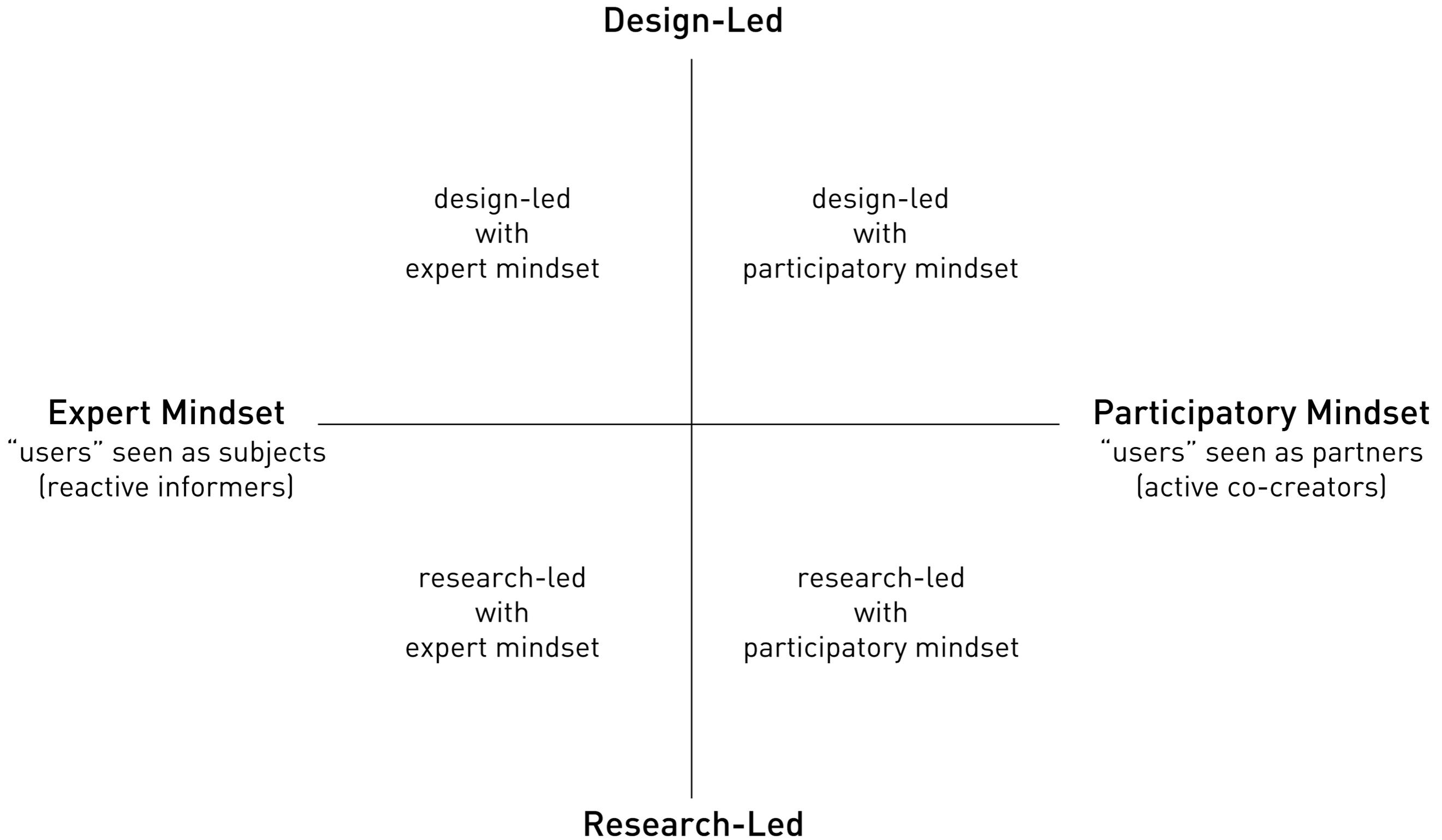


Interaction Design

Chapter 5 (May 13, 2015, 9am-12pm):
Applying Interaction Design I

Recap Session Day 3+4:



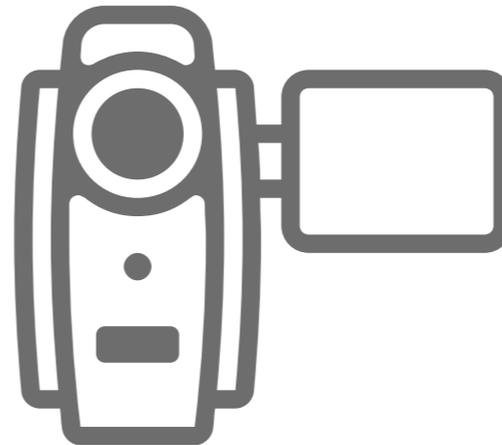
source: [6+7]

Four Approaches to Design

<i>Approach</i>	<i>Overview</i>	<i>Users</i>	<i>Designer</i>
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

Four basic activities

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

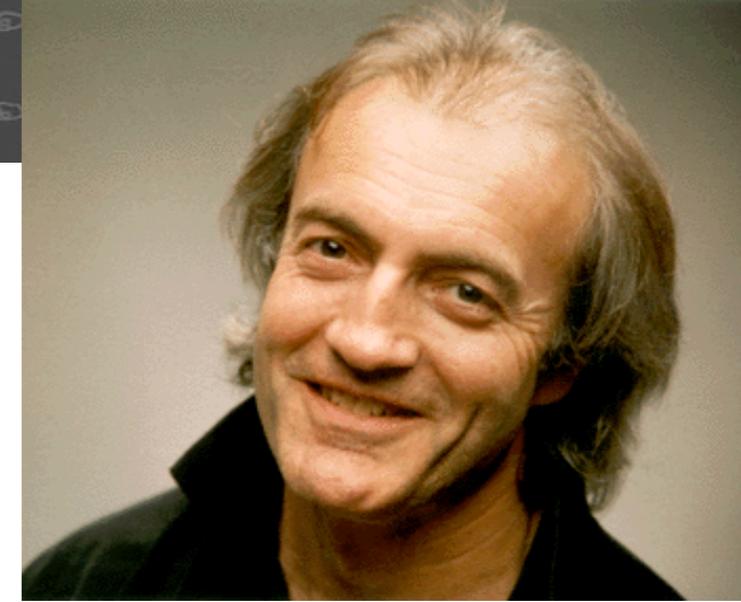


Summary:

- **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**

Why is sketching useful?

