

# Tangible dreams

Introduction to prototyping

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Idea<sup>s</sup>





# What is a prototype?

**“An approximation of the product along one or more dimensions of interest” (Ulrich & Eppinger, 2016)**

**“Any representation of a design idea, regardless of the medium” (Houde and Hill, 1997)**

**“A physical representation of your idea or project” (Dina, 2024)**

# Why do we prototype?

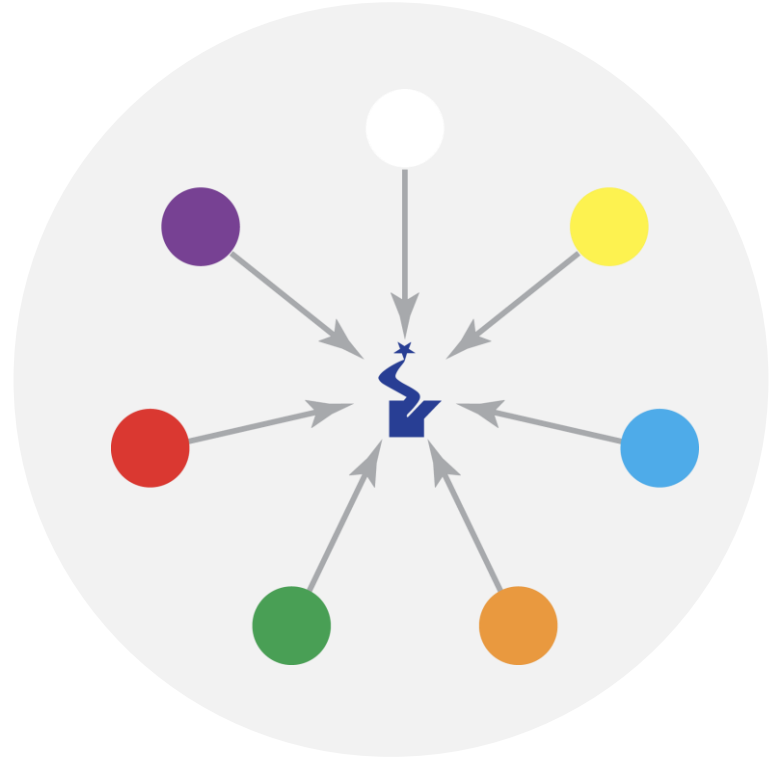
 **Exploration through action**  
Experimenting and learning by doing

 **Challenging assumptions**  
Investigate assumptions through building and testing, instead of theoretically thinking

 **Internal communication**  
Can make internal communication more focused



# Internal communication



# Why do we prototype?



**Exploration through action**  
Experimenting and learning by doing



**Challenging assumptions**  
Investigate assumptions through building and testing, instead of theoretically thinking



**Internal communication**  
Can make internal communication more focused



**External communication**  
Tool to communicate, test and validate with externals



**Creating serendipity**  
Create unplanned discoveries

# Prototypes vary in fidelity

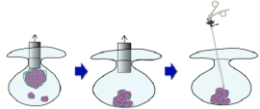
- Distance to the final solution
- Refers to the level of details and functionality built into a prototype
  
