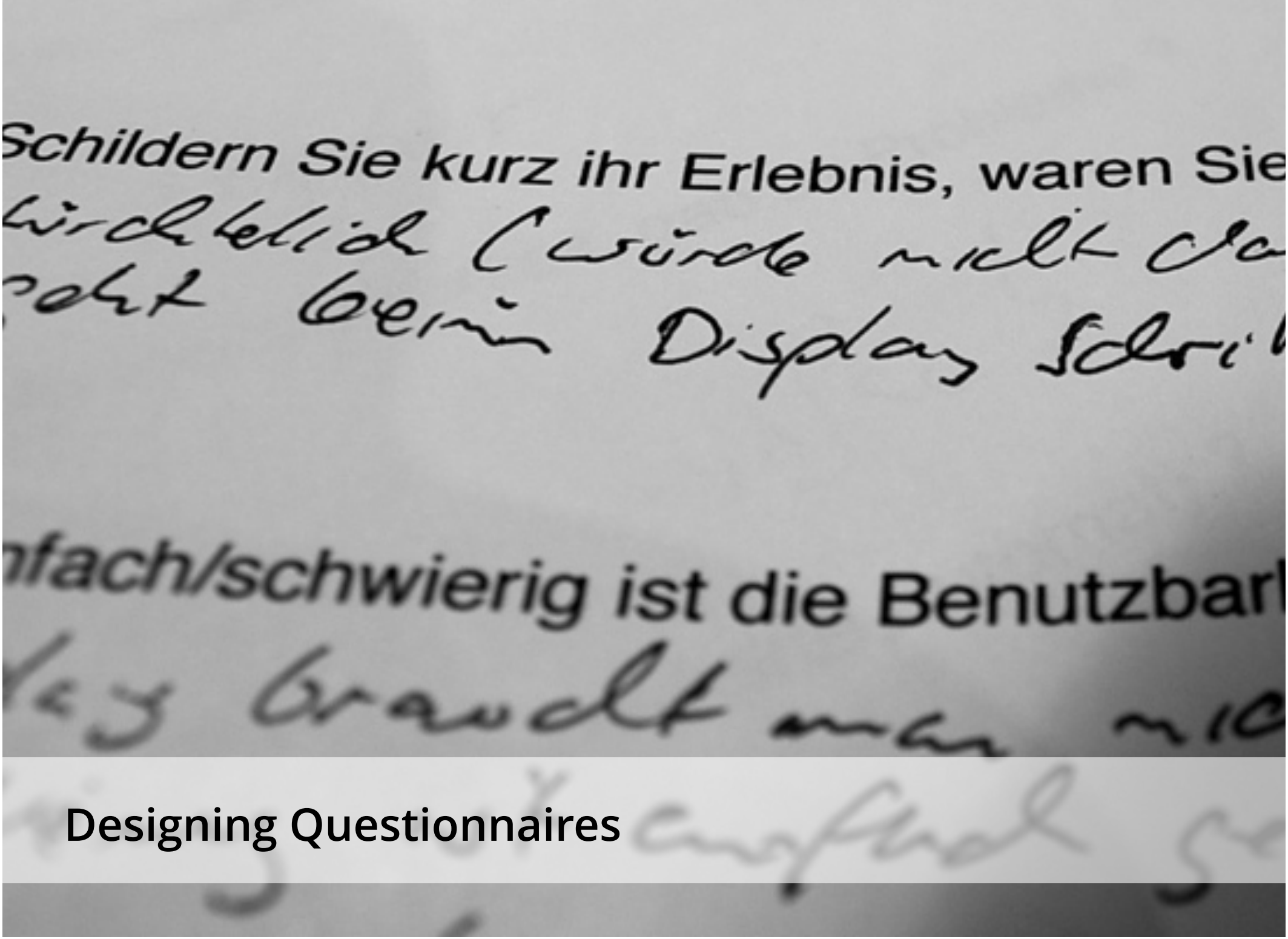
Artefacts or props can play a significant role in the process by
(1) staying focused and structured on the topic and
(2) making a complex technology or system explainable within a short timeframe (sketch, props, 3D artefacts)

Low Fidelity Artefacts

Low Fidelity Artefacts

“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

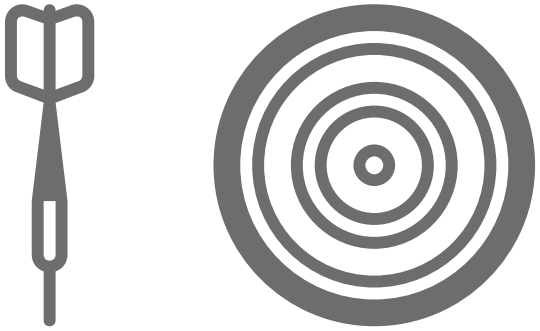


Designing Questionnaires

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)