- Early ideation
- Think through ideas
- Force you to visualize how things come together
- Communicate ideas to others to inspire new designs
- Active brainstorming



Clear vocabulary

Plentiful

Suggest and explore rather than confirm

Quick and inexpensive

Timely, when needed

Disposable

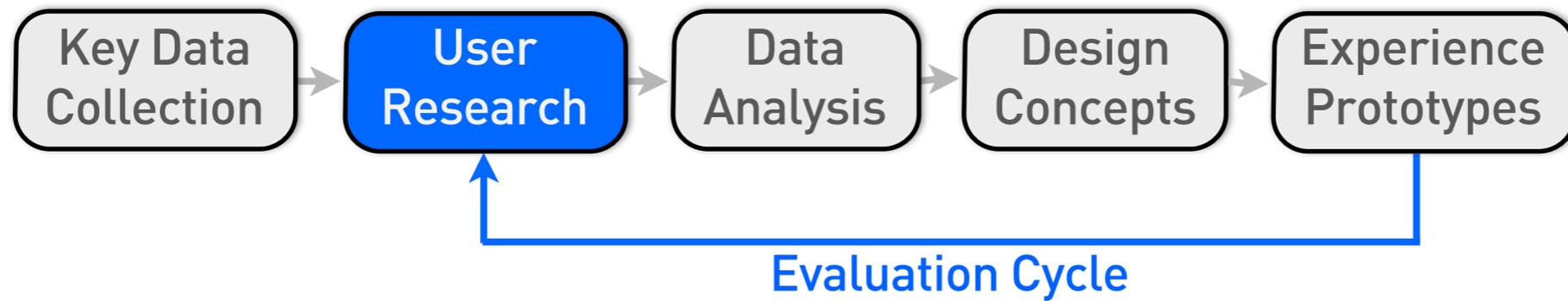
Minimal detail and distinct gesture

Ambiguous

Appropriate degree of refinement

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



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

Bill Buxton

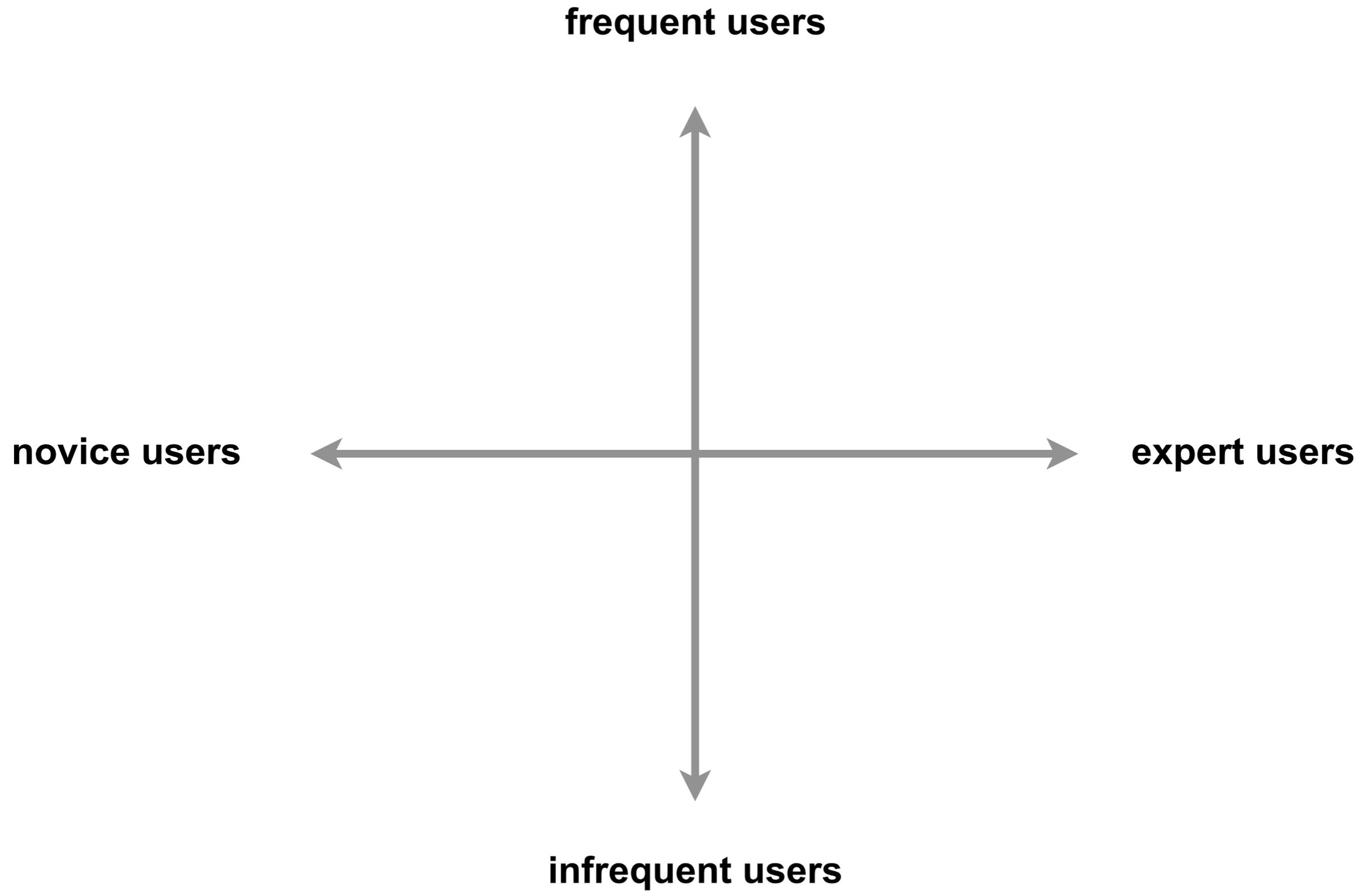


People

source: [8]

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

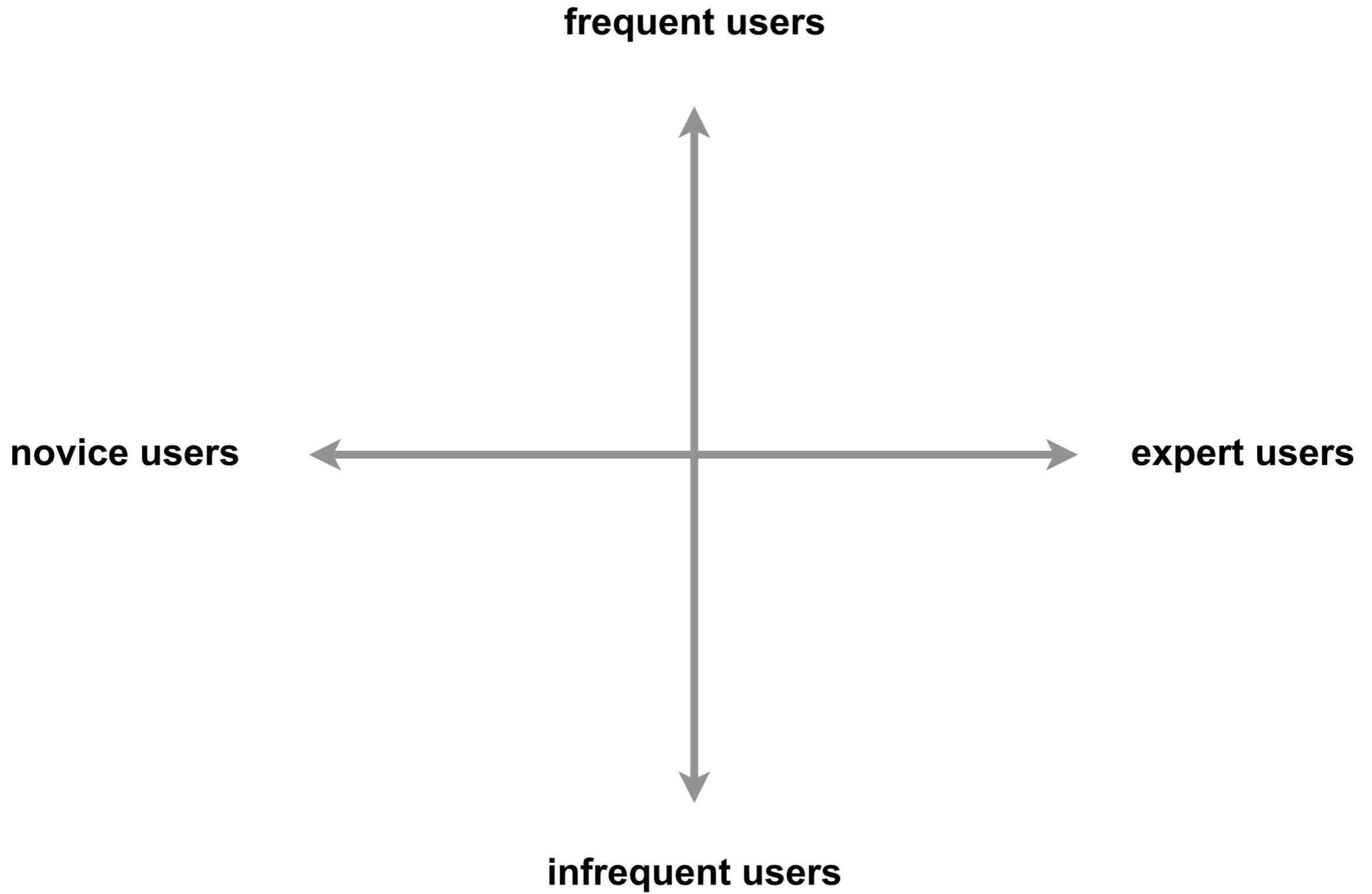
Susan Dray - Dray & Associates, Inc., USA





