Needfinding

(FOR DIGITAL WELLBEING)

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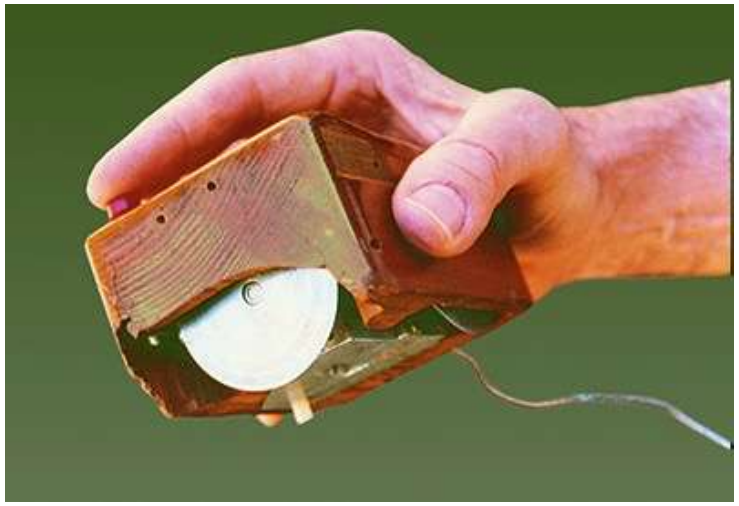
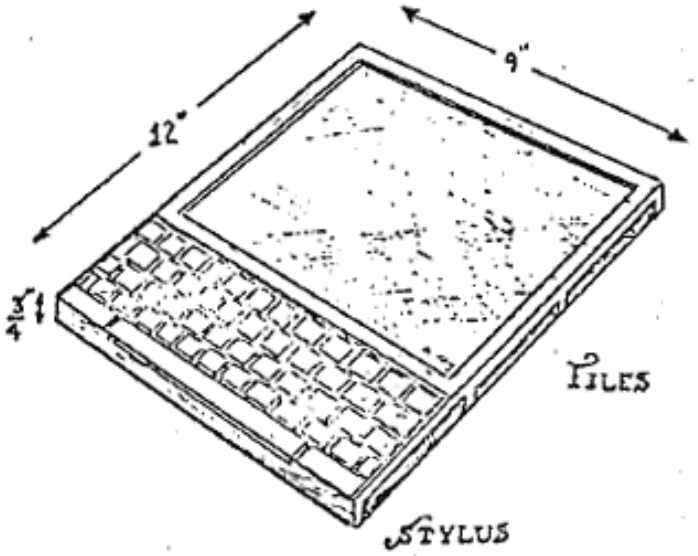
Goals

- Understanding the system requirements and user needs
  - “Needfinding”
- Knowing tools and instruments for Needfinding
- Knowing how to use Needfinding toos and instruments in the Digital Wellbeing research area

Human-Computer Interaction… In Brief

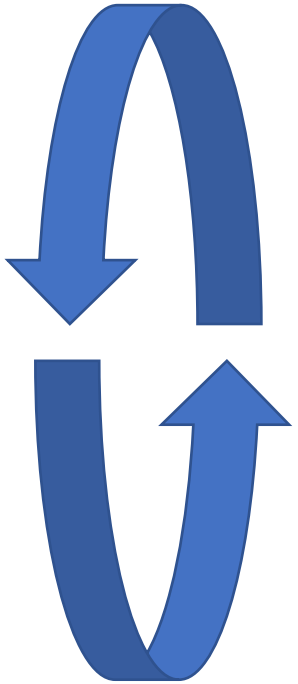


- A multi-disciplinary field
- Concerned with the **design, evaluation,** and **implementation** of interactive computing systems for human use
  - and with the study of **major phenomena** surrounding them
- Involves two *entities* (the human and the computer) that determine each other behavior over time
  - framed in terms of humans' **goals** and related **tasks/pursuits**



