Design Thinking

CPSC 544 Fundamentals in Designing Interactive Computational Technology for People

Week 2, Class 2

Material created by Joanna McGrenere, Leila Aflatoony, Karon MacLean, Jessica Dawson & Heather O'Brien

Today

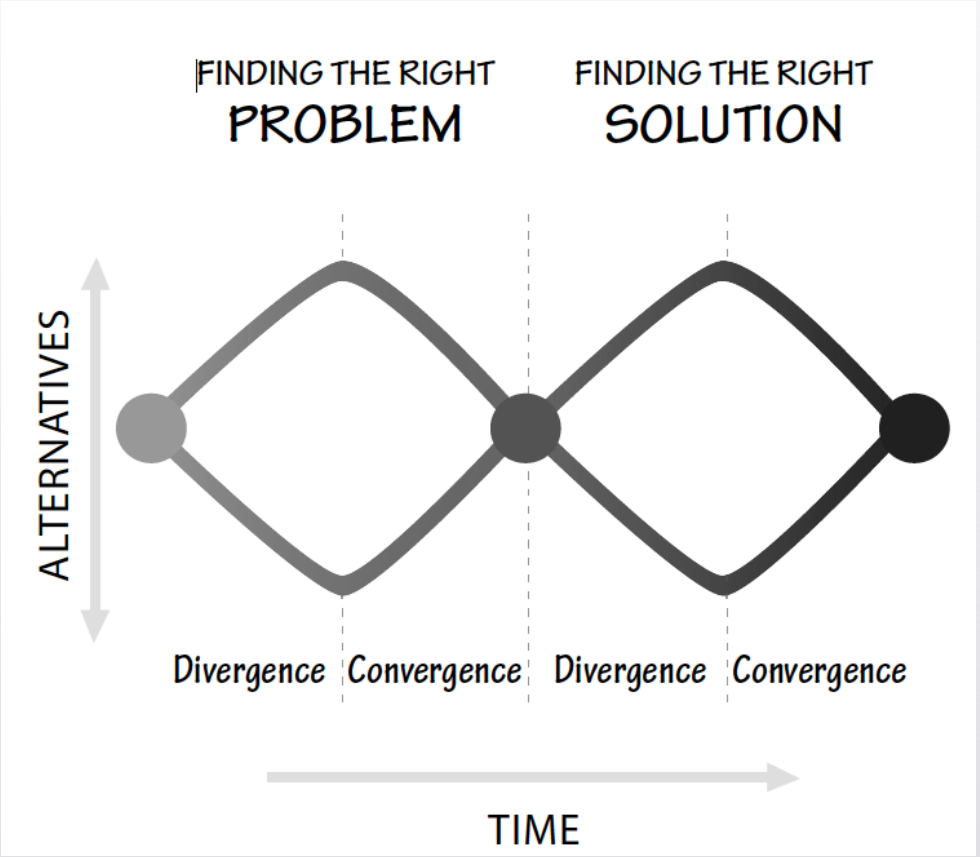
- Design thinking – lecture & class discussion (<35m)
  - Relate process to the 544 course project
  - Please ask questions!
- Short Activity/discussion on Reading (10m)
- Discuss project topics in "World Café" (35m)
  - Small-group discussions
  - Follow up survey to understand 1) what you want to work on and b) your strengths and interests
  - Tentative recommendations for group formation by Wed (***IF*** surveys returned on time)
- AFTER CLASS: 2 surveys!

Learning objectives

- Explore different approaches to the design process and their fundamental commonalities
- Develop a high-level understanding of the Design Thinking process stages
- Apply understanding of design thinking in an in-class activity based on the podcast on today's reading list

The design process

The Double-Diamond Model of Design



Human-centred design process

- Observation
- Idea generation: brainstorming
  - Generating a lot of ideas
  - Don't jump to criticize
  - Question everything
- Prototyping: a mock up of a potential solution
- Testing
    - Norman, The design of everyday things

Where does the design process start?

With understanding the problem:

→ **what human activities** need better support?

