



EIROforum

IDEATION & PROTOTYPING TO LEARN

A”

Aalto University
Design Factory

Agenda for today

- 9:00 **Session 1: Kick-off and Introduction**
- 10:00 Coffee break
- 10:30 **Session 2: Ideation**
- 11:30 Lunch
- 12:30 Talk: Creativity in Science
- 13:30 Talk: Imagination and Creativity
- 14:15 **Session 3: Evaluating Ideas**
- 15:15 Coffee break
- 15:45 **Session 4: Prototyping & Testing**



ROHAN



VIKKI

40

design factories around the world

Year of founding
V01.2022



Europe and the Middle East 24

Asia Pacific 8

Americas 8

DF
GN Design
Factory
Global
Network

2008 01 Aalto University Design
Factory

2010 02 Sino-Finnish Centre

2011 03 Design Factory Melbourne

2012 04 Duoc Design Factory

2014 05 Ideasquare @CERN

2015 06 Design Factory Korea

07 Porto Design Factory

08 Nexus Design Factory

09 Future Design Factory

2016 10 METU Design Factory

11 Design Factory Javeriana
Bogota

12 NYC Design Factory

13 RTU Design Factory

2017 14 UPV Design Factory

15 Design Factory São Paulo

16 Design Factory New Zealand

17 Warsaw Design Factory

18 FusionPoint

19 Kyoto Design Lab

20 Cali Design Factory

2018 21 Inno.space

22 University of Tartu Delta
Sandbox

23 SIT Design Factory

2019 24 HAMK Design Factory

25 St. John's University Design
Factory

26 Hannam Design Factory

27 Design Factory Shenkar

28 Oper.Space

2020 29 DF London

30 Nandin

2021 31 DF Aveiro

32 Viikki Food DF

33 Link Menu Fabrikas

34 DF Pforzheim

35 DF Stuttgart

36 iCubo

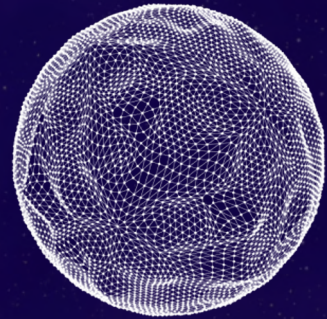
2022 37 DF Nantes

38 SEIUNISA

2023 39 DF Manchester

40 FORGE Design Factory

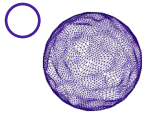




ATTRACT phase 2

Developing breakthrough
technologies for science and society





What is ATTRACT

breAkThrough innovaTion pRogrAmme for a pan-European Detection and Imaging eCosysTem

The goal of ATTRACT is to establish a systematic framework to transform breakthrough technologies, developed from fundamental research purposes into breakthrough innovations that can be turned into sound industrial applications and provide added value for society.

ATTRACT has been initiated by nine European entities (the ATTRACT Consortium):

- European Organization for Nuclear Research (CERN),
- Aalto Korkeakoulusäätiö SR (AALTO),
- ESADE Ramon Llull University (ESADE),
- ESRF - The European Synchrotron (ESRF),
- European X-Ray Free-electron Laser GmbH (European XFEL),
- European Molecular Biology Laboratory (EMBL),
- European Southern Observatory (ESO),
- Institut Max von Laue Langevin - Paul Langevin (ILL),
- European Industrial Research Management Association (EIRMA).

18 ATTRACT R&D&I Projects, 8 Socioeconomic Studies, 10 Student Programmes

HOUR 1

INTRODUCTION

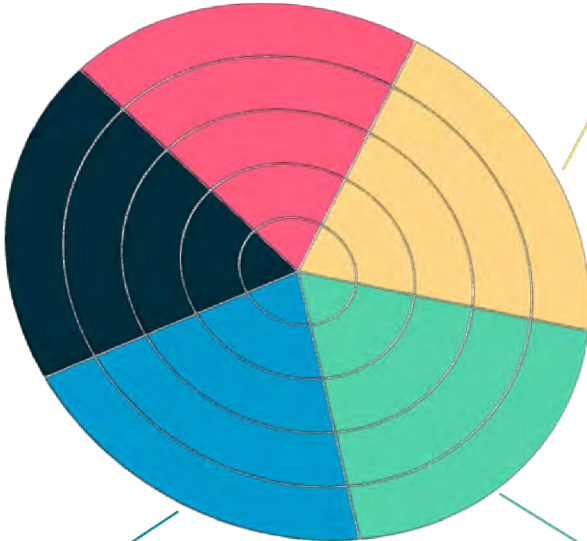


So who (really) are you?

HANDS-ON MAKER

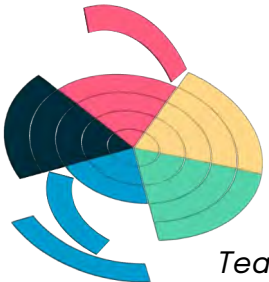
BUSINESS THINKER

COORDINATION MASTER



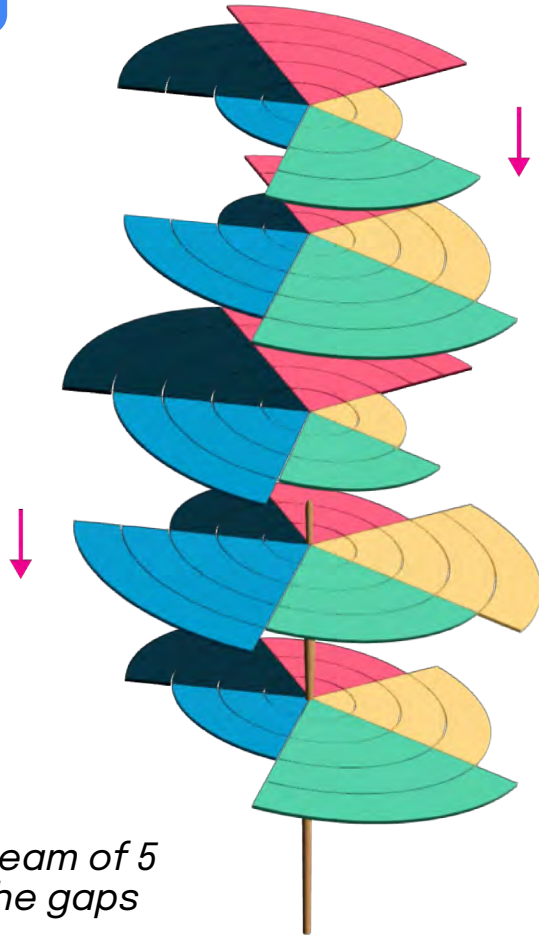
IDEA STAR

TECH GURU

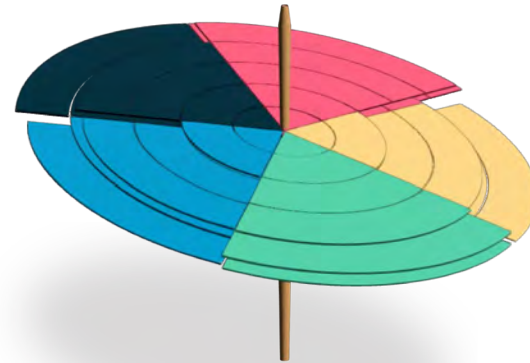


Tear away!

