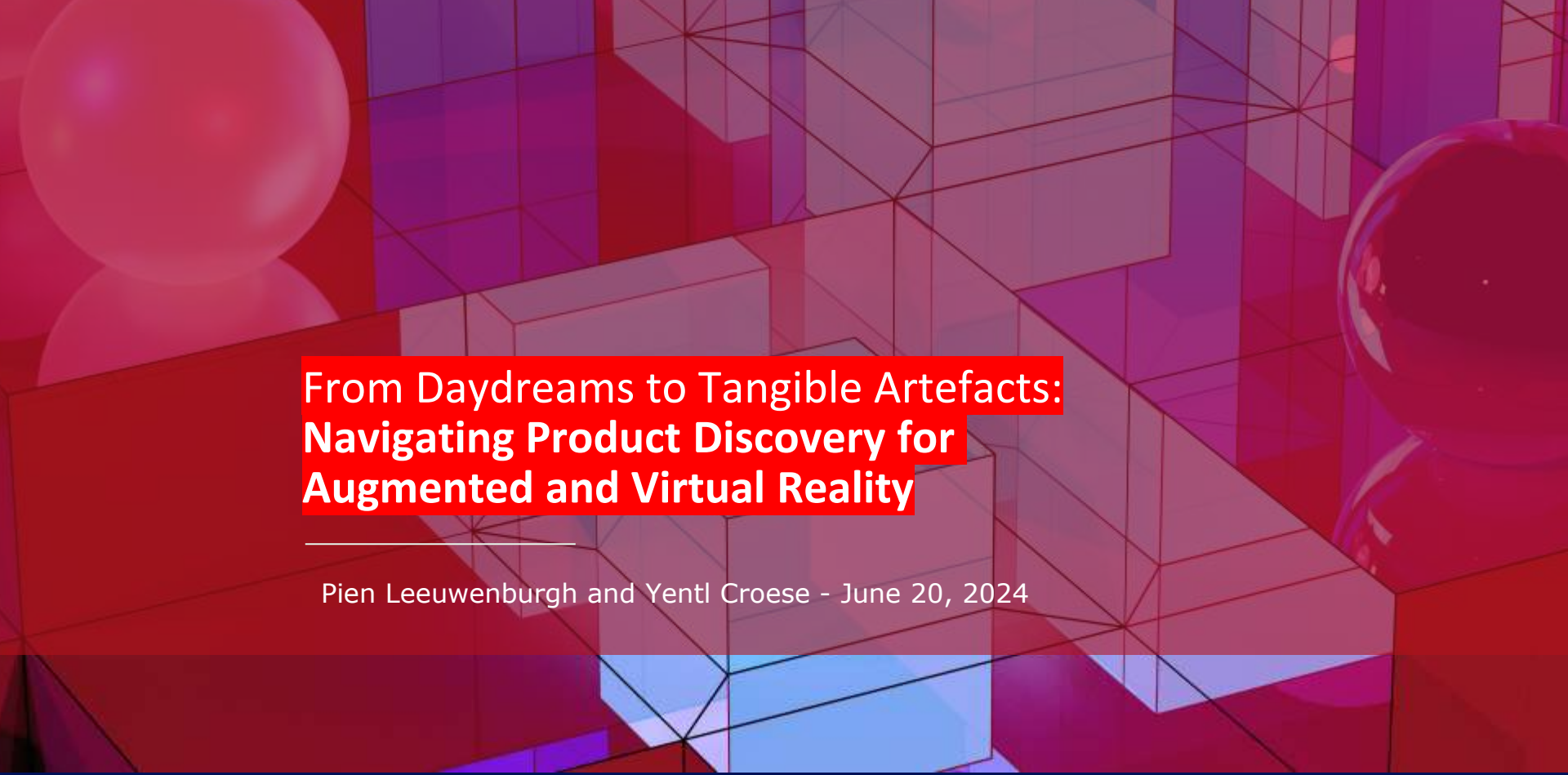

From Daydreams to Tangible Artefacts: **Navigating Product Discovery for Augmented and Virtual Reality**

Pien Leeuwenburgh and Yentl Croese - June 20, 2024

Universiteit Leiden
Leiden Learning & Innovation Centre

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Program

Today

1. Introduction to Design Thinking
2. The power of XR for education
3. Matching your vision with the medium’s traits
4. Role of Prototyping
5. Rapid prototyping, let’s do it ourselves!

Raise your hand if…

Product Discovery?

Product Discovery

The process of **identifying**, **conceptualizing**, and **validating** innovative product ideas.