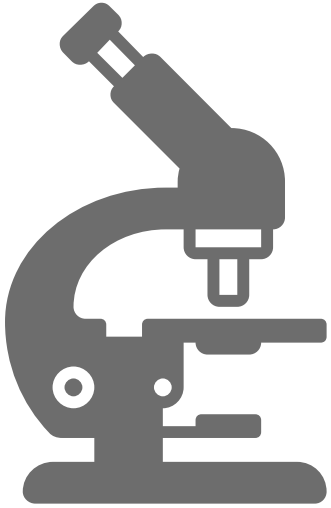
Advice on Questions to Ask:

- **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]

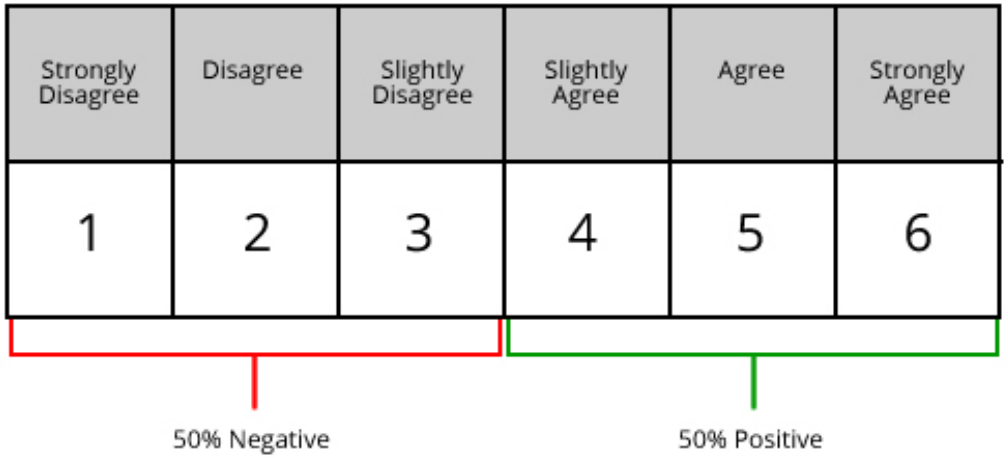
Questionnaire design

- 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

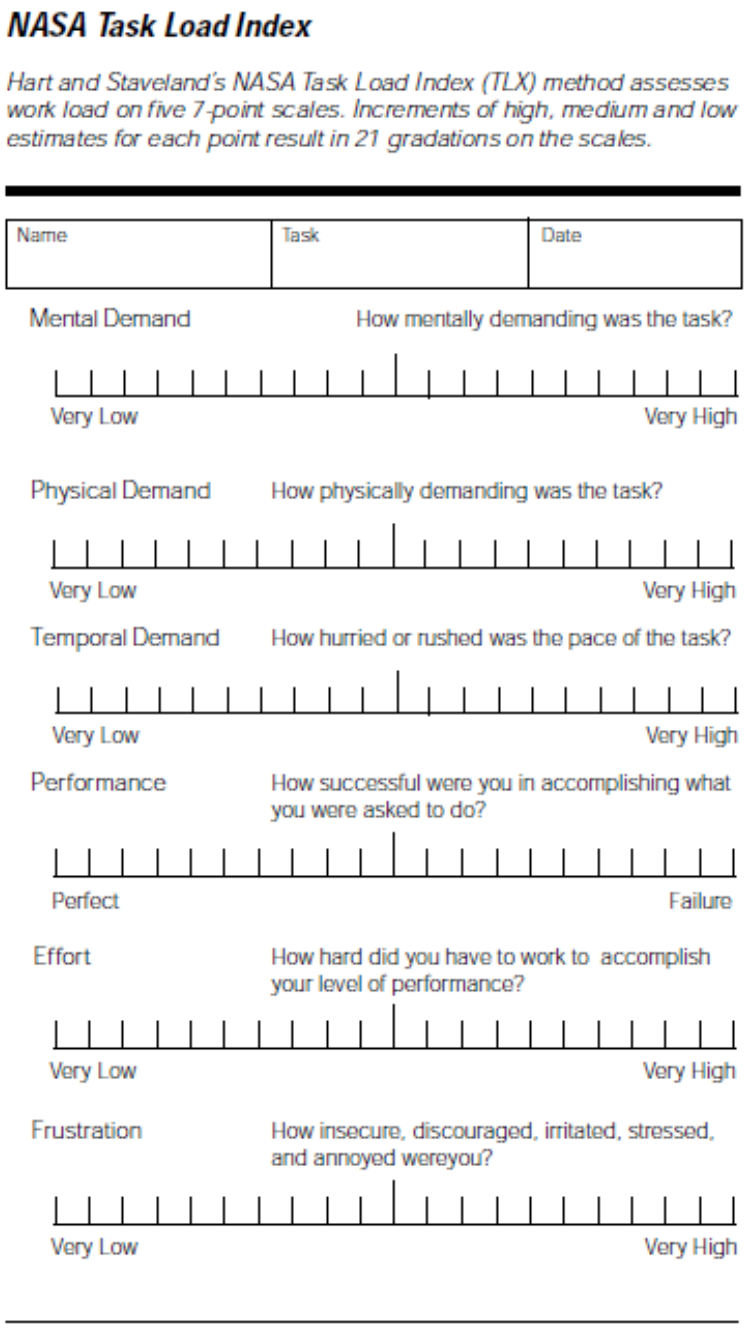
- **'Yes' and 'No'** checkboxes
- **Checkboxes** that offer **many options**
- **Rating scales**
- **Likert scales (**Rensis **Likert)**
- **semantic scales**
- **3, 5, 7 or more points?**
- **Open-ended responses**



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

source: [8]

NASA TLX



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.