HCI Is Multidisciplinary

- Psychology and cognitive science
  - User perceptual, cognitive and problem-solving skills
- Ergonomics
  - User's physical capabilities
- Sociology
  - Understanding the wider context of the interaction
- **Computer Science and Computer Engineering**
  - **Building the necessary artifacts (HW, SW)**
- Business
  - Satisfying market needs
- Graphic design
  - Produce an effective interface presentation
- Technical writing
  - Documentation, manuals, on-screen content
- …



To help us in applying expertise from many different fields:

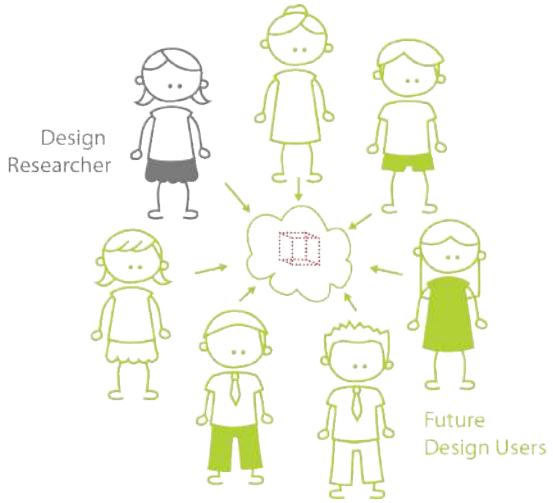
- Design methods and processes
- Models
- Heuristics
- Best practices
- Conventions
- Experiments and user studies

User-Centered Design (UCD)

- Avoid the risk of software project failure
  - Estimated 50% are affected by bad developer<->user/client communication
- UCD takes the needs, wants, and limitations of the **actual end users** into account **during each phase** of the design process
  - User-centered design issues are discovered during the early stages
- Benefits: systems easier to learn, with faster performance, with less human errors, encourage users to discover advanced features, and avoids "building the wrong system"
- Issues: how to find users? How many? How motivated? How to speak their language? How to extract user needs, business needs, organizational implications?

Participatory Design

- One step further than UCD, users are directly involved in the collaborative design of the things and applications they use
- Engage a group of users
  - Discussions
  - Creating scenarios, sketches, dramatizations
  - Creating and testing lo-fi prototypes
  - Continuous meetings, flexible management
  - Highly reliant on the skills of the group moderators/leaders (keep involved, filter ideas, reward participation, work around resistances, …)
  - More effective with more mature and prepared user populations (less with kids, elderly, disabled, …)