- Low vs. High Fidelity
- Horizontal vs. Vertical
- Paper vs. Tool



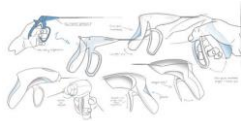
# Example of a **product** prototype

Low fidelity

High fidelity



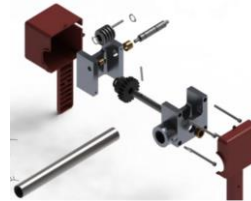
Concept  
visualization



Sketching



Quick & dirty  
mockup



3D model



Functional  
Prototype

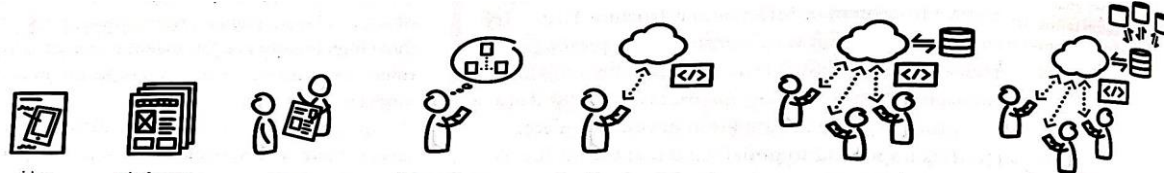
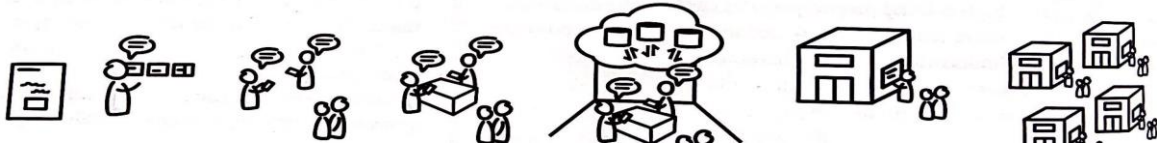


Pre-production  
prototype

Service / process

Digital

Physical





# Prototypes have an audience



Who gets/uses the prototype?

- User
- Customer
- Colleague
- Manager
- Venture Capitalist

# Prototypes have a purpose

## Communication

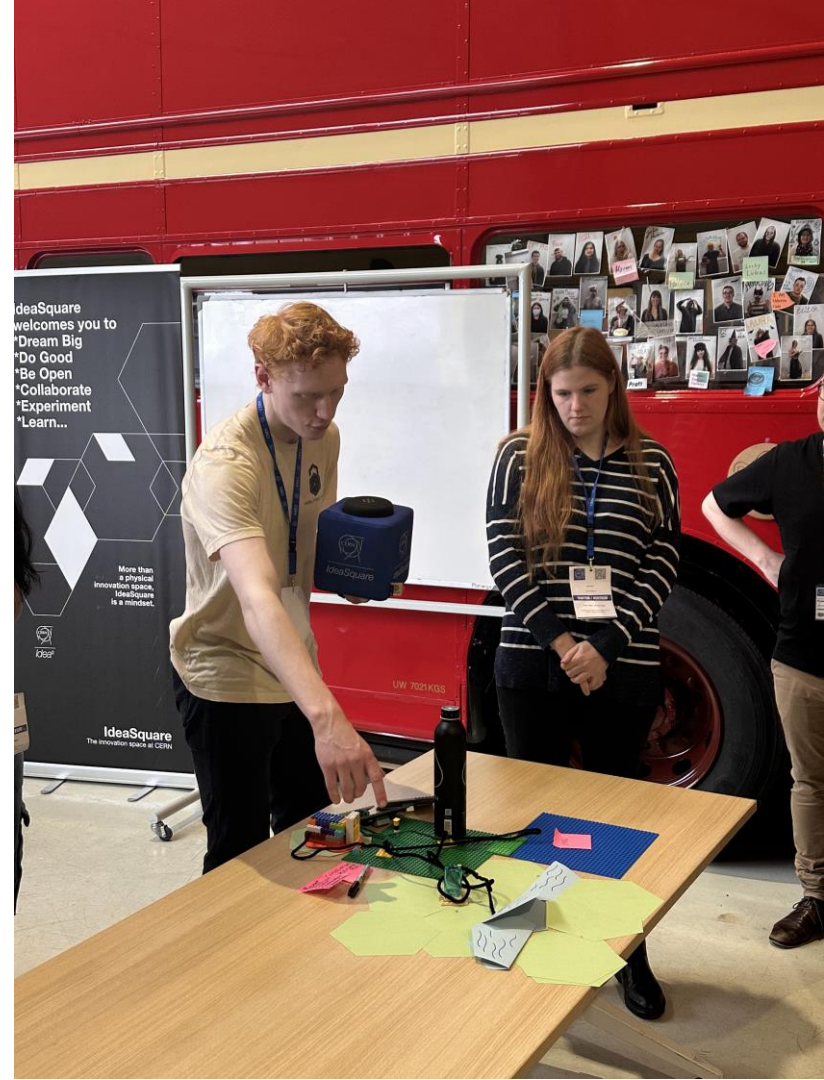
- To decision makers; or to other roles in the development process.