Name	Task	Date

Mental Demand — How mentally demanding was the task?
Very Low — Very High

Physical Demand — How physically demanding was the task?
Very Low — Very High

Temporal Demand — How hurried or rushed was the pace of the task?
Very Low — Very High

Performance — How successful were you in accomplishing what you were asked to do?
Perfect — Failure

Effort — How hard did you have to work to accomplish your level of performance?
Very Low — Very High

Frustration — How insecure, discouraged, irritated, stressed, and annoyed wereyou?
Very Low — Very High

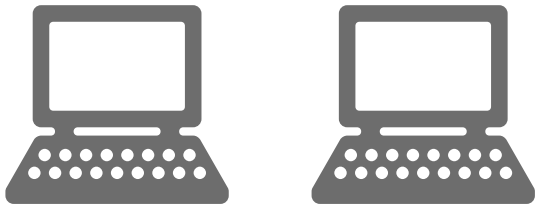
https://upload.wikimedia.org/wikipedia/commons/f/fc/NasaTLX.png

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 ?



source: [10]

Questionnaires should accommodate all possible answers:

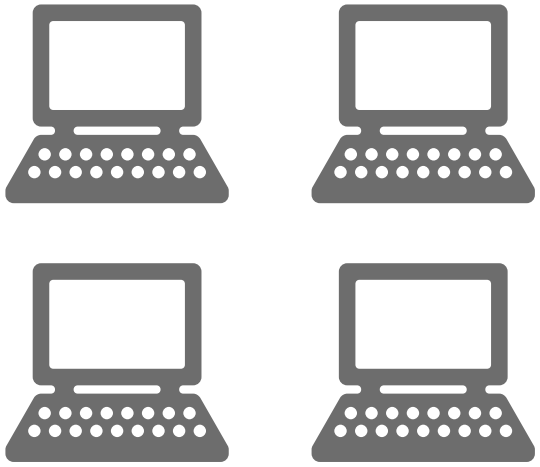
e.g., consider the question:

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?

source: [8]

https://commons.wikimedia.org/wiki/File:Deaf_or_HoH_person_at_his_workplace_using_a_Video_Relay_Service_to_communicate_with_a_hearing_person_via_a_Video_Interpreter_and_sign_language_SVCC_2007_Brigitte_SLI_%2B_Mark.jpg

Choosing and combining techniques

- Depends on
  - The **focus** of the study
  - The **participants** involved
  - The **nature** of the technique
  - The **resources** available

source: [8]

https://commons.wikimedia.org/wiki/File:Vision_Research_Phantom_v2511.jpg

Scheduling and Time Planning

	Duration
(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	.....
(13) Analyzing Data	.....
(14) Preparing Report	
(15) Printing and distribution	

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]

