Interaction Design
(User Experience Design I)

Chapter 4 (May 18th, 2017, 9am-12pm):

User Experience (UX) Design Research

Recap Session Day 3:

Design-Led

design-led
with
expert mindset

design-led
with
participatory mindset

Expert Mindset
"users" seen as subjects
(reactive informers)

Participatory Mindset
"users" seen as partners
(active co-creators)

research-led
with
expert mindset

research-led
with
participatory mindset

Research-Led

source: [6+7]

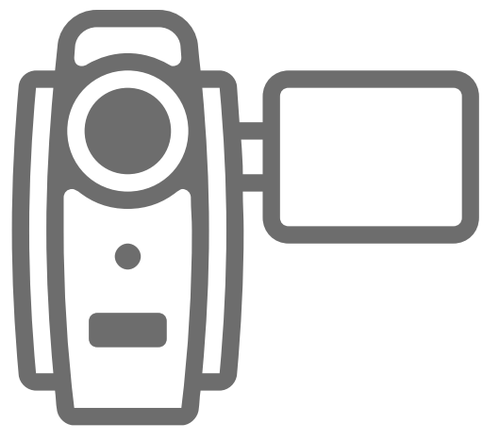
Four Approaches to Design

Approach	*Overview*	*Users*	*Designer*
User-Centered Design	Focuses on user needs and goals	Guide the design	Translates user needs and goals
Activity-Centered Design	Focuses on the tasks and activities that need to be accomplished	Perform the activities	Creates tools for actions
Systems Design	Focuses on the components of a system	Set the goals of the system	Makes sure all the parts of the system are in place
Genius Design	Relies on the skill and wisdom of designers used to make products	Source of validation	Is the source of inspiration

source: [5]

Four basic activities

- Identifying needs and establishing requirements
- Developing alternative designs
- Building interactive versions of the designs
- Evaluating designs



source: [4]

Summary:

• **Goals** are important in UCD -> interaction designer focus on what the user ultimately wants to accomplish.

• Interaction designer determines the user´s task and means necessary to achieve those goals -> always with the users needs and preferences in mind
• Interaction designers involve users at every stage of the process
• Users are consulted of the very beginning of a new project
• Interaction designers conduct extensive research (Chapter 4) up front to determine what the users goals are in the current situation
• Interaction Designers test and try prototypes of a system with users

• **User data is a determining factor throughout the project when making decisions**

source: [5]

Interaction Design
(User Experience Design I)

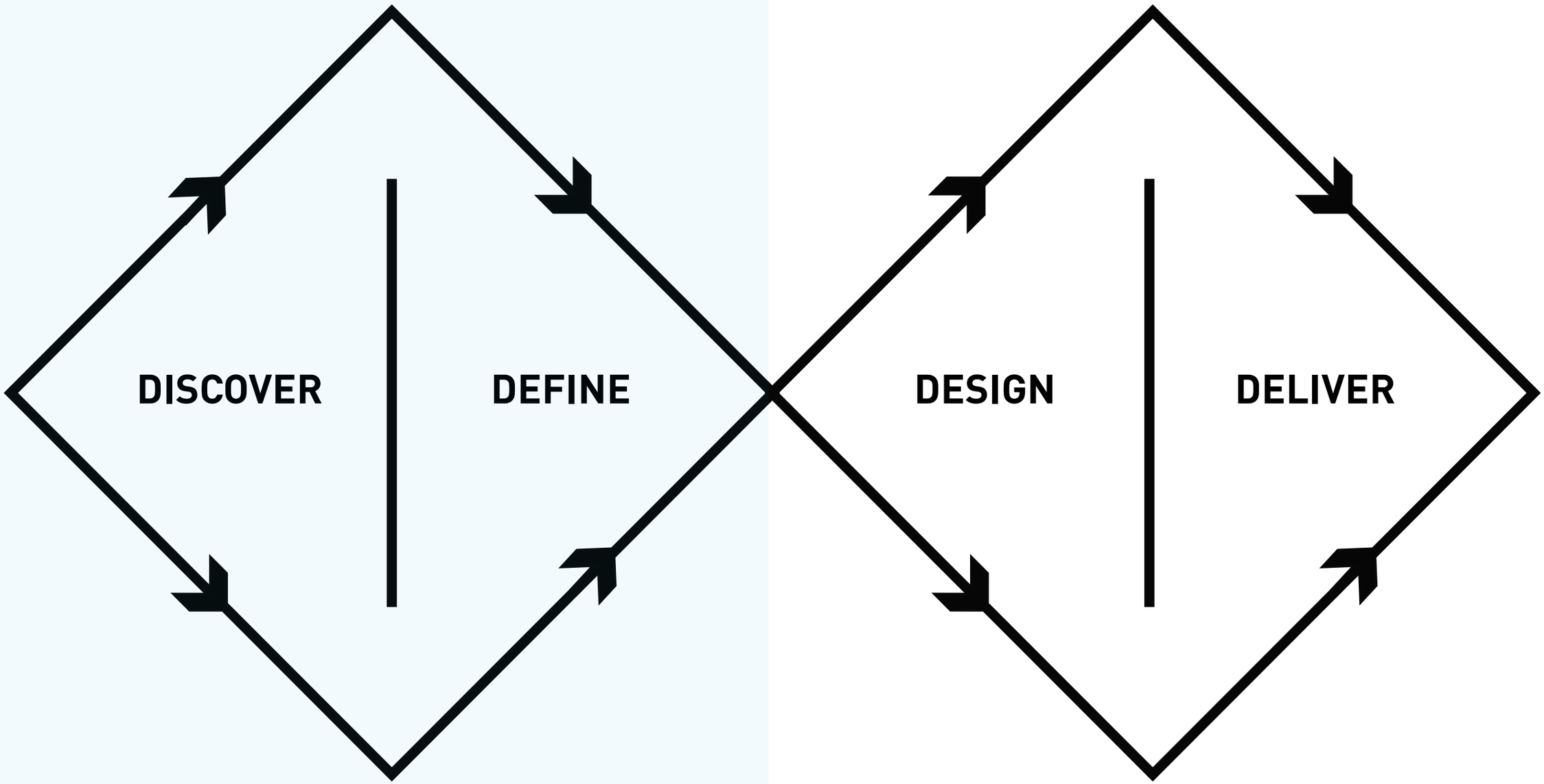
Chapter 4 (May 18th, 2017, 9am-12pm):

User Experience (UX) Design Research

Applying Interaction Design

- What is Design Research ?
- Conducting Design Research
- HCI-related and practical information for your own studies
- Interpretation of Data and Presentation of Results