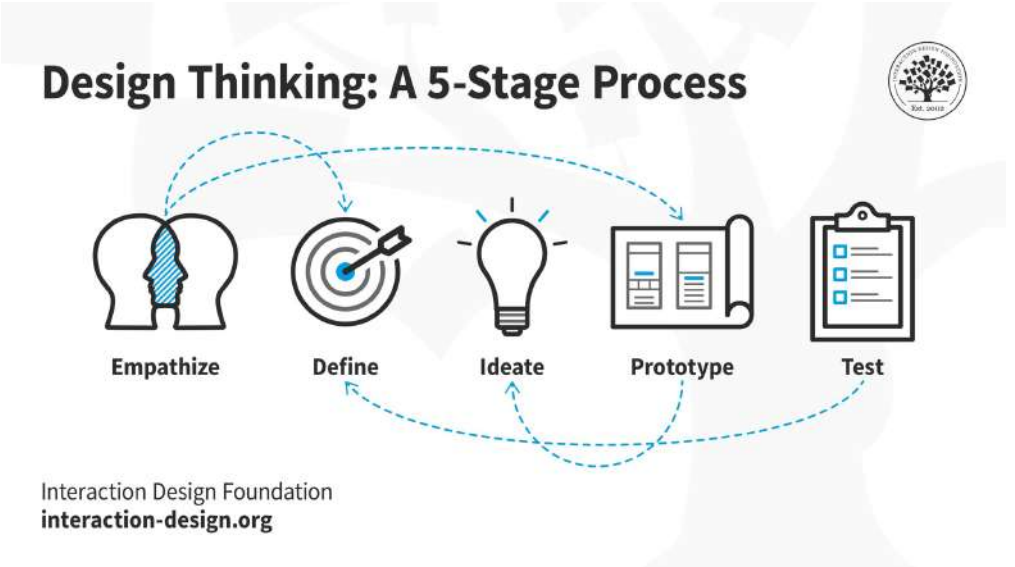


Design Thinking

- *"A human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success."*

— Tim Brown, IDEO's Executive Chair

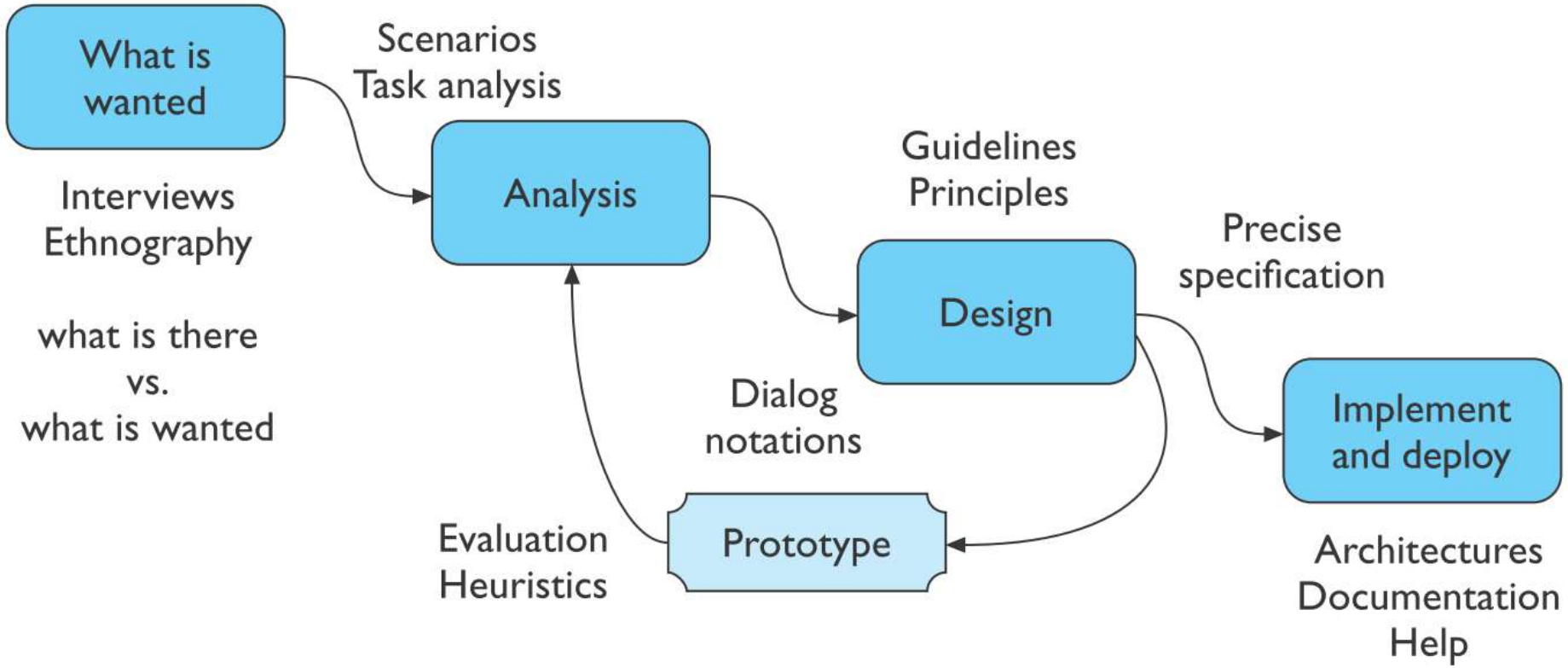
- A 5-stage, non-linear and iterative, process
  1. **Empathize** – research users' needs
  2. **Define** – state the found needs
  3. **Ideate** – challenge assumptions and ideate
  4. **Prototype** – create solutions
  5. **Test** – try the solutions out