It's about **exploring** and determining **what** to build, for **whom**, and **why**, before diving into the how”

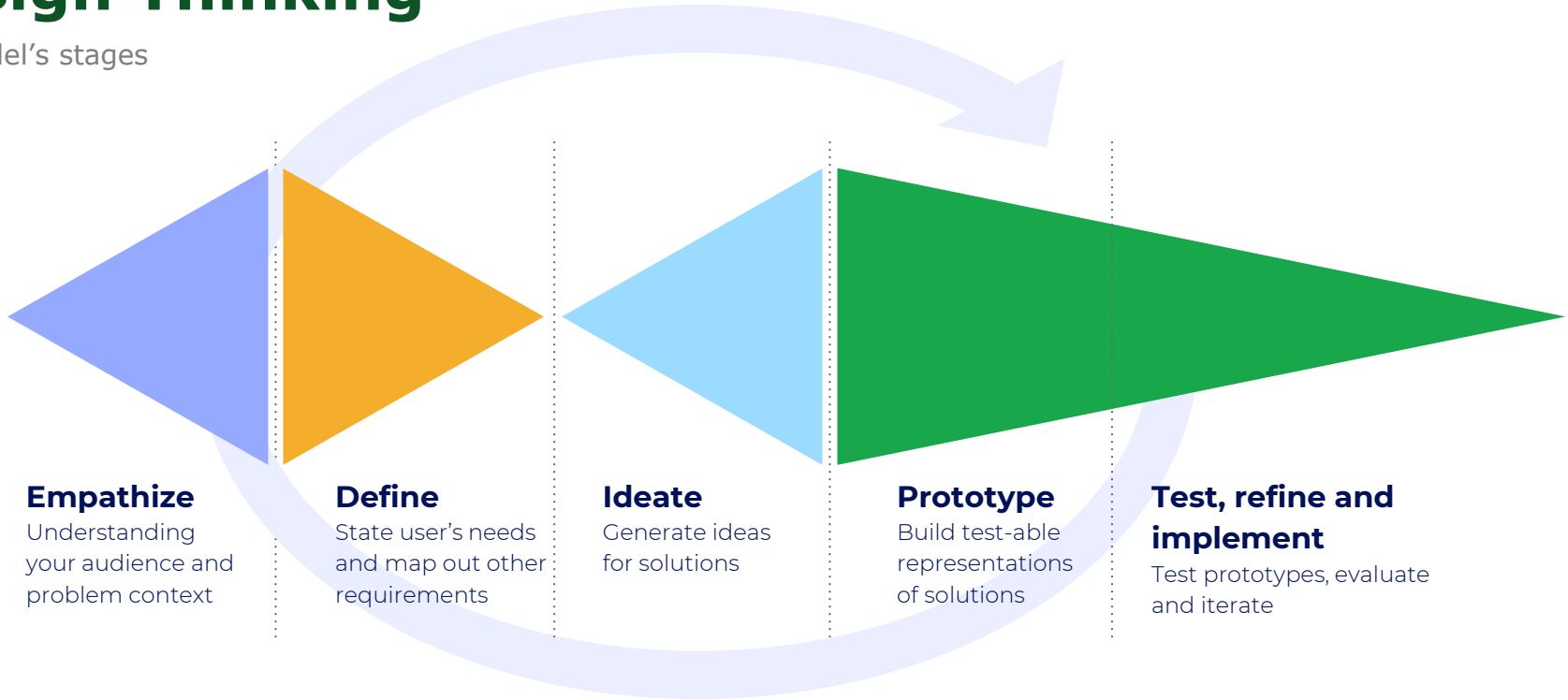
Design Thinking

Design thinking is a **human-centered approach** to **innovation** that makes use of the designer's toolkit to integrate the **needs of people**, **possibilities** of technology and **business requirements**.

- Tim Brown, Executive chair of IDEO

Design Thinking

The model's stages



Empathize
Understanding your audience and problem context

Define
State user's needs and map out other requirements

Ideate
Generate ideas for solutions

Prototype
Build test-able representations of solutions

Test, refine and implement
Test prototypes, evaluate and iterate

Design Thinking

The process

Why use Design Thinking for XR Projects

User-Centered Focus. XR experiences must be intuitive and user friendly.

Innovative Solutions. DT encourages creativity and exploration. Great for the endless possibilities of XR.

Cross-collaboration

Improve **communication** between different expertise and teams.

Before costly development, DT let's you **test early and often**

In small groups – 5 min:
Choose an idea to focus on

(your own or from the examples)

The potential of XR for education and research

What traits to look for in XR?

Does the medium [XR] match your needs?

1. Make the inaccessible accessible

NASA Space Launch System

NASA Space Launch System

Users experience the excitement of standing on the launch pad beneath NASA's massive new rocket, the Space Launch System (SLS) and see the breathtaking visual of the rocket bursting through clouds.

View in the Oculus store

2. Immerse and empathize

Travelling While Black

Travelling While Black

Traveling While Black is a cinematic VR experience that immerses the viewer in the long history of restriction of movement for black Americans and the creation of safe spaces in our communities.

View in the Oculus store

3. Ensure focus

SnowWorld

SnowWorld

SnowWorld is used to shifts concentration of patients in pain away from their pain to an icy, virtual environment bathed in cool blues and whites, where their only task is to throw snowballs at an endlessly advancing group of penguins.