→ **specifying** usability; utility; user experience

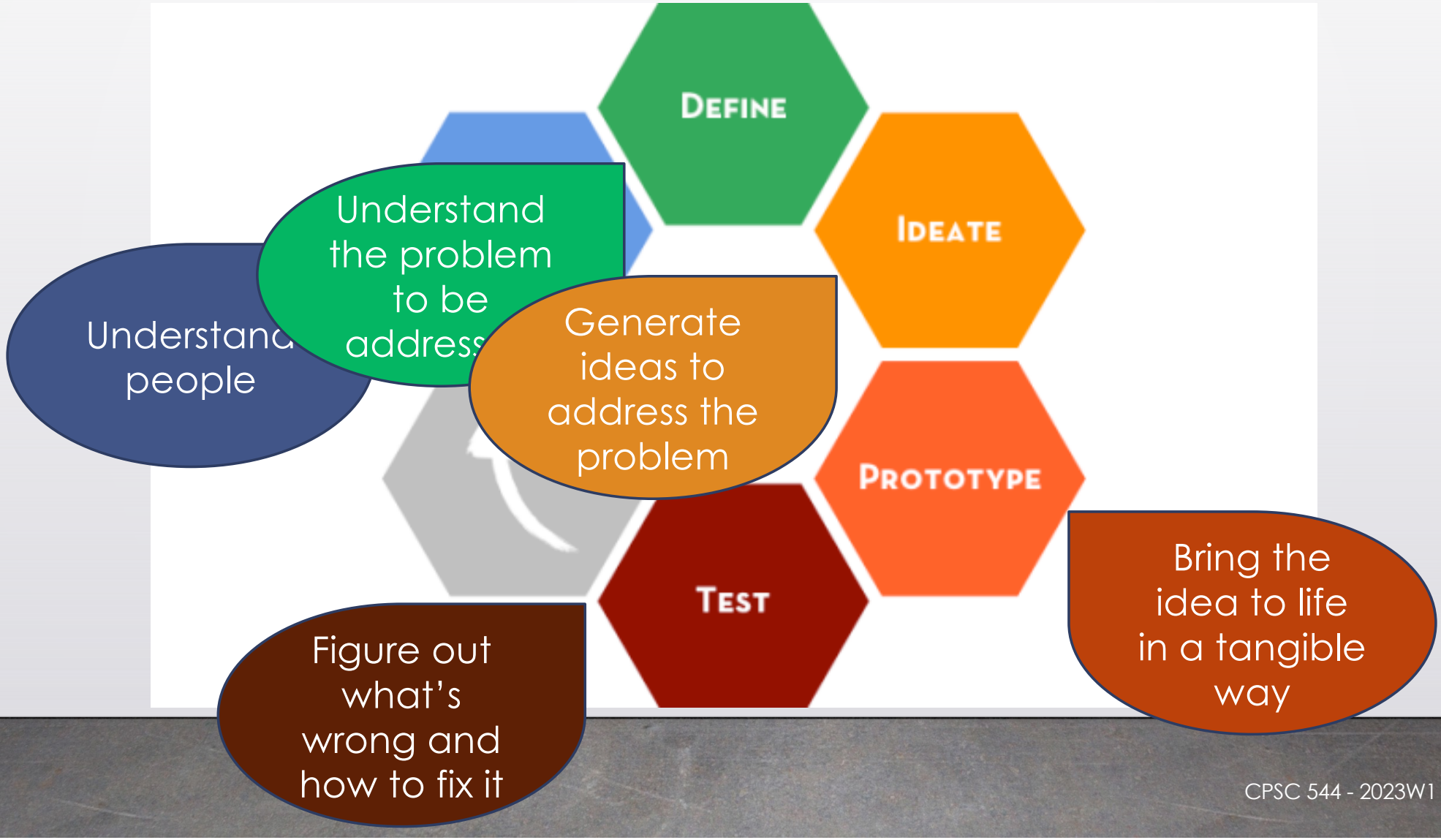
→ Only then – how to **deploy** it for usefulness

Why "activity-centered design"?

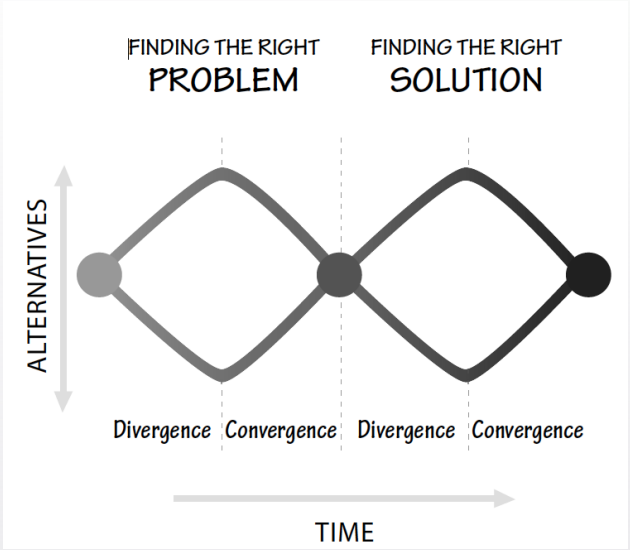
- There is no such thing as the "average person"
  BUT people's activities in particular contexts may be similar
  - E.g., workplaces
- What is the difference between an **activity** and a **task**?
  - **Activity**: "a collected set of tasks" to achieve a higher-level goal
  - **Task**: "an organized, cohesive set of operations directed toward a single low-level goal"
    - Norman, p. 232