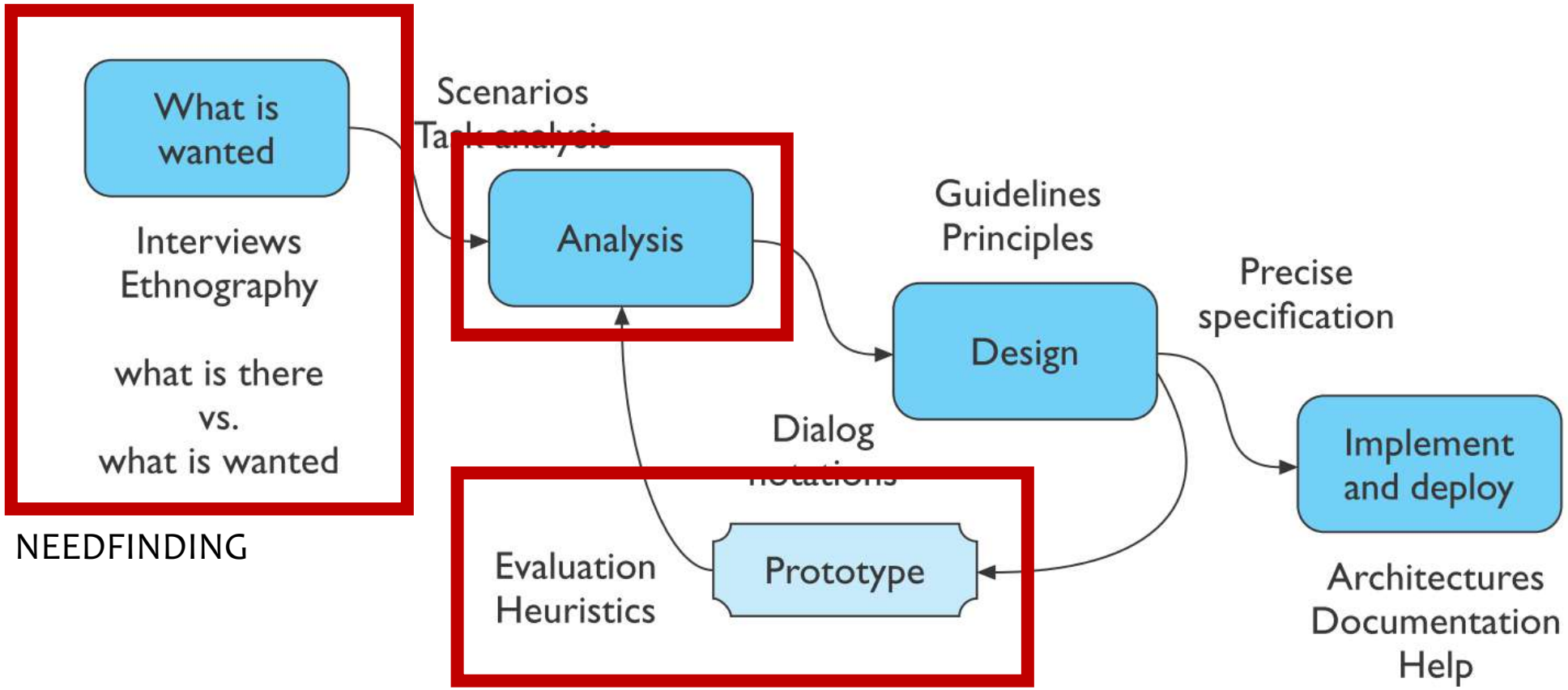
Service Design

- Describe the contemporary shift from *products* (e.g., a car of a specific brand) to *services*, e.g., the car as a tool for an elderly customer that wants to take an Uber ride to visit a friend
- Focus on the complete experience, including business resources and processes
- Build upon five *key principles, a*ccording to "This is Service Design Thinking":
  1. **User-centered** – focus on all users
  2. **Co-creative** – include all relevant stakeholders
  3. **Sequencing** – break a complex service into separate processes
  4. **Evidencing** – envision service, not product, experiences
  5. **Holistic** – design across networks of users and interactions

Human-Centered Design Process
(simplified and generic)



Human-Centered Design Process in This Course
(simplified and generic)



What is Needfinding?

