Interaction Design

Chapter 4 (June 1st, 2011, 9am-12pm): Applying Interaction Design I

II Applying Interaction Design

May

June

July

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

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

Bill Buxton

People

source: [8]

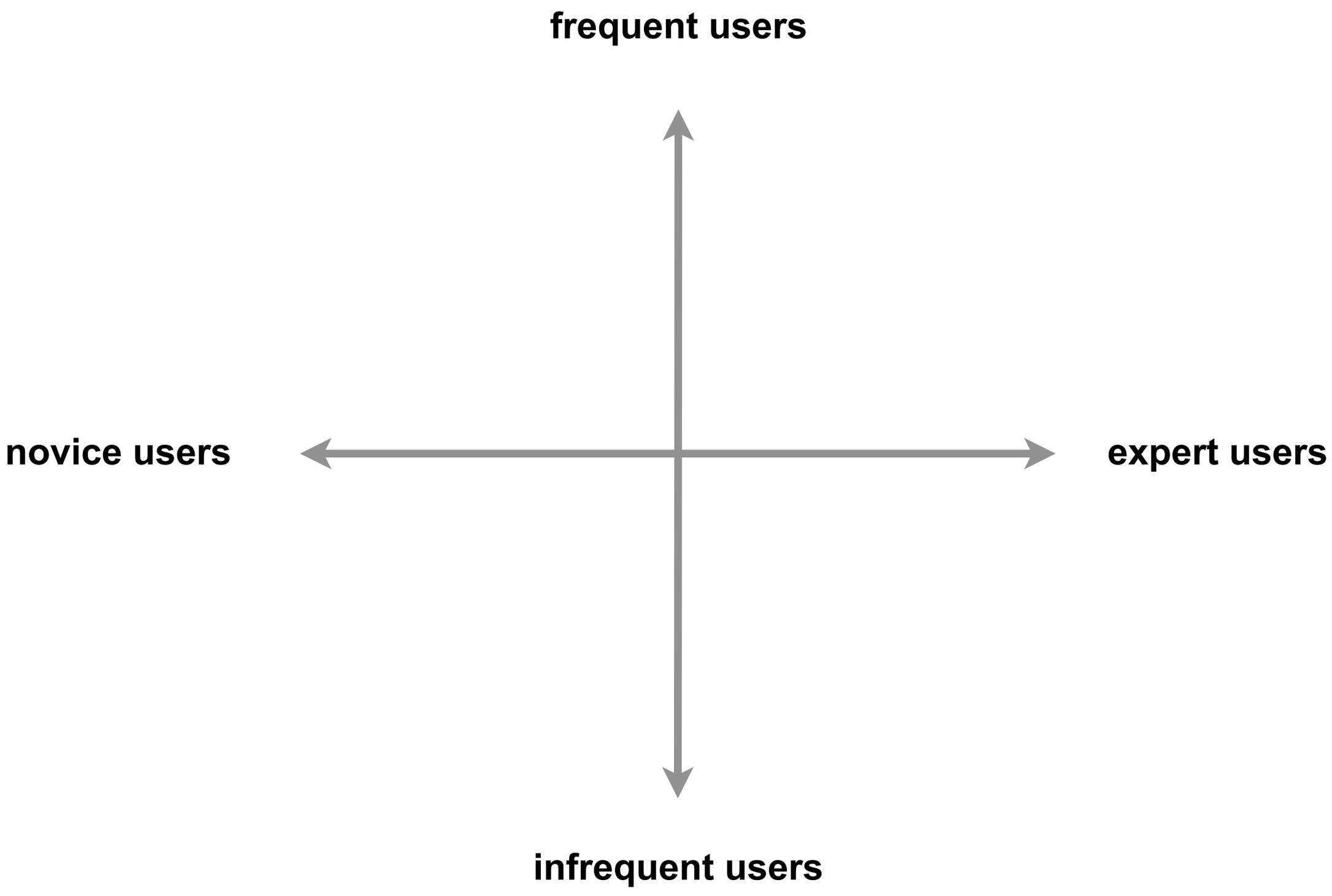
In design research we are driven by a need for a deeper understanding

Susan Dray - Dray & Associates, Inc., USA

source: [3]

BMW 3 Series Cockpit

image source © BMW


frequent users
novice users
expert users
infrequent users

BMW Racing Cockpit

image source © BMW

Different user types and usage frequency will require dedicated solutions.

