Design Thinking
CERN Winter School

Dr. Julia Bauer

Vienna, November 21 & 22

Hello!

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Business Ideation

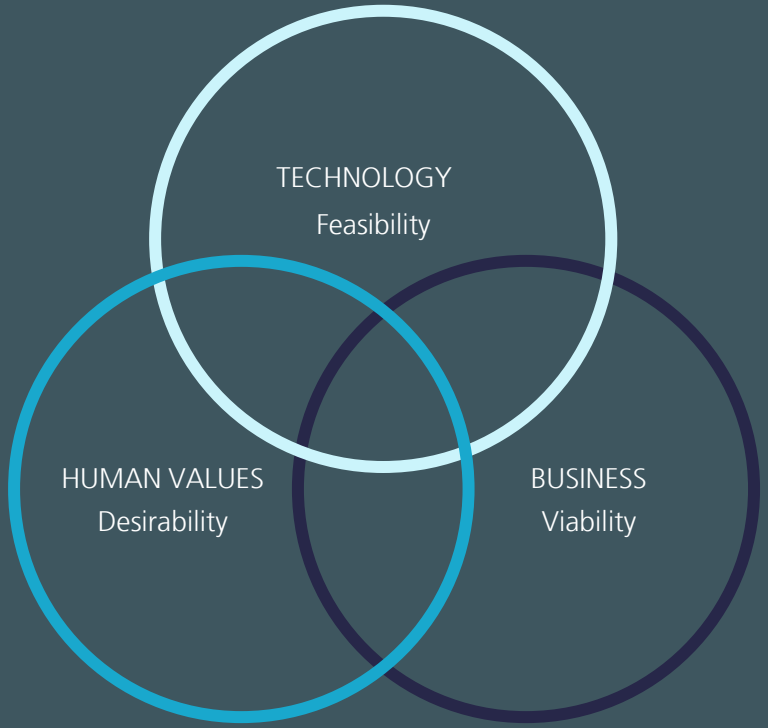
OBJECTIVE OF THE WORKSHOP

Get to know a new, human-centered approach of **solving problems**

Experience **one design thinking cycle** in order to create new, innovative solutions

Develop **visualizations** of potential solutions

Have **fun** ☺



AGENDA

Nov. 21, 2017

9:00am

Welcome and introduction

Team building
Gain a common understanding of underlying topic

User research and interview preparation

Around 12:30
LUNCH

Conduct interview

Define
Story share-and-capture
Clustering
Nuggeting
Persona
Point-of-View & HMW

Ideation
Develop innovative solutions and select one

05:00pm

Human Bingo

DESIGN THINKING???

Design Thinking

THREE MAIN ELEMENTS

MULTIDISCIPLINARY TEAM

ITERATIVE PROCESS

FLEXIBLE ROOM

OUR WAY OF WORKING

Post-its

OUR WAY OF WORKING

Time boxing

OUR WAY OF WORKING

Be curious!

OUR WAY OF WORKING

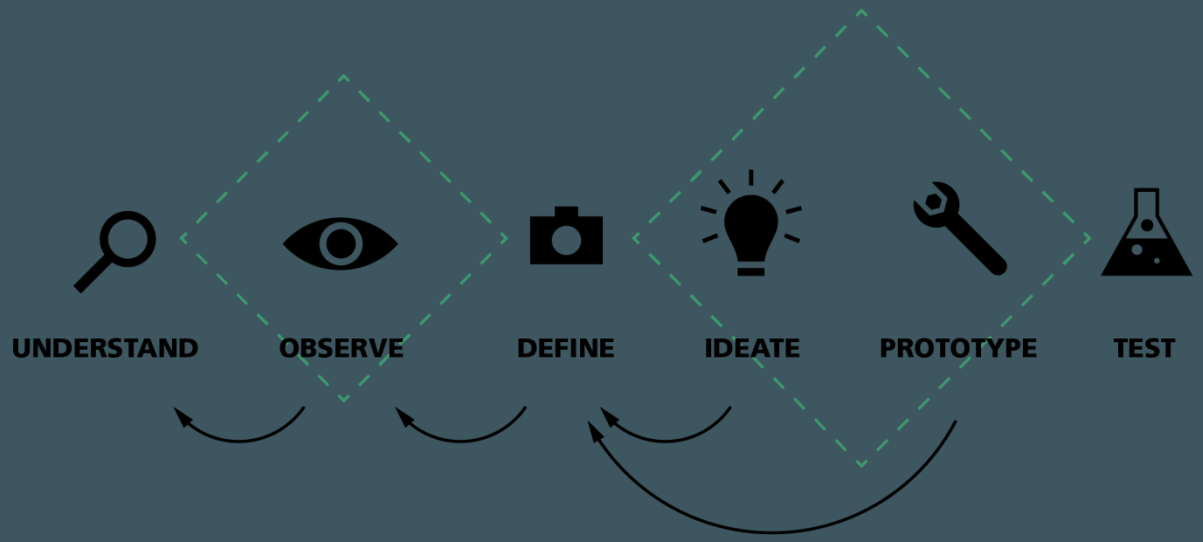
Be a team player!