View on youtube

4. New interactions for active and playful learning

Tilt Brush

Tilt Brush

Tilt Brush combines virtual reality with drawing, painting, design, photography, and sculpture. Several educational institutes implemented the use of the application in art and other programs involving creativity and conceptual thinking.

Visit the Tilt Brush website

5. Skill training

AugMedicine: Lung Cases

AugMedicine: Lung Cases

Lung Cases simulates the process of listening to the lungs. This application allows medical students and doctors to train themselves on a wide range of scenarios in diagnosing patients that present with shortness of breath.

Checkout this article on the creator's website

6. Virtual collaboration

Imperial College using Microsoft Dynamics Remote Assist

Microsoft Dynamics Remote Assist

Using Microsoft Dynamics Remote Assist, Imperial College aims to transform the delivery of lab-based teaching through remote collaboration.

- More on how Imperial College applied Remote Assist
- Go to the remote assist product page

In small groups – 5 min:
fill in the design question sheet

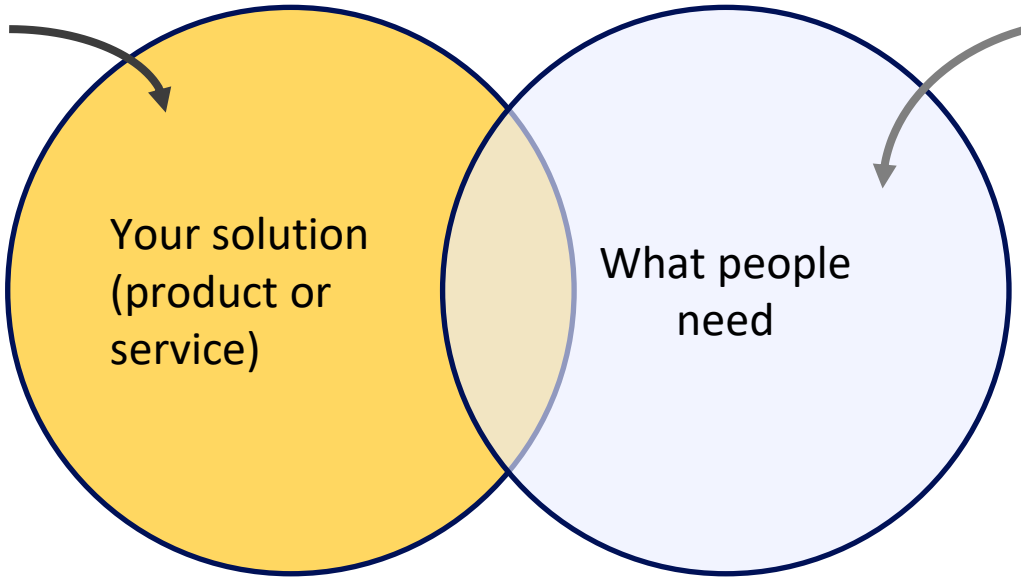
Is there another medium that might be better fitting for your project? Why?

Okay, so we now know our reasoning for why XR (or medium ‘x’) would be useful…

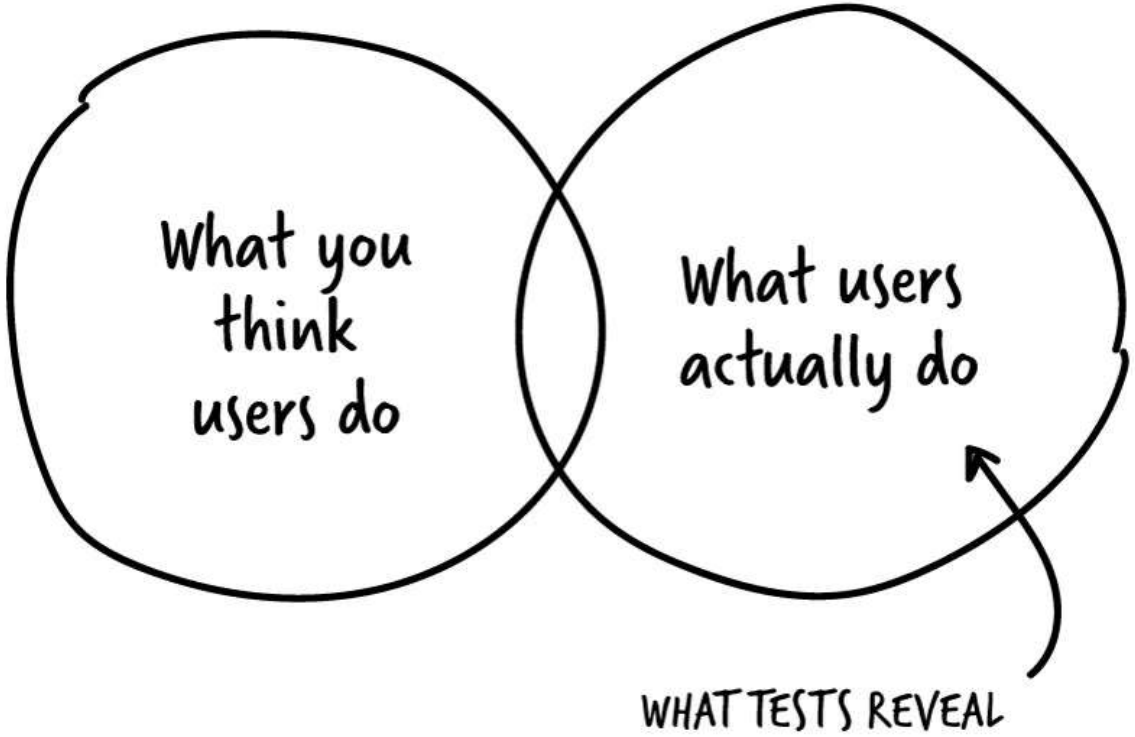
How to know if we’re right?