BMW 3 Series Cockpit

image source © BMW





BMW Racing Cockpit

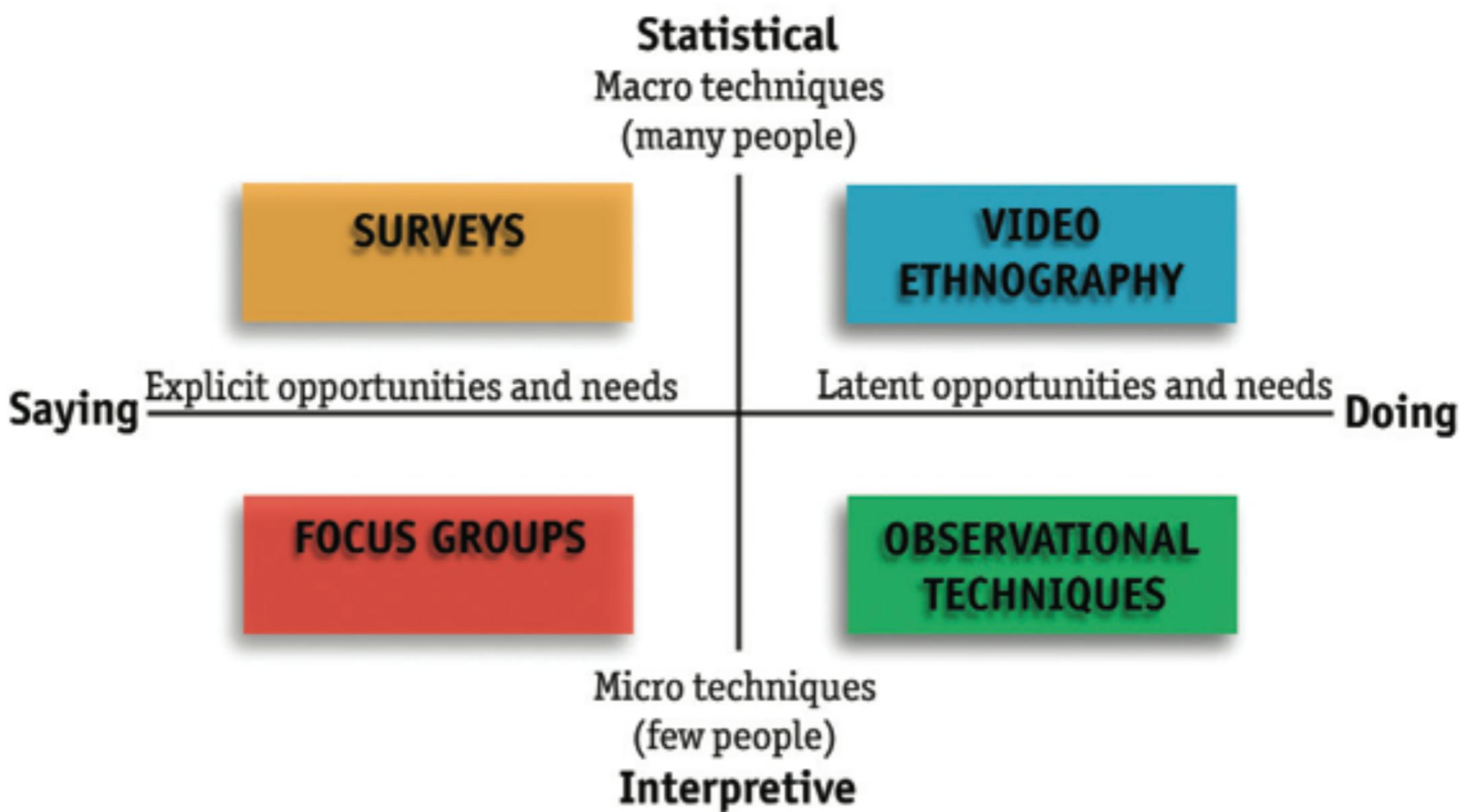
image source © BMW

**Different user types and usage frequency
will require dedicated solutions.**

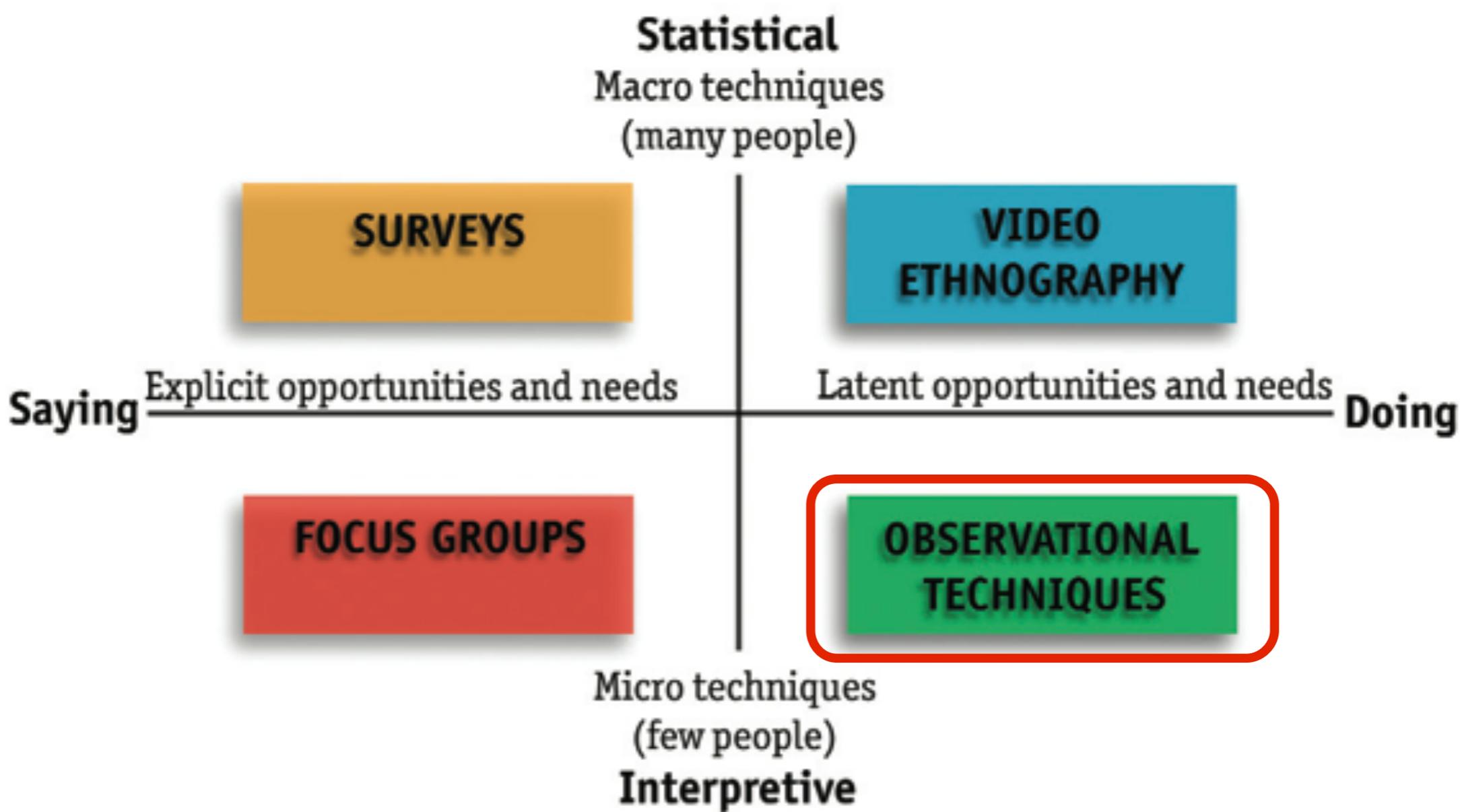
It is essential to the success of interaction design that designers find a way to understand the perceptions, circumstances, habits, needs, and desires of the ultimate users.

