Introduction to Human Computer Interaction (IHCI)

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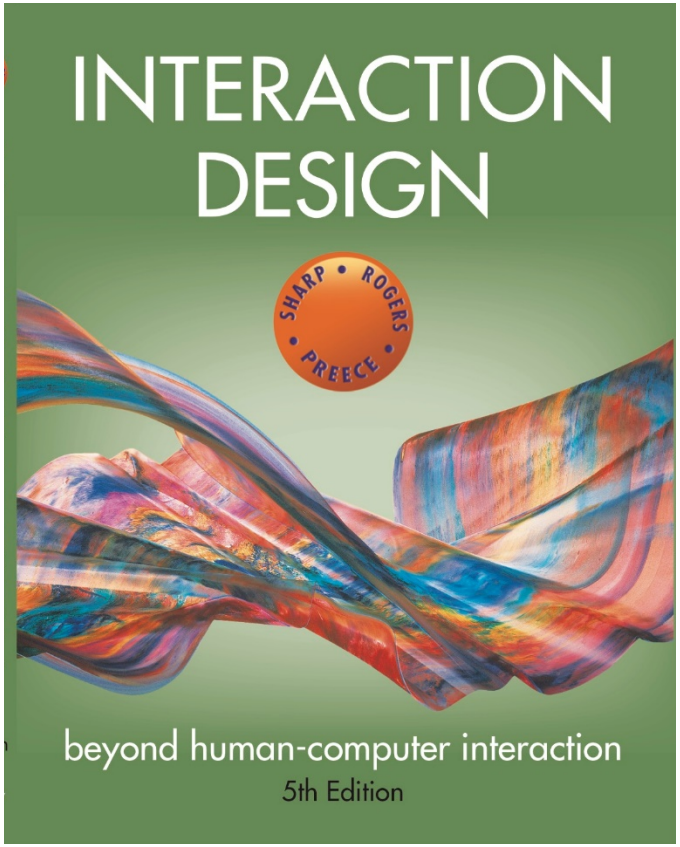


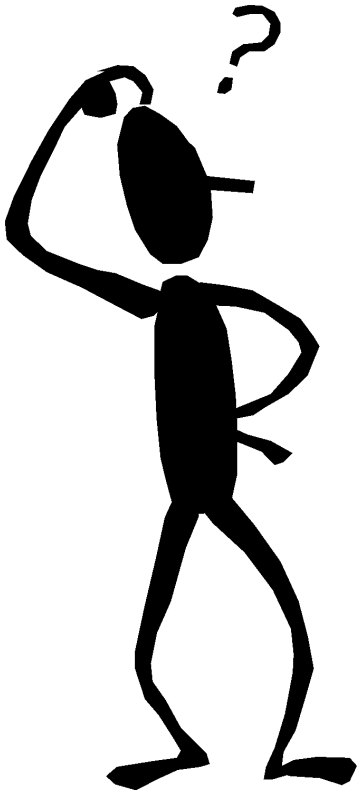
Chapter 2

THE PROCESS OF INTERACTION DESIGN

Overview

What is involved in Interaction Design?

- Understanding the problem space
- Importance of involving users
- Degrees of user involvement
- What is a user-centered approach?
- Four basic activities of interaction design
- A simple lifecycle model for interaction design