Create your own core capability kebab!



*Find a random team of 5
that can fill in the gaps*



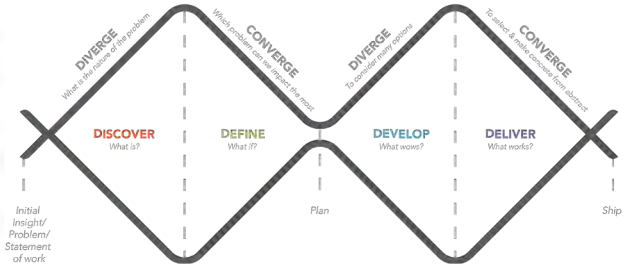
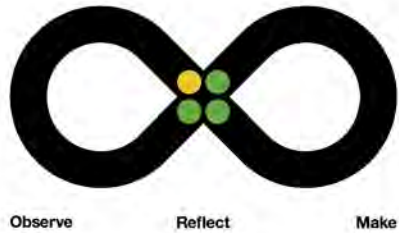
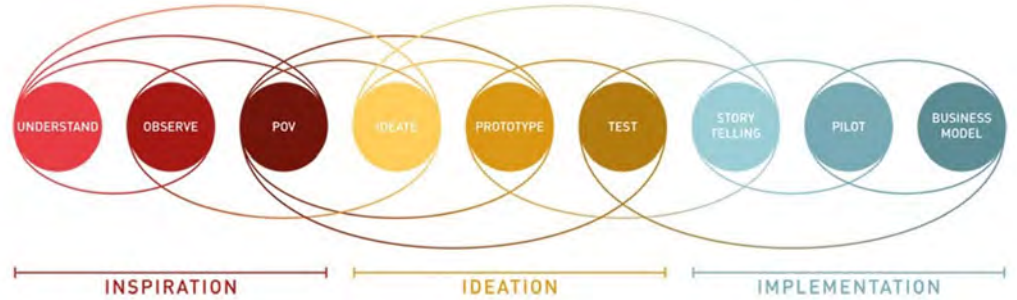
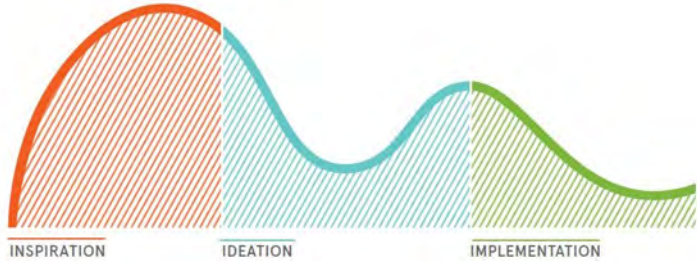
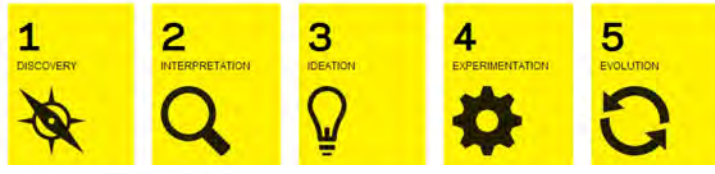
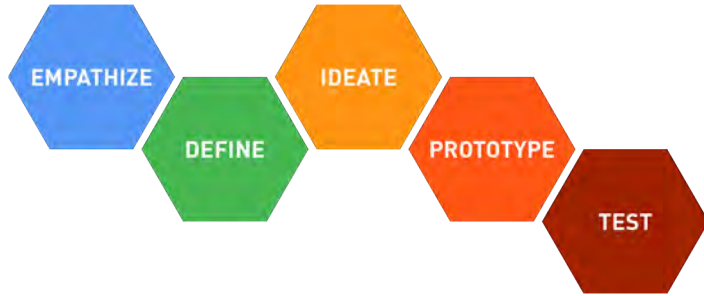


Design thinking is..