## Exploration

- To explore alternatives for design

## Evaluation

- To validate the effect of the concept on the user
- To find out, if it is technically feasible
- To evaluate the users experience with the design

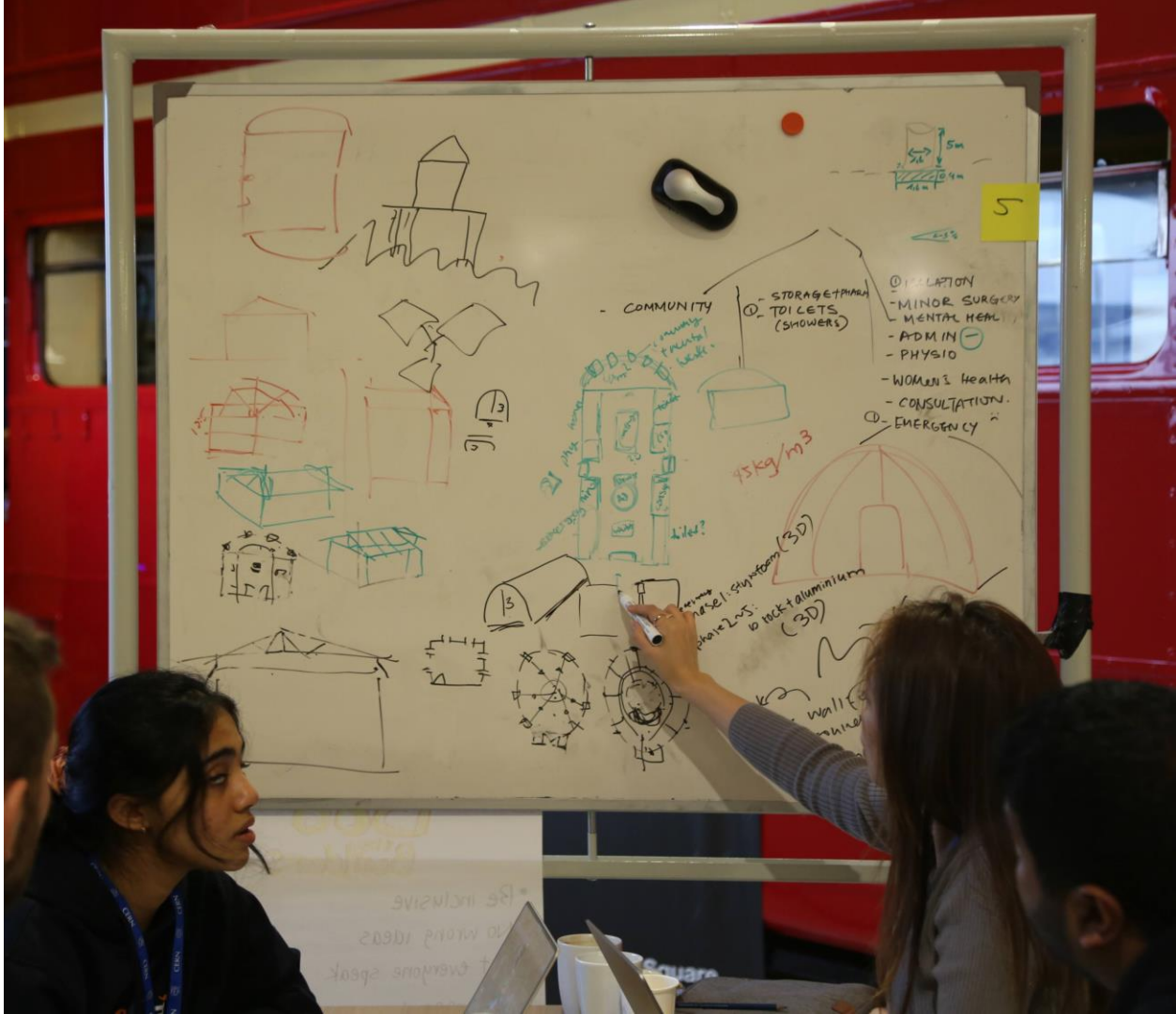


# Prototypes have different methods

- i. Sketching*
- ii. Role-Play*
- iii. Storyboard*
- iv. Cardboard Mock up*
- v. Table top*
- vi. Wizard of Oz*
- vii. Wireframing*
- viii. ...*



