

Design Thinking and Advanced Prototyping

ELEC-C9821 – Reflective Prototyping



Aalto University
School of Electrical
Engineering

Salu Ylirisku

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Today's agenda

09:15 - 10 Lecture

1. Design Thinking Revisited
2. Small Exercise

10:15 - 12 Workshop

3. Teamwork: Ideation with Storyboards
4. Discussion

Learning goals

- **Learn a new way to think about design thinking**
- **Learn about the activities that are essential to the design thinking process**
- **Learn how important your own previous work is for what will happen next – and what freedom in this means**



Design Thinking Model: 3-2-1

Design Thinking happens on three layers of inter-linked activities

- **Contextualization**
 - Finding out what defines your success
- **Reflection**
 - Finding out what your design object should be
- **Prototyping**
 - Finding out what works for your aim

Contextualise

Reflect

Prototype

Each layer is comprises of two kinds of activities

- **Contextualization: Engaging and Exploring**
- **Reflection: Articulating and Evaluating**
- **Prototyping: Building and Testing**

Contextualise

Reflect

Prototype

Engage

Articulate

Build

Test

Evaluate

Explore

Engaging

- Engagement is about you getting people involved in your design effort.
- Users, co-workers, managers, engineers, stakeholders
- You are expecting people to contribute by
 - providing information and inspiration, and by
 - co-designing and evaluating your design.
- You need to 1) get in contact and 2) get them involved.



Images of Engaging

User studies, workshops, user tests, pitching



Project-in-a-day



Empathy



Materials

Exploring

- **Exploration is about you learning what your design may be related to.**
 - About finding competing alternative solutions
 - About finding possible technologies to be used
 - About finding what the use context is like
 - About generating other/related ideas
- **Only documented and shared observations matter.**

Articulating

- **Articulating is about you expressing what you think is relevant to your project.**
 - It is about interpretation
 - What is central to your project
 - What are the user needs
 - What are the key design requirements



Images of Articulating

Diagrams

Personas

BACKGROUND I would like to hike on a backpacking trip on the coast, but my only hiking experience is on the trails and I am a beginner. I would like to hike on the coast with a good friend. I would like to hike on the coast with a good friend. I would like to hike on the coast with a good friend.

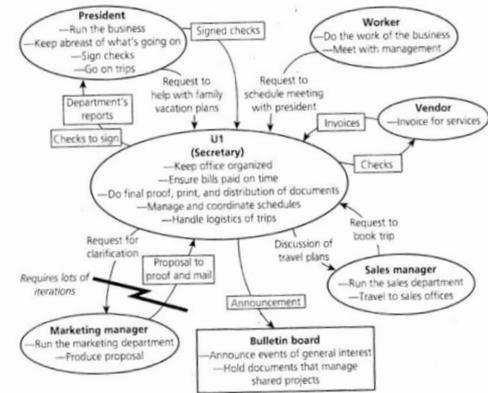
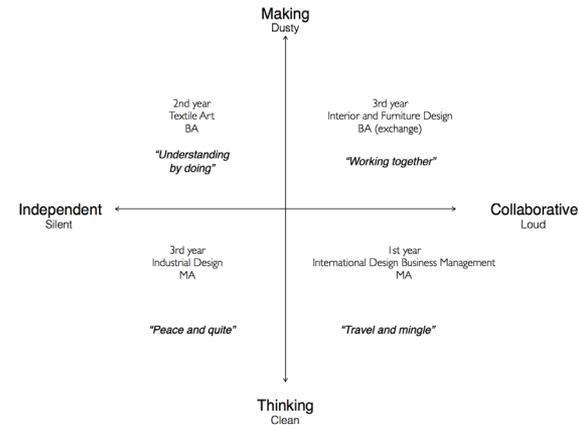
Be your master!

Tammie, 43

STYLE I like to hike alone or with a good friend. I would like to hike on the coast with a good friend. I would like to hike on the coast with a good friend.