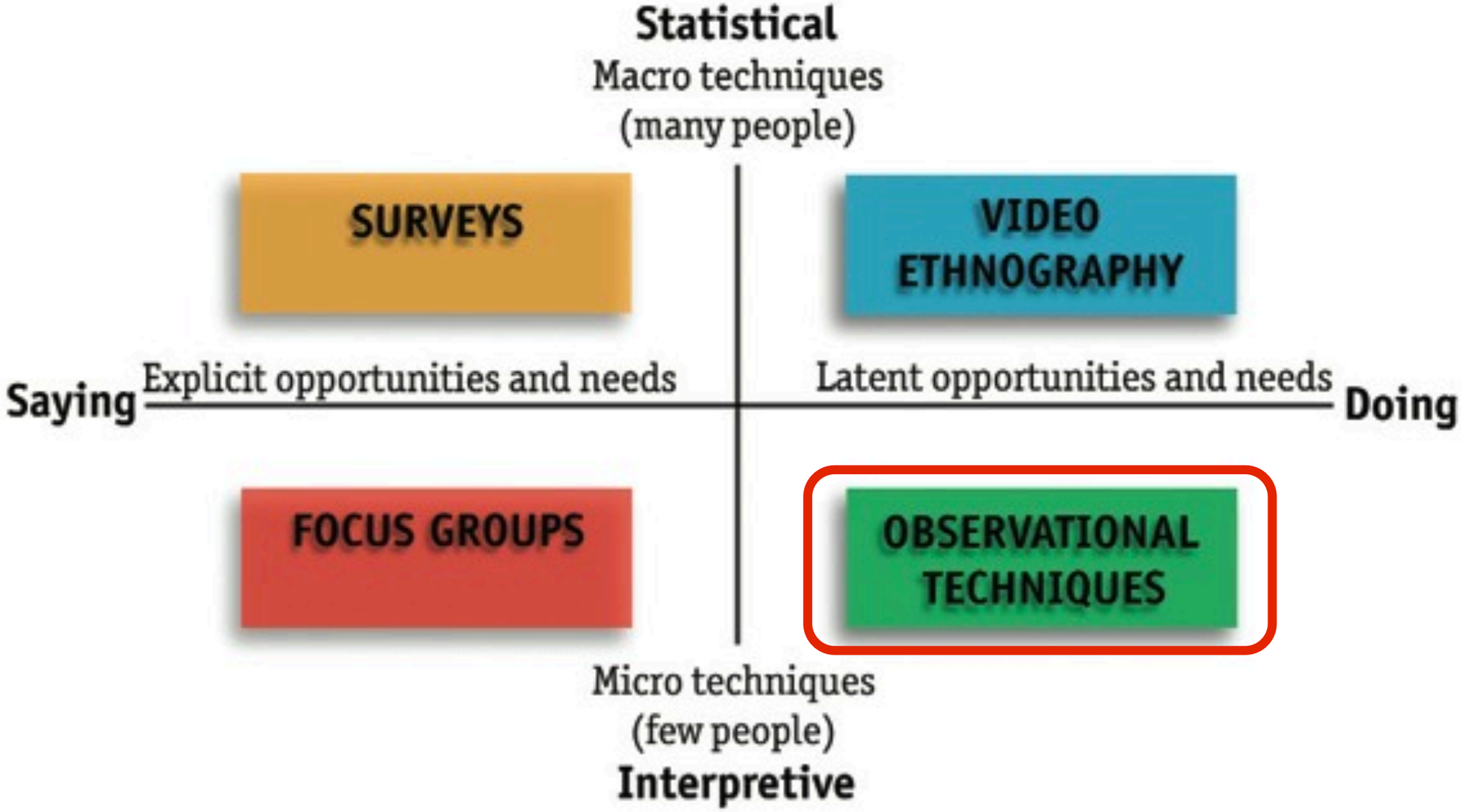
Prototyping

source: [8]

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
Explicit opportunities and needs
Latent opportunities and needs
Saying
Doing
FOCUS GROUPS
OBSERVATIONAL TECHNIQUES
Micro techniques
(few people)
Interpretive

source: [8]

ANALYSIS

Definition of the system

What is the problem?