Jane Fulton Suri, 2005

source: [8]



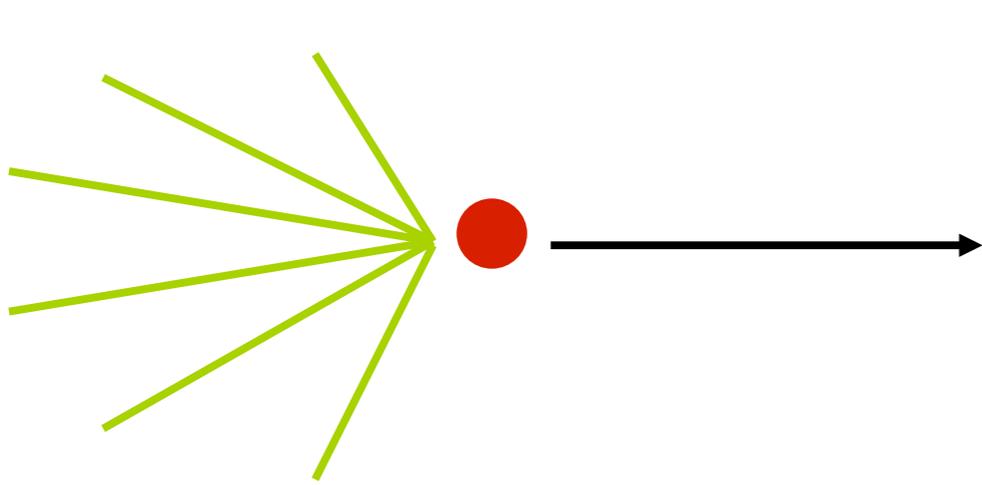
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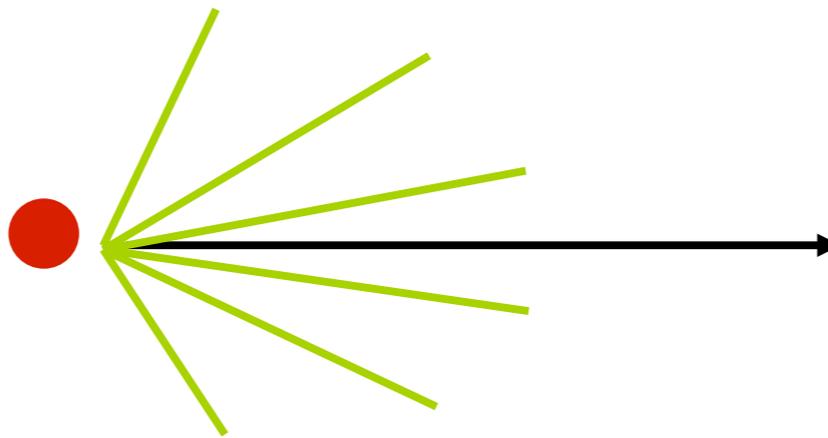
ANALYSIS

Definition of the system
What is the problem?



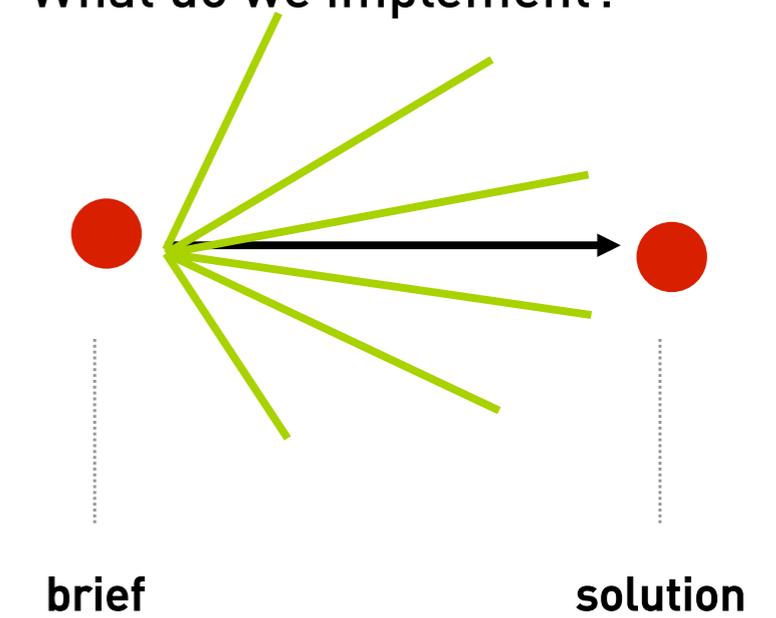
EVALUATION

Possible alternatives
What future do we want?



SYNTHESIS

Design of final solutions
What do we implement?