TECHNOLOGY AND GEAR I like to hike on a good old paper map. I like to hike on a good old paper map. I like to hike on a good old paper map.

ACCESSIBILITY ISSUES I have trouble seeing at night. I have trouble seeing at night. I have trouble seeing at night.

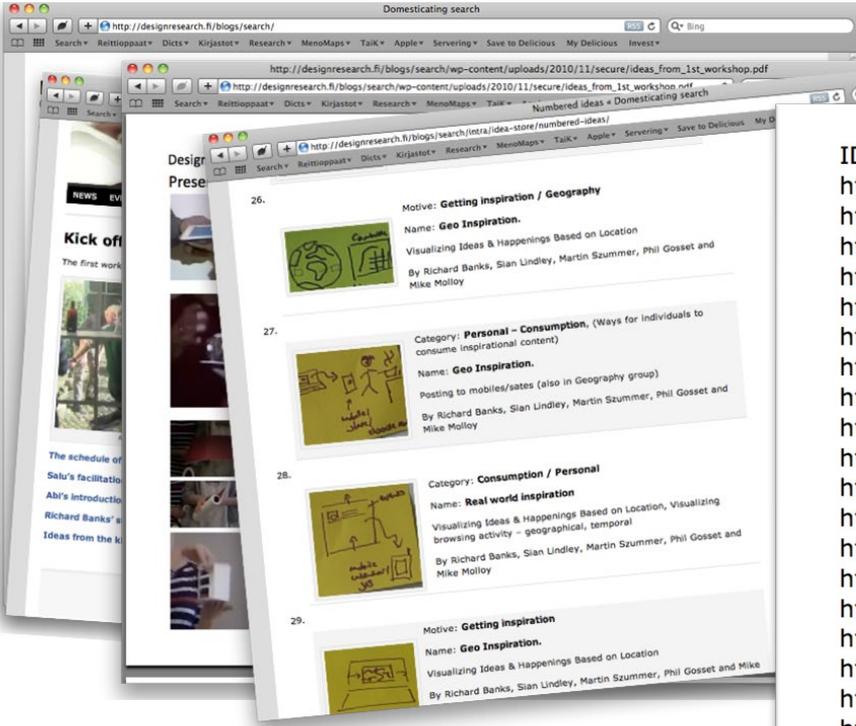


Design Directions

Evaluating

- **Evaluating is about you judging what is relevant to your project and developing your judgment.**
 - Is this idea a valuable one?
 - Is this finding a useful one?
 - Does this technology work well for us?
 - Is our interpretation of the user needs appropriate?
 - Is our interpretation of the key design requirements ok?

Images of Evaluating



IDEAS TO BE PROTOTYPED

<http://de To-doing>
<http://de Support for reflection on patterns and rhythms>
<http://de Task management system>
<http://de The Portal>
<http://de Silent social networking / Inner circle>
<http://de Virtual Scrap Book>
<http://de Intimate lamp>
<http://de Wishing Well>
<http://de The Gobblers' bench>
<http://de Daylight torch>
<http://de DVDJ>
<http://de Inspiration sharing service>
<http://de The clarity suite>
<http://de Web-based jukebox>
<http://de The Empathytravelometer>
<http://de More intelligent mapping>
<http://de Token lamp>
<http://de Token bracelet>
<http://de Body book>
<http://de A satisfying/point-giving todo list>
<http://de Mood wall map>
<http://de The Choice>