# Sketches



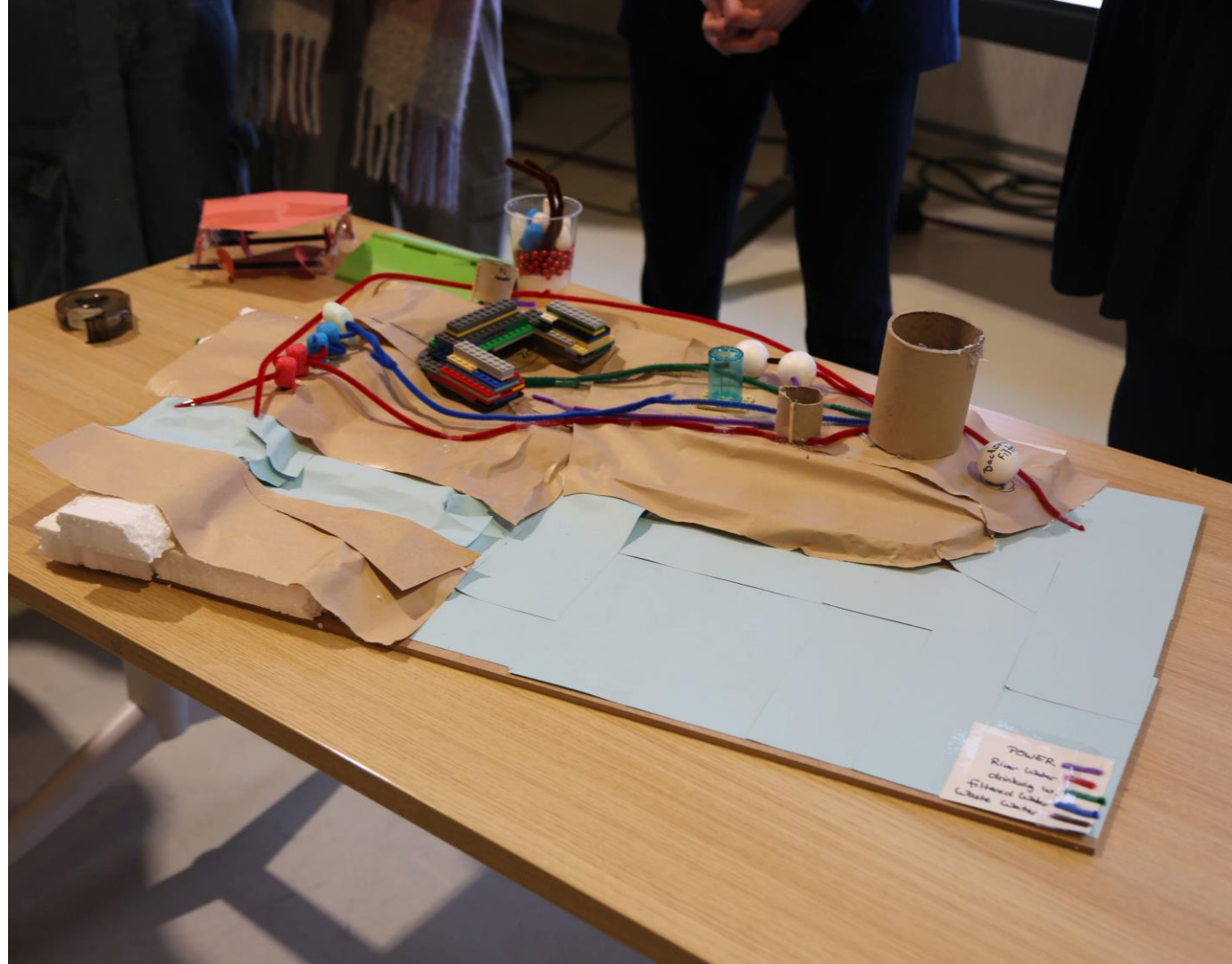
# Cardboard/paper prototypes

e.g. Jacobsen & Meyer, 2017; Warfel 2009

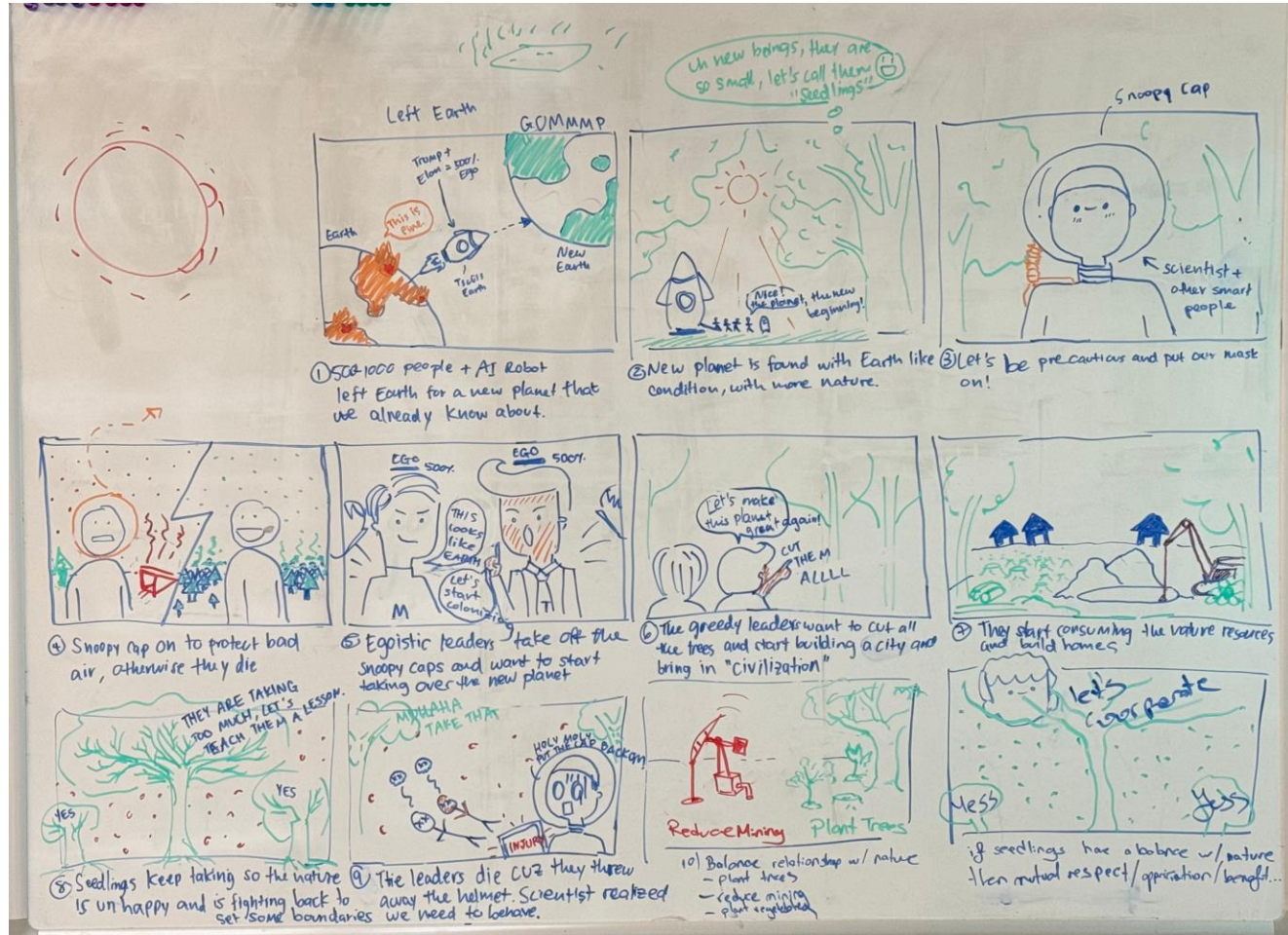


Image: Use Tree, Berliner Kompetenzzentrum für Usability Maßnahmen, <http://projektUse.kke.tu-berlin.de/methode-prototyping>

# Table top

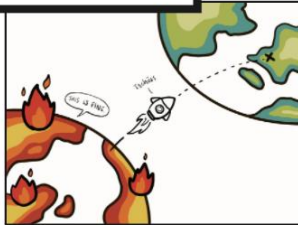


# Storyboard



# Storyboard

## WHEN IN GOMMP-X...



Earth is barely livable and humanity discovered another Earth-like planet called "GOMMP-X"



A handful of specialists like scientists, researchers, doctors, leaders, including an AI robot that preserved all the knowledge are sent on this mission.