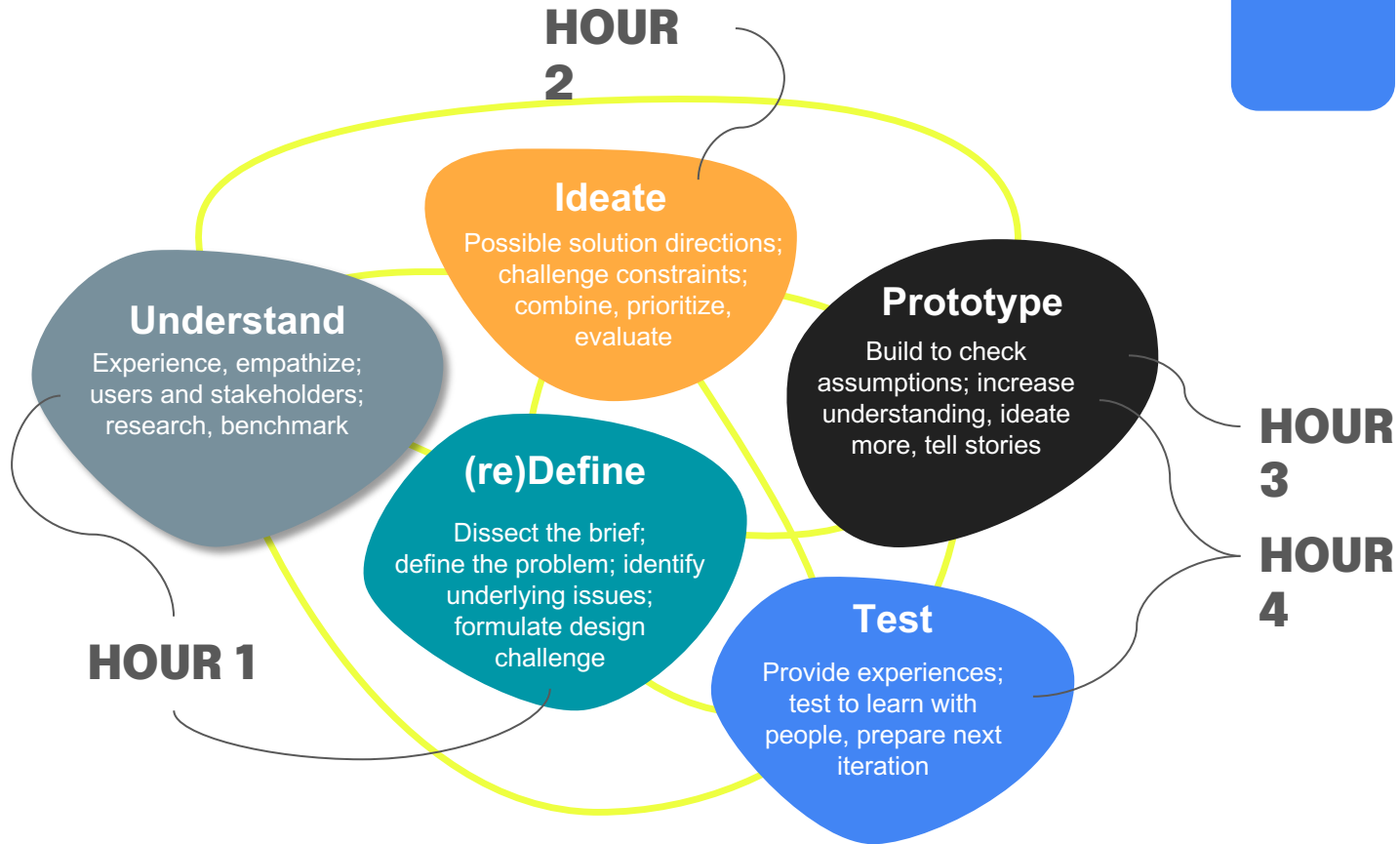
“

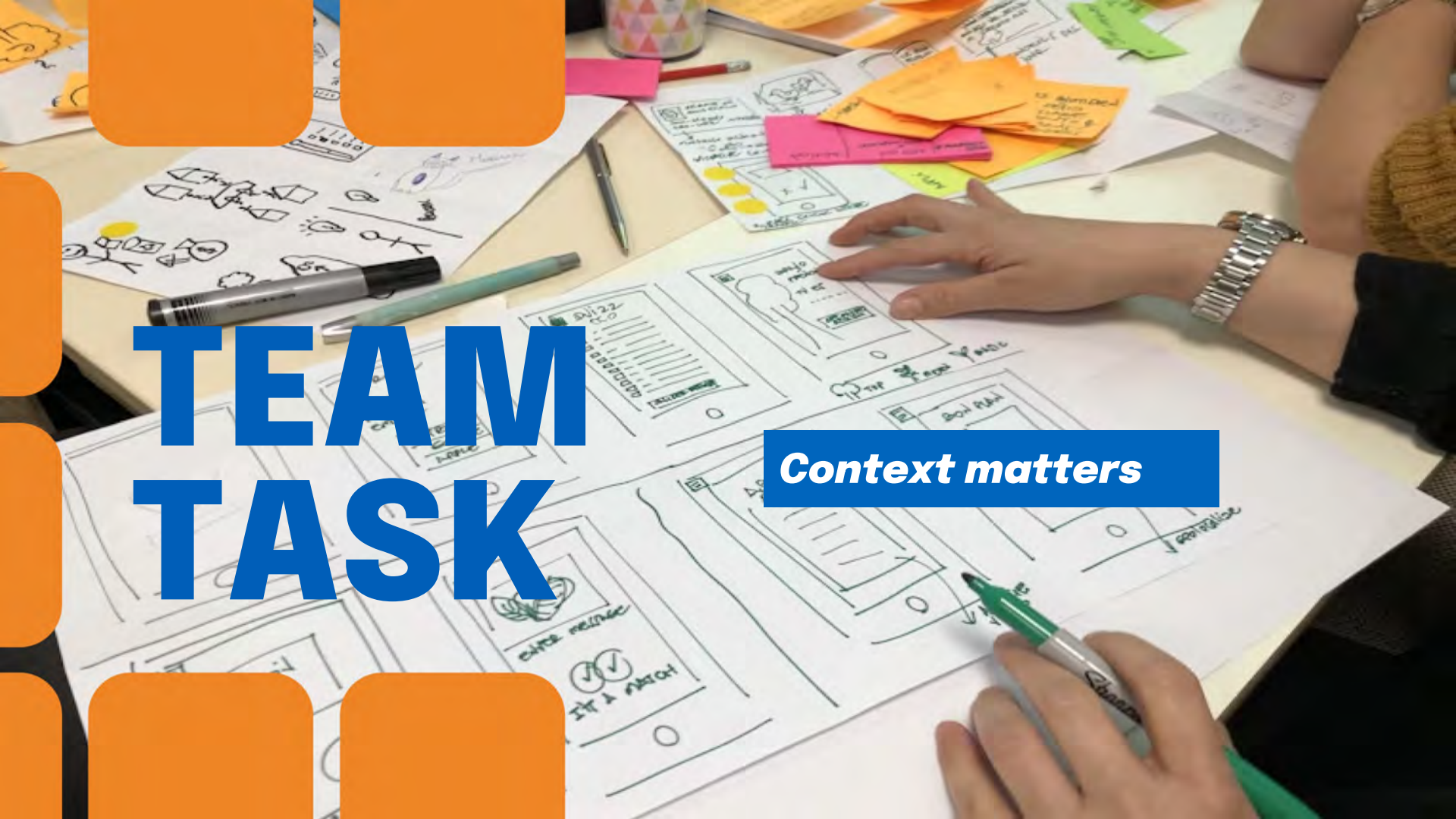
... a team-based, multidisciplinary approach to problem solving derived from the field of industrial design to support people to address messy, ill-structured problems incorporating thought processes and methods underlying design practice, aimed at supporting engineers, designers, and others to design together.

Models



Sprint





TEAM TASK

Context matters

Context 1

City of Paris and the Olympics

You are representative from the city of Paris and the Olympics is around the corner!

Find out ways on how can you make the Olympics experience good for the participants (visitors and the athletes). Think bigger and then smaller (look at transport, garbage, accommodation, timing, doping etc)



Context 2

A control center of the future

What does your control center in/at your lab look like in the future?

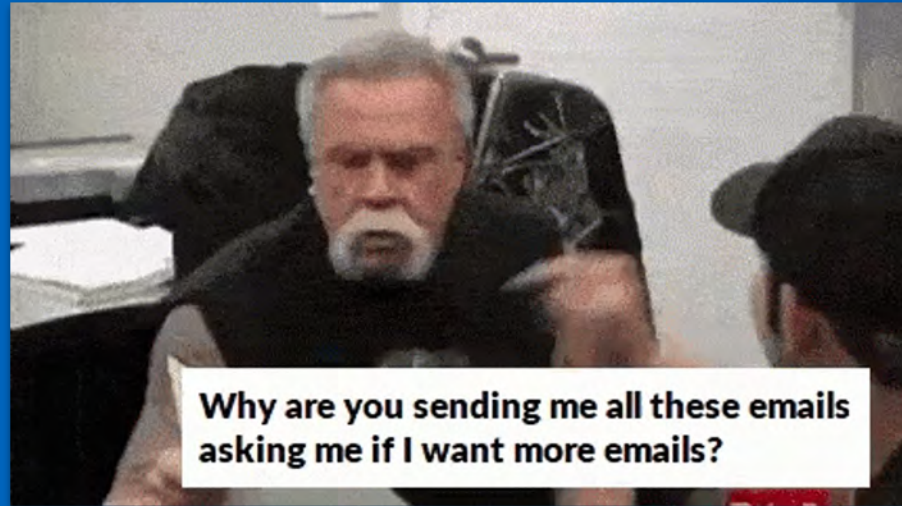
What would be the extra concepts that can improve how work happens in your own ecosystems



Context 3

GDPR and how can we streamline it (convenience with privacy)

How can we create services and products that can creatively build on the GDPR laws while improving convenience and ensuring privacy?





Pick your poison!

What do we have in common? What opportunities do we see?