AVERAGE STARS

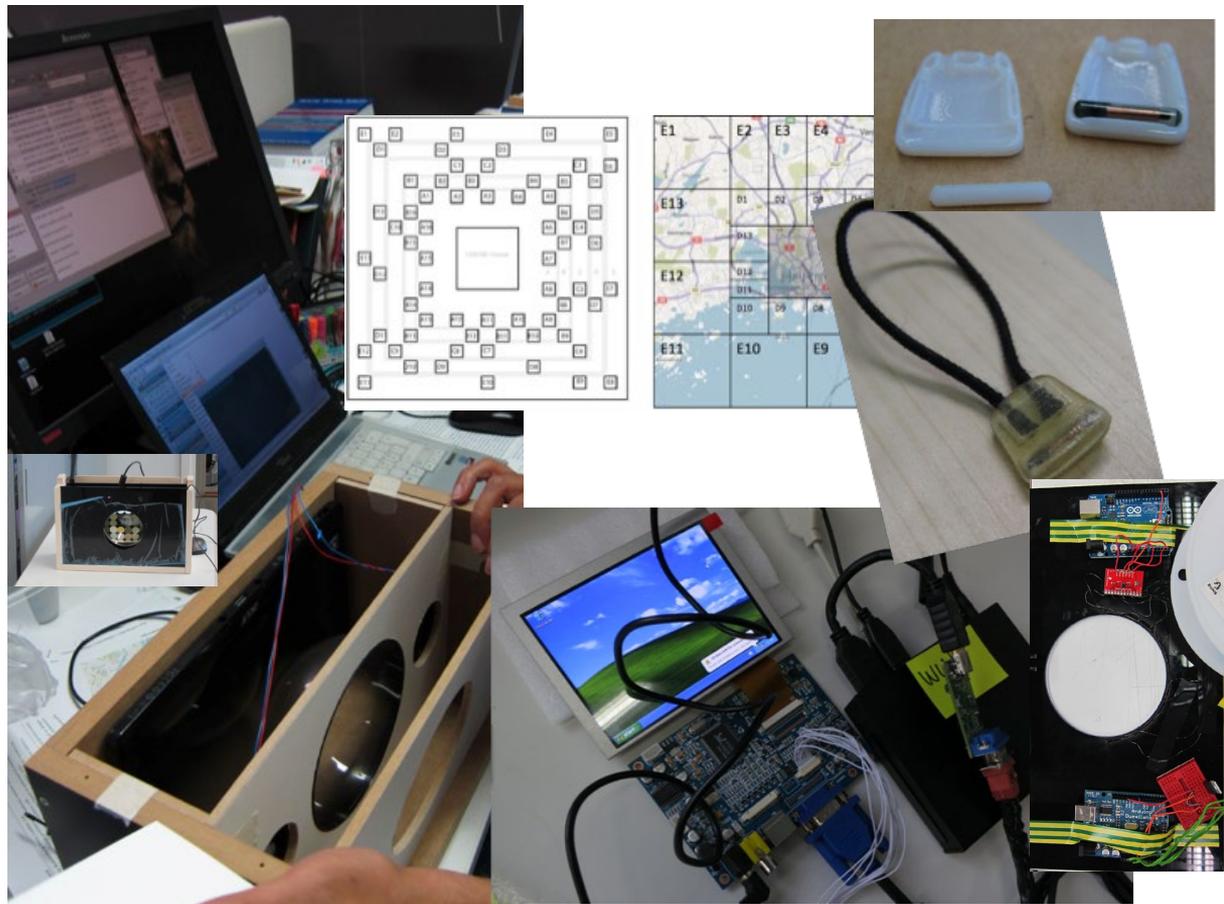
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Building

- **Building is about you creating a material and functional expression of what might become real.**
- **It enables to answer questions like:**
 - Can the thing be built?
 - Are the components available for building this thing?
 - How can we place the parts that people see and feel?
 - How can we make the components interact the way we want?