Applying UX Design

- What is UX Design Research and which method to choose ?
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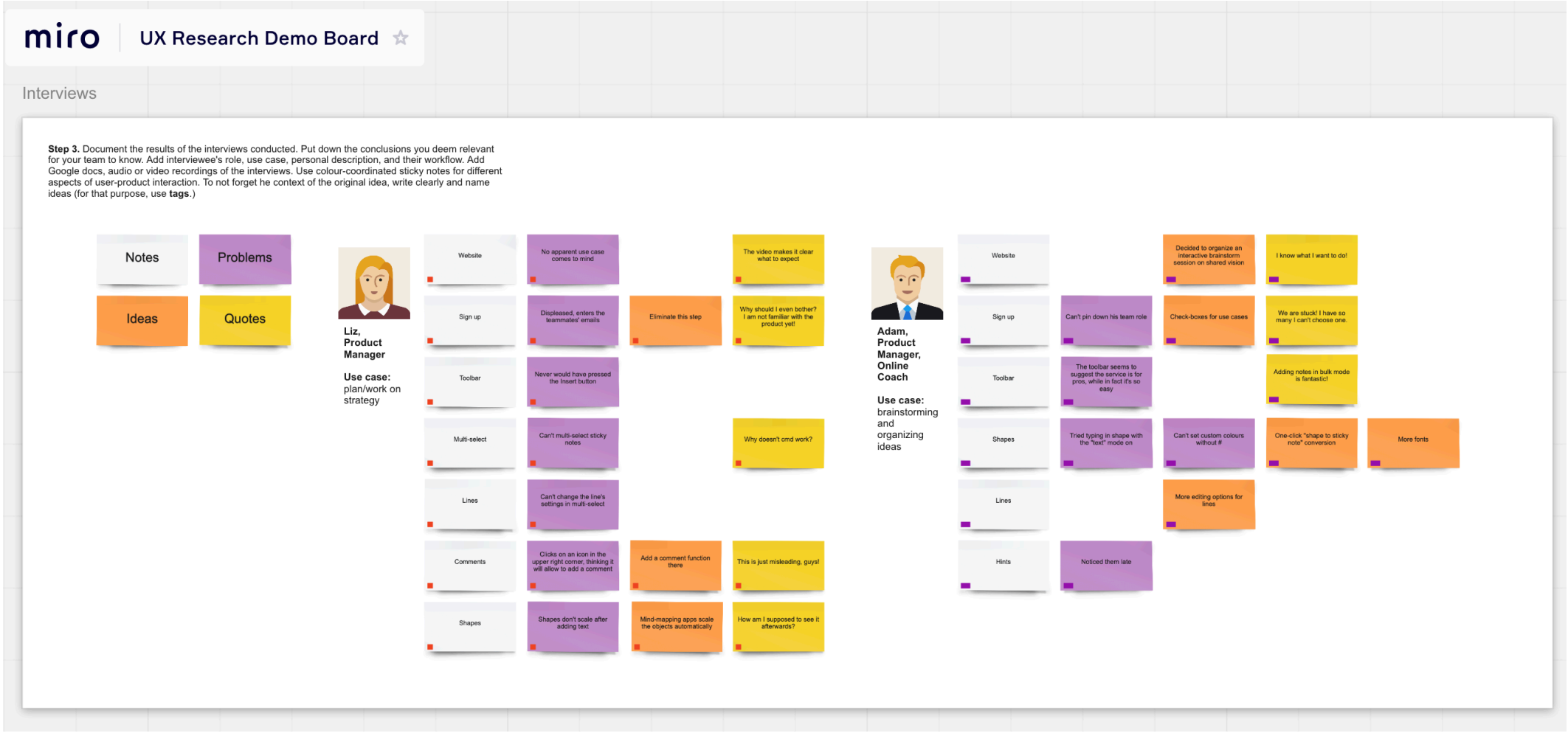
Miro Board Template



AFFINITY DIAGRAMS

How

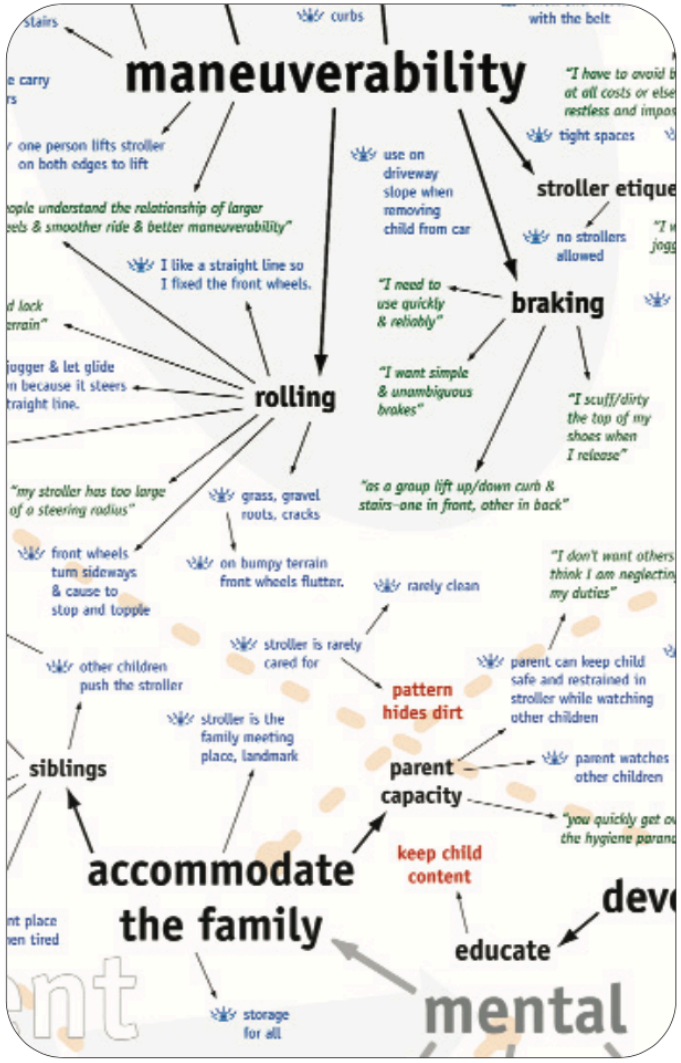
Cluster design elements according to intuitive relationships, such as similarity, dependence, proximity, and so forth.

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.