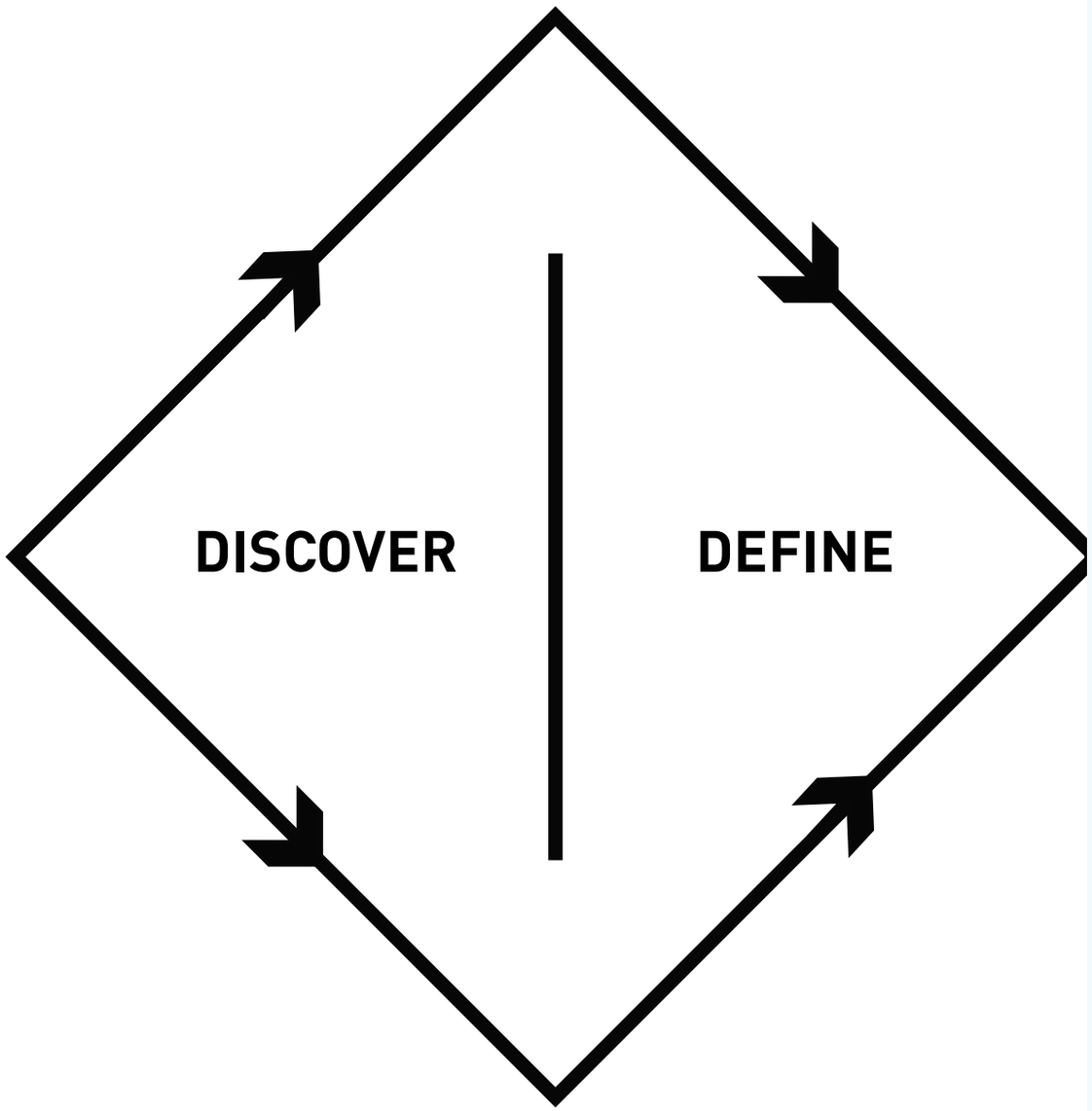
Double Diamond



Why? and How?

source: [2]

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

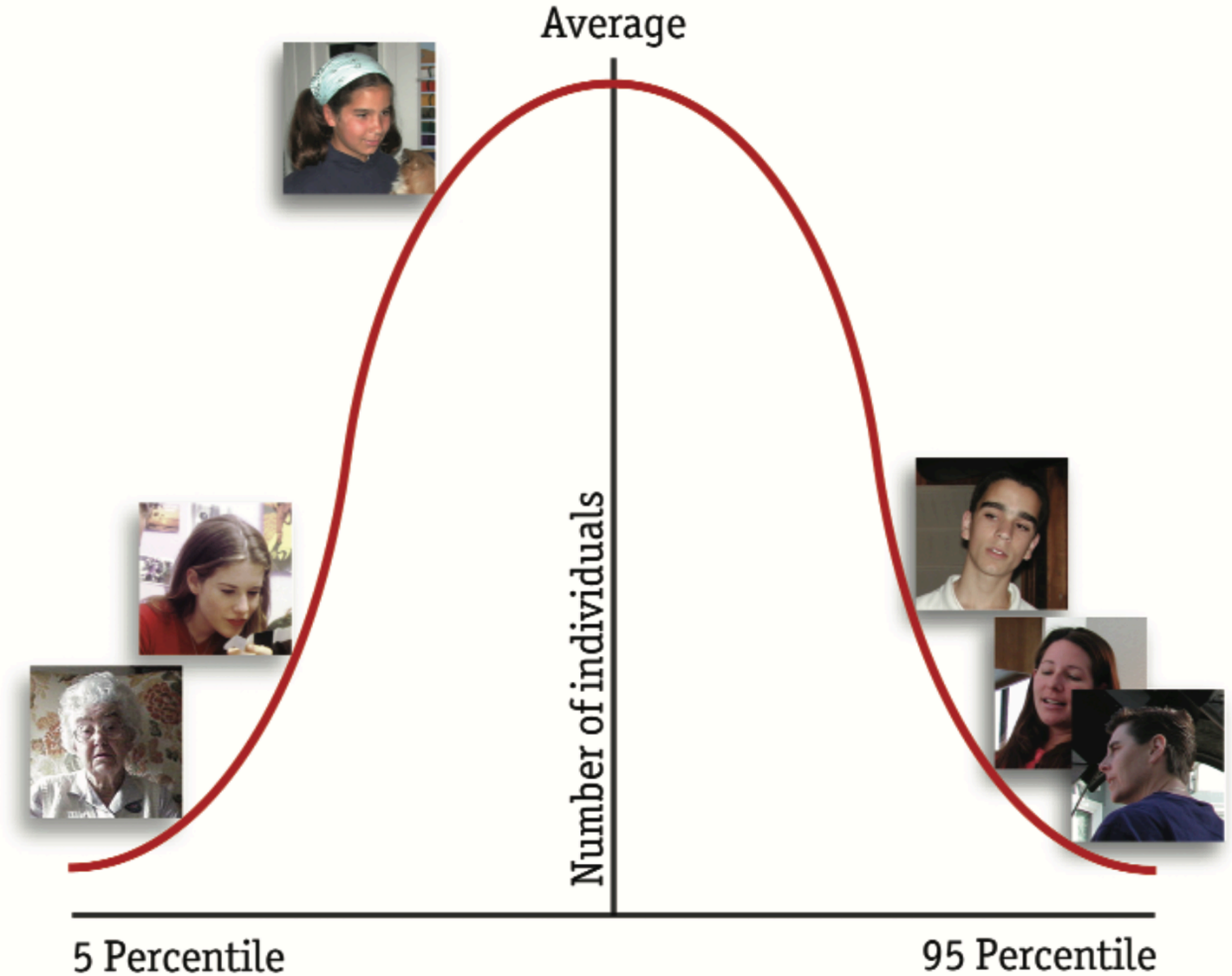
source: [2]

Designers not only tell a story, they listen to one...