- Needs: **gaps** in a system

- Needfinding: discovering opportunities by **recognizing** this gaps

What is Needfinding?

- Figure out the story of **what** and **why**…

- … and tell a new one!

Main Needfinding Questions

- Needfinding = **Finding Potential User Needs**
  - What do users need?

- That also requires
  - Who are the users?
  - How are they doing it, now?
  - What is the context in which they are doing it?
  - Can’t we just ask them?

Know Your Users (1)

«*Know Your Users*»

- Who are the users of the system?
  - Uniform, or different categories/groups?
  - Young/old? Novice/experienced?
  - Do not think of "generic" users, split the categories
- ***You*** are not a [representative] user
  - Designers and developers' skills, knowledge, attitude, background, interests, … are totally unlike those of your users
  - Except by chance (e.g., you use the smartphone, you are on social networks …)

Know Your Users (2)

- Talking to users
  - Surveys
  - Interviews
  - Direct involvement (participatory design)
  - Bypass corporate policies
  - Understand real current behavior, pain points, workarounds, …
- Watching users
  - Observation sessions
  - Video recording (and analysis)
  - Diaries
  - Analyze their work (artifact, processes, action sequences)
  - Discuss with users the findings of the observation (may discover the “why”)

Know Your Users (3)

- Imagining users
  - When real users are not available
  - Imagine how a real user would behave (very difficult)
  - Building “imaginary” users: *personas*
    - Detailed description of hypothetical persons in a given role
    - Imagine them as they were a real person

Needfinding Methods

With a focus on the digital wellbeing research area

Methods Outline

- Observation, ethnographic research
- Diaries
- Interviews

Observation

“You can observe a lot, just by watching” – Yogi Berra

Ethnographic Observation

- Embed in the users' environment, culture, behavior
- Goal: to obtain the necessary data to influence interface (re)design
- Learn the language of users and their environment
- Listen and observe carefully
  - Sometimes ask questions and clarifications
- Audio-Video Record / Take Notes
- Risks:
  - Misinterpret observations
  - Disrupting normal practice
  - Overlooking important information

What Should Learn By Observation? (1)

1. What do people do now?
2. What values and goals do people have?
3. How are these activities embedded in a larger ecology?
4. Similarities and differences across people
5. Other types of context, like time of day

Especially tacit (unspoken) knowledge

What Should Learn By Observation? (2)

- Process vs. Practice
- Process: how things are officially supposed to happen, and are officially part of the training
- Practice: set of workarounds, practical tricks, information learnt from the field and from experience, etc., that are part of daily activities

How to Conduct User Observations
https://www.interaction-design.org/literature/article/how-to-conduct-user-observations

Types of Observation (1)

Controlled Observation, within a Lab environment

- **Easy to reproduce.** If you use a quantitative approach – easy to get similar results by repeating
- **Easy to analyze.** Quantitative data requires less effort to analyze than qualitative data.
- **Quick to conduct.** Recruitment may take a little time, the controlled observation is fairly fast to run.
- **The Hawthorne Effect.** The act of observation of how someone does something can change their approach to carrying out the task.

Types of Observation (2)

Naturalistic Observation: studying the user "in the wild", less structured

- **More reliable**. When people use a product in real life – they are much more likely to encounter the frustrations (and benefits) of real life use than they are in a lab following a set of instructions.
- **More useful for ideation**. Qualitative research can generate lots of ideas for product improvement as it opens up possibilities that aren't found in quantitative research.
- **Difficult to include a representative sample.** More expensive and time consuming to conduct, limits the reach of the research. Use this kind of research to create ideas and then test those ideas with other forms of research.
- **Difficult to make them replicable.** Problem with sample sizes and dependence on the observer.
- **Hard to manipulate external variables.** For example, if it's raining when you observe your users working on a smartphone – their behavior is likely to be different to when it's sunny. You have no control over the weather "in the wild".