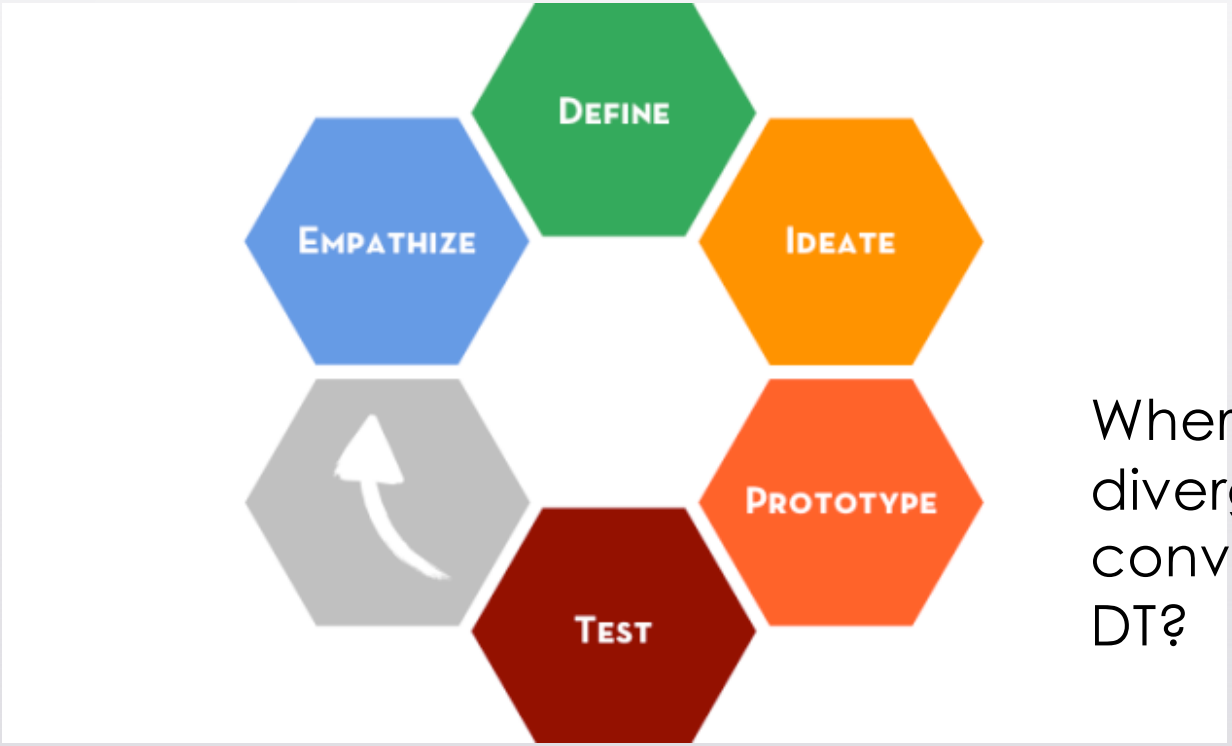
Design Thinking

Design thinking



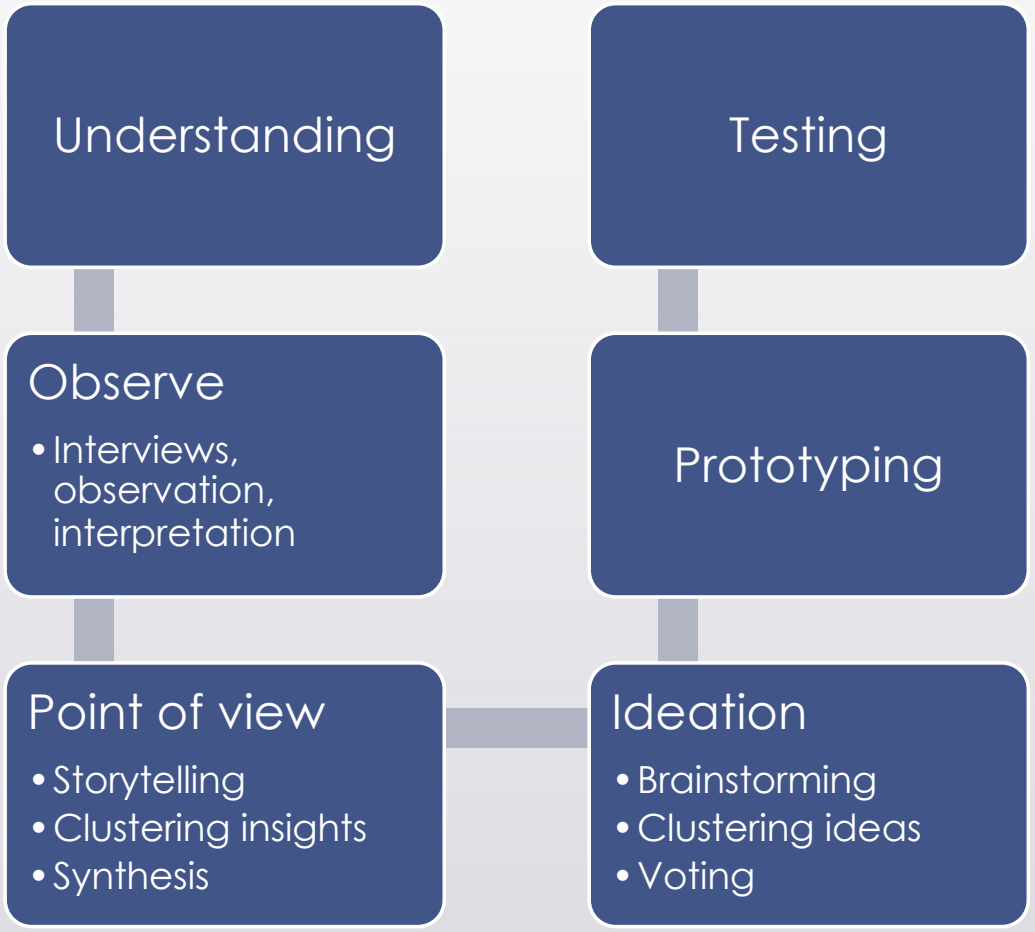
Relate this back to the double-diamond





Where does the divergence and convergence happen in DT?

Design thinking –
as an Engineering process model



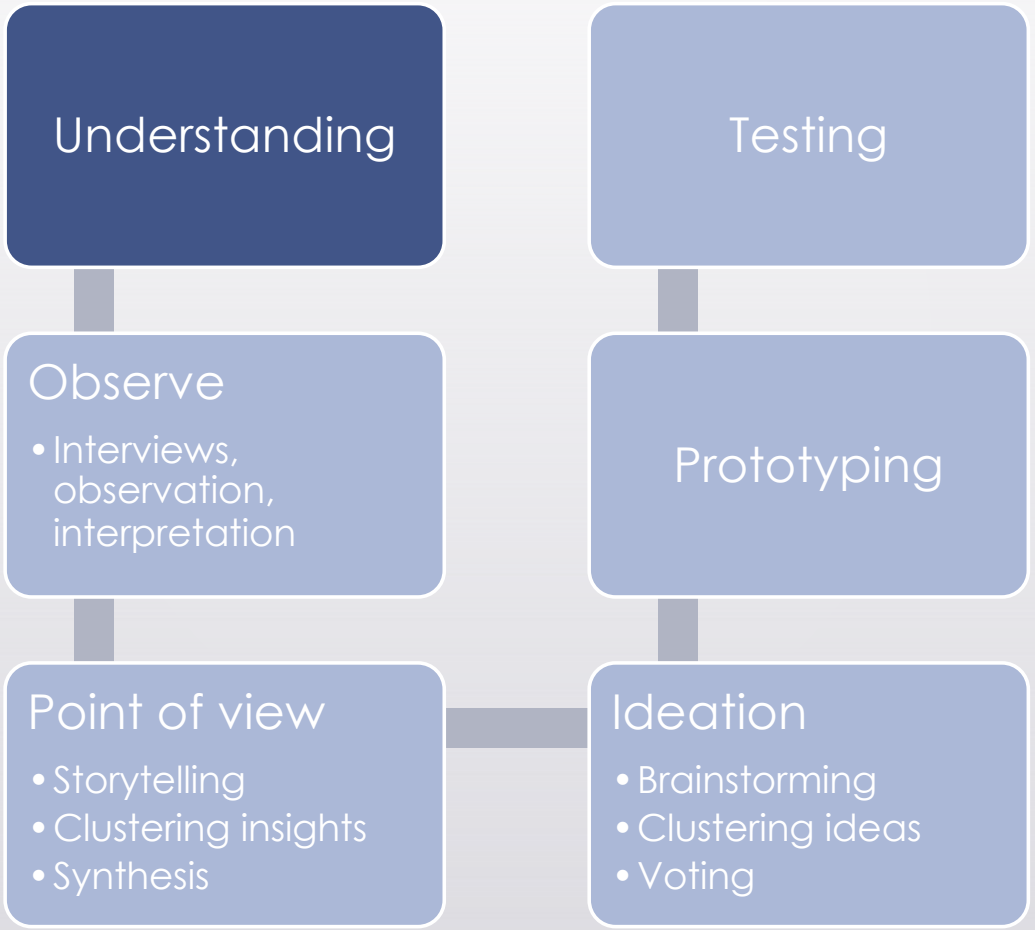
Thoring, K., & Müller, R. M. (2011). Understanding design thinking: A process model based on method engineering. In *DS 69: Proceedings of E&PDE 2011, the 13th International Conference on Engineering and Product Design Education, London, UK, 08.-09.09. 2011* (pp. 493-498).