EVALUATION

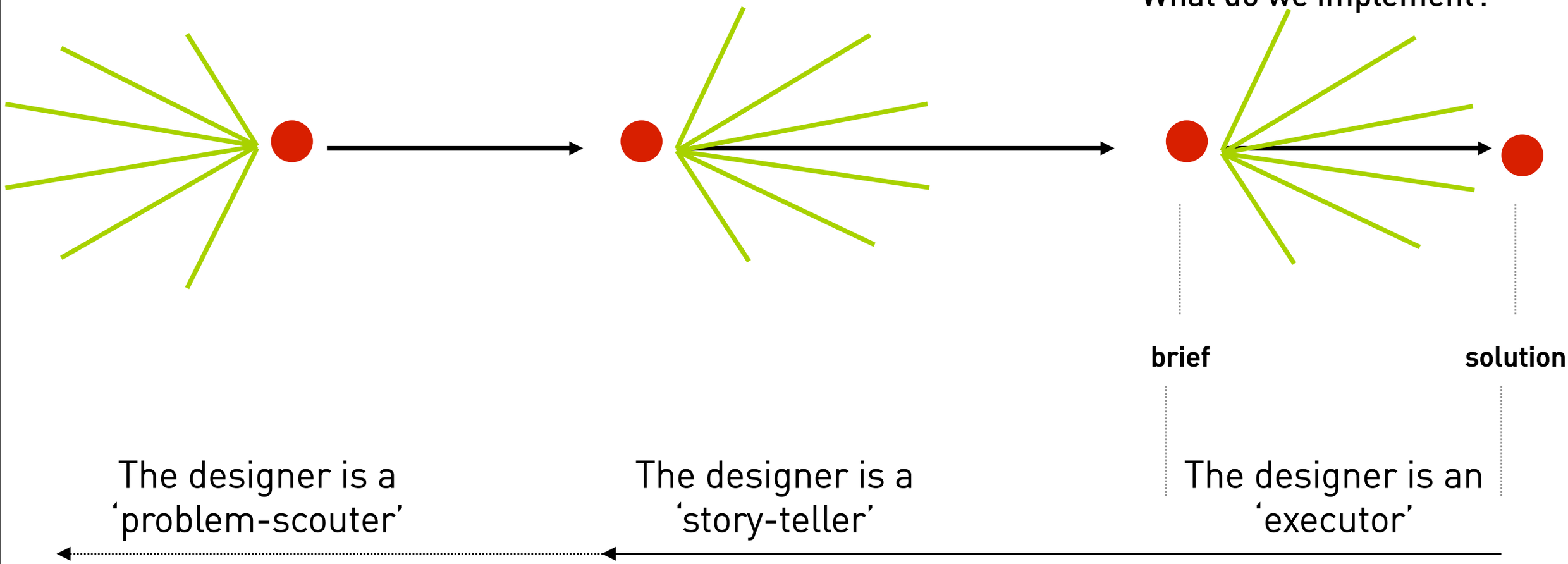
Possible alternatives

What future do we want?