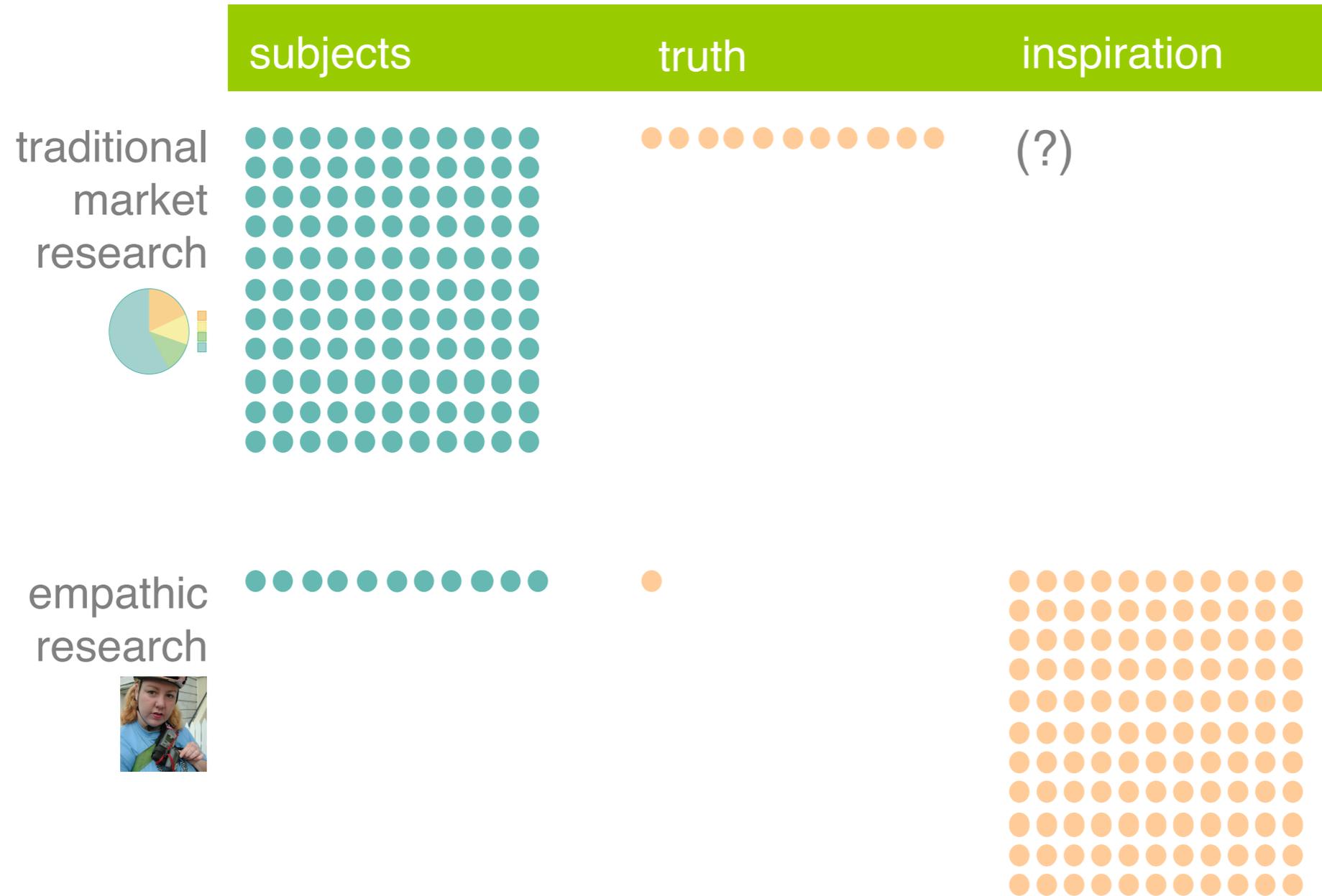


The designer is a
'problem-scouter'

The designer is a
'story-teller'

The designer is an
'executor'





source: [4]

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.

Design Research' Roots

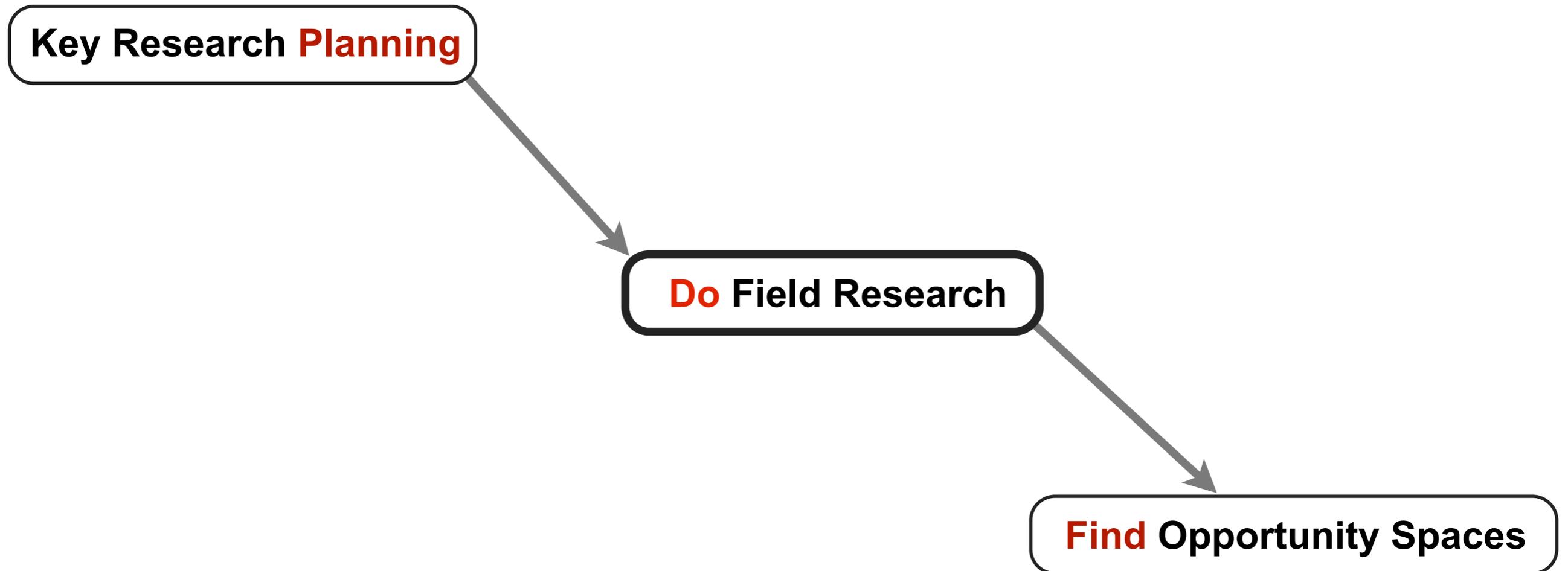
The importance of design with user needs in mind is not new. Since design has roots in craft, customised solutions by craftsman can be considered the first user-centred design.