Blending In

- **Becoming part of the wall** (Complete Observer)
- Avoid being intrusive or modifying behaviors
  - Avoid video-recording or interruptions
- Schedule time for discussing your observations

- **Becoming "one of them"**, like a spy (Complete Participant)
- Undergo training process
  - Official information
  - Matter-of-fact information shared by co-workers
- Observe all the practices
- Validate your observations with the others

Data Collection

Subjective

- Impressions
- Ranking/ratings by users on different questions
- Written summary report
- Artifacts and “hints” in the workplace

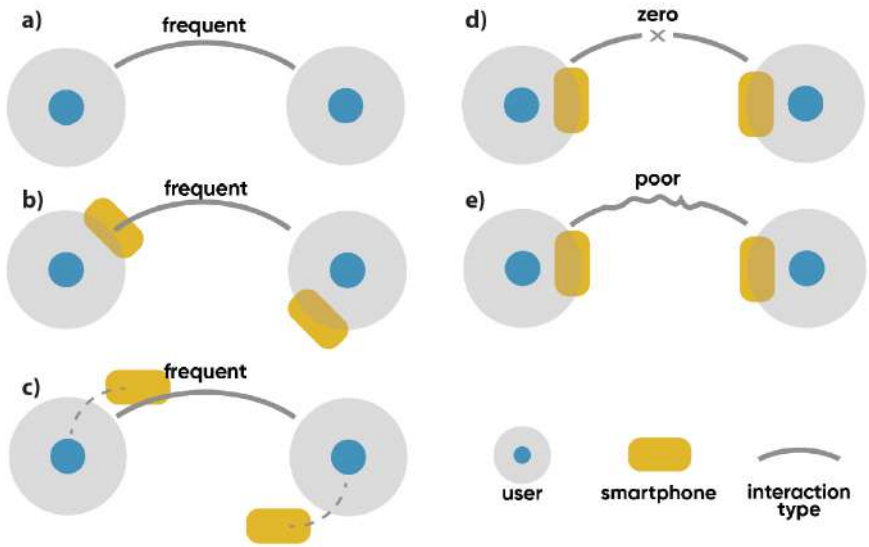
Objective

- Anecdotes
- Critical incidents
- Observed errors
- Observed workarounds

Observerving in Digital Wellbeing Research

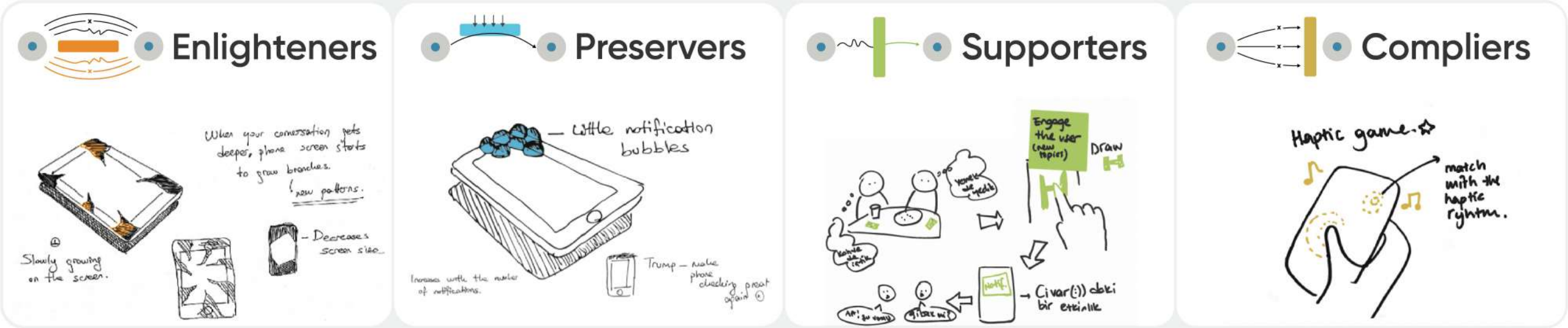
Genç and Coşkun, *Designing for Social Interaction in the Age of Excessive Smartphone Use*, CHI 2020, https://doi.org/10.1145/3313831.3376492