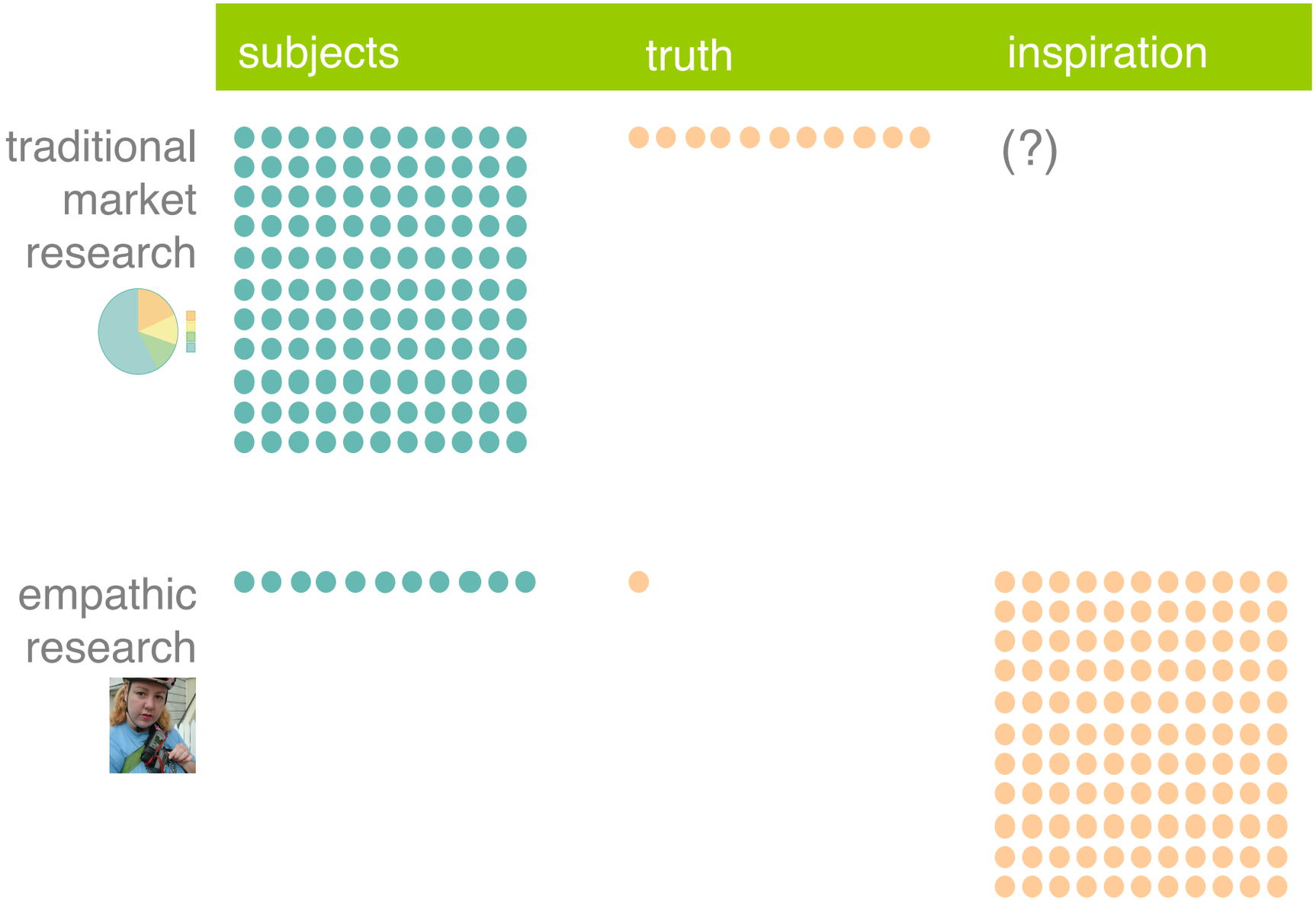
SYNTHESIS

Design of final solutions

What do we implement?



source: [4]


subjects
truth
inspiration
traditional market research
(?)
empathic research

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.

source: [4]

Design Research' Roots

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

Many methods employed in design research have their roots in cultural anthropology, social behavioral 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 I

- What is Design Research ?
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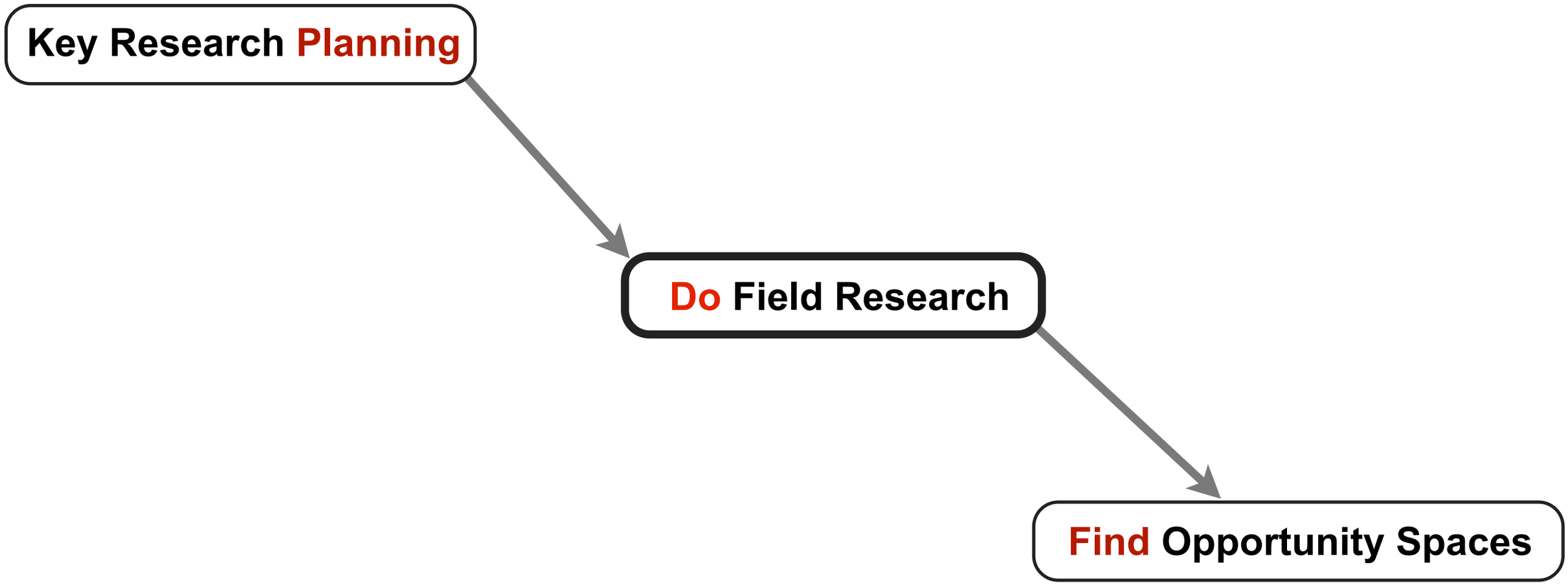
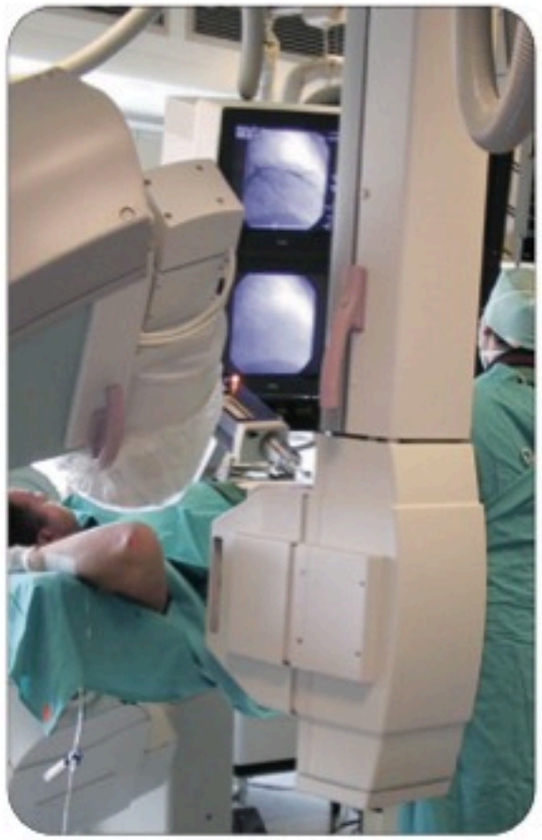
Design Research is mostly structured:



source: [10]

IDEO Method Cards

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



FLY ON THE WALL

A DAY IN THE LIFE

SHADOWING

PERSONAL INVENTORY

source: [7]

Fly on the Wall

How
Observe and record behavior 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]

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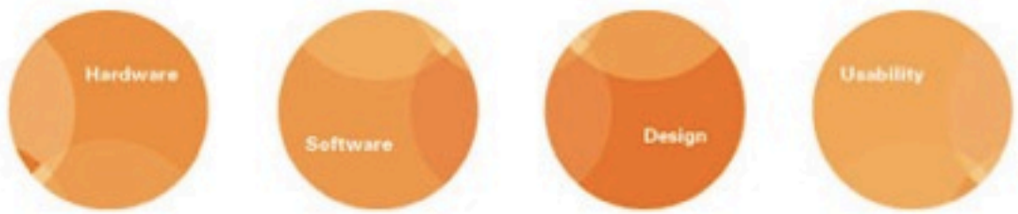

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A Day in the Life

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

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”

Interviews in the “Wild”

Interviews in the “Wild”

Interviews in the “Wild”

Interviews in the “Wild”

Focus Group

http://www.vernonresearch.com/site-images/FocusGroup.jpg

Focus Group Basics

- informal gathering of 6-8 people
- focused on a specific topic
- get indication how people think and feel
- collecting opinions, attitudes, feelings, perceptions, and ideas

source: [2]

Focus Groups (Pros and Cons)

Advantages

- wide range of information
- in-depth information (Why the user …)
- possibility to explore related topics or go into more detail
- cheap and easy to do

Disadvantages

- the moderator plays a significant role and can influence the results
- no quantitative information can be gathered
- findings can not easily be generalized

source: [2]

It’s really hard to design products by focus groups. A lot of times, people don’t know what they want until you show it to them.

Steve Jobs

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 ?
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Four key issues

- **Setting goals**
  - Decide how to analyze 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 analyze

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]

Probs in the Design Reserach Process:

Artifacts or probs 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, probs, 3D artifacts)

Low Fidelity Artifacts

Low Fidelity Artifacts

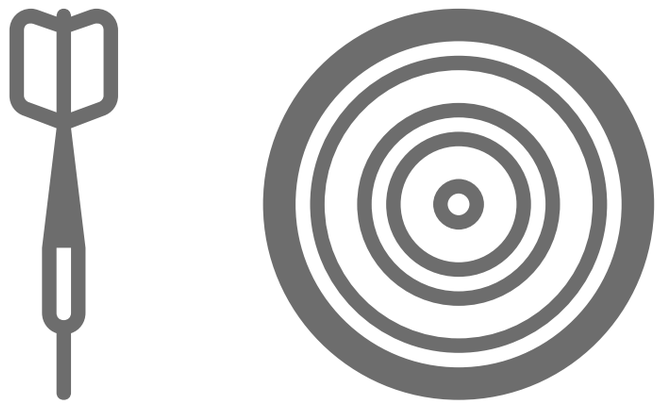
Low Fidelity Artifacts

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)

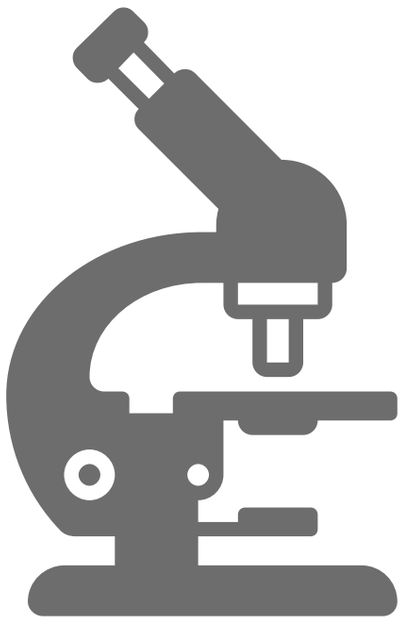


Advice on Questions to Ask:

- **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 analyze**, 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**

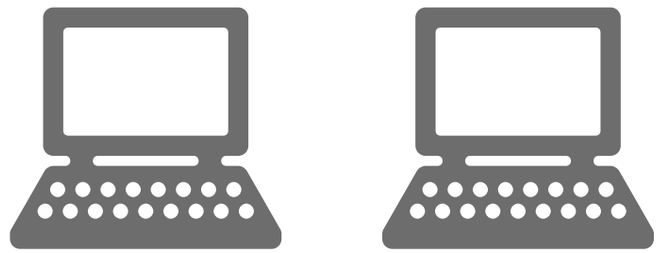
source: [8]

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:

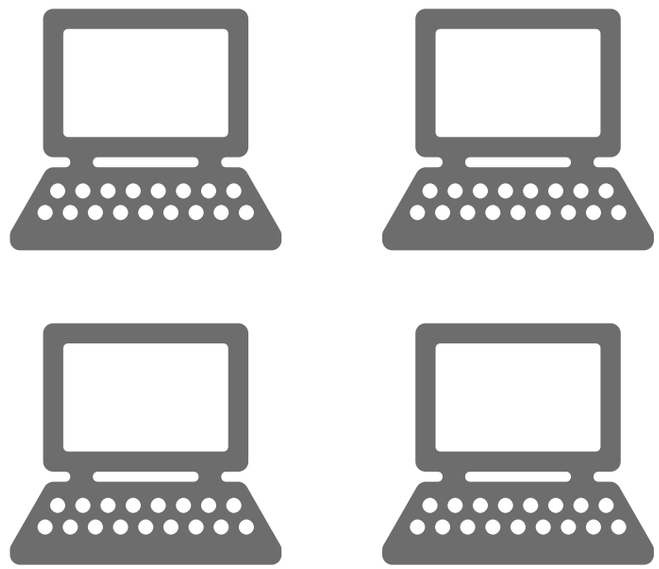
e.g., consider the question:

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

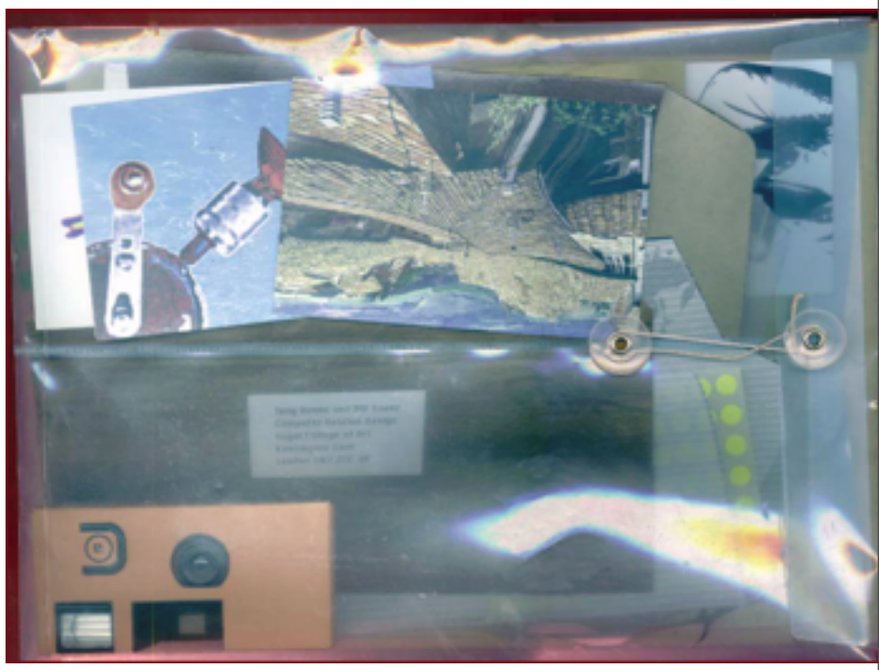
- - The person. **Who?**
  - The place. **Where?**
  - The thing. **What?**

- **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]