Images of Building



Testing

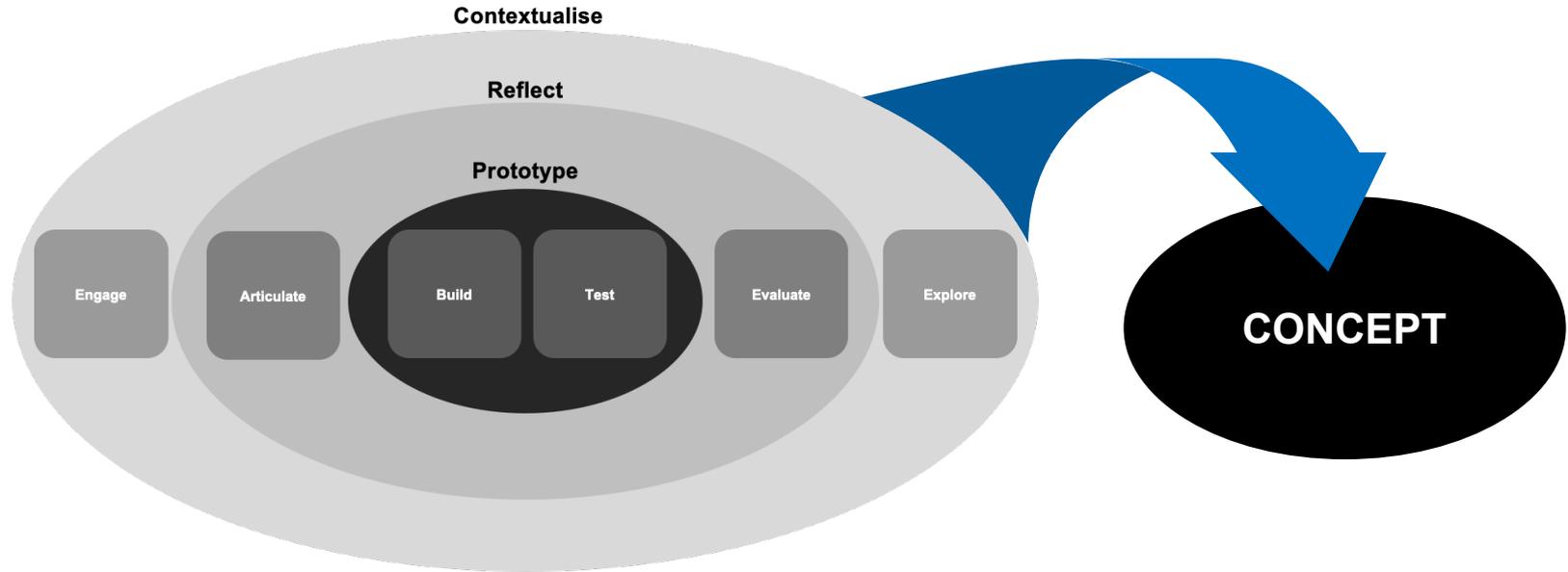
- **Testing is about you setting up such experiments that enable you to learn what matters to your in your project.**
- **An experiment is defined by:**
 - Setting up learning goal(s)
 - Setting up requirements based on the learning goal(s)
 - Setting up a situation to get data about how your build works