- observations conducted in four coffeehouses;
- GOAL: identify the behaviors pertaining to smartphone use during daily social interactions;
- the observer was a non-participant, there was no contact with the observed population;
- the observer watched the interactions between people and take notes regarding the influence of smartphone use on these interactions;



Identified social interactions during observations

Observerving in Digital Wellbeing Research



Four Design Approaches derived from the observations: a) Enlighteners b) Preservers c) Supporters d) Compliers

Diaries

Move the observation to the daily routine, with the help of the users

Diaries for Longer Observation Periods

- Observing users for long periods of time in many locations (“in the wild”) is not possible by an observer
- Diaries are tools (paper-based or computer-based) that require users to take note of their actions
  - When they perform a specific action
  - At predefined time intervals
- Stronger motivation should be ensured (incentives?)
- Analysis of the diaries may be done off-line (by researchers) or in the context of an interview

Using Diaries in Digital Wellbeing Research

✍️ ACTIVITY:

In a notebook, create a simple chart like this one:

APP	PERSUASIVE TECHNIQUE	NOTES
Instagram	Received a push notification that I had three unread messages	Received first thing in the morning, when I usually check social media
Google	Recommended articles about celebrity gossip	I tend to click on these types of articles

Keep track of all the places online you notice persuasive techniques. You can do this now and look around for a short time, keep track over the next 24 hours, or over the course of the week. No matter the amount of time, pay close attention to the role persuasive technology plays in your life.

✍️ activity:

In a notebook, create a simple chart like this one:

APP	TIME OF DAY/TIME USED	OBSERVATIONS	HOW IT MADE ME FEEL
Snapchat	Morning/30 minutes	I wanted to do my homework, but I kept getting notified to keep talking to my friend	I was frustrated that I couldn't just ignore it
Instagram	After school/An hour, in and out	A group of friends took selfies showing off new makeup	I felt bad that I can't afford new makeup, and stressed about how tired I looked
TikTok	In bed/An hour, in and out	I got sucked in by a live video of a user I'd never seen before, and then I clicked to other similar issues	It was really entertaining, but then I couldn't sleep and I felt tired and unfocused the next day

Use this chart to help you think through what is happening while you're on social media. Keep track for 24 hours or a week. Be honest with yourself about what you're experiencing.

SOURCE: https://www.humanetech.com/youth

Interviewing

Asking users about their needs and desires…

…what could possibly go wrong?

Main Forms of Interviews

- In-person interviews
  - Time-demanding, in-depth knowledge
  - Structured vs Unstructured
  - One-to-one vs. Focus groups
- Surveys
  - Fast, more superficial
  - Sets of questions with predefined possible answers
  - Paper-based or on-line

Beware!

- Users don't know what they want
  - Maybe subconsciously, but not rationally
  - They will tell what they think you like to hear
  - Especially for "new" products or "disruptive" technologies
  - They lack the creativity or the technical expertise to understand the new product
  - They take the current context for granted (e.g., required workarounds "because, yes")

Stop Asking Users What They Want
https://uxplanet.org/stop-asking-users-what-they-want-21e9ba646bce

Choosing Participants For Interviews

- Representative of target users
  - [All] Stakeholders
- May be current users of a similar system
- Might also be the non-users (for a new product)
- Approximate, if necessary (with similar users)

- Incentives, motivations, small gifts

Executing Interviews

- Schedule a time and place comfortable for users
- Introduce yourself, explain your purpose
  - You are not testing them; they are helping you
- Begin with open-ended, unbiased, non-leading questions
- Ask the question and let them answer
  - Give enough time. The 2nd reply is often more interesting than the 1st.
- Follow-up with related questions. Deep dive into interesting points

Interview
http://dlrtoolkit.com/interview/

Guidelines For Questions

- Structured questions are easier to process, unstructured questions solicit more comments
- Open-ended questions, with follow-up discussion
- For quantitative questions (e.g., rate in a scale 1 to 5, such as Likert), always ask what they mean by “4”
- Aim at direct, concrete, specific questions that ask for detailed answers
- Use the language of the user
- Always try the question with a smaller (trusted) group, for debugging

Examples of Open-Ended Questions

- ‘Tell me about your typical day.’
- Tell me three good things about. .. ’
- ‘and three bad things.’
- ‘What has gone wrong with the application recently? How did you cope?’
- ‘What else should we have asked about?’