AFFINITY DIAGRAMS

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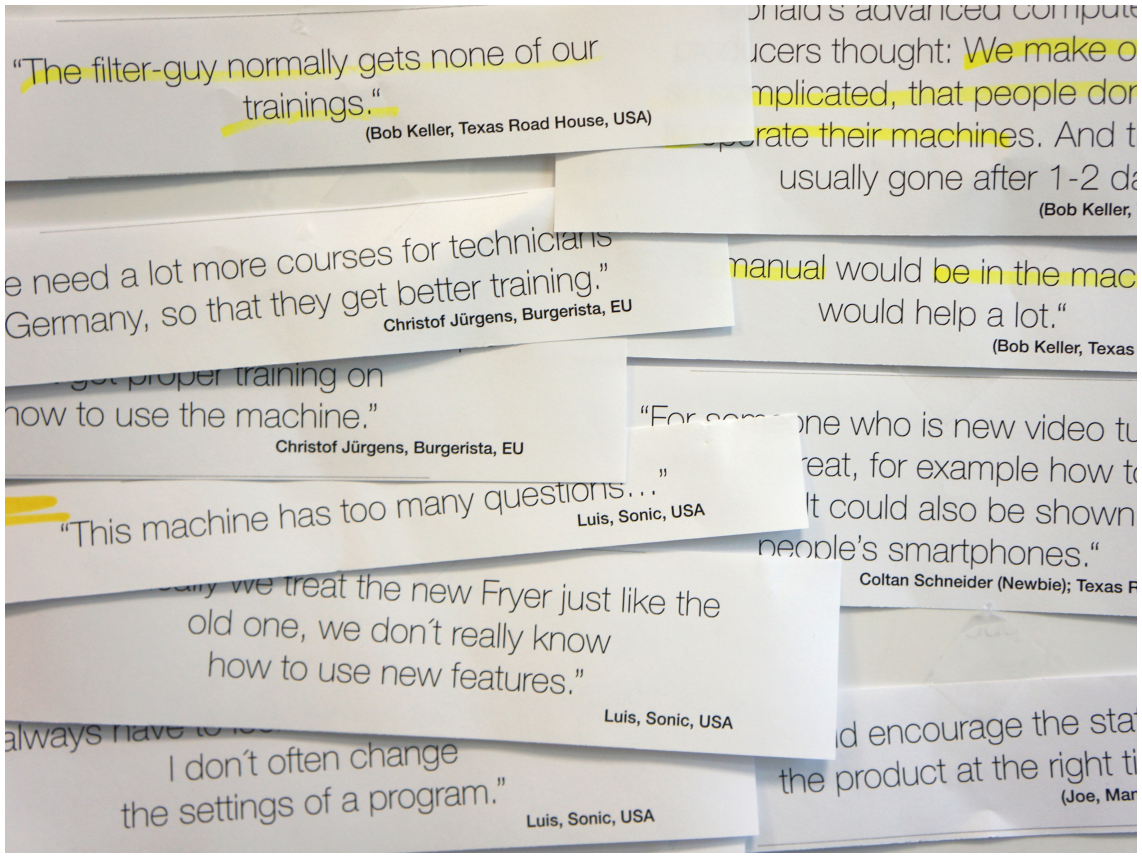
UX Data Analysis Workshop

UX Data Analysis Workshop



UX Report contains:

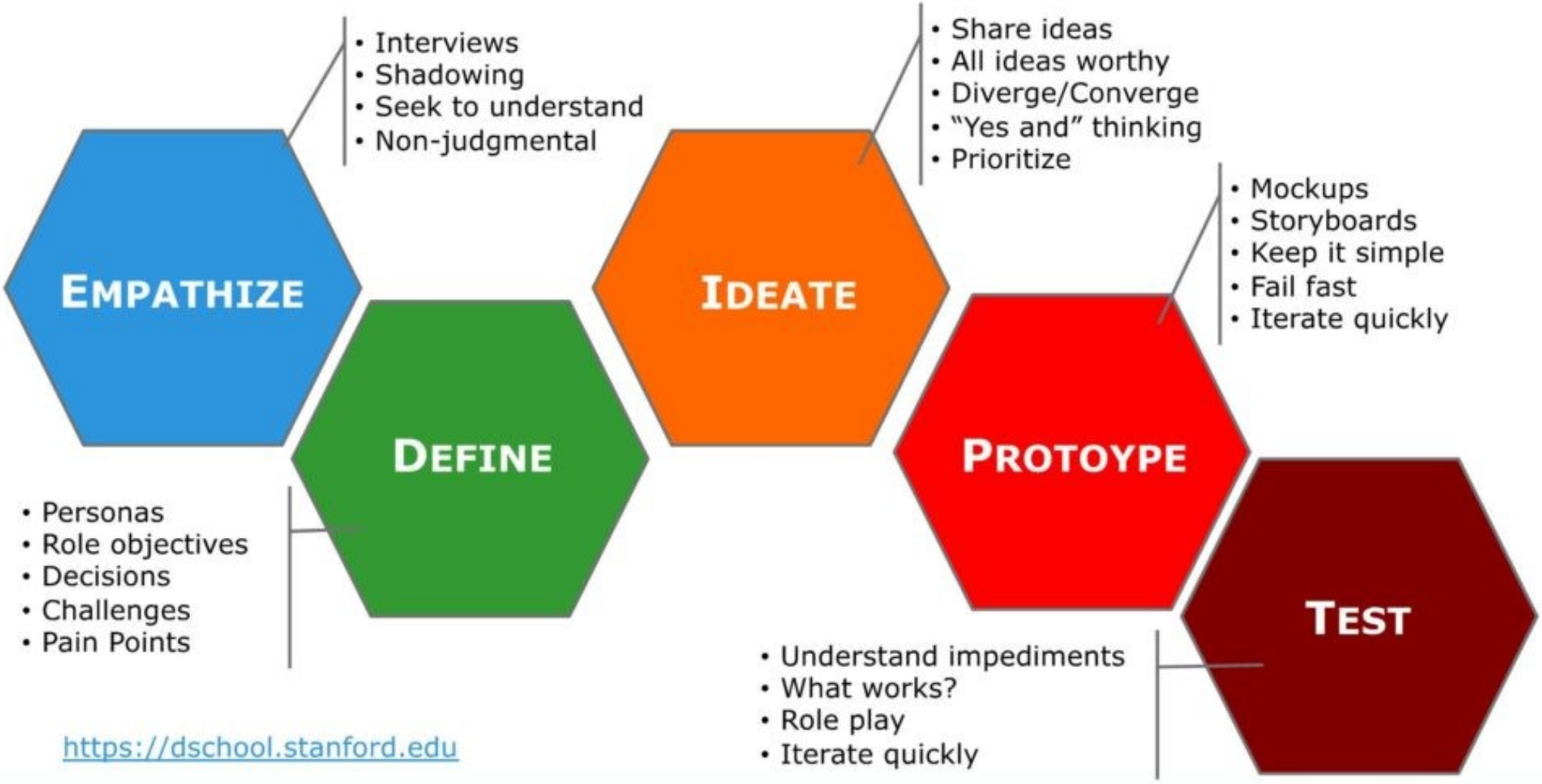
- Study Design
- User Profiles
- Questionnaire Results
- Affinity Diagrams
- Interview Quotes
- Summarised Findings
- Design Recommendations

IMAGO DESIGN Manitowoc

FRYMASTER
UX RESEARCH REPORT US / EMEA

06.09.2016

Stanford d.school Design Thinking Process



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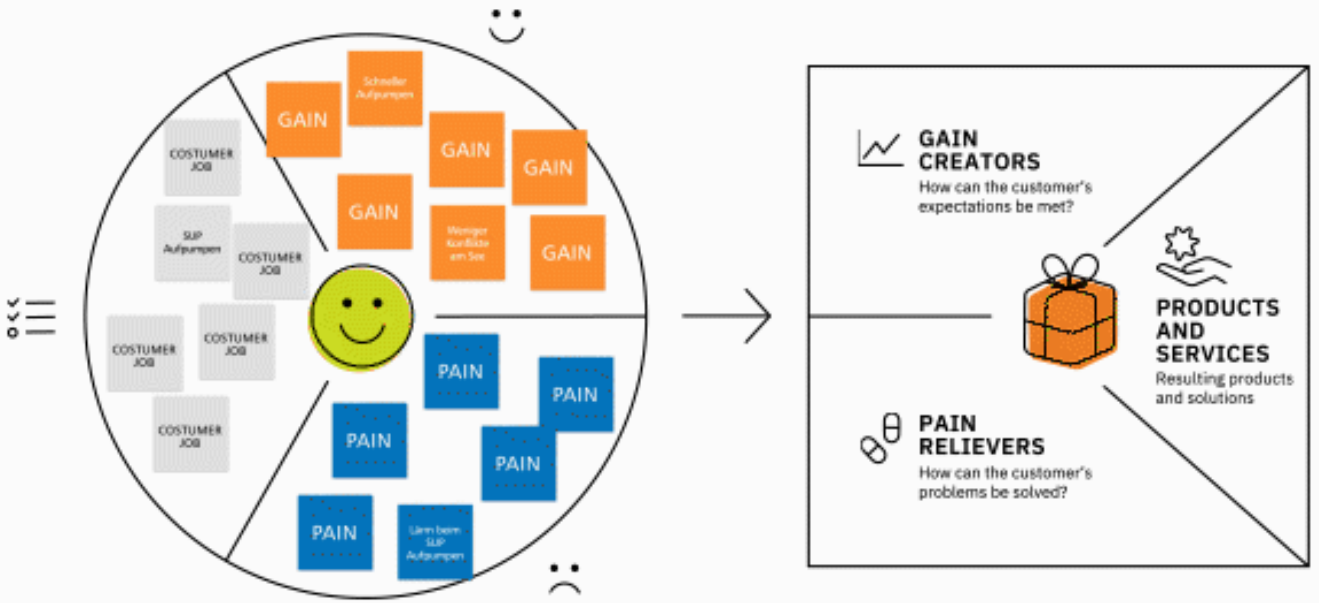
Vision Workshop

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.