Bill Buxton

People

source: [8]

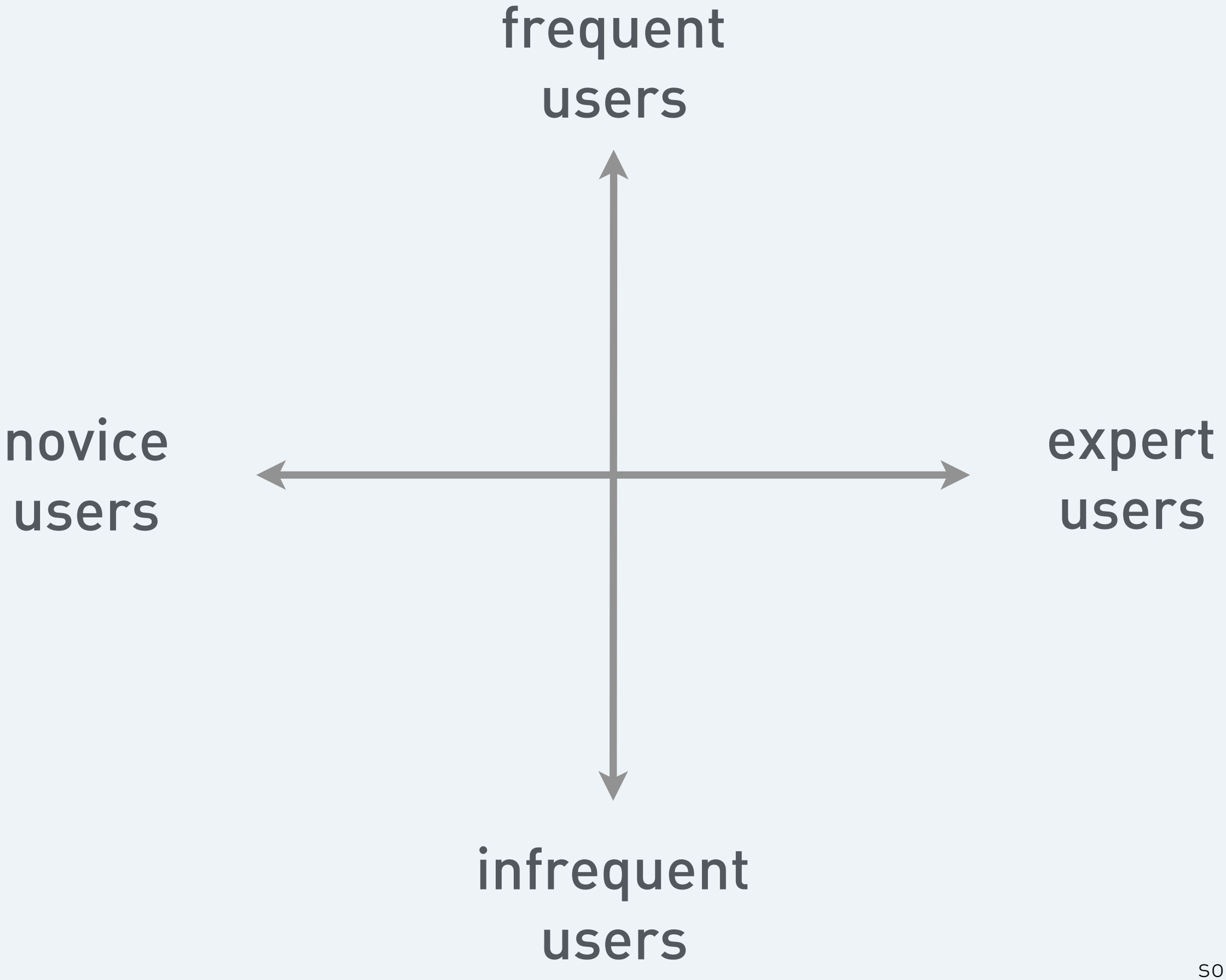


source: [8]

In design research we are driven by a need for a deeper understanding

Susan Dray - Dray & Associates, Inc., USA

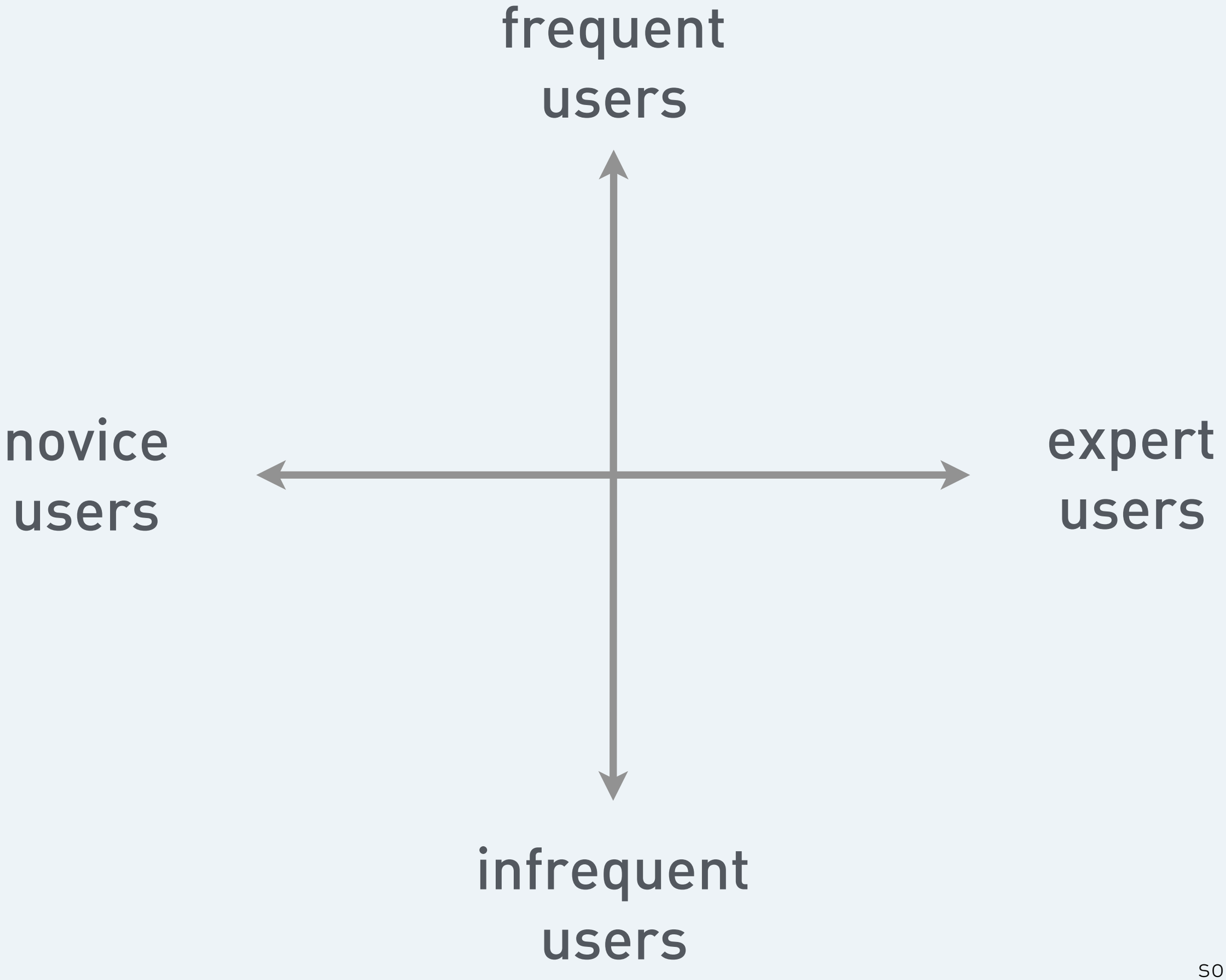
source: [3]