Images of Testing

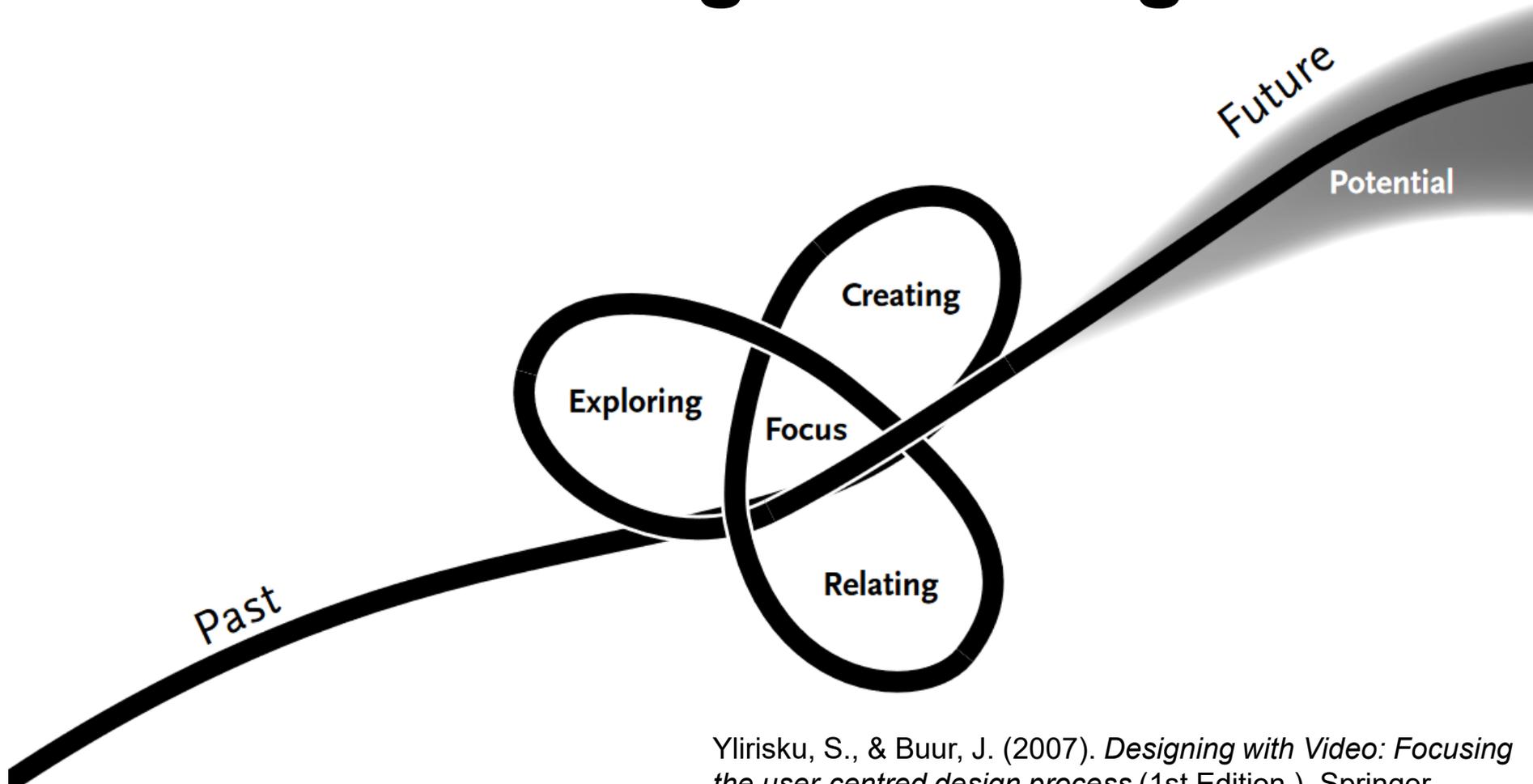


Design Thinking Model 3-2-1