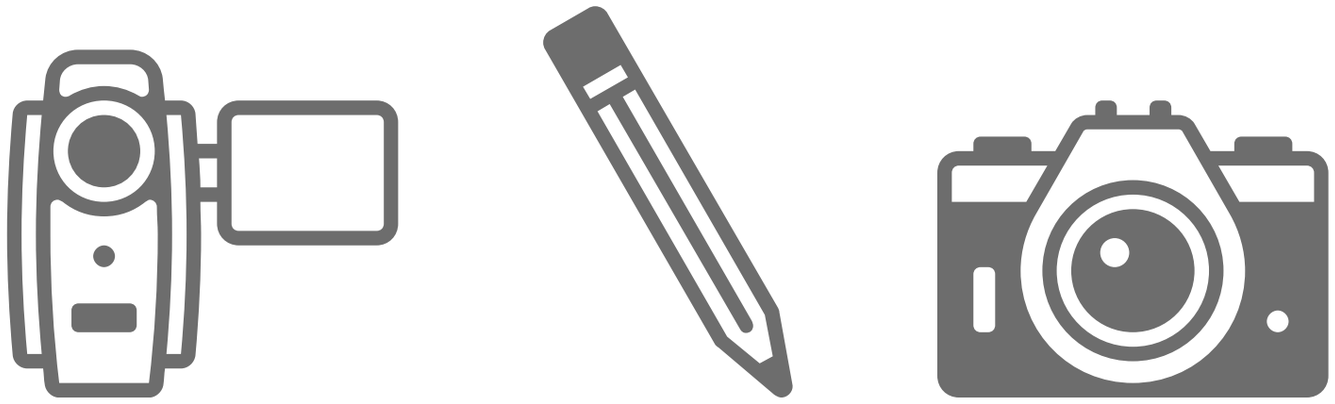
Scheduling and Time Planning

	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]