Understand

Goal:
Collect information

How:
Secondary research

Output:
What has already been done? What are the gaps?



Project Links:

Preparation:
DFP Literature review workshop

Empathize:
Annotated Bibliography

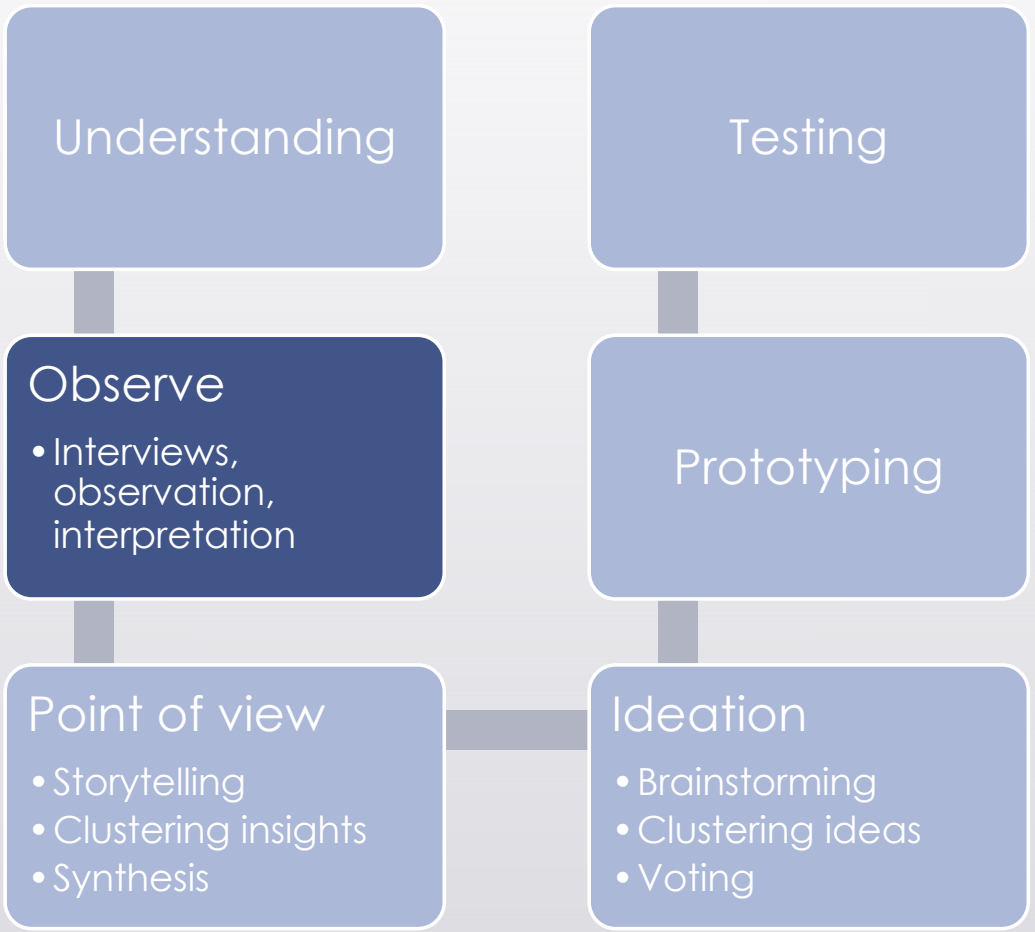
Thoring & Müller (2011)

Observe

Goal #1:
Gather insights from users

How:
Fieldwork – interviews, observations

Output:
Notes, transcripts, photos, videos; Interpretation of fieldwork data



Project Links:

Preparation:
Class on ethics
Class activity workshopping ethics materials

Prepare and execute fieldwork study

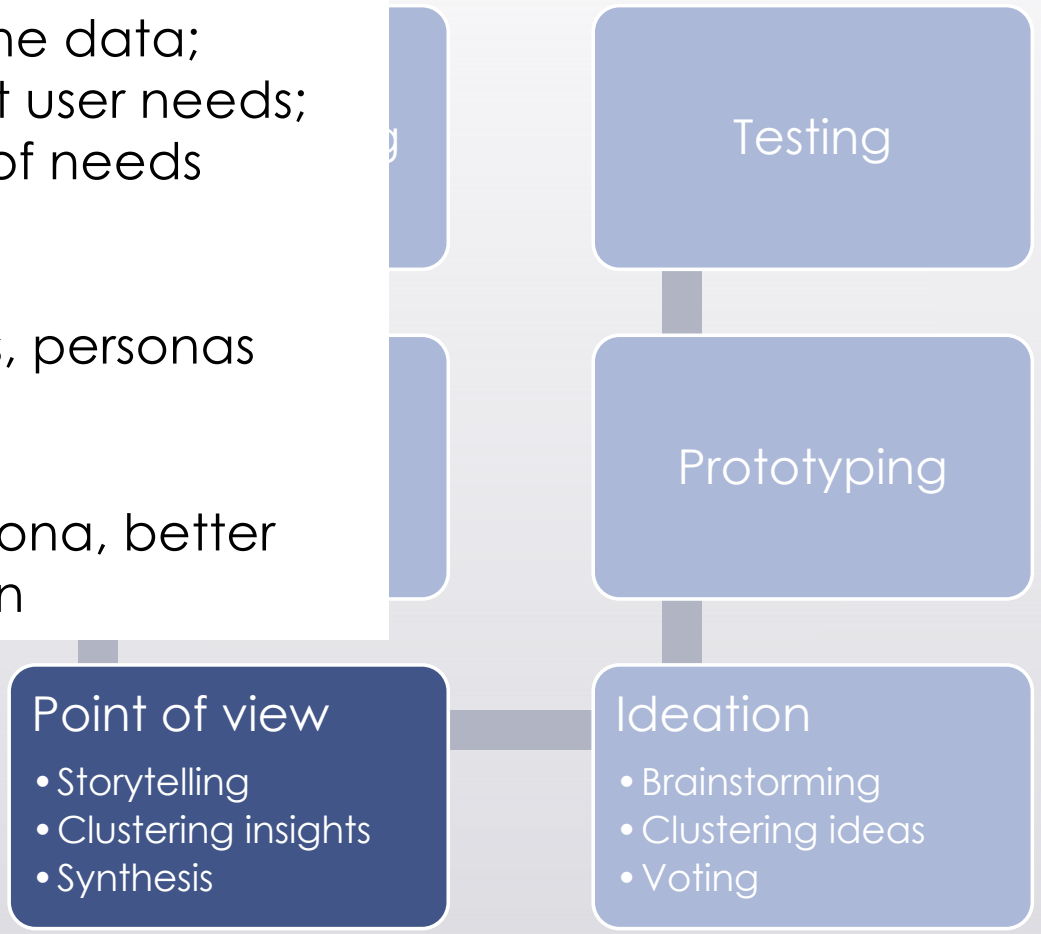
Thoring & Müller (2011)

Point of view

Goals:
Tell the story of the data; visually represent user needs; develop theory of needs

How:
Affinity diagrams, personas

Output:
Framework, persona, better sense of direction



Project Links:

Preparation:
in-class activities

Ideate#1 – Tasks, task analysis, requirements

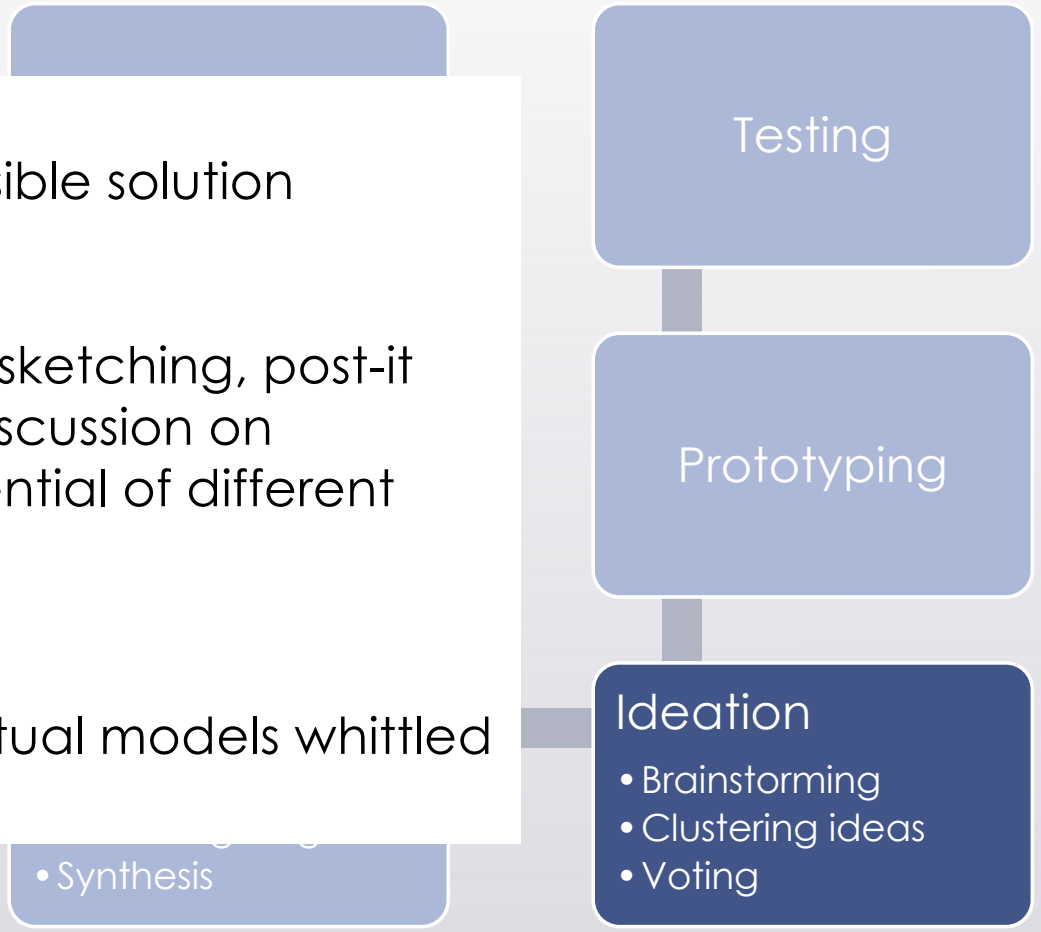
Thoring & Müller (2011)