frequent
users
novice
users
expert
users
infrequent
users

source: [2,4]

BMW i8 Cockpit

Image © BMW Group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source: [2,4]

BMW DTM Racing Cockpit

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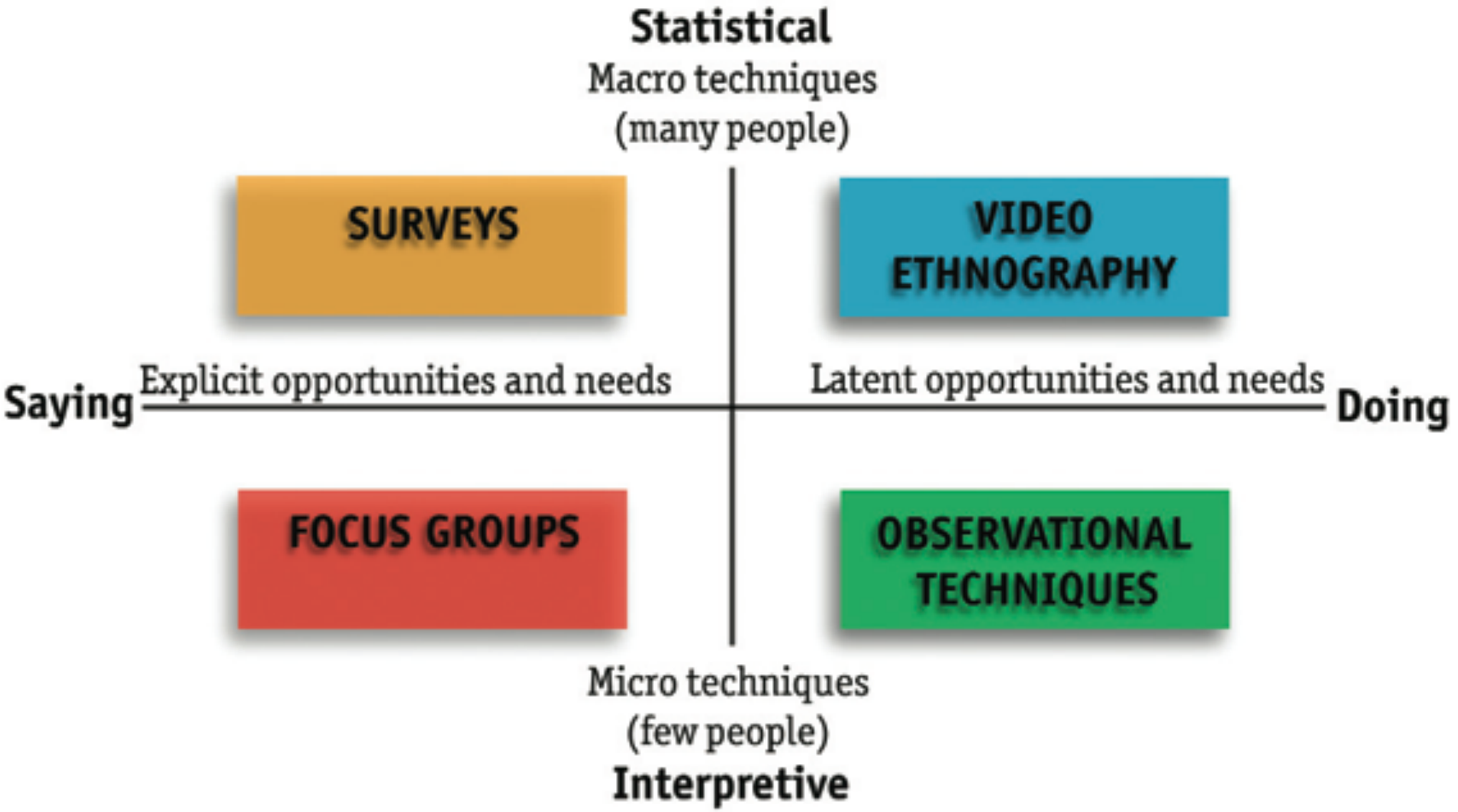
Different user types and usage frequency will require dedicated solutions.