Bad questions – To Avoid

- Is feature [x] important to you?
  - ‘Leading’ question
- What would you like in a tool?
  - User are experts in their domain, not expert in design
- What do you like in [x]?
  - Assuming question. Maybe he doesn’t like it
- What would you do in a hypothetical situation?
  - Users cannot imagine the complete environment or an unusual situation

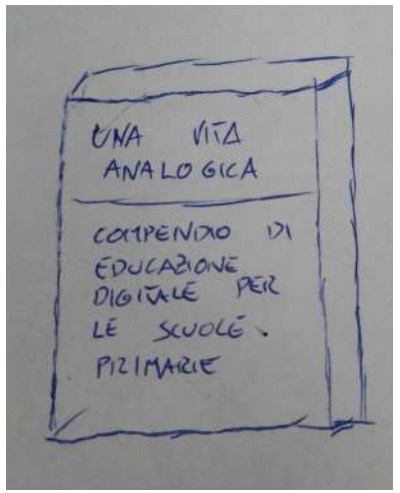
Bad questions – To Avoid

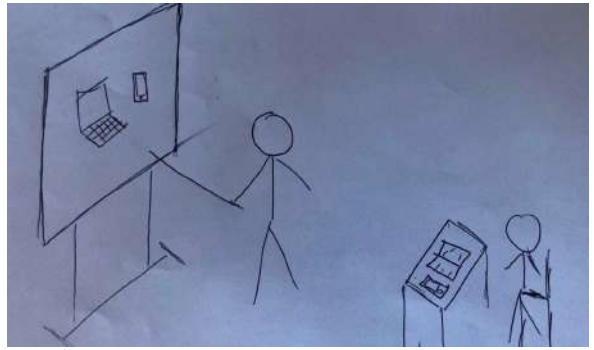
- How often do you do [x]?
  - Humans are very bad at estimating (and biased in the answers)
  - May obtain by log analysis (if an application already exists)
- Binary questions (yes/no)
  - Do not yield motivation
- ‘How do you reach the decision? Did you meet? Did someone decide without you? …’
  - Avoid suggesting possible answers. Trust the question: ask it and wait in silence

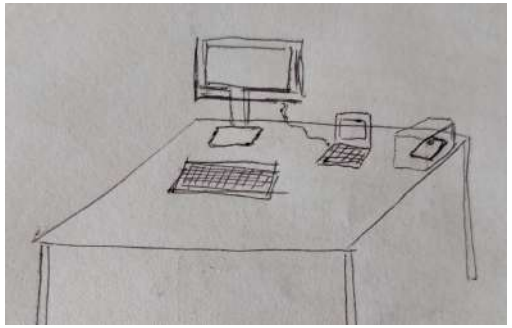
Interviews in Digital Wellbeing Research

Monge Roffarello and De Russis, *Coping with Digital Wellbeing in a Multi-Device World*, CHI 2021, https://doi.org/10.1145/3411764.3445076

- interview with a sketching exercise with 20 participants;
- GOAL: understand, directly with users, how digital wellbeing is affected by the usage of multiple devices, and how to take into account multi-device experiences in the context of digital wellbeing;
- semi-structured interview method:
  - *"Do you happen to use more than one device at the same time? How does that make you feel?"*
  - *"What makes you switch from one device to another? How often does this happen?"*







Solutions to improve Digital Wellbeing sketched by participants

References

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- Shneiderman, Plaisant, Cohen, Jacobs, Elmqvist & Diakopoulos: Designing the User Interface: Strategies for Effective Human-Computer Interaction, 6th Edition, Chapter 4, 5.4
- Lazar, Feng, Hochheiser: Research Methods in HCI, 2010, Chapter 9 (Observation), Chapter 5 (Surveys)

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