Ideation

Goal:
Generate possible solution

How:
Brainstorming, sketching, post-it notes, team discussion on feasibility/potential of different ideas

Output:
Many conceptual models whittled down to one



Project Link:

Preparation:
Sketching, conceptual models

Ideate #2 – Conceptual models

Thoring & Müller (2011)

Prototyping and testing

Goal:
Build prototype and...

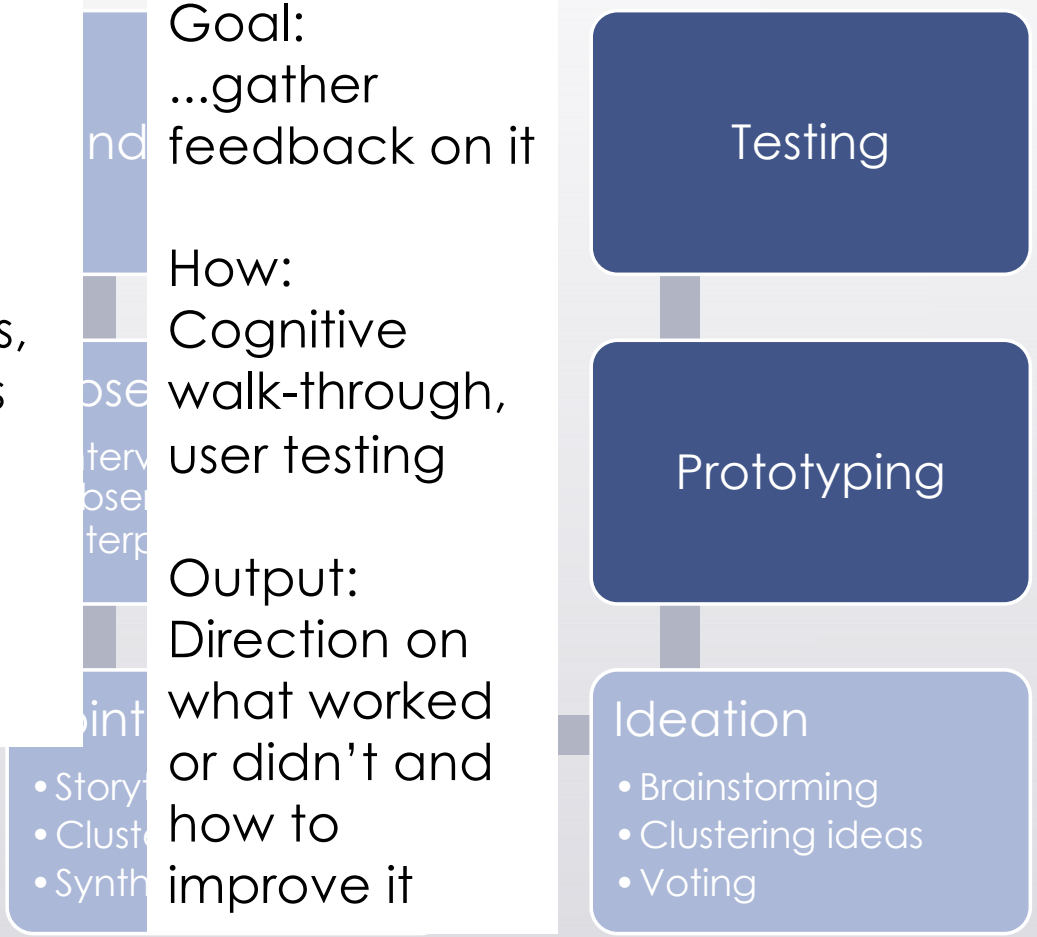
How:
Paper, templates, prototyping tools