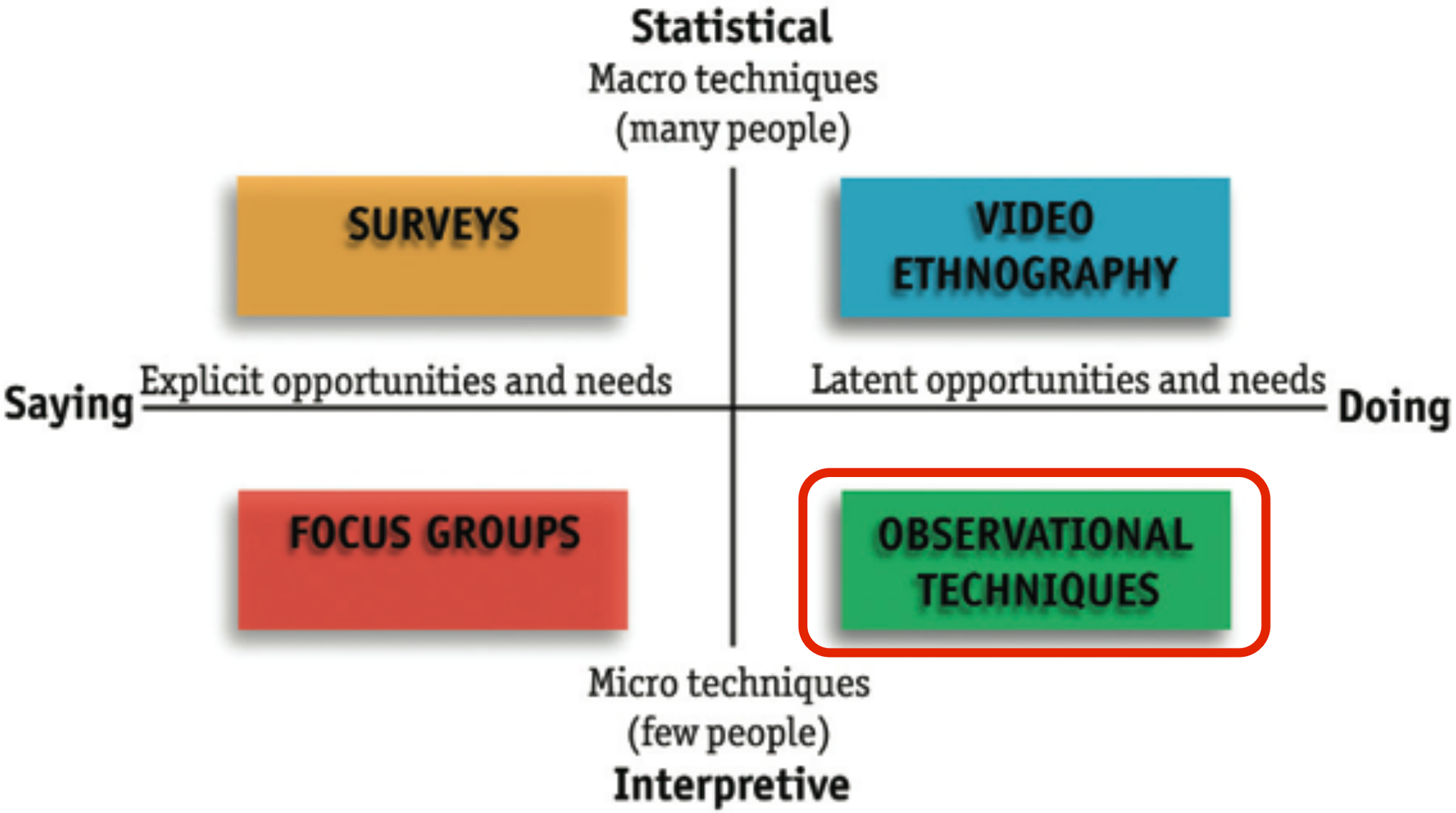
It is essential to the success of interaction design that designers find a way to understand the perceptions, circumstances, habits, needs, and desires of the ultimate users.

Jane Fulton Suri, 2005

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]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ANALYSIS

Definition of the system

What is the problem?

EVALUATION

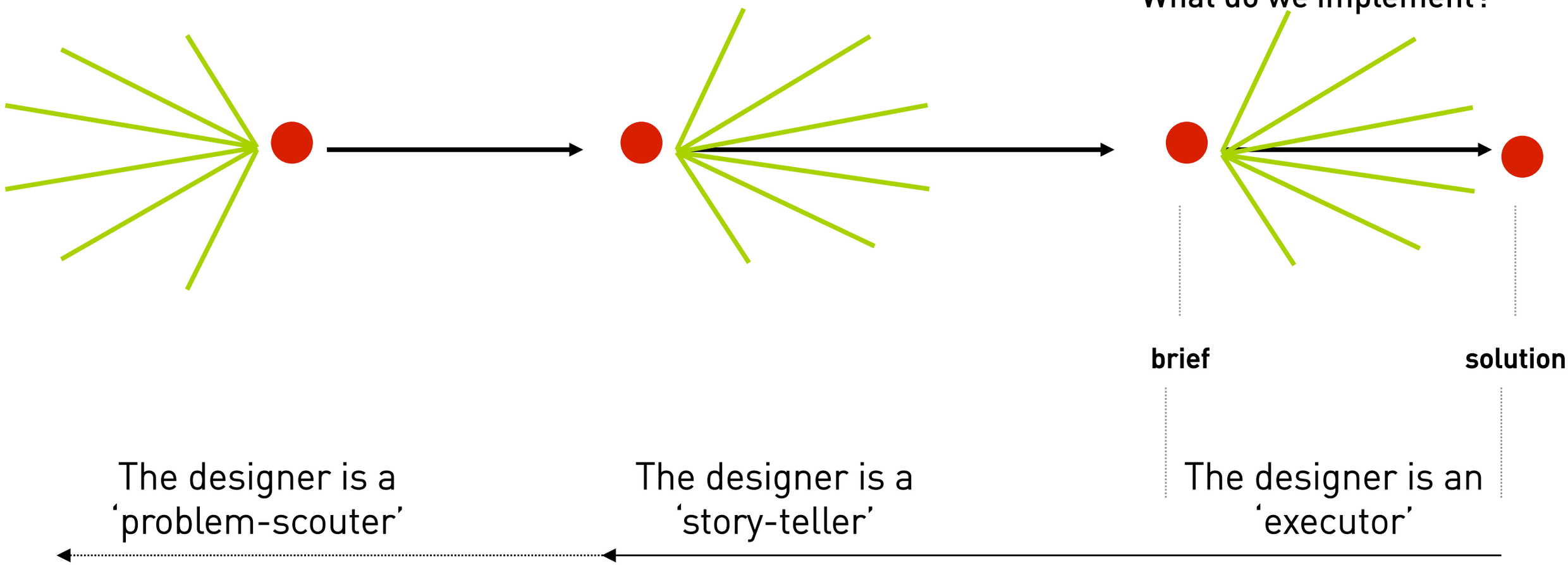
Possible alternatives

What future do we want?

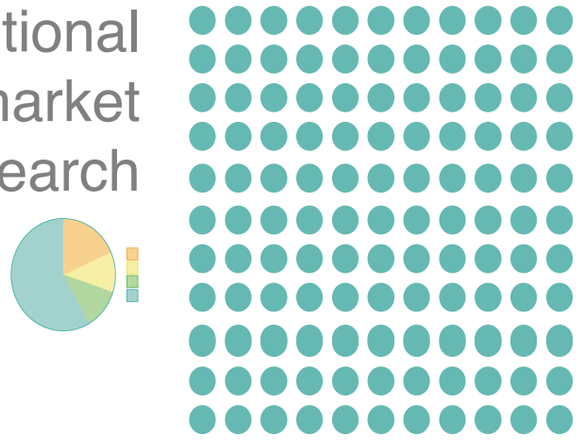
SYNTHESIS

Design of final solutions

What do we implement?



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.