They arrived with the hope of "new beginning" as this planet is full with nature and resources.



The leaders came out from the spaceship thinking the environment **must be safe** for humans. So, they took their protection suit off.



With excitement, combined with ego and greed, they immediately start taking over ...



They start cutting, digging, consuming resources and building things for the settlement ... and bringing in "civilization"



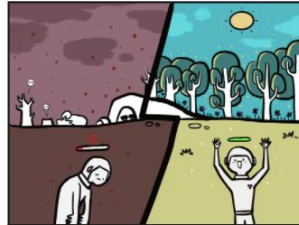
But little did they know, on this planet, the nature have strong intelligence, feelings and soul ... Humans are crossing the line, the nature is now unhappy!



So, as a reaction and communication, they release toxic spores and human's health start to decline, and eventually die.



The specialists quickly noticed and put the protection suit back on, and realized "a change needs to be made"



Overtime, humans start to learn about this new planet. The more nurturing, the more good spores, the healthier and thriving humans become ... and vice versa.



But this doesn't mean that humans cannot take resources and build anything at all. It's just more about the balance.



The nature sees and appreciate the effort from the humans. So, they accept and are happy to live together in harmony :)

... RESPECT THE NATURE



# Video Prototypes



# Video Prototypes



//GEOLOGICAL UPDATE

..FLASH FLOODS IN CALIFORNIA

..CATASTROPHIC WEATHER EVENTS HAMPER ECONOMIC GROWTH

the world's population changes home or work due to climate related activities \*

# Video Prototypes



# Design Improvisation

Laurel, 2003

- experiencing product concepts through active testing and interaction between potential actors/users.
- like in an improvisational theatre, the actors are assigned particular roles relevant to the use of the product
- enhanced understanding of a product's consequences with regards to experience and social practice



# Invisible Design

Briggs et al., 2012

- a special form of video prototyping that focuses on generating insights and ideas in the early stages of concept development
- involves the creation of ambiguous films in which characters discuss a technology that is not directly shown
- particularly suitable for early stages of concept development in order to present general concept ideas and for first tests of resonance with potential users



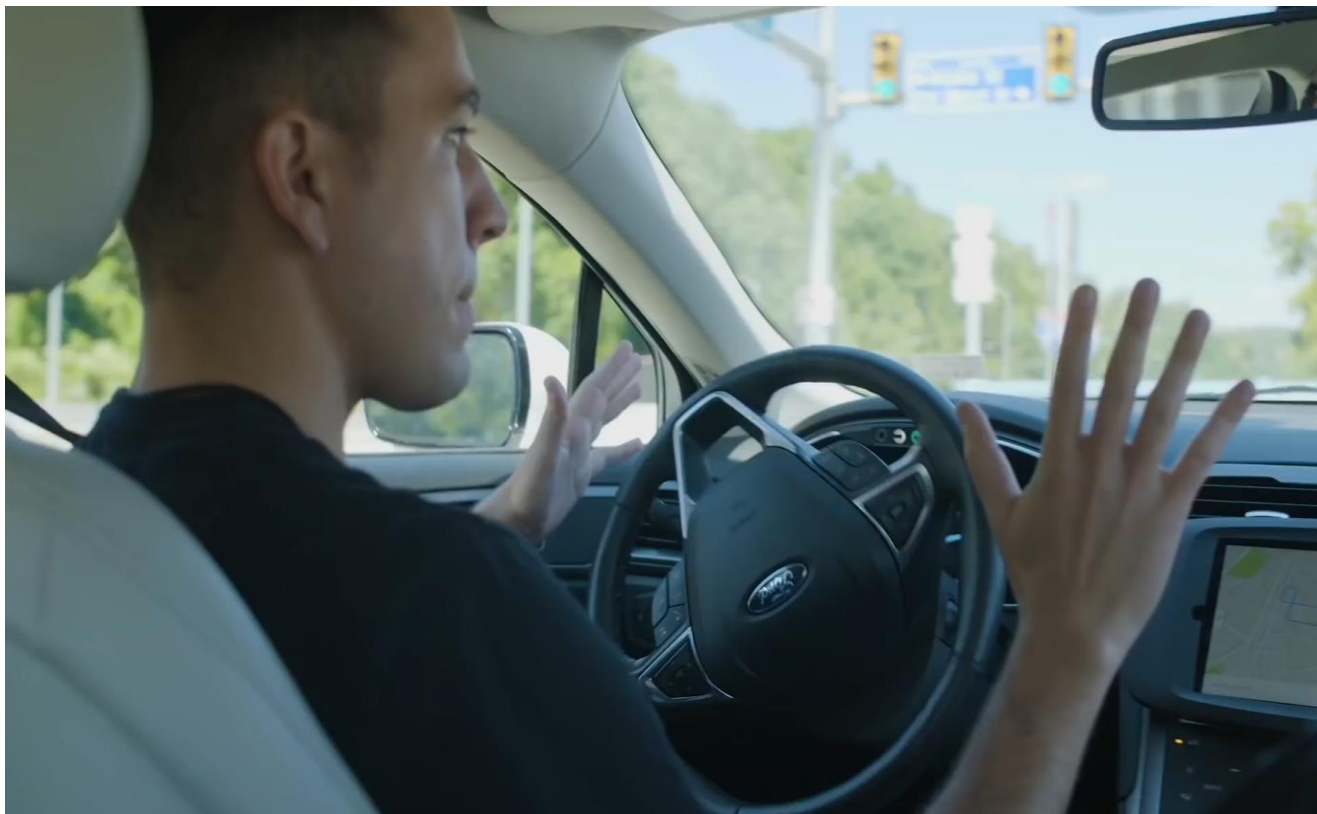
# Placeholder Prototypes: Fictional product experience in daily routines