- Take 2-3 min individually to consider the challenge context. What kind of challenges exist within this context?
- As a group discuss the challenges that everyone identified.
- Using post-it notes write down as many challenge as you can. Stick to 1 idea per note.
- Just focus on challenges, solutions will come later :-)

ACTIVIT

What do we take forward?

As a group discuss and make two choices:

1. Pick two of the challenges you identified to take into the next activity. Use it to create a clear '*How might we*' question.

How might we

[what: goal]

so that

[who: stakeholder]

can

[why: need/insight]

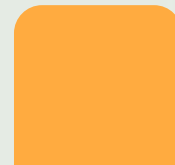
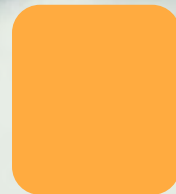
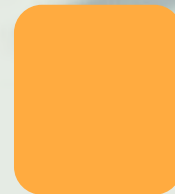
ACTIVITY

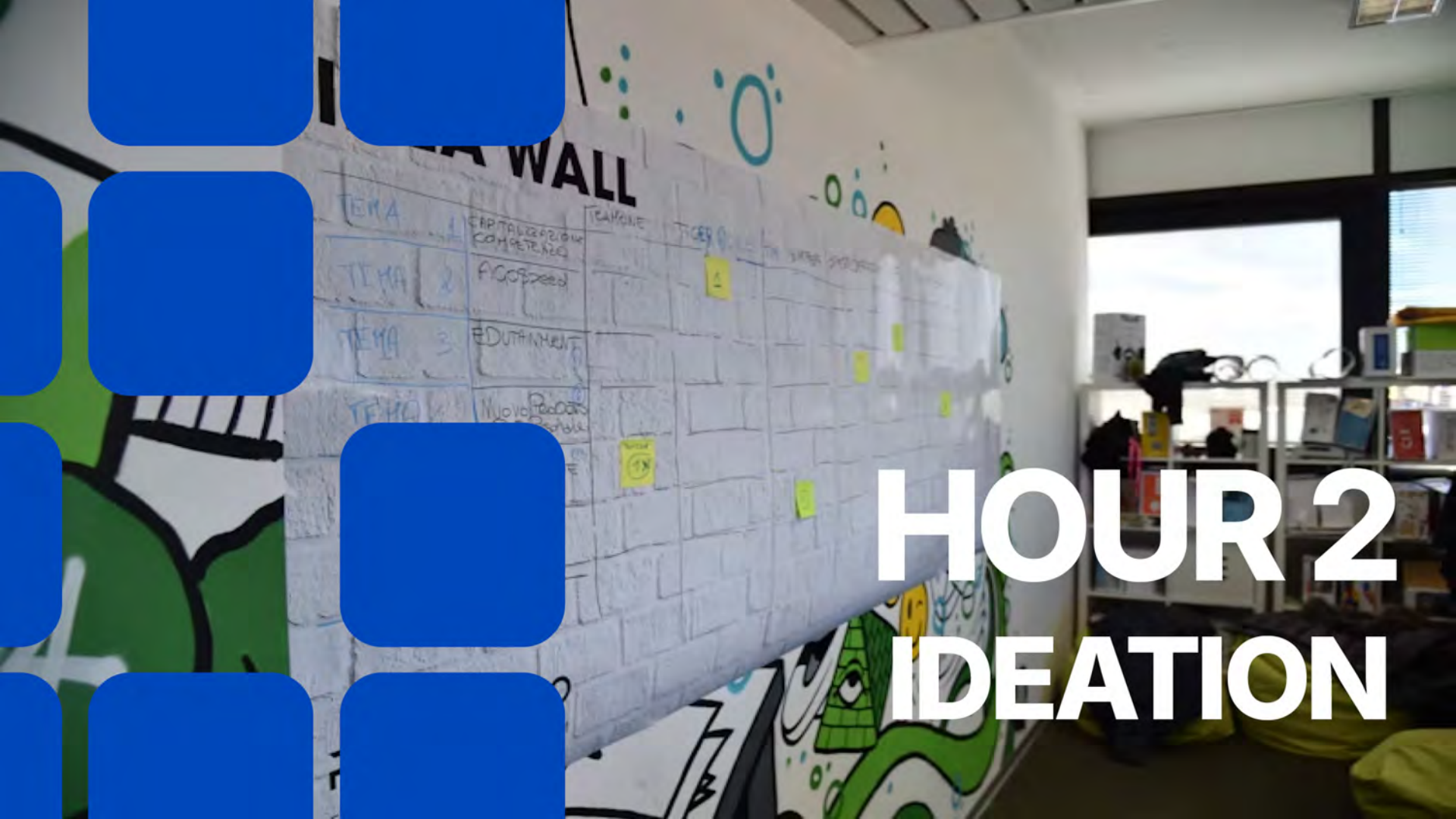


Love the problem

not the solution

Coffee break



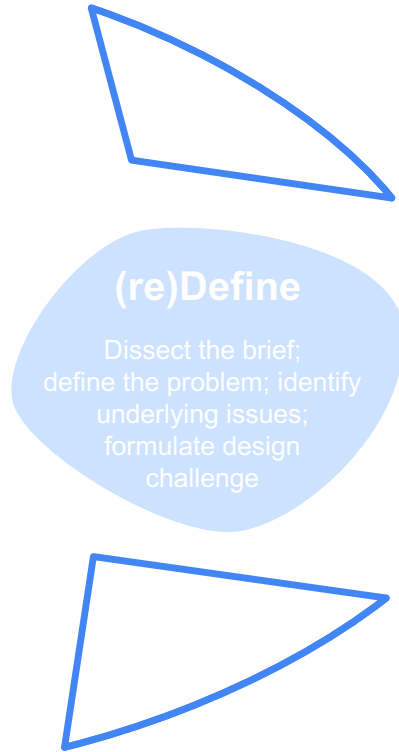


HOUR 2 IDEATION

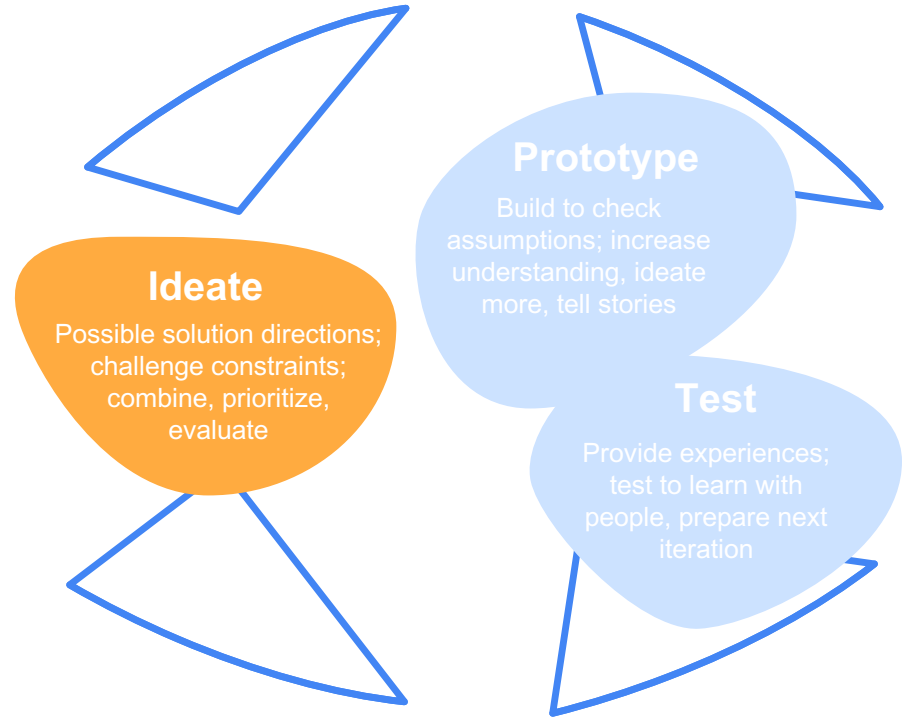
HOUR ONE



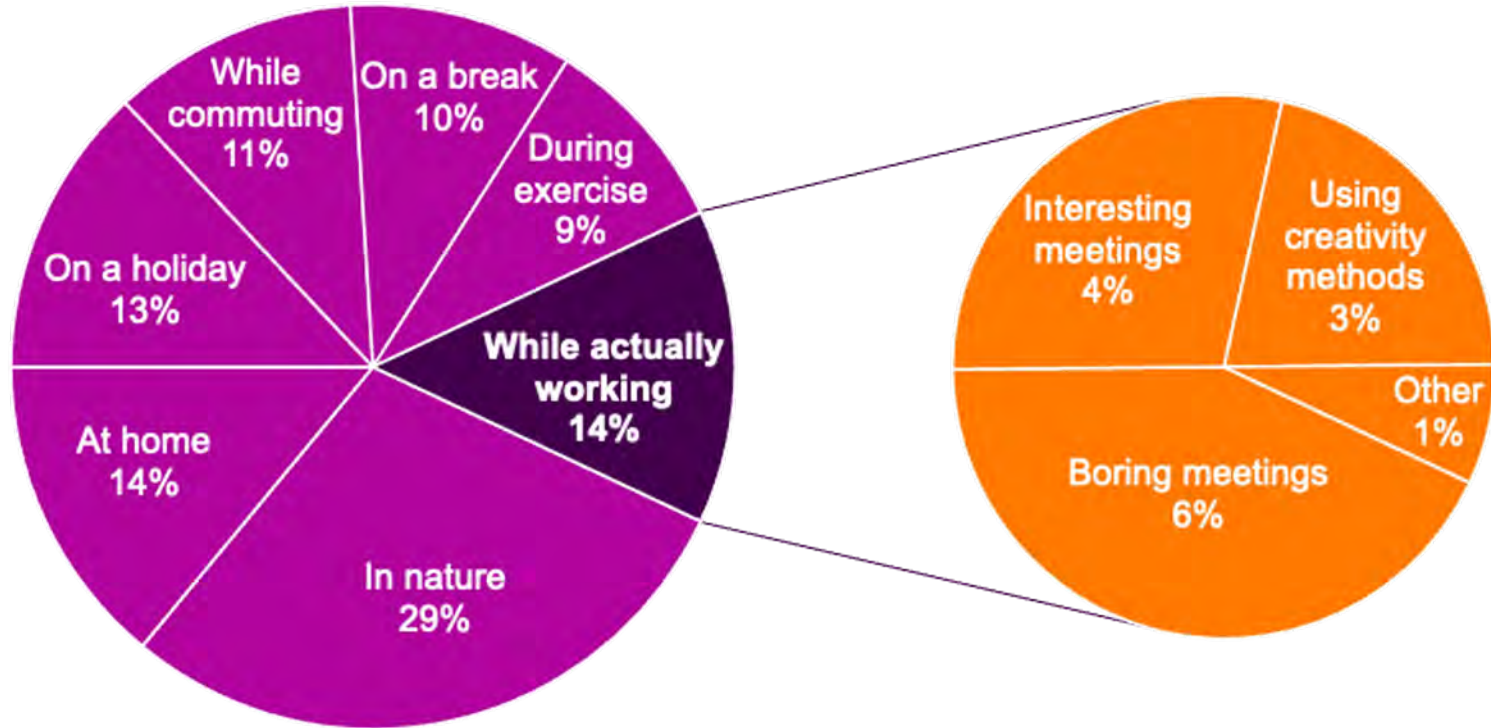
HOUR TWO



HOUR THREE & FOUR



Where are ideas born?



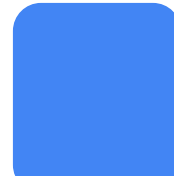


Ideation session goals from the perspective of ideas

- Quantity, quantity, quantity
- Pushing the boundaries – you can always come down to earth
- New and surprising combinations

Creative idea =

a *novel and useful* idea



Brainstorming rules

1. Go for quantity (quantity brings quality)
2. No criticism
3. Welcome unusual ideas
4. Combine and improve the ideas of others

+

5. Challenge assumptions
6. Focus on the topic
7. One conversation at a time
8. Be visual

Work in groups of 4-6


Have a facilitator if possible

Start with reflecting on the problem

Impose structure (categorization, break)



Yes, and...!

A close-up photograph of a person's hands pouring a thick, white, viscous liquid from a white plastic funnel into a white container. The background is blurred, showing what appears to be a laboratory or industrial setting with some equipment and text. The text 'TEAM TASKS' is overlaid in large, bold, blue capital letters on the left side of the image. There are several orange rounded square shapes scattered around the text and the top and bottom edges of the image.