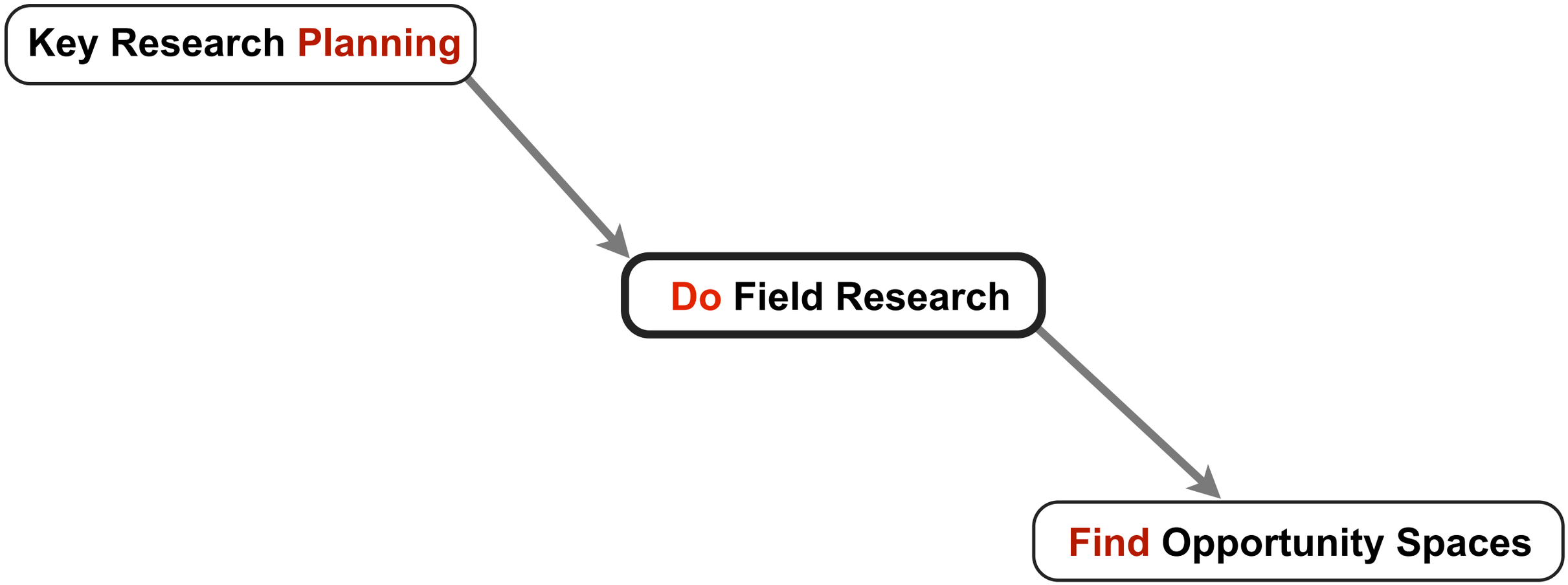
Many methods employed in design research have their roots in cultural anthropology, social behavioural sciences and psychology (for example: experiments, questionnaires, interviews, observation), some have been adapted from marketing disciplines (e.g. focus group, workshops, telephone survey), while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

source: [4]

Applying Interaction Design

- What is Design Research ?
- Conducting Design Research
- HCI-related and practical information for your own studies
- Interpretation of Data and Presentation of Results

Design Research is mostly structured:



source: [10]

IDEO Method Cards

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IDEO Method Cards

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

FLOW ANALYSIS

How

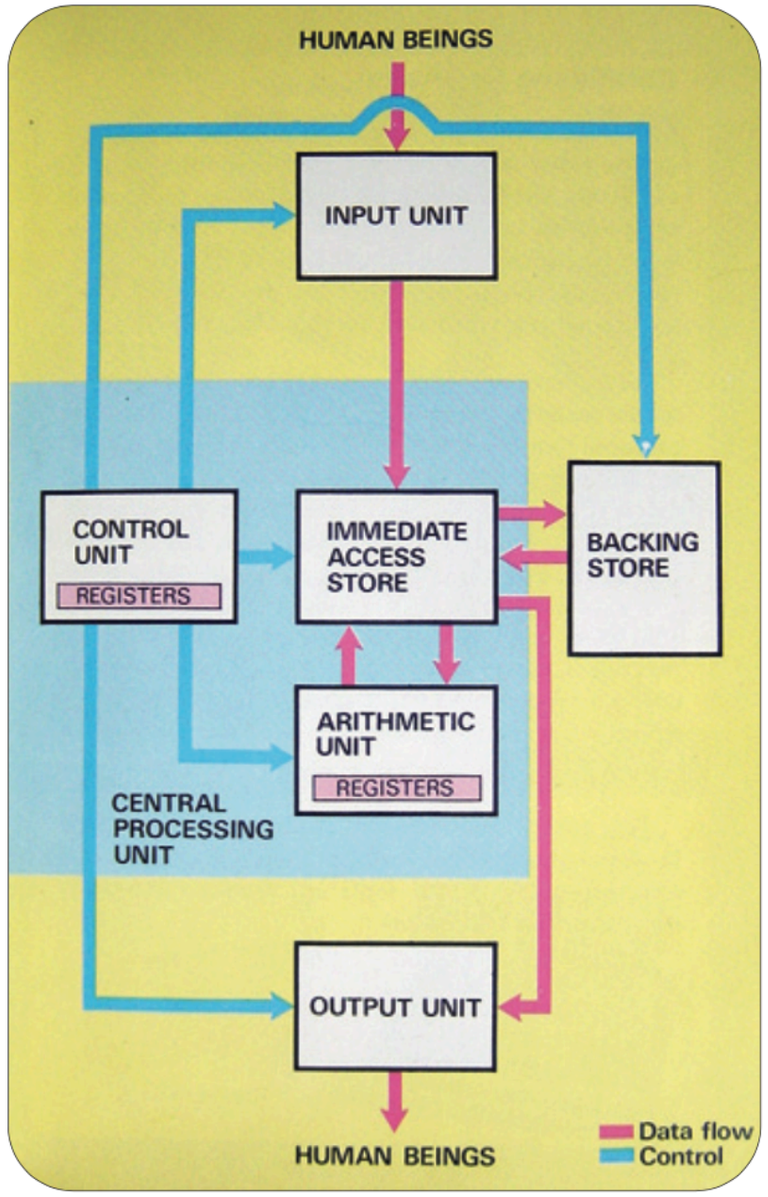
Represent the flow of information or activity through all phases of a system or process.