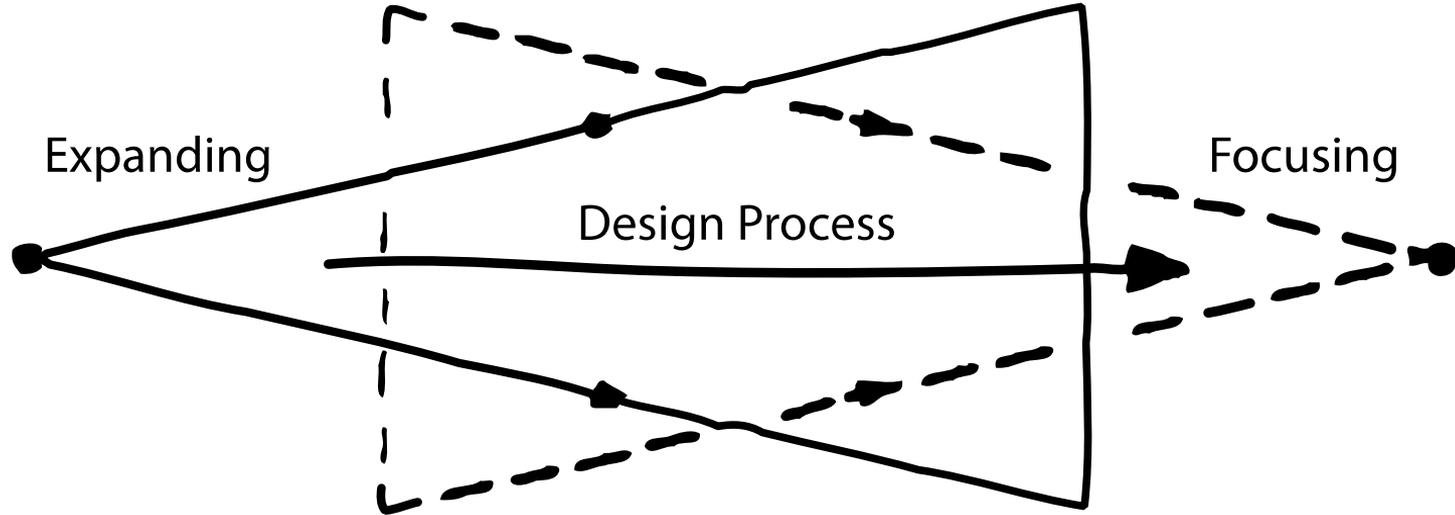


Freedom in Design Thinking

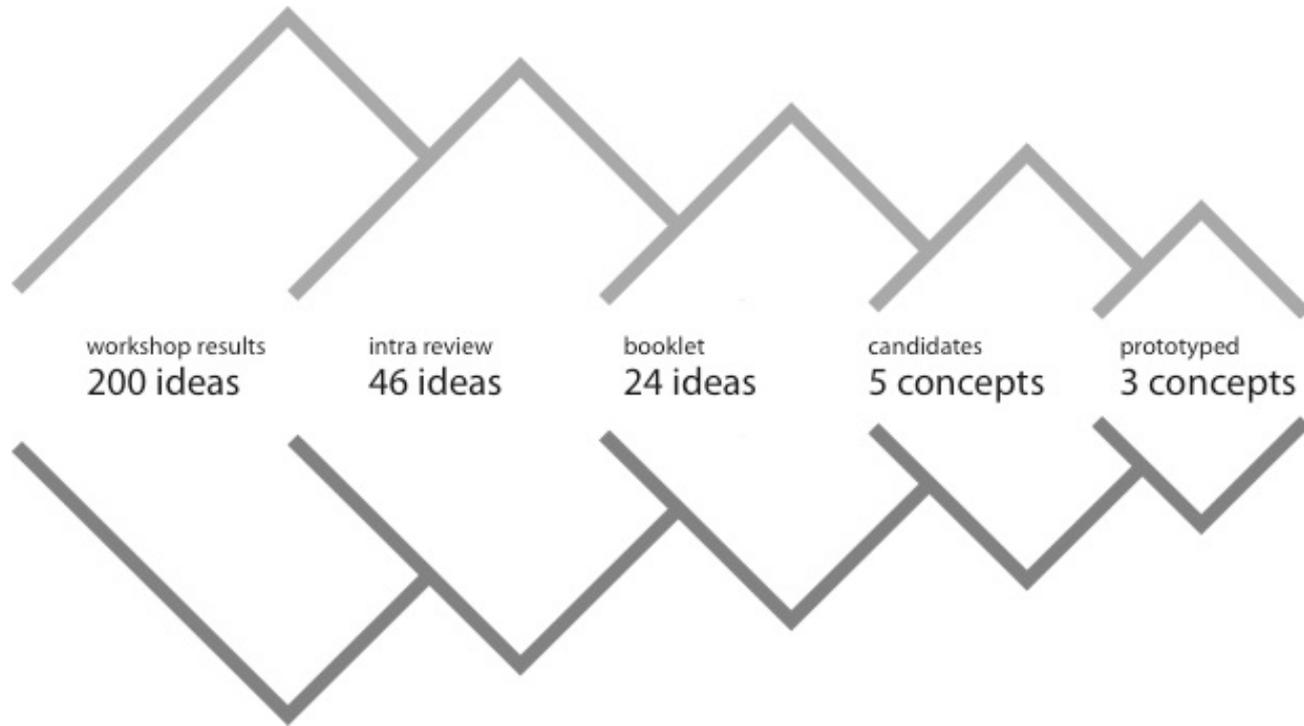