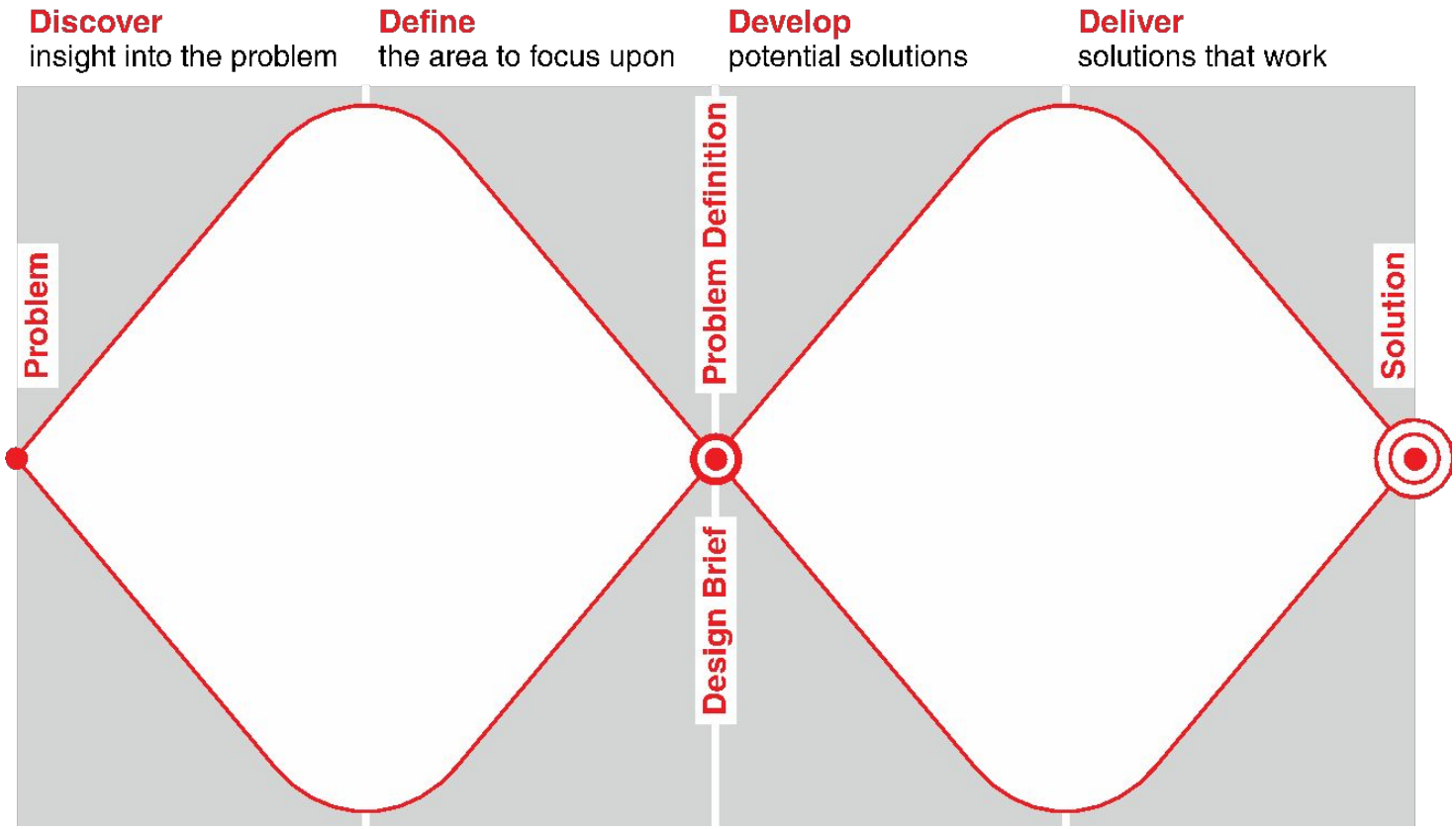
Some practical issues

- Who are the users?
- What are the users' needs?
- How to generate alternative designs
- How to choose among alternative designs
- How to integrate interaction design activities within other lifecycle models

What is involved in Interaction Design?

- It is a process:
  - Focused on discovering requirements, designing to fulfil requirements, producing prototypes and evaluating them
  - Focused on users and their goals
  - Involves trade-offs to balance conflicting requirements
- Generating alternatives and choosing between them is key
- Four approaches: user-centered design, activity-centered design, systems design, and genius design

The double diamond of design



Source: Adapted from [The Design Process: What is the Double Diamond?]

ACTIVITY 2.1

This activity asks you to apply the double diamond of design to produce an innovative interactive product for your own use. By focusing on a product for yourself, the activity deliberately de-emphasizes issues concerned with involving other users, and instead it emphasizes the overall process.

Imagine that you want to design a product that helps you organize a trip. This might be for a business or vacation trip, to visit relatives halfway around the world, or for a bike ride on the weekend—whatever kind of trip you like. In addition to planning the route or booking tickets, the product may help to check visa requirements, arrange guided tours, investigate the facilities at a location, and so on.