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

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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

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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 for

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

AFFINITY DIAGRAMS

How

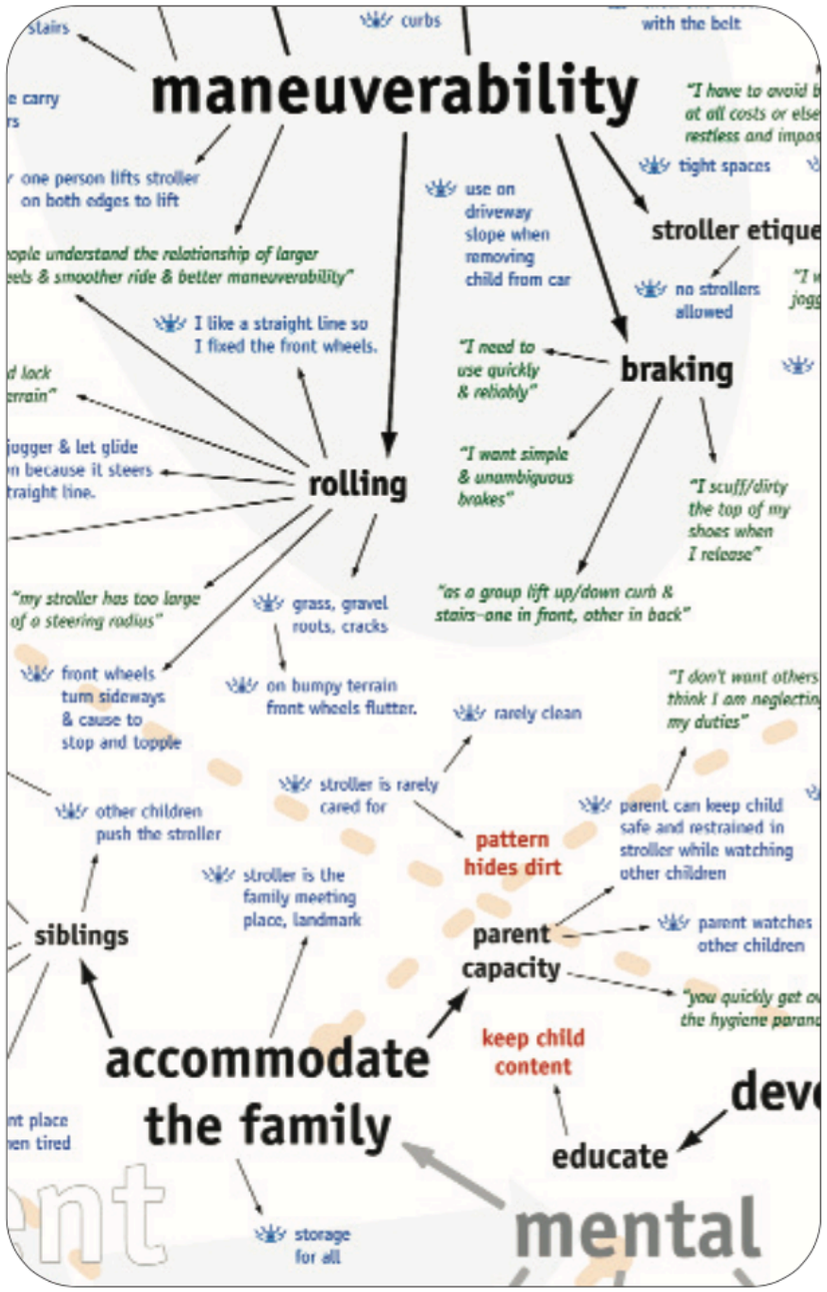
Cluster design elements according to intuitive relationships, such as similarity, dependence, proximity, and so forth.

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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LOOK

FLY ON THE WALL

A DAY IN THE LIFE

SHADOWING

PERSONAL INVENTORY

source: [7]

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]

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]

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]

Interviews in the “Wild”

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 Interaction Design I

- What is Design Research ?
- Conducting Design Research
- HCI Study Design
- Interpretation of Data and Presentation of Results

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

source: [2]

Data recording

- Notes, audio, video, photographs
- Notes plus photographs
- Audio plus photographs
- Video

source: [8]

Tools of Trade:

wikimedia 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]

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

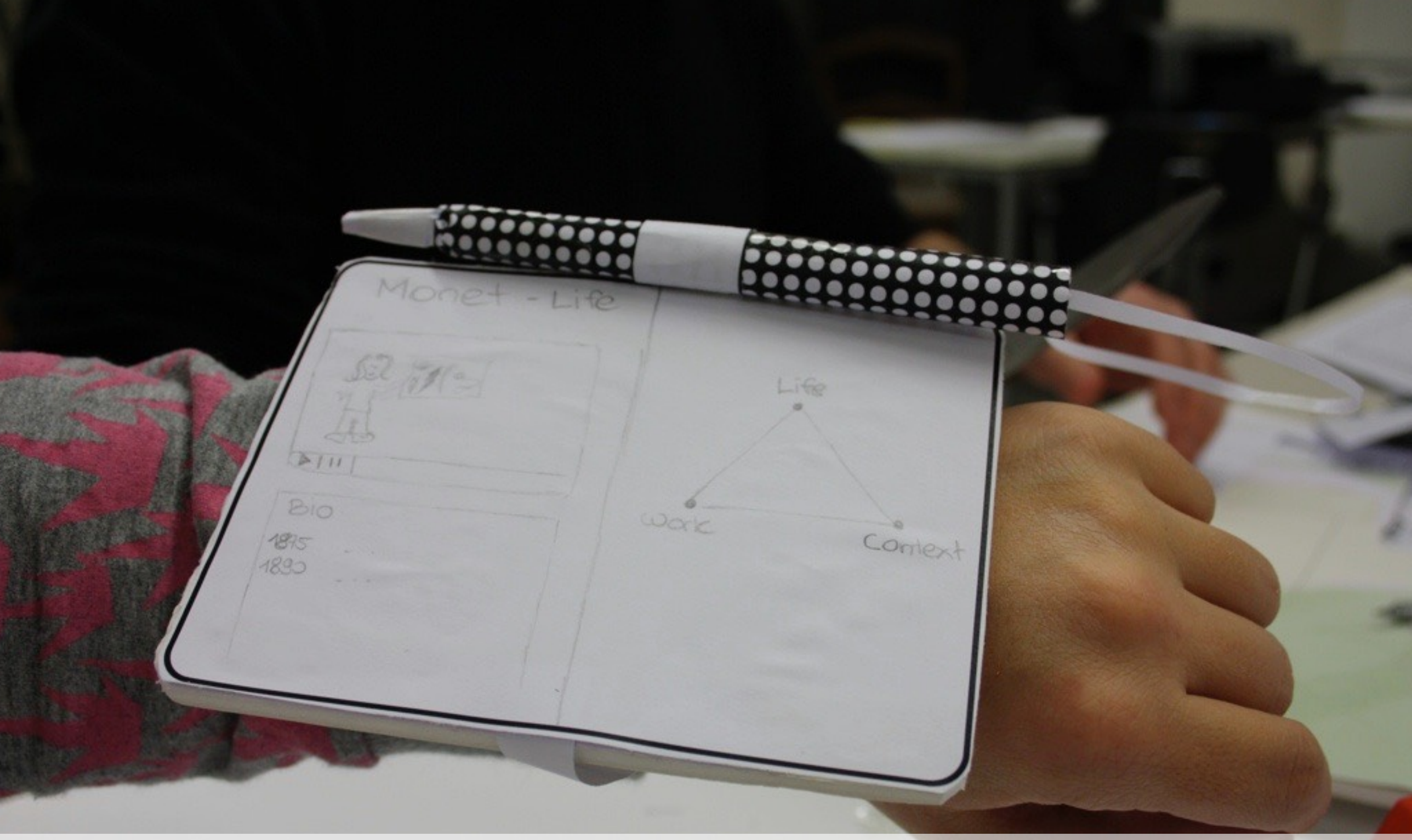
Props - devices for prompting interviewee, e.g., a prototype, scenario