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 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:





IDEO Method Cards



FLY ON THE WALL



A DAY IN THE LIFE



SHADOWING



PERSONAL INVENTORY

source: [7]

Fly on the Wall

How

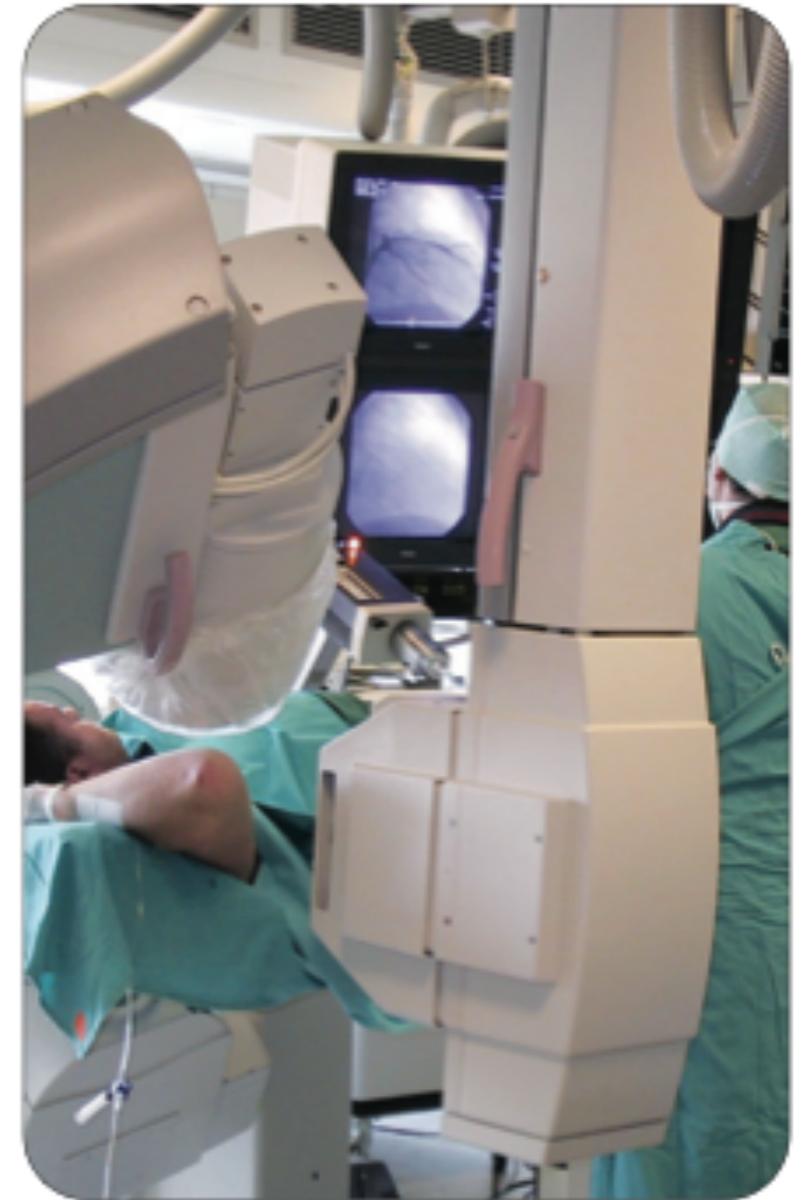
Observe and record behaviour within its context, without interfering with people's activities.

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.



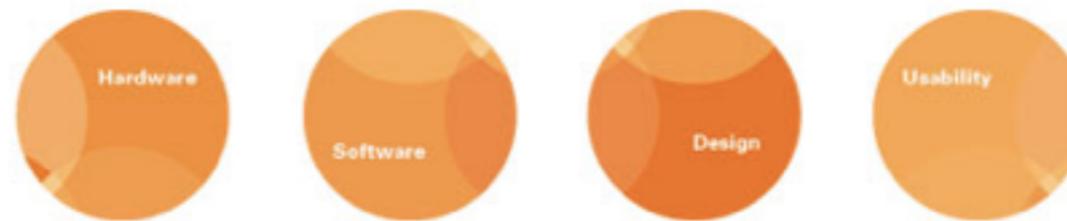
FLY ON THE WALL



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- News



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Displays 	Embedded Touch Panels 	Embedded Processors 	Embedded Boards 	Embedded Box PCs
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[Learn more](#)



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 behavior.

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

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

Summary Observation

- **Direct observation in the field**
 - Structuring frameworks
 - Degree of participation (insider or outsider)
 - Ethnography
- **Indirect observation: tracking users' activities**
 - Diaries
 - Interaction logging





Interviews in the “Wild”



Interviews in the “Wild”



Interviews in the “Wild”



Interviews in the “Wild”



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'
- Analyzing video and data logs can be time-consuming
- Collections of comments, incidents, and artifacts are made

Applying Interaction Design I

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

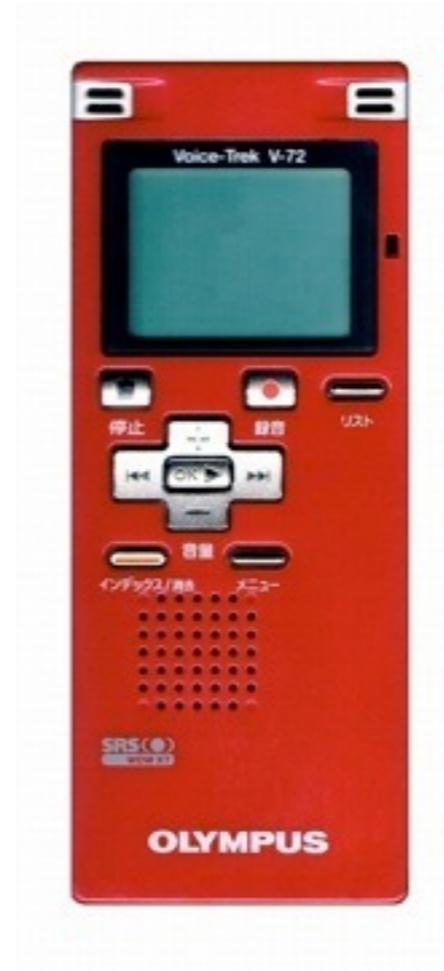
Four key issues

- **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

Data recording

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

Tools of Trade:



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.

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

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.