1. Using the first three phases of the double diamond of design, produce an initial design using a sketch or two, showing its main functionality and its general look and feel. This activity omits the fourth phase, as you are not expected to deliver a working solution.
2. Now reflect on how your activities fell into these phases. What did you do first? What was your instinct to do first? Did you have any particular artifacts or experiences upon which to base your design?

(*Continued*)

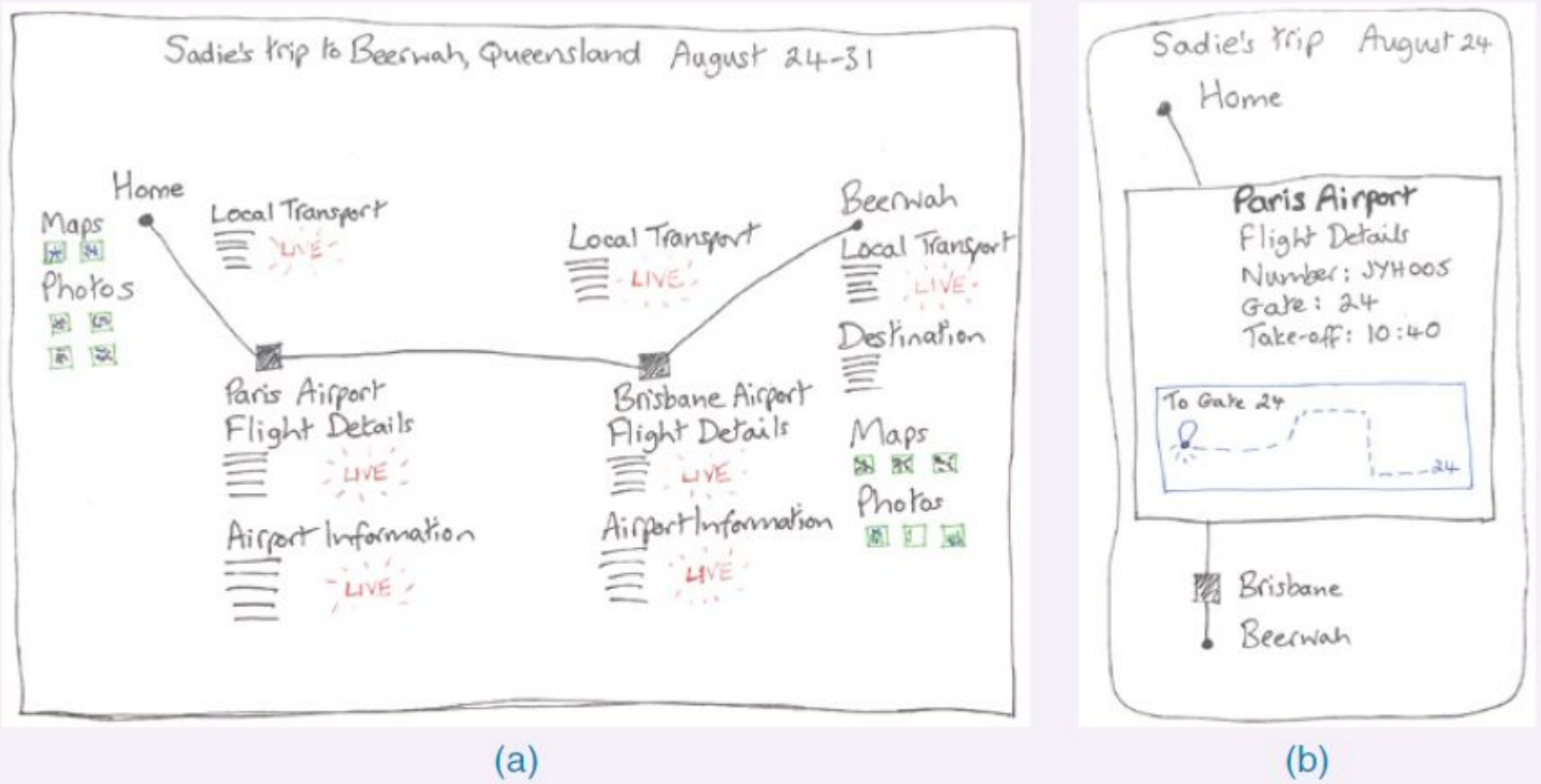


Figure 2.2 Initial sketches of the trip organizer showing (a) a large screen covering the entire journey from home to Beerwah in Australia and (b) the smartphone screen available for the leg of the journey at Paris (Charles de Gaulle) airport

Understanding the problem space

Explore

- What is the current user experience?
- Why is a change needed?
- How will this change improve the situation?