~~fail~~ learn as fast as possible

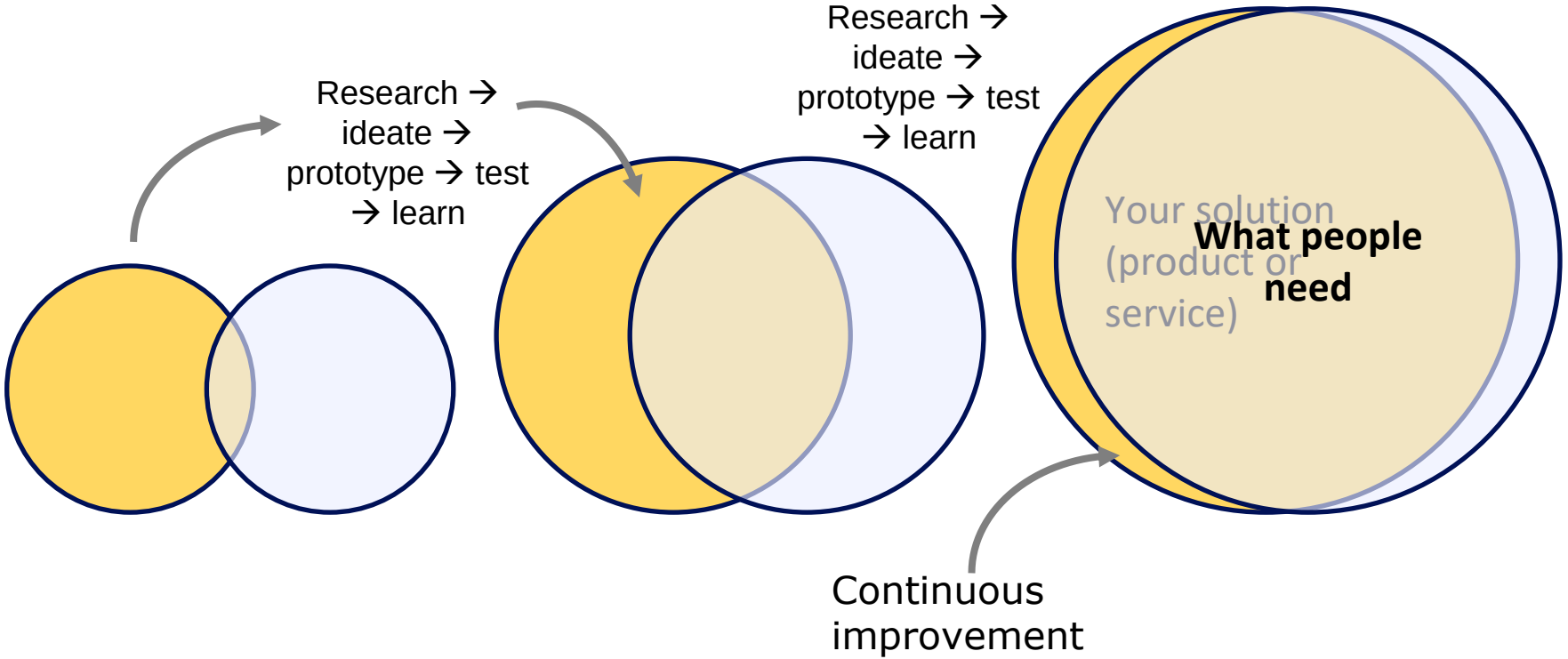
Waste of time, money, energy



Unresolved needs..