Value Proposition Canvas

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.



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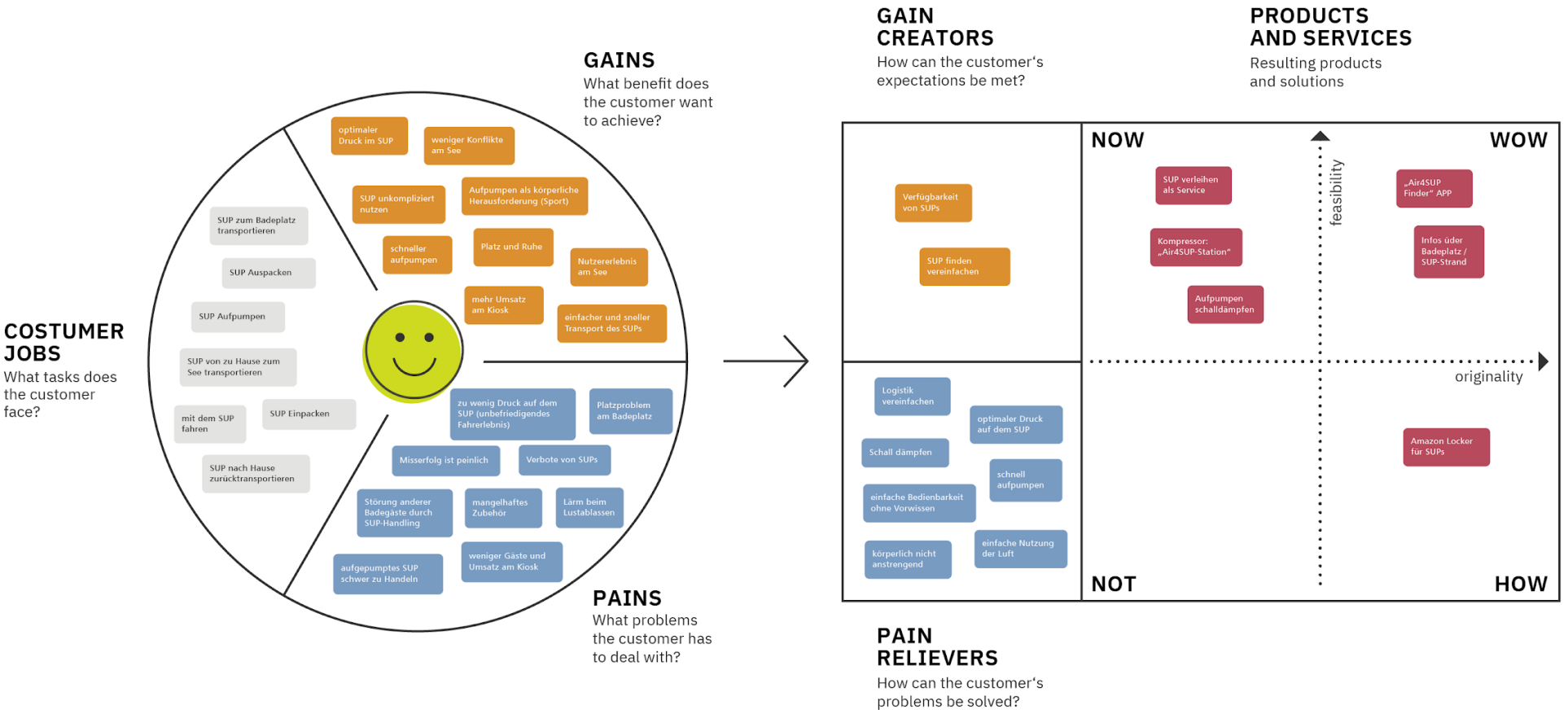
Value Proposition Canvas