Articulating the problem space

- Team effort
- Explore different perspectives
- Avoid incorrect assumptions and unsupported claims

Importance of involving users

Expectation management

- Realistic expectations
- No surprises, no disappointments
- Timely training
- Communication, but no hype

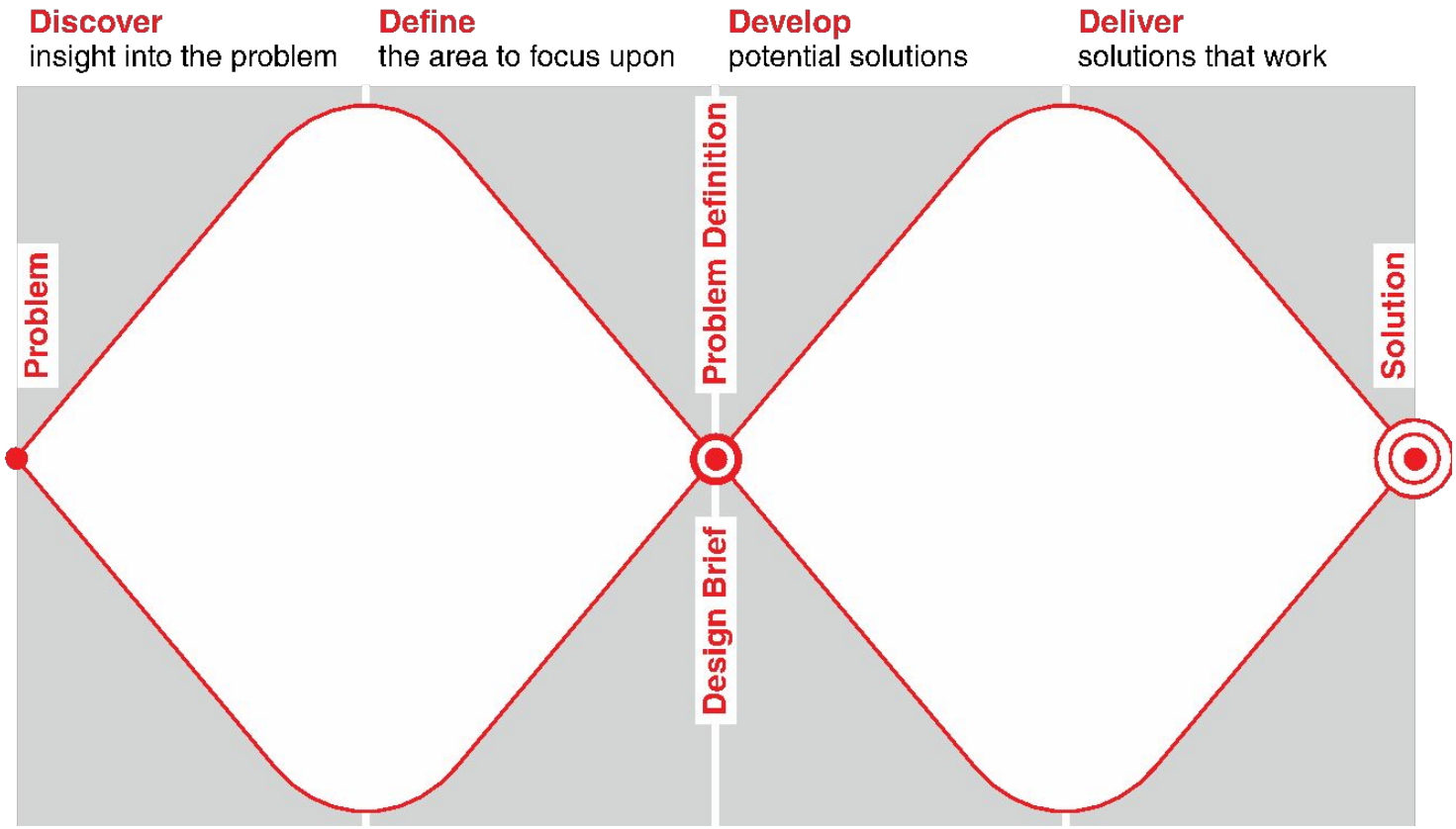
Ownership

- Make the users active stakeholders
- More likely to forgive or accept problems
- Can make a big difference in acceptance and success of product

Degrees of user involvement

- Member of the design team
  - Full time: constant input, but lose touch with users
  - Part time: patchy input, and very stressful
  - Short term: inconsistent across project life
  - Long term: consistent, but lose touch with users
- Face-to-face group or individual activities