What you think users do
What users actually do
WHAT TESTS REVEAL

Functional failing to learn as fast as possible
(also: user research and prototype testing)



Principles Design Thinking

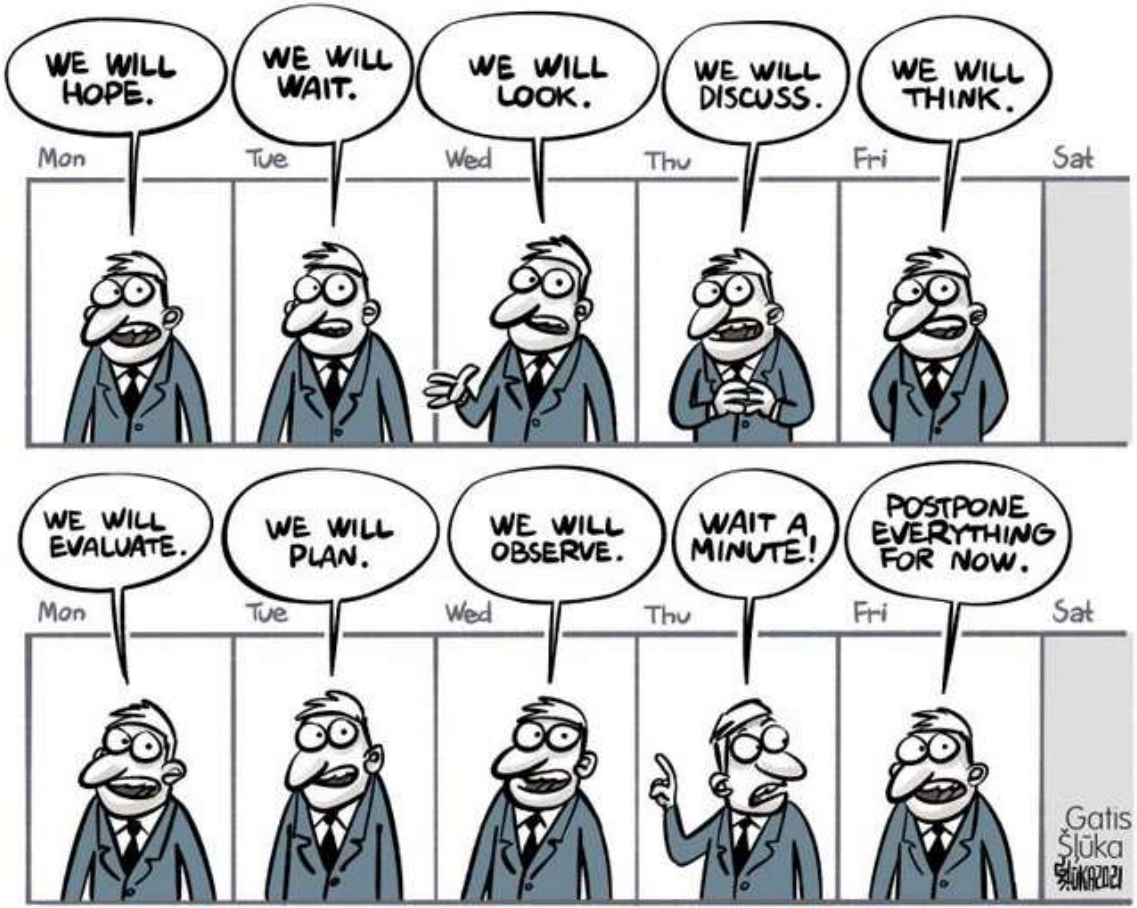
Empathy

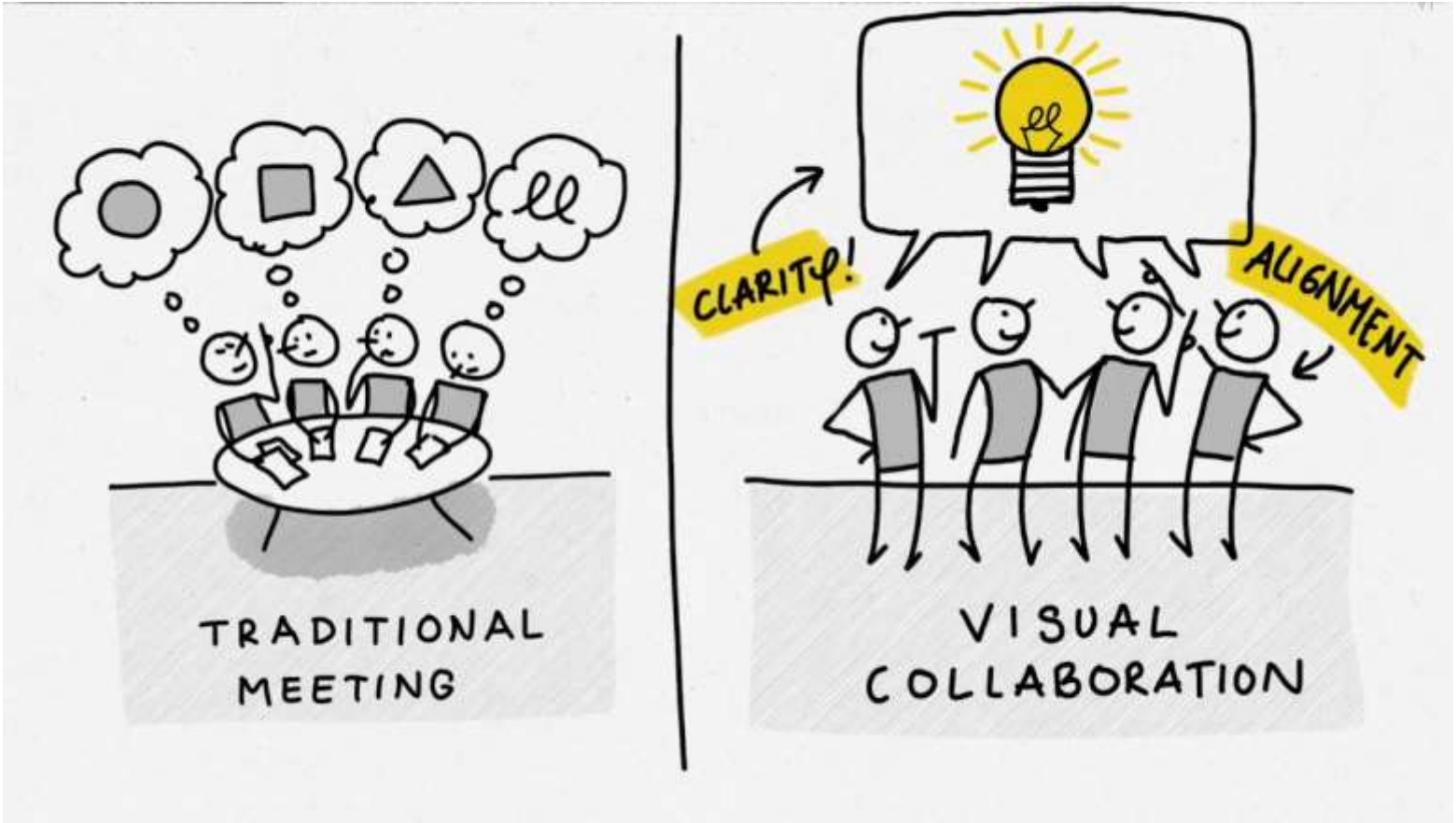
Show, don't tell

Doing > thinking

Embrace experimentation

Design ~~Thinking~~ Doing


WE WILL HOPE.
WE WILL WAIT.
WE WILL LOOK.
WE WILL DISCUSS.
WE WILL THINK.
Mon
Tue
Wed
Thu
Fri
Sat
WE WILL EVALUATE.
WE WILL PLAN.
WE WILL OBSERVE.
WAIT A MINUTE!
POSTPONE EVERYTHING FOR NOW.
Mon
Tue
Wed
Thu
Fri
Sat
Gatis Šlūka


TRADITIONAL MEETING
CLARITY!
ALIGNMENT
VISUAL COLLABORATION

What is a prototype?

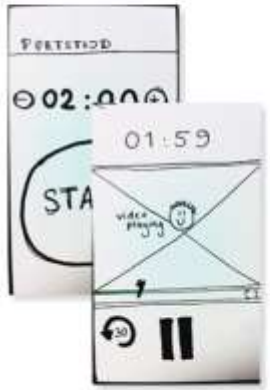
- Tangible/visible and **testable** version of an idea
- **Decision making tool** to answer open questions
- Ready for **iteration**: make > test > learn > adapt > test > learn > adapt > test >





Early sketching

Early sketches were made to discuss the concept with experts and parents of potential users and come to an agreement of the general flow with the different team members.



Low fidelity prototyping

Simplified wireframes served as means to a low fidelity prototype that was used in a first usability evaluation.

Functional Design

Before the actual visual design was applied, I created a functional design using more defined wireframes that included interaction refinements. This served as an initial guide for the developers.

Important concept: fidelity

Challenges of prototyping for XR

Sometimes, developers are also the designers and coders want to code ;)

“We don’t have the time (aka money), we just need to start building and deliver an MVP.”

“Oh yes this prototype is great, we want this! Can we start using it next week?”

Prototyping tools for spatial experiences (ar/vr) are less developed (but they are there!)

Prototyping flat vs spatial digital interfaces: different skills, tools etc.

Trade offs between speed and specificity (how to fail fast while still failing correctly).