Enriching the interview process

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



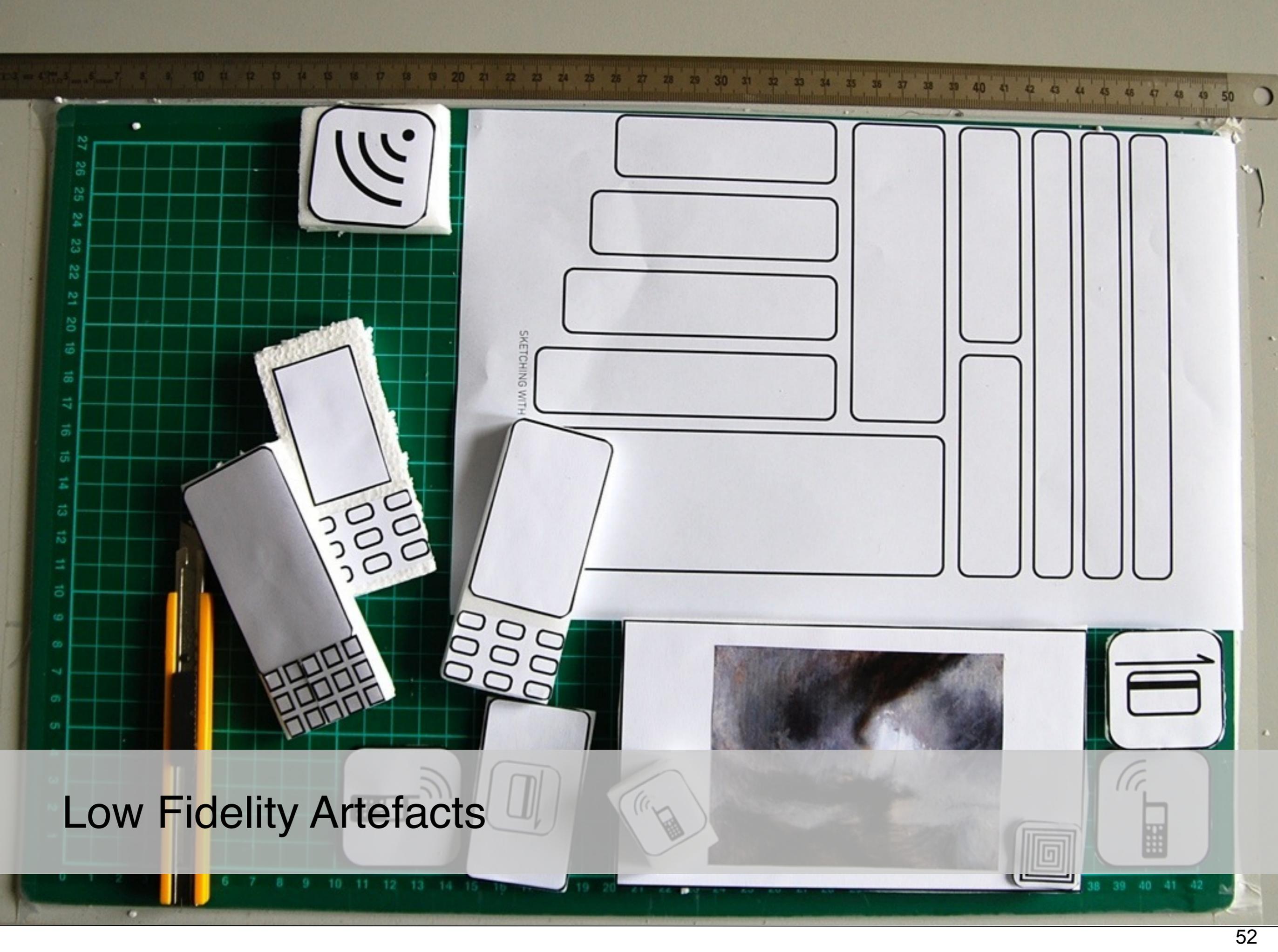
source: [8]

Props in the Design Research Process:

Artefacts or props can play a significant role in the process by

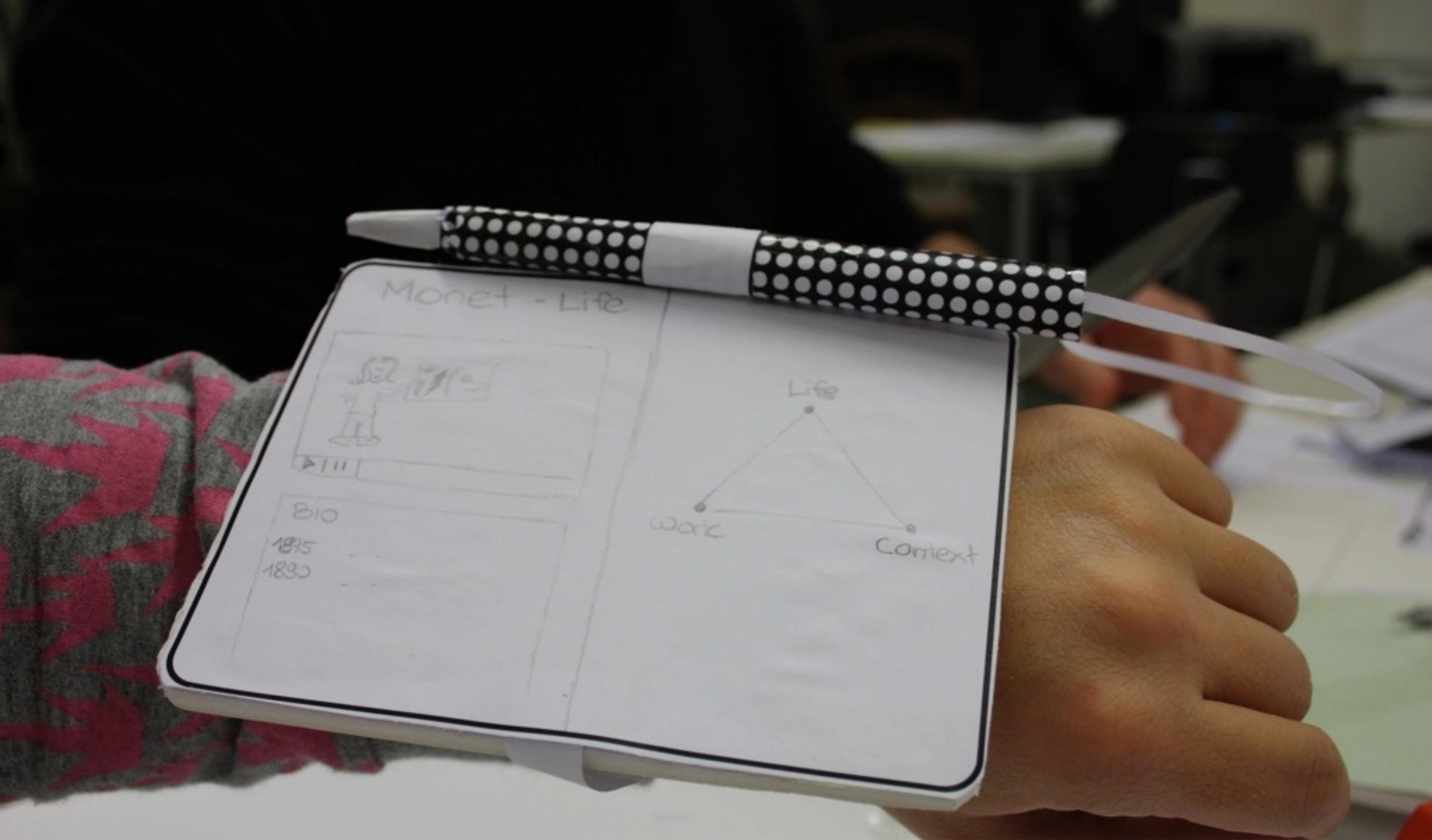
- (1) staying focused and structured on the topic and
- (2) making a complex technology or system explainable within a short timeframe (sketch, props, 3D artefacts)

Low Fidelity Artefacts





Low Fidelity Artefacts



Low Fidelity Artefacts

Schildern Sie kurz ihr Erlebnis, waren Sie
tatsächlich (würde nicht da
geht beim Display Schrift

einfach/schwierig ist die Benutzbar
keit braucht man nicht

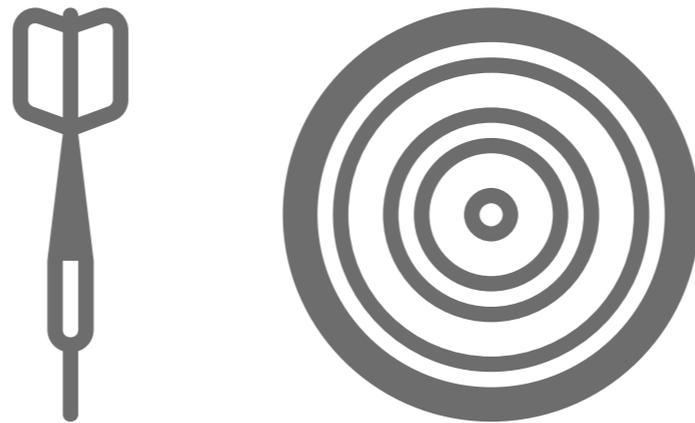
Designing Questionnaires

What is it we are trying to understand?