- Online contributions from thousands of users
  - Online Feedback Exchange (OFE) systems
  - Crowdsourcing design ideas
  - Citizen science
- User involvement after product release

The double diamond of design



Source: Adapted from [The Design Process: What is the Double Diamond?]

What is a user-centered approach?

User-centered approach is based on:

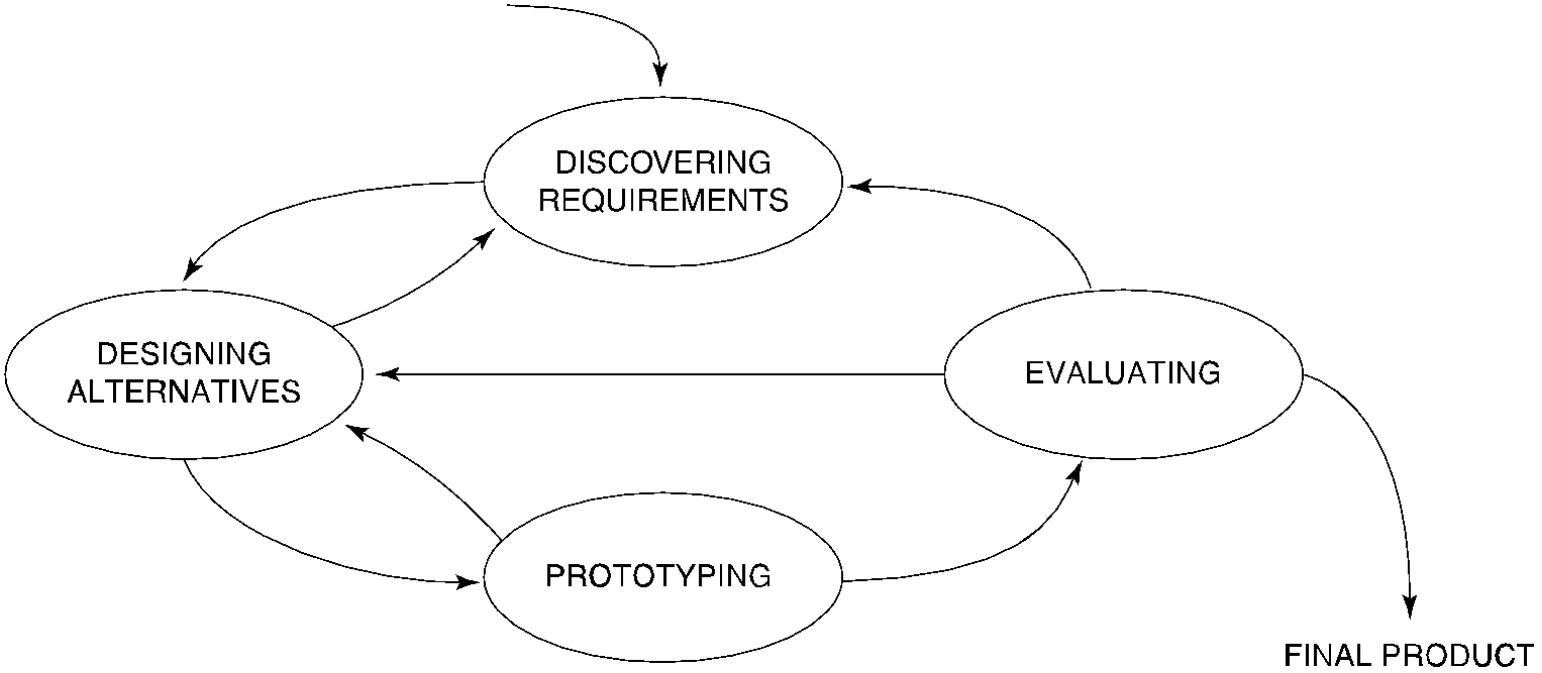
- Early focus on users and tasks: directly studying cognitive, behavioral, anthropomorphic, and attitudinal characteristics
- Empirical measurement: users' reactions and performance to scenarios, manuals, simulations, and prototypes are observed, recorded, and analyzed
- Iterative design: when problems are found in user testing, fix them and carry out more tests