TEAM TASKS

What would be the worst solution?

1. Pick one of the “How might we question” you formed as a group and turn it into a negative question.
2. For 5 minutes, jointly come up with the worst possible solutions to your HMW statement. Write down each idea on a separate post-it.

ACTIVITY

What would be the worst solution?

- 1. Pick one of the “How might we question” you formed as a group and turn it into a negative question.**
- 2. For 5 minutes, jointly come up with the worst possible solutions to your HMW statement. Write down each idea on a separate post-it.**
- 3. Flip around a few of the worst ideas. What would be their total, positive and concrete opposites?**

ACTIVITY

Negative brainstorming

Removes the pressure to come up with good ideas

Might lead to original ideas when the bad ideas are turned to positives

A good way to kick-off ideation

1. Turn the design challenge to a negative one

How to create a service no one wants to use?

What would the worst possible development discussion be like?

2. Generate ideas freely for a short period of time
3. Finish by trying to turn negative ideas into their positive opposites

Let's use find strange connections.

1. Use your How Might We challenge.
2. Listen to the prompt.
3. Write as many solution ideas on separate sticky notes as you. We'll let you know when time is up.
4. We'll give a new prompt after 2 minutes.

Remember!

- Go for quantity (quantity brings quality)
- No criticism
- Welcome unusual ideas
- Combine and improve the ideas (of others)

ACTIVIT

Let's use find strange connections.

1. Use your How Might We challenge.
2. Listen to the prompt.
3. Write as many solution ideas on separate sticky notes as you. We'll let you know when time is up.
4. We'll give a new prompt after 2 minutes.

Remember!