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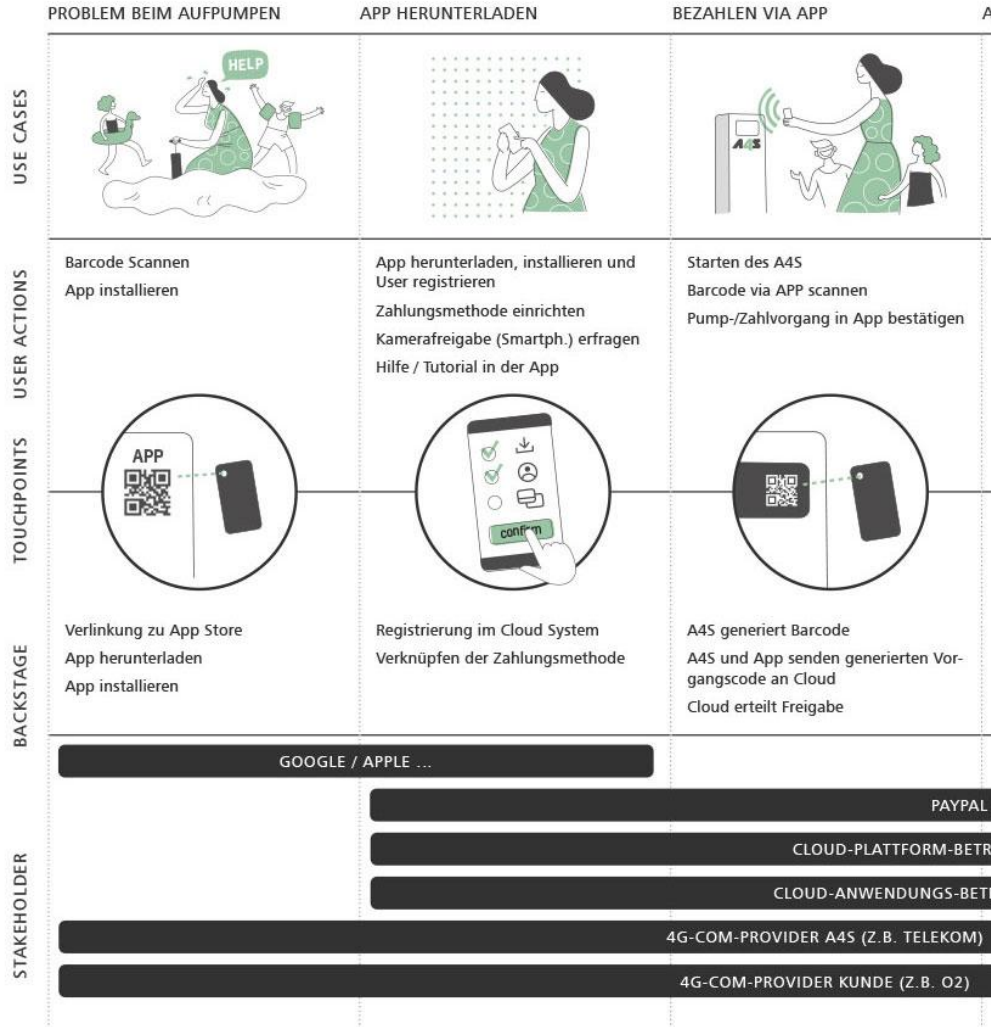
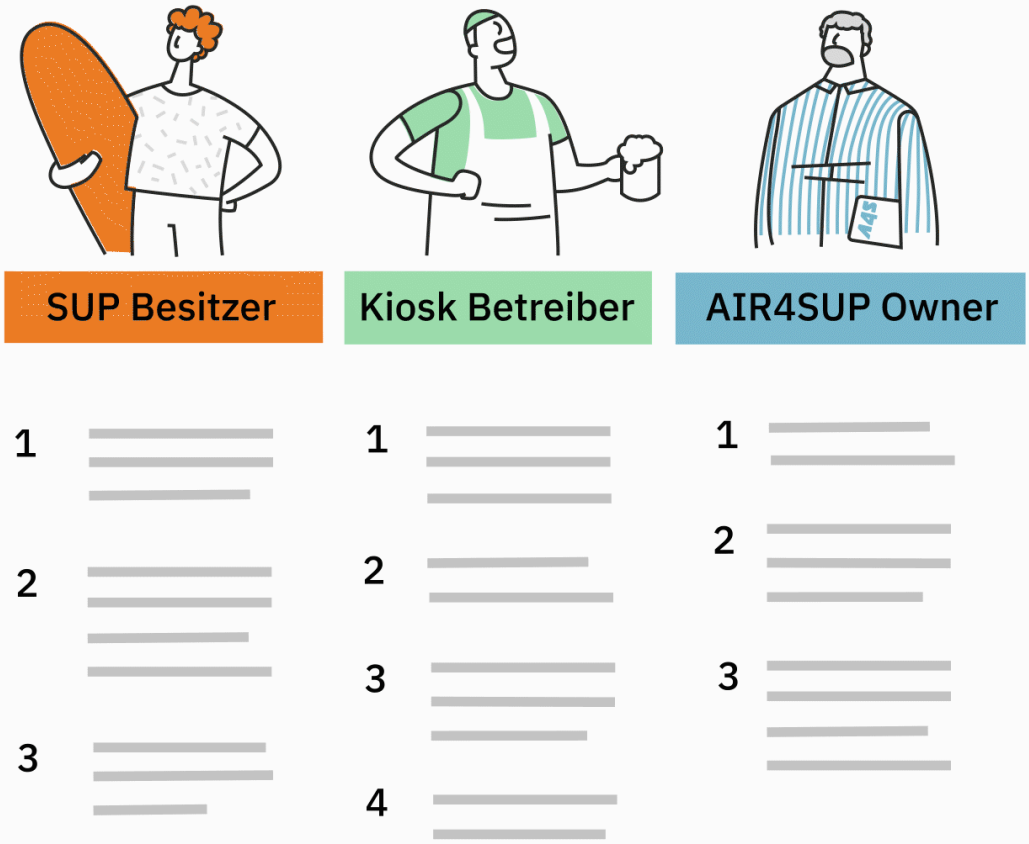
UX Blueprinting

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.



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