Sproll et al., 2010

- a placeholder object (e.g., a little stone) represents a product concept
- field experience phase: subjects carry this placeholder as a continuous reminder of the product concept in daily life situations
- documentation of (fictitious) "product experiences" in different ways, e.g. via voice memos or via written diaries
- retrospective interviews: summary reflection about the product's potential



# Wizard of Oz

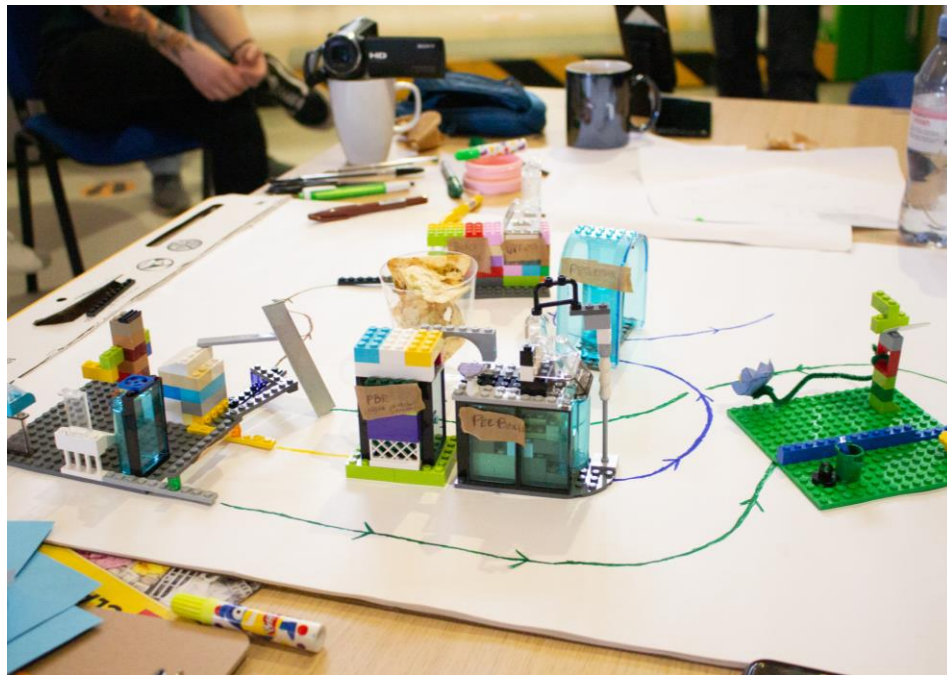


# Roleplay

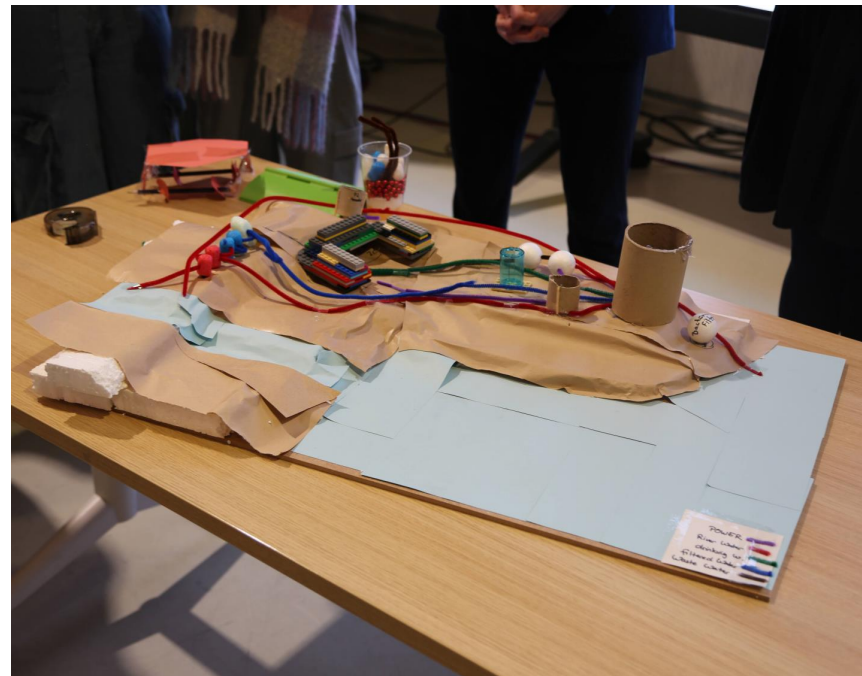
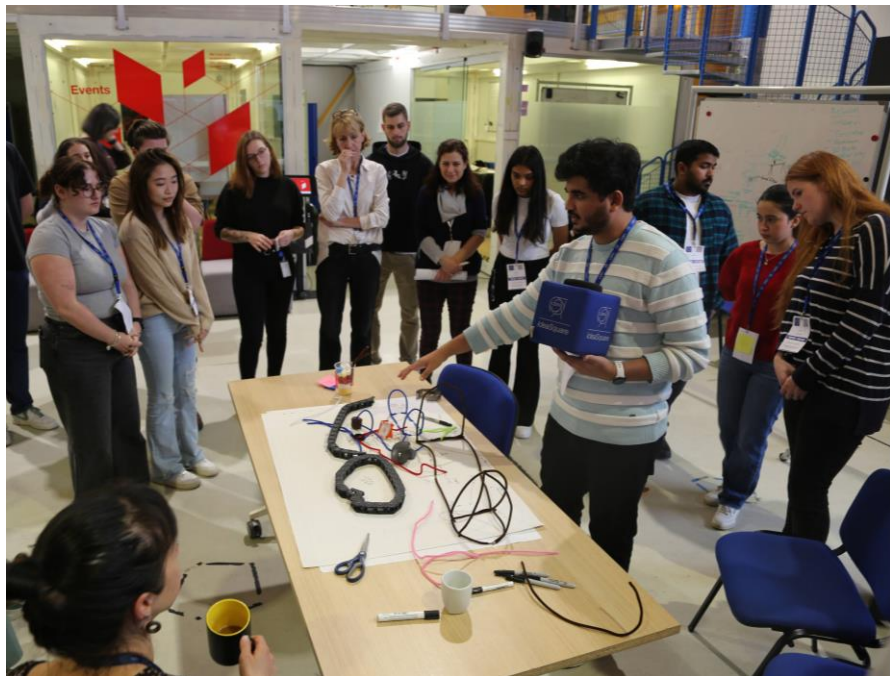




# Systems



# Systems





**The space is yours!**

# The Machine Shop

Prototype  
workshops



# The Electro Shop

Prototype  
workshops



# The 3D Studio

Prototype  
workshops





# PROTOTYPING CHARADES

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**MOCK-UP**



**EXPLAIN**



**MIMING**



**SKETCH**