- Go for quantity (quantity brings quality)
- No criticism
- Welcome unusual ideas
- Combine and improve the ideas (of others)

ACTIVITY

How might Batman solve this issue?



**How might this issue be solved
in 2100?**



**How might this issue be solved
on the Moon?**



Constrained Ideation

1. Novel ideas are found in novel connections.
2. It can be difficult to achieve this 'on demand'.
3. By forcing constraints on our thinking that require novel connections, it helps bridge

Also have a look at 'forced analogies' if this method works for you.



***Welcome
back!***

Let's go for a BIG number of ideas.

1. Grab one of the templates being handed out.
2. In 5 minutes you will write 3 ideas on 3 separate post-it notes and stick them in the top row.
3. At the end of the round, everyone will pass their templates clockwise to the person next to them.
4. This person has 5 minutes to read the ideas already added, and add 3 more in the next row. They can either build on ideas from the previous row or be new ideas.
5. Repeat.

ACTIVIT

435 Brainwriting

4 people/rounds (the number and rounds can be adjusted)

3 ideas per paper/round

5 minutes to generate ideas

A method combining individual and group input

Allows everyone to be heard, no group pressure

Rotation allows improving the ideas.

You can use a template or simply draw blocks on a piece of paper or a whiteboard.



Example structure for a 60min ideation session



- **Going over the challenge (what are we ideating solutions for) 5 min**
- **Ideating alone 5 min**
- **Sharing ideas 10 min**
- **Ideating together and building on ideas 20 min**
- **Clustering ideas and voting 20 min**

Materials and guidelines for a 2 hour ideation session

<https://designbites.aalto.fi/toolkits/ideation-toolkit/>



Lunch + Talks

We continue at 14.15!