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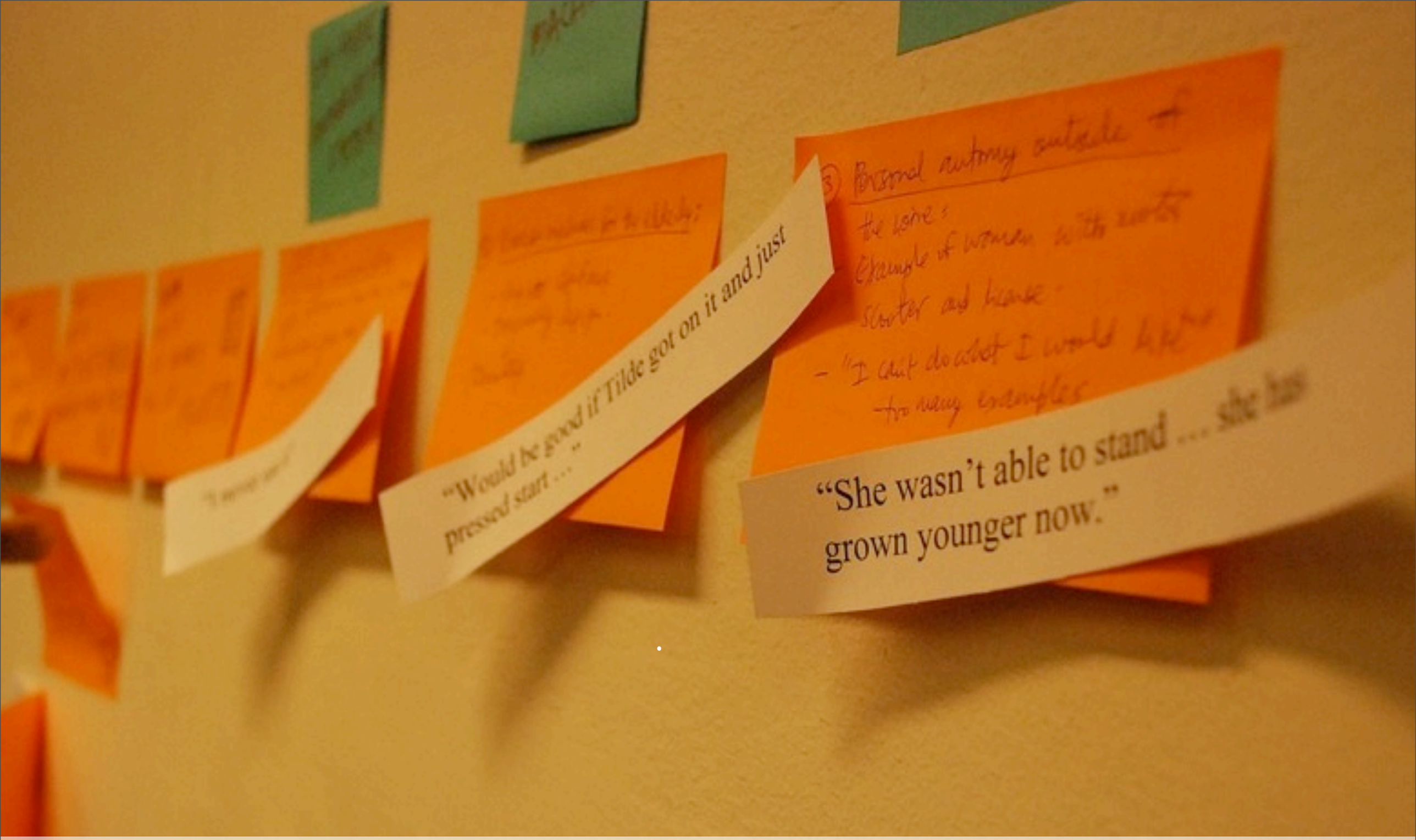
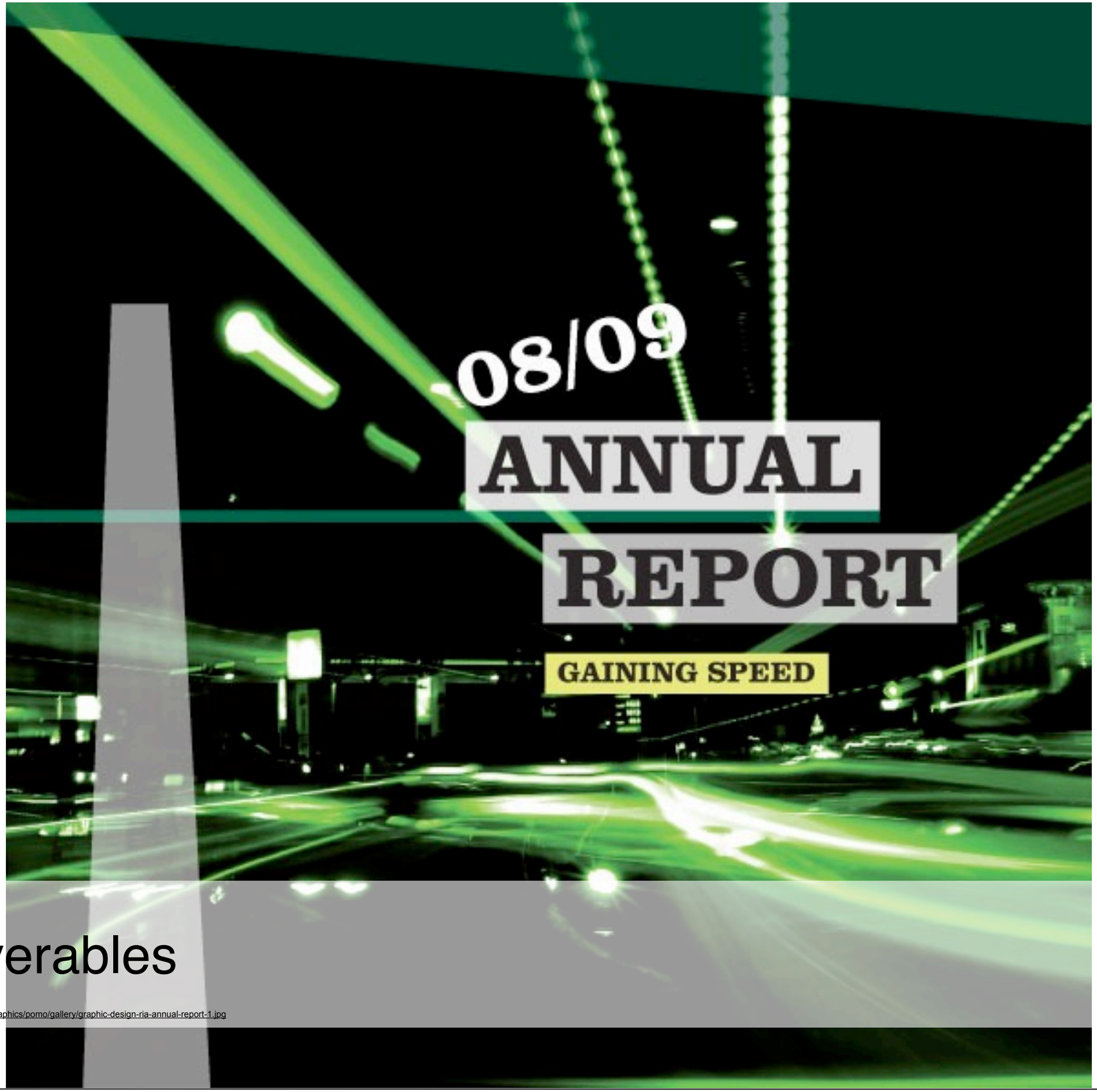
Just to name some companies executing large amounts of design research:

Extracting Data (Collaging)



Extracting Data

Deliverables



http://www.pomo.com.au/graphics/pomo/gallery/graphic-design-ria-annual-report-1.jpg

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