Four basic activities of Interaction Design

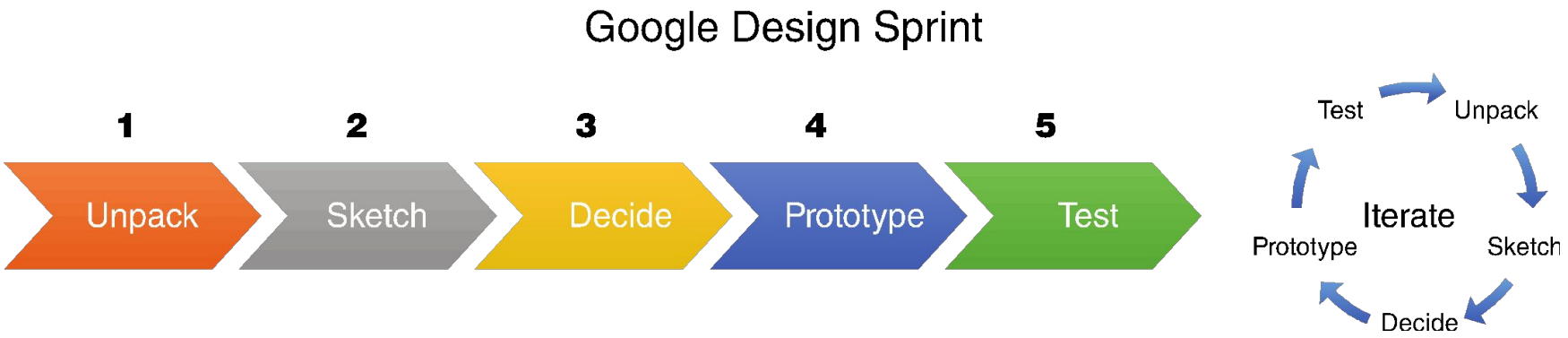
1. Discovering requirements
2. Designing alternatives
3. Prototyping alternative designs
4. Evaluating product and its user experience throughout