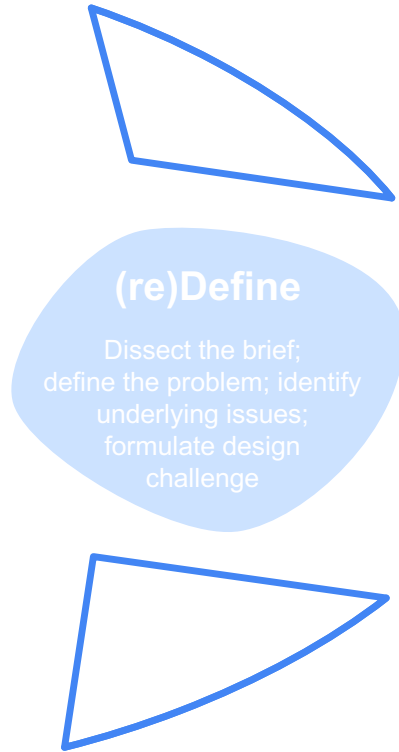
HOUR 3

EVALUATION & PROTOTYPING

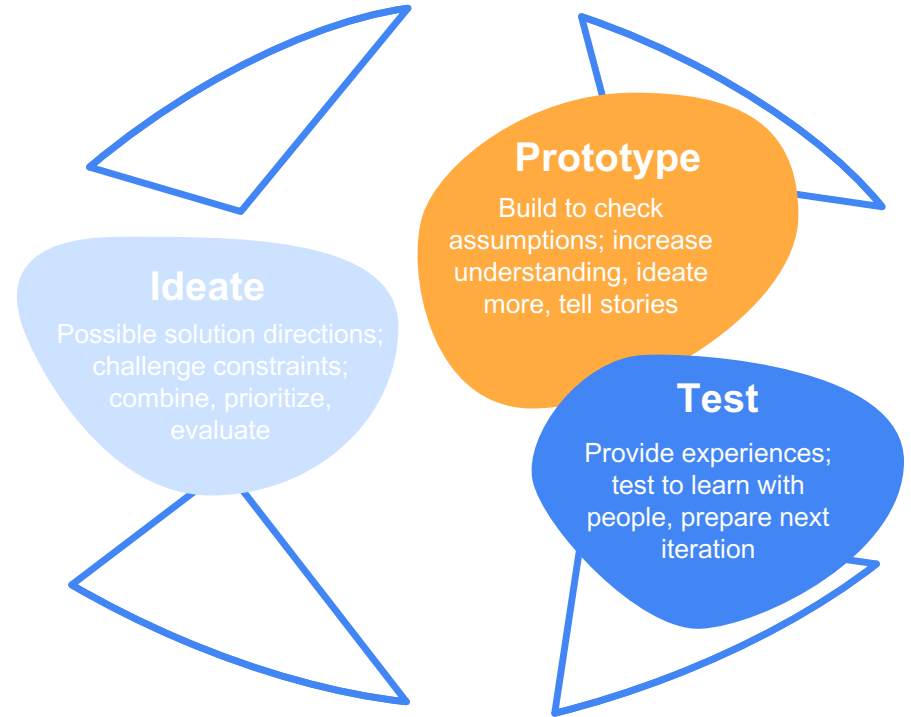
HOUR ONE



HOUR TWO



HOUR THREE & FOUR



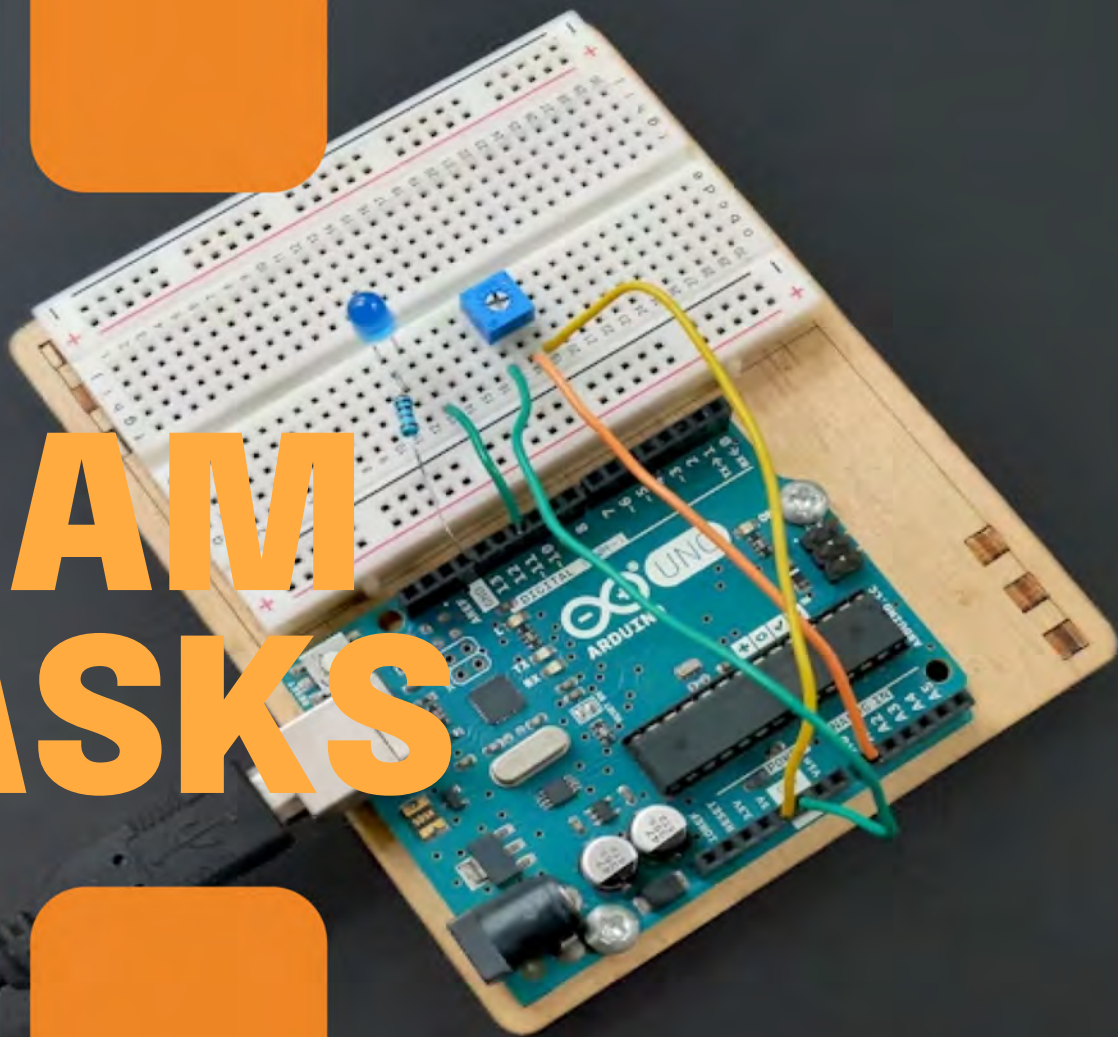
Idea evaluation & selection

Fast, intuitive vs. systematic and thorough – early on you need to narrow down and prioritize

- Voting
- Idea selection matrix
- Plus, minus, interesting (PMI)



TEAM TASKS



Let's find an idea to take forward.

- 1. Vote for the most exciting/promising idea – everyone has three votes to distribute as they wish to the ideas.**
- 2. Simply use a marker to make dots for your three votes.**
- 3. Can you combine the ideas with the most votes or are they mutually exclusive?**

ACTIVIT

Let's find an idea to take forward.

- 1. Vote for the most exciting/promising idea – everyone has three votes to distribute as they wish to the ideas.**
 - 2. Simply use a marker to make dots for your three votes.**
 - 3. Can you combine the ideas with the most votes or are they mutually exclusive?**
-
- 1. Select 1 idea to take forward to prototyping. As a team spend a bit more time finalising the concept.**

ACTIVIT



How the customer explained it



How the Project Leader understood it



How the Analyst designed it



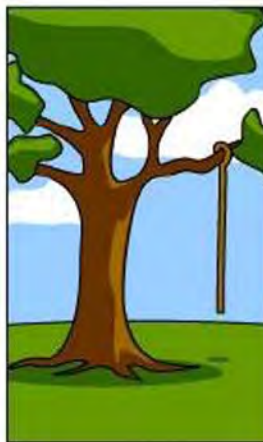
How the Programmer wrote it



How the Business Consultant described it



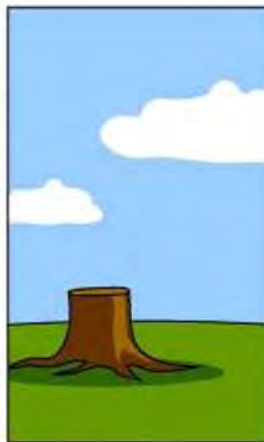
How the project was documented



What operations installed



How the customer was billed



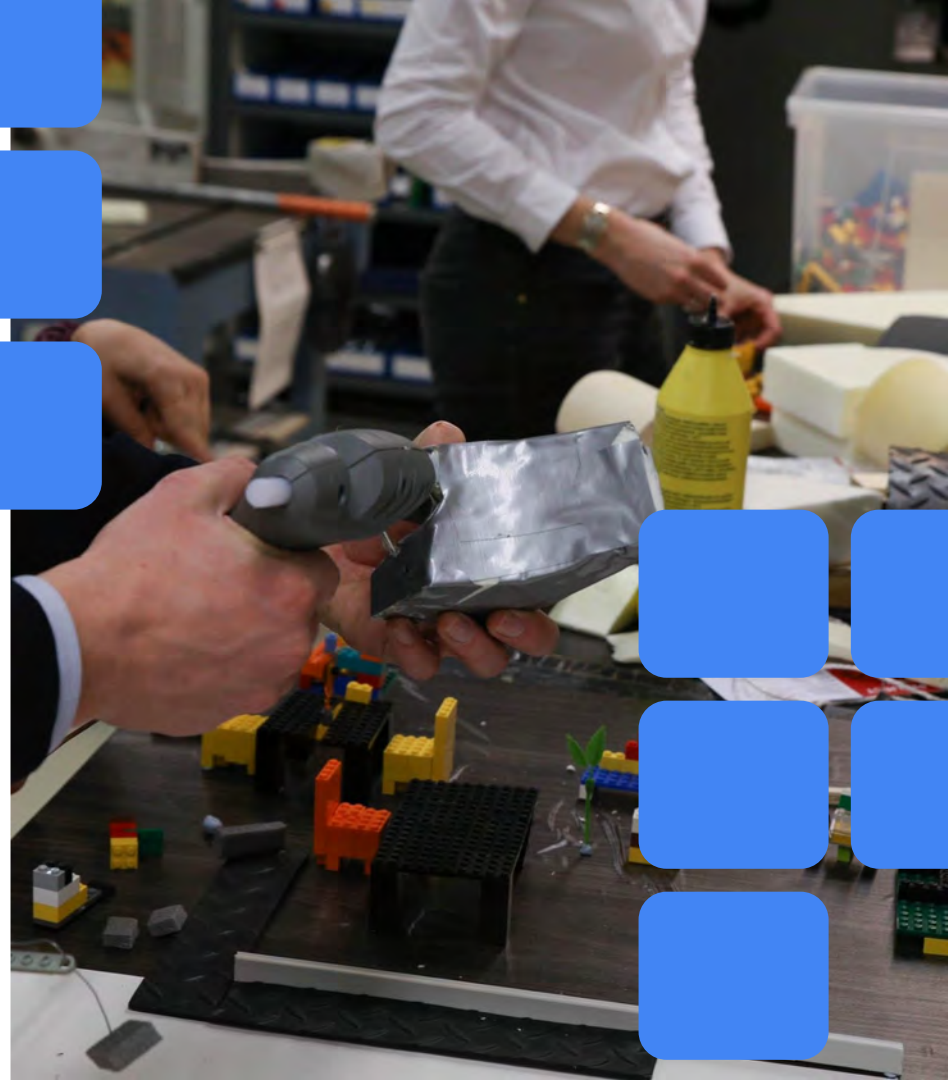
How it was supported



What the customer really needed

Prototype / experiment for...