- set **Goals!**...

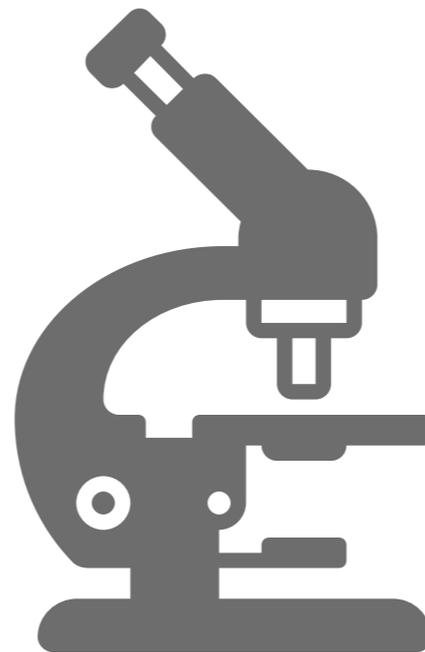
...and write a **short abstract**

(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))



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

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**.

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**

Questionnaires should accommodate all possible answers:

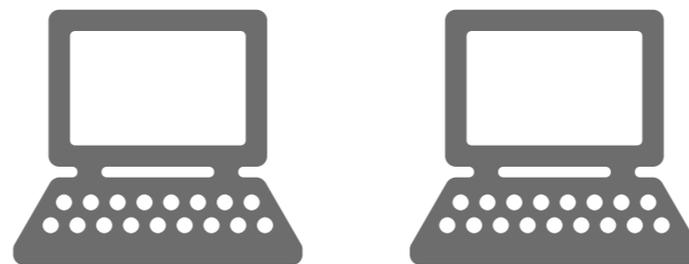
e.g., consider the question:

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**

Encouraging a good response

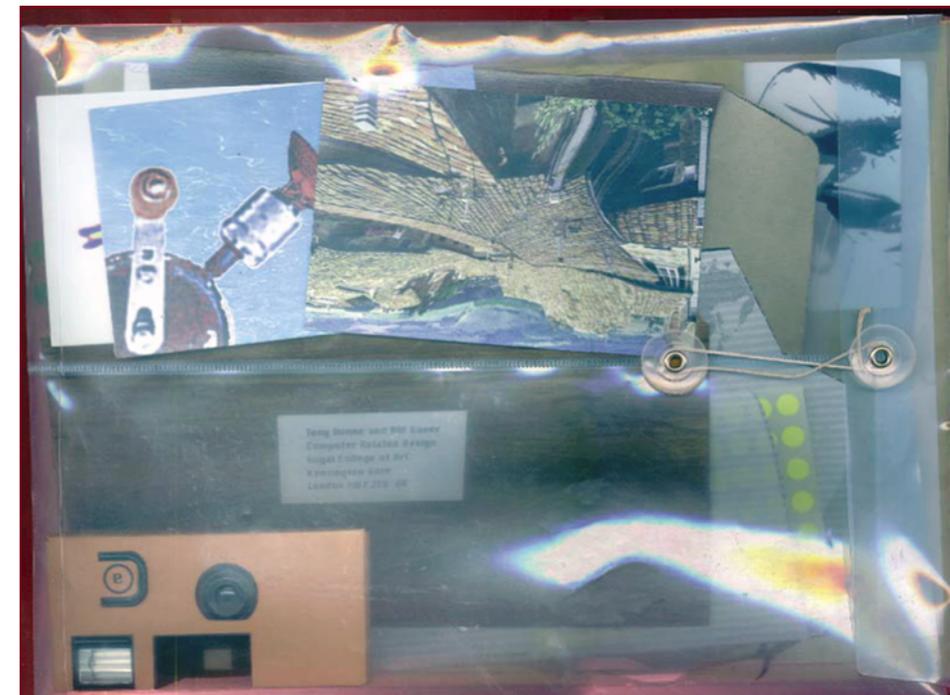
- Make sure purpose of study is clear
- Promise anonymity
- Ensure questionnaire is well designed
- Offer a short version for those who do not have time to complete a long questionnaire
- If mailed, include a stamped addressed envelope
- Follow-up with emails, phone calls, letters
- Provide an incentive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

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?

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

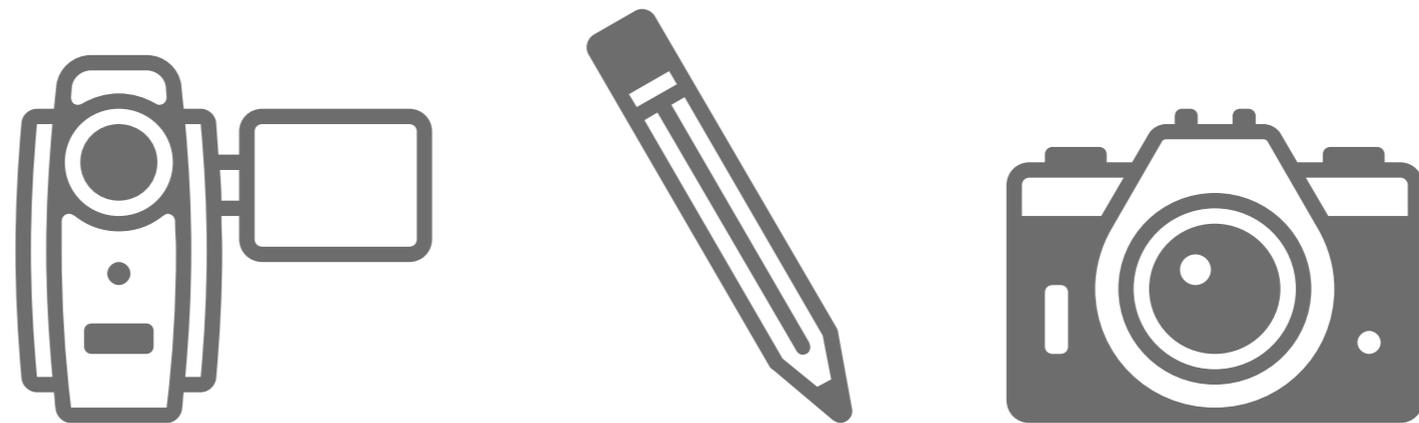
Duration

(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]

Affinity Diagram

- A method for sorting and making sense out of data to identify themes and discover unseen connections
- Data points can be recorded on sticky notes and sorted into logical groups/themes

Affinity Diagram

- Brainstorm or use the recoded research data to identify ideas, aspects and issues
- Record each finding on cards or post-it notes
- Look for related concepts
- Sort notes or cards into groups until all cards have been used
- Repeat as many times as needed
- Add labels to themes if appropriate
- Draw connections between findings and themes

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- [3] CHI'10 *Panel Discussion on User Research*, 2010.
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