A simple interaction design lifecycle model

Exemplifies a user-centered design approach

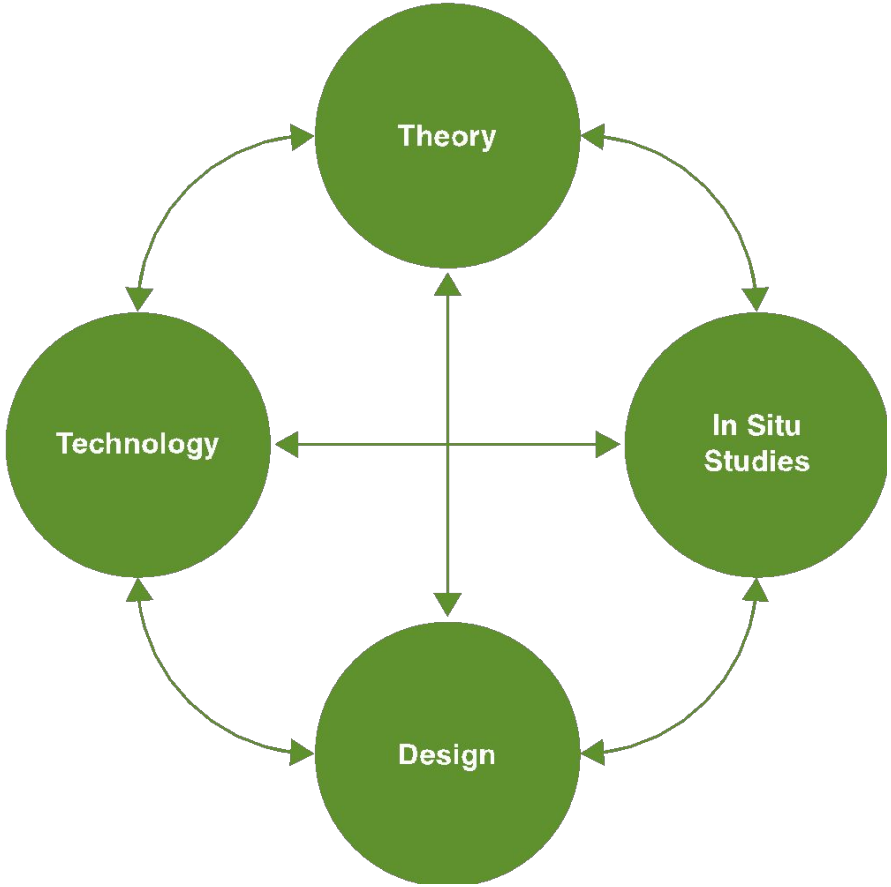


Another lifecycle model: Google Design Sprints (Knapp et al., 2016)



Source: *Google Design Sprints* (used courtesy of Agile Marketing)

Another lifecycle model: Research in the Wild (Rogers and Marshall, 2017)



A framework for research in the wild studies

Source: Rogers and Marshall, 2017, p6. (used courtesy of Morgan and Claypool)

Some practical issues

- Who are the users?
- What are the users' needs?
- How to generate alternative designs?
- How to choose among alternatives?
- How to integrate interaction design activities with other lifecycle models?

Who are the users/stakeholders?

Not obvious

- 382 distinct types of users for smartphone apps (Sha Zhao et al, 2016)
- Many products are intended for use by large sections of the population, so user is “everybody”
- More targeted products are associated with specific roles

Stakeholders

- Larger than the group of direct users
- Identifying stakeholders helps identify groups to include in interaction design activities

What are the users' needs?

- Users rarely know what is possible
- Instead:
  - Explore the problem space
  - Investigate who are the users
  - Investigate user activities to see what can be improved
  - Try out ideas with potential users
- Focus on peoples' goals, usability, and user experience goals, rather than expect stakeholders to articulate requirements

How to generate alternatives

- Humans tend to stick with something that works
- Considering alternatives helps identify better designs
- Where do alternative designs come from?
  - ‘Flair and creativity’: research and synthesis
  - Cross-fertilization of ideas from different perspectives
  - Users can generate different designs
  - Product evolution based on changing use
  - Seek inspiration: similar products and domain, or different products and domain
- Balancing constraints and trade-offs

How to choose among alternatives

- Interaction design focuses on externally-visible and measurable behavior
- Technical feasibility
- Evaluation with users or peers
  - Prototypes not static documentation because behavior is key
- A/B Testing
  - Online method to inform choice between alternatives
  - Nontrivial to set appropriate metrics and choose user group sets
- Quality thresholds
  - Different stakeholder groups have different quality thresholds
  - Usability and user experience goals lead to relevant criteria

How to integrate interaction design activities within other models

- Integrating interaction design activities in lifecycle models from other disciplines requires careful planning
- Software development lifecycle models are prominent
- Integrating with agile software development is promising because:
  - It incorporates tight iterations
  - It champions early and regular feedback
  - It handles emergent requirements
  - It aims to strike a balance between flexibility and structure

Some key points

Four basic activities in interaction design process

- Discovering requirements
- Designing alternatives
- Prototyping
- Evaluating

User-centered design rests on three principles

- Early focus on users and tasks
- Empirical measurement using quantifiable and measurable usability criteria
- Iterative design