- Feedback
- Clarification of the problem
- Creating (shared) understanding
- Co-creation
- Understanding things that do not exist



Rough (or low-fidelity) prototyping

PROS

- Quick and inexpensive
- Possible to make instant changes and test new iterations
- Disposable/throw-away
- Overall view of the product with minimal time and effort, as opposed to focusing on the finer details over the course of slow, incremental changes.
- Available to all regardless of ability and experience
- Helps avoid users being inclined to focus and comment on superficial characteristics, as opposed to the content
- Encourages and fosters design thinking approach with taking fast action and iterating

CONS

- Lack of realism due to the basic and sketchy nature of low-fi prototypes
- Often remove control from the user, as interaction is often basic or imagined



Range of immersion



Storyboard



Desktop
walkthrough



Cardboard
prototype



Paper
prototype



Service
staging



Wizard of
Oz



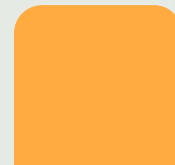
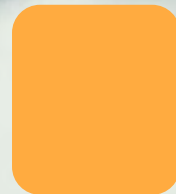
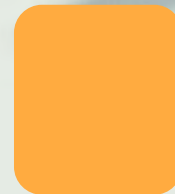
What can we learn, and how? What should we learn?

Ideas have many testable components. You need to choose which are the most important learnings and which components to test for those.

- Identify key elements of your idea; what needs to be tested, what are the most important questions to answer?
- Choose which questions you focus on first. What kind of prototype is the most useful to answer these questions?
- Focus on learning, not getting it right immediately.

ACTIVIT

Coffee break





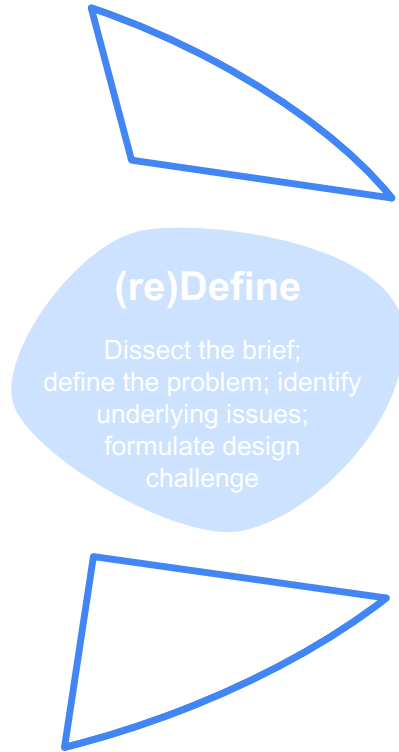
HOUR 4

EVALUATION & PROTOTYPING

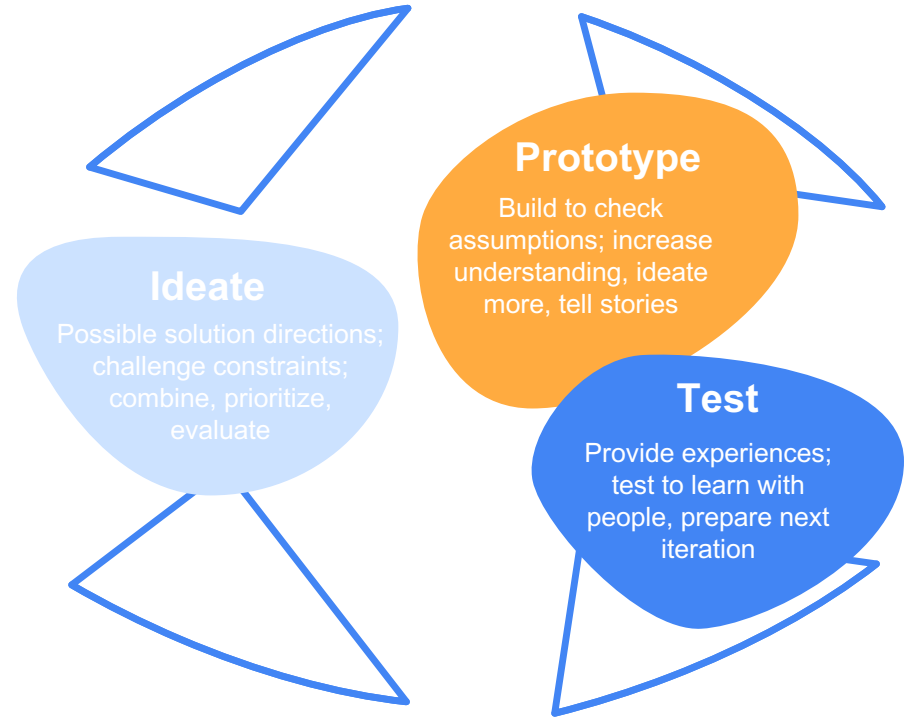
HOUR ONE



HOUR TWO



HOUR THREE & FOUR



Prototype and test with purpose

Planning the experiment

1. What is our riskiest assumption?
2. What do we need to learn?
3. How can we measure our learning? What is the key metric?
4. What kind of experiment enables this? – What, who, when, where?
5. What is our success criteria for the experiment?

Conducting the experiment

Build, measure, learn

Reflecting on the experiment

1. What did we learn from the experiment?
2. What new questions did we discover?
3. What did the experiment reveal about our assumptions?
4. How can we develop the idea further?
5. What should we do/test next?

A workshop table covered with a dark green cloth, cluttered with various craft supplies including a blue bowl, a green bowl, a pink paper, a small green dinosaur figurine, and several colorful pom-poms. In the background, people are seated at tables, engaged in activities. The scene is brightly lit and colorful. The text 'TEAM TASKS' is overlaid in large white letters on the left side of the image.

TEAM TASKS

R1

Let's make to learn!

From the testable elements you identifies, pick 1 as a team to test.

- Pick 1 testable component.
- Using any of the material available create a prototype to show and text the element. Get creative! How can you simulate an interaction? How can you show a function?
- Work as a team and be mindful of time! You will only have a few minutes...

ACTIVIT

R1

Let's make to learn!

TEST!

- Swop 2 member with another team.
- Walk them through your prototype, ask them to engage with it.
- Get feedback on **what is** and **isn't clear**.

ACTIVIT

R2

Let's make to learn!

Reflect on what you found out.

- As a team talk through the user interaction with the prototype.
- What was their feedback?
- Update your prototype to leverage the insights that were shared.
- You will again, only have a few minutes....

ACTIVITY

R2

Let's make to learn!

TEST!

- Swop members with the same team you shared your prototype with in the last round BUT make sure the individuals who stayed behind in the last round, now move to the other group.
- Walk them through your prototype, ask them to engage with it.
- Ask them what could make the prototype **more meaningful for them.**

ACTIVIT



**TEAM IDEA
SHARING**

Let's share our ideas

- Sometimes, simple is the best way to share insights. It also implies that we fully understand the problem or concept we are exploring.
- Think about your original challenge question and your final idea.
- Create a short explanation of both **that a 10 year old will understand.**
- Let's share our statements.

ACTIVIT

A decorative graphic on the left side of the slide consisting of several blue rounded squares of varying sizes and arrangements. There is one square at the top left, a vertical column of four squares below it, and a second vertical column of three squares to the right of the first column.

Group wrap up. Why does this matter?

- Innovation in teams.
- Building resilience and adaptability.
- Pushing for novelty.
- Complexity of today's challenges.
- Future skills

THANK YOU

&

**Stay
Weird!**