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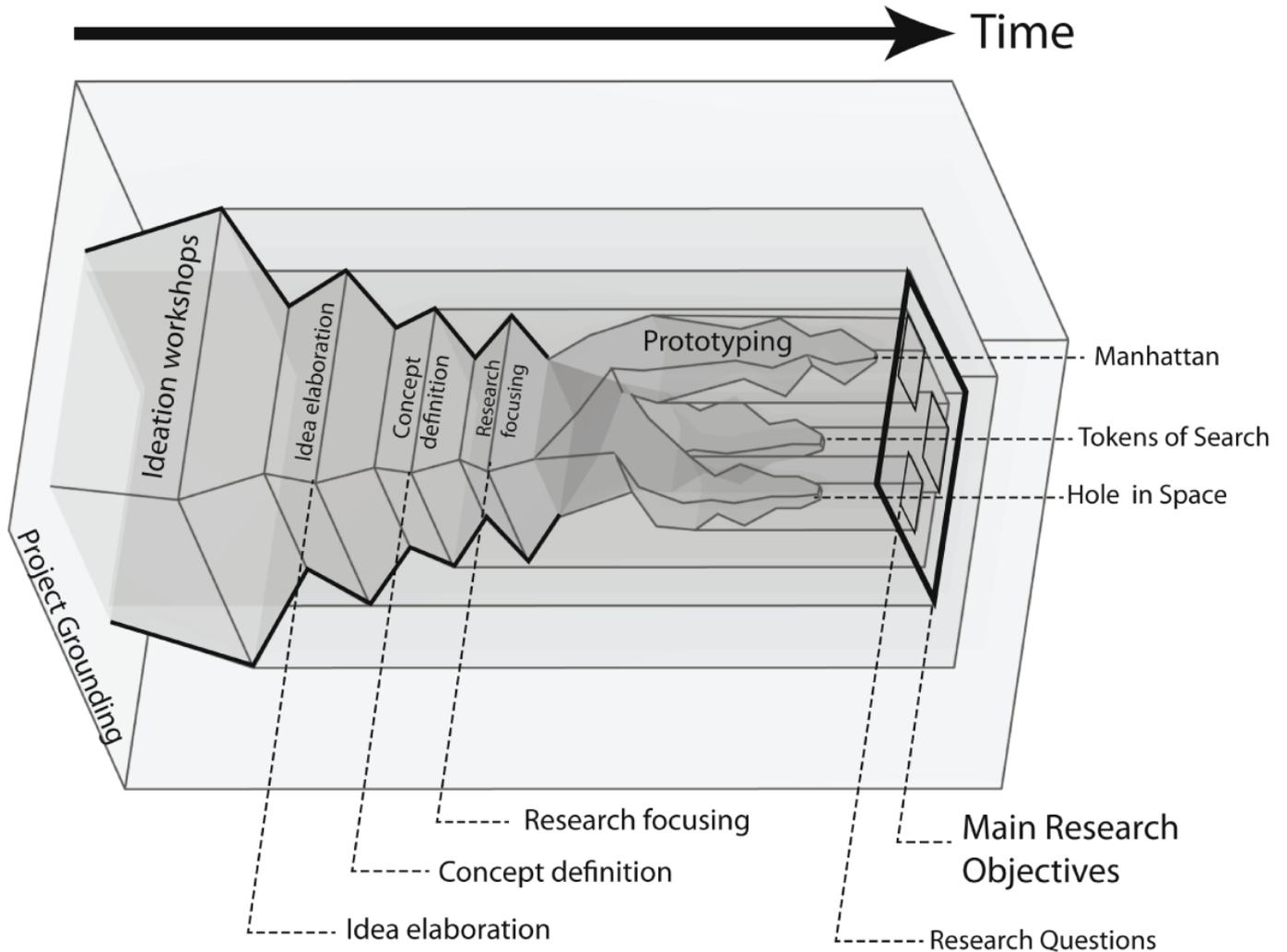