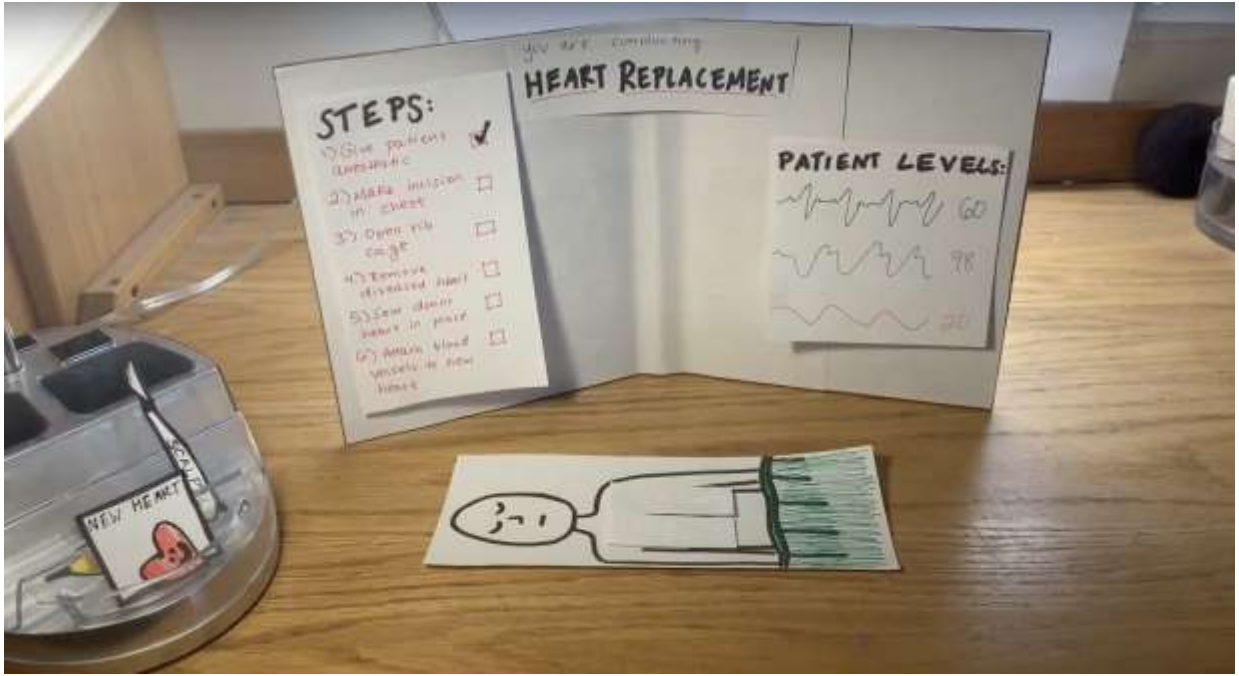
Let’s do it anyway!

examples

Paper prototyping

→ Quickly visualize the conceptual flow you have in mind

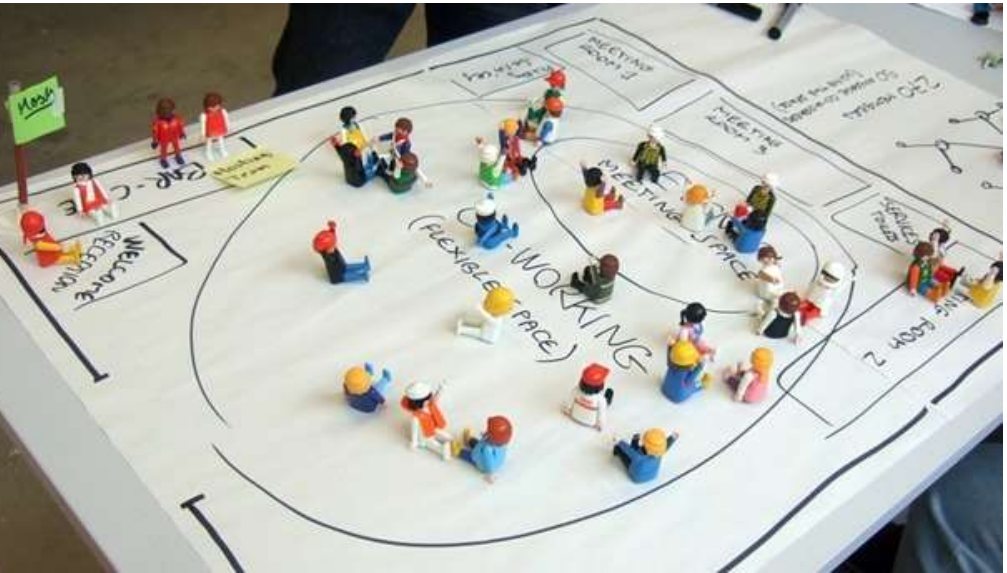
→ Communicate with colleague / client etc.



Examples

- https://www.youtube.com/watch?v=mNt-rt6x3zI&ab_channel=JillyP98
- https://www.youtube.com/watch?v=5Oq_fVol_88&ab_channel=believeititstaken
- https://www.youtube.com/watch?feature=oembed&v=yafaGNFu8Eg&ab_channel=UXPlayground
- https://www.youtube.com/watch?v=2OQBm1GNq4k&ab_channel=KurtisHaut

Desktop walkthroughs using miniature and handcraft material



Testing a specific element only

→ Focus on testing the main concept first and strip away the extras.

#concept-validation

Paper prototyping in the ELEVATE project, read more in the meetup recap: https://xrera.eu/teaching-challenging-concepts-in-molecular-and-cellular-biotechnology-using-vr-recap-meetup-11/
or through:

Reen, F. Jerry, et al. "The Use of Virtual Reality in the Teaching of Challenging Concepts in Virology, Cell Culture and Molecular Biology." *Frontiers in Virtual Reality* 2 (2021): 62.