Output:
Something tangible people can respond to

Goal:
...gather feedback on it

How:
Cognitive walk-through, user testing

Output:
Direction on what worked or didn't and how to improve it



Project Link:

Preparation:
In-class activities and prototype presentation

#Prototype + Evaluate

Thoring & Müller (2011)

Iteration is the key feature

- Why do we have to iterate so much in HCI design?
- Because – it's hard to predict or perfectly model:
  - people – diversity in abilities, needs, motivations …
  - contexts of use
  - how they want to do their task/activity
  - how they will view your interface

  → the designer's own progressive understanding of issues

Role of "evaluation" in the design process

- At all stages, we must connect our design progress to user's and task needs and contexts
- Many ways of doing this, e.g., interviews, walkthroughs of the prototype
- HCI has classically called this "evaluation" (any involvement of the user/human)
- Evaluation techniques/methods: tools in a toolkit
- Each tool has strengths/weaknesses, and a cost to use
- CRUCIAL: know your tools and choose effectively

In-class activity

Empathize * Define * Ideate * Prototype * Test

… in a complex system!

RJ 1 Feedback: Sep 11th 2023

Note from TAs: *Great comments everyone!*

- *Don't forget we keep your top 5 RJ marks for the term. Many responses were too long (we're looking for* ***MAX 2 paragraphs*** *- see canvas for more information).*
- *Please respond to 2+ assigned readings; refer to the for your readings.*

In the future there will be some points taken for overlooking these..

I've been pondering a question: **Who determines the level of understanding people have about different things?**
We often assume that people possess certain knowledge and don't require explicit signifiers and affordances in our designs. But who makes this judgment? Doesn't it vary across different cultures and contexts?

Ch6: Coming from an **engineering background**, I find the iterative cycle of human-centered design similar to the engineering design cycle. **The main difference I noticed is at the beginning** - engineering designs start by **consulting** the stakeholders (including the users), while the HCD cycle starts with **observing** the users. The latter can be more efficient in capturing the "true needs" among multiple groups of users because of its objective nature.

I noticed that while observing people interacting with items I've started applying the ideas of affordances and signifiers, and I can see how the field of HCI/HCD can be so helpful in better connecting with the world - and oneself. Don Norman brings these ideas into the business and capitalist contexts - talking about product managers and selling the items we are trying to understand and create - and the whole thing hit me weirdly. **These logics under capitalism felt like it reinforced the construction of an inequitable world: those with equity to buy products are the people for whom design is prioritized**, the designs of HCI help adapt the world to the needs of the user, and **the more the world adapts to an individual the less disabled they become (under the social model of disability) and able to gain equity through capitalism**.
Since we must design for practice and not just theory, I am looking forward to what others have researched to make a theoretical ethical HCI more practical, and my journey will start with the paper *Human-Computer Insurrection: Notes on an Anarchist HCI (2019)* by Os Keyes, Josephine Hoy, and Margaret Drouhard

Reading: a comment from last year:

Norman highlights (1) asking the right question, and (2) design principles are fundamentally the same across all domains …

I think that is what Our Food Future has done exceptionally well with its circular and regenerative food system.

They identified the core problems of their community, including the lack of biodiversity from mono-production model and local food waste problem amongst others.

They then implemented a regenerative farming approach that makes the soil healthier, more sustainable and water preserving, and uses a community supportive agriculture model so food waste from one community member is used to support growing the crops of another."

Activity

In-class activity **(10m):** design within and for complex systems

In small groups **(3-4 ppl)**, discuss the podcast you listened to for today about circular design in the food system.

- Choose one stage of the DT process. Then, consider some stories and ideas you heard that speak to this stage.
- Be broad in deciding what constitutes "design"!!
- Consider things such as
  1. Who are the stakeholders and designers at this stage?
  2. Is some kind of evaluation taking place during the design stage?
  3. How are notions of linearity and iteration described?
  4. **How do "focus on the product" principles, like we see in the Norman readings, apply to complex systems? What still works, and what needs to be rethought?**

Project Topics

World Café

30 min

Instructions:

- Choose 3 topics that you would consider working on.
- Go to the **Google doc (link on Slack)** and sign up to talk about ONE topic in EACH of THREE ROUNDS
- There is a *wildcard* spot if you want to come up with your own ideas
- Discuss the topic in indicated corner of the room (10 min each)

Wrap-up

2 surveys: **both due by Noon Tomorrow (Sept 12)**

Links on Integrated Schedule

Survey 1: Team Forming Info – so we can form your teams

Survey 2: Prep for our Literature Review workshop
(Wednesday – Guest Lecture)