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



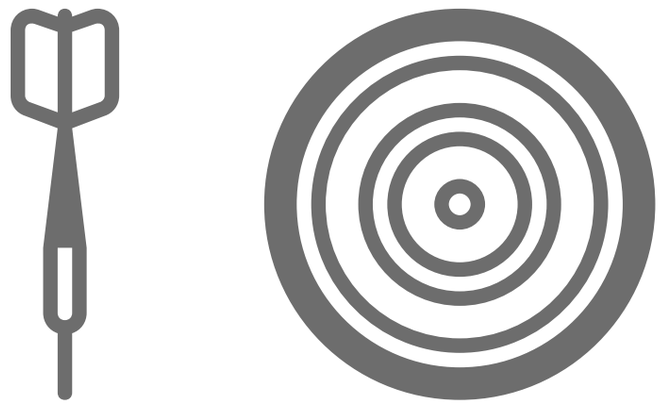
Low Fidelity Artefacts

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)

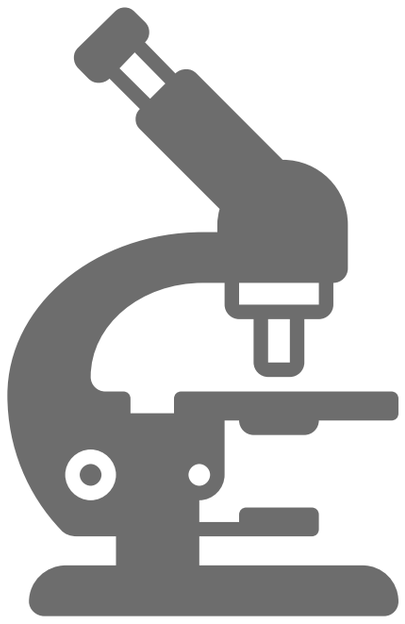


Advice on Questions to Ask:

- **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**
- **semantic scales**
- **3, 5, 7 or more points?**
- **Open-ended responses**

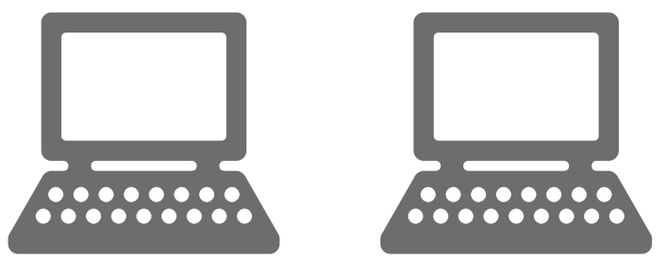
source: [8]

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:

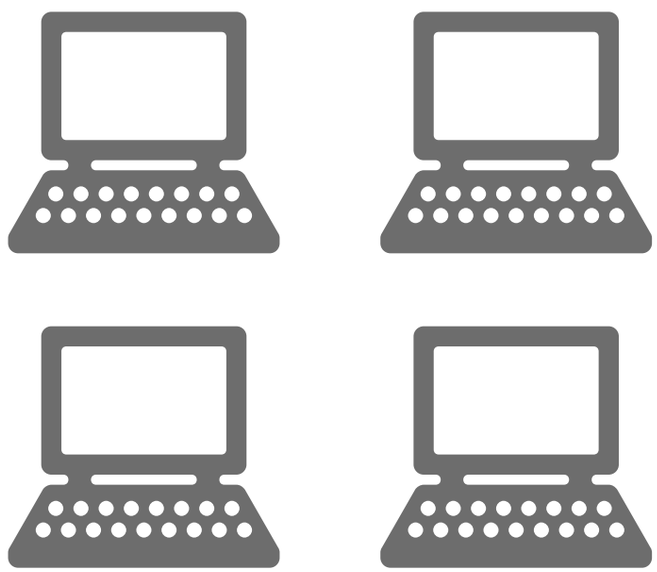
e.g., consider the question:

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 **shor**t. 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

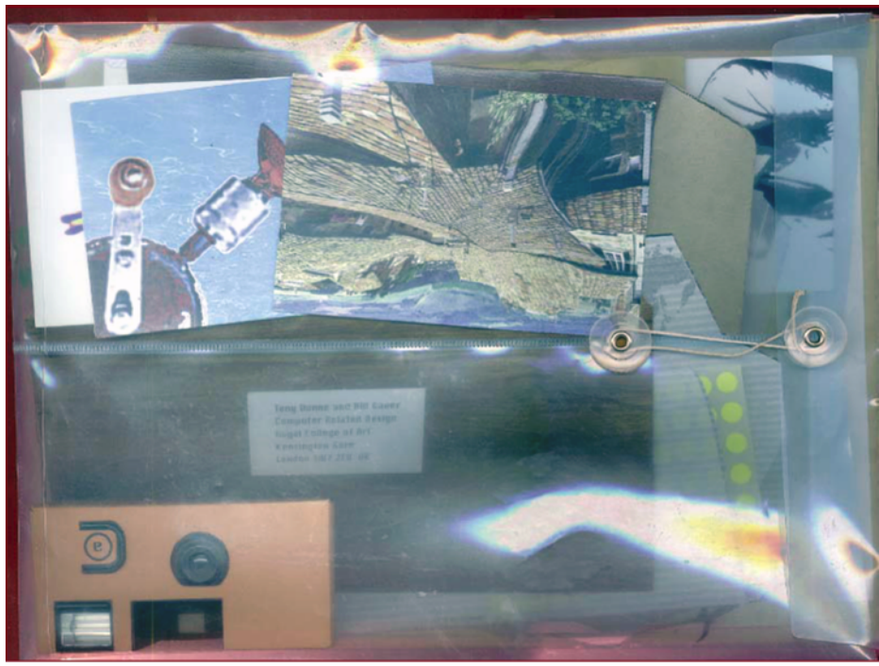
- - The person. **Who?**
  - The place. **Where?**
  - The thing. **What?**

- **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 organized?

source: [8]

Choosing and combining techniques

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



source: [8]

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]

References:

[1] Buxton, W. Sketching User Experiences, *Morgan Kaufmann 2007.*
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