This is a cardboard version of a vending machine, do you see how the form could also be used to test out XR experiences??

https://selfservicedesign.wordpress.com/2012/03/26/full-size-cardboard-prototypes/

Wizard of Oz // Role Playing // Paper

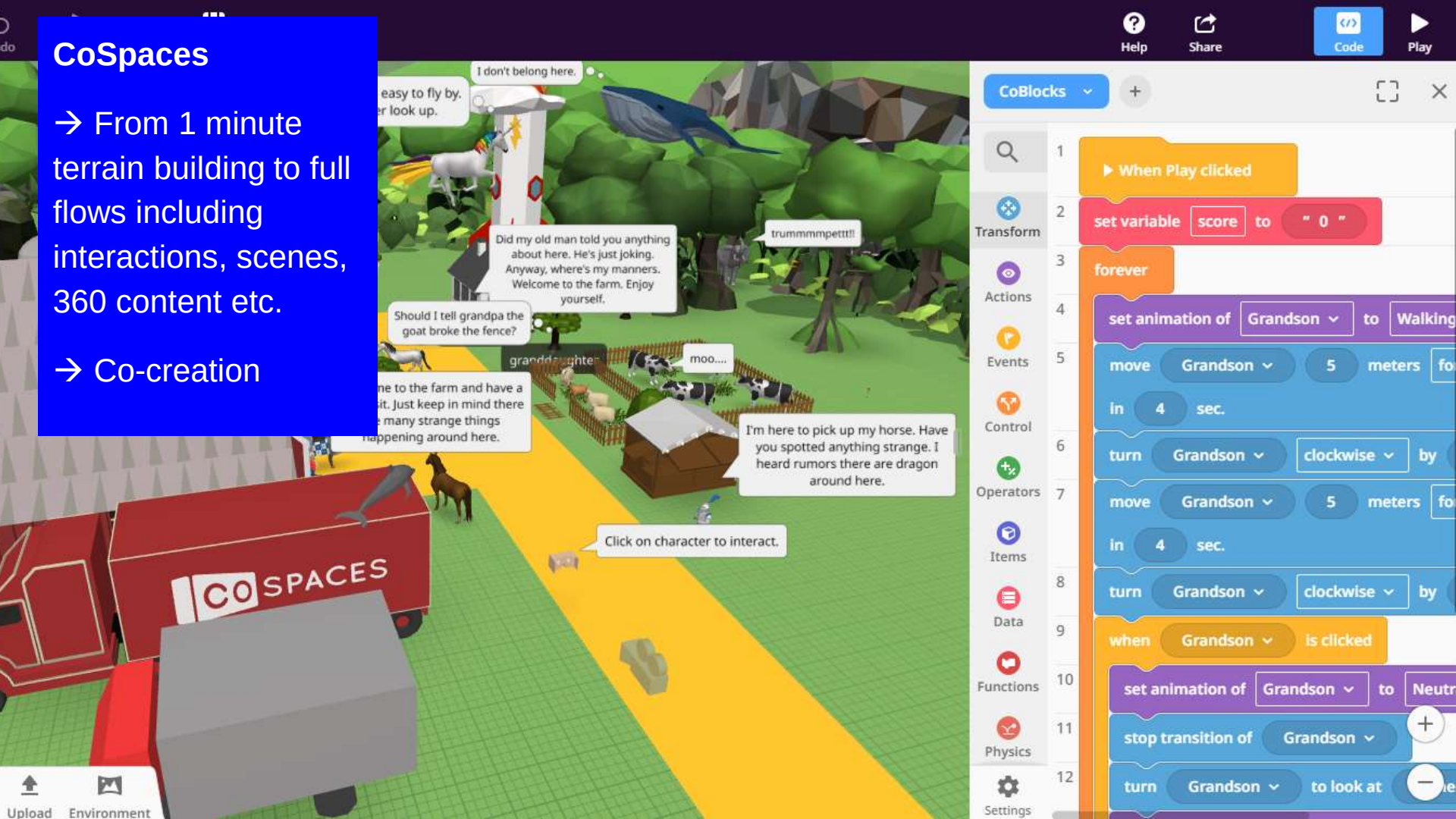
→ Quickly visualize the conceptual flow you have in mind

→ Communicate with colleague / client etc.

CoSpaces

→ From 1 minute terrain building to full flows including interactions, scenes, 360 content etc.

→ Co-creation



Tools like Warp VR →
‘Drag and drop tools’: add interactivity to 360 content without the need for programming knowledge.

→ Not just for prototyping! This may be your end product!

https://www.warpvr.com/

In groups ~30min:

Make a pototype of your project

and show the group in the end :-)

Show us what you've made!

Thank you!

Yentl Croese
y.croese@llinc.leidenuniv.nl

Pien Leeuwenburgh
p.leeuwenburgh@llinc.leidenuniv.nl

Universiteit Leiden

Leiden Learning & Innovation Centre

The presentation will be uploaded on the Media & Learning website.

If you have interest in the accompanying templates such as *making a storyboard* and *setting up test plan* or if you have any questions or requests, please reach out!

p.leeuwenburgh@llinc.leidenuniv.nl

hello@llinc.leidenuniv.nl