Freedom in Design Thinking



Domesticating Search Project





Freedom in Design Thinking

By generating alternatives, you have the freedom to choose, i.e. make informed decisions on what to focus on.

Ideation Exercise: From Observations to Ideas

Focus your attention

The following image will be shown for 7 seconds



Task 1

Answer your question in 1 minute

Task 2

Answer your question in 1 minute

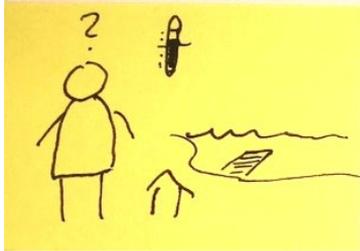
Task 3

Answer your question in 1 minute

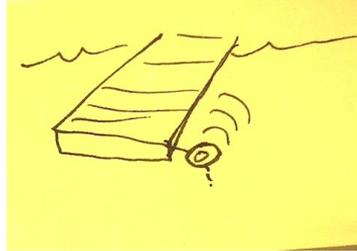
-- Presence Check --

Workshop: Expressing ideas as Story Boards

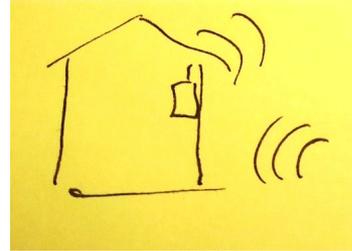
Example – Remote Temp Sensing



The owner of a summer cabin at a lake, Petra, wants to know how cold the water is at her summer cabin.



She has a wireless thermometer attached to her dock that measures water temperature.



The wireless thermometer sends the temperature data to internet service once a day.



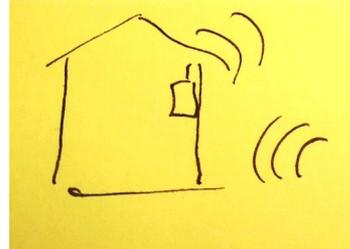
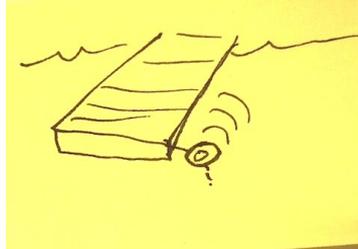
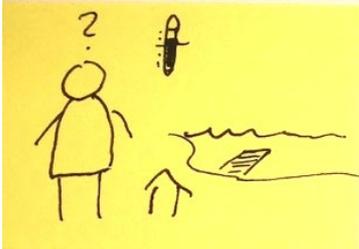
Petra can see the lake temperature on her mobile phone.

In 30 minutes

Sketch out as many storyboards of your ideas as you can

Start with a user and their goal

Illustrate key events



This week

- **Project: At least 3 design ideas / team**
- **Write your diary and submit it**
- **Exercises (Fri 14-16, Mon 14-16, Tue 10-12)**
 - There are **REQUIRED** – and you need to reflect on them in your diaries