OUR WAY OF WORKING

Think user-centric!

Design Thinking

Experience a different way of solving problems



Understand problems

Create solutions

UNDERSTAND

Get a **common understanding** within your team.

OBSERVE

Develop **empathy** for your user.

DEFINE

Synthesize the **key insights** of your research.

IDEATE

Develop as many ideas as possible.

PROTOTYPE

Make your idea tangible.

TEST

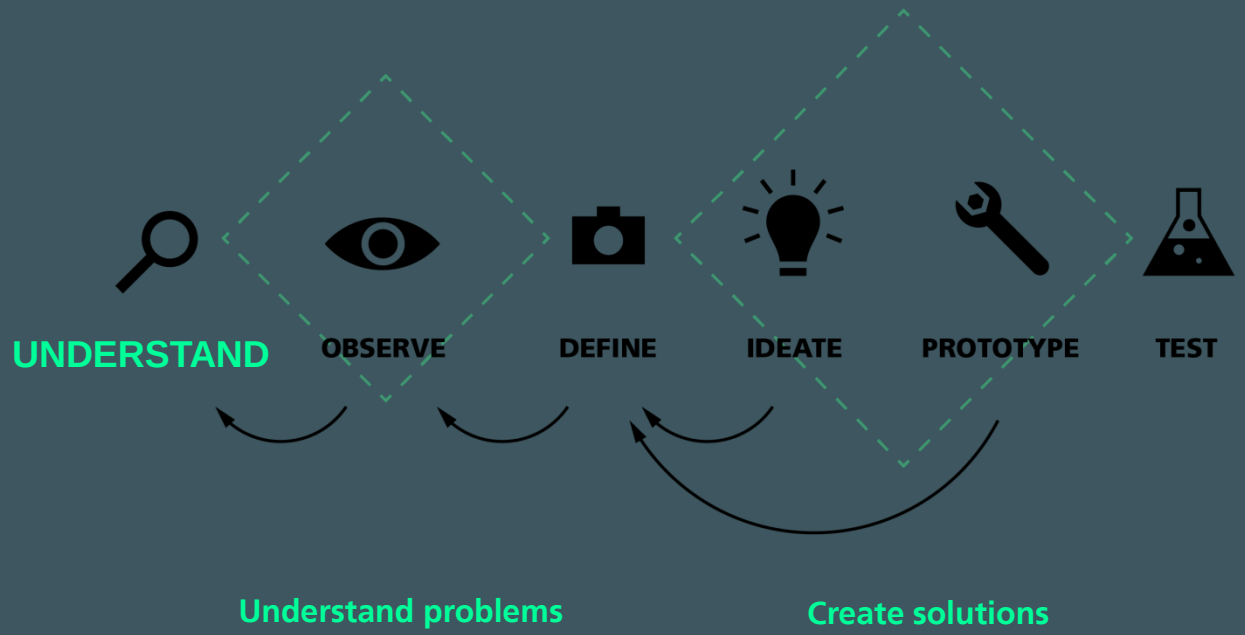
Test your prototype
with your user.

TEAMBUILDING

Heterogeneity first!

Design Thinking

Experience a different way of solving problems



UNDERSTAND

Gain a common understanding

Getting all team members on the same page about the underlying topic

OUR DESIGN CHALLENGE:

Redesign the WU campus studying experience

Let’s start DOING!

Discuss your **studying experience**:

- What did you like, what did you not like when you were a master student? Name concrete examples and state emotions.
- Did you study at a campus? Good experiences? Bad experiences? Why?
- When was the last time you had a very positive studying experience? What was it? Negative?

Stakeholder map

- Who is involved in creating a studying experience?
- Who is having a studying experience?
- Who is making decisions?
- Who has further influence on this topic?

Put all different stakeholders that are involved on post-its.

Exploration of different directions

- What topics in relation to the “WU campus studying experience” do you find most interesting?
- When you think further: in which directions do they lead you?
- Which direction has the potential to lead to new solutions?

Select one vague direction you further want to explore within your team and write it down.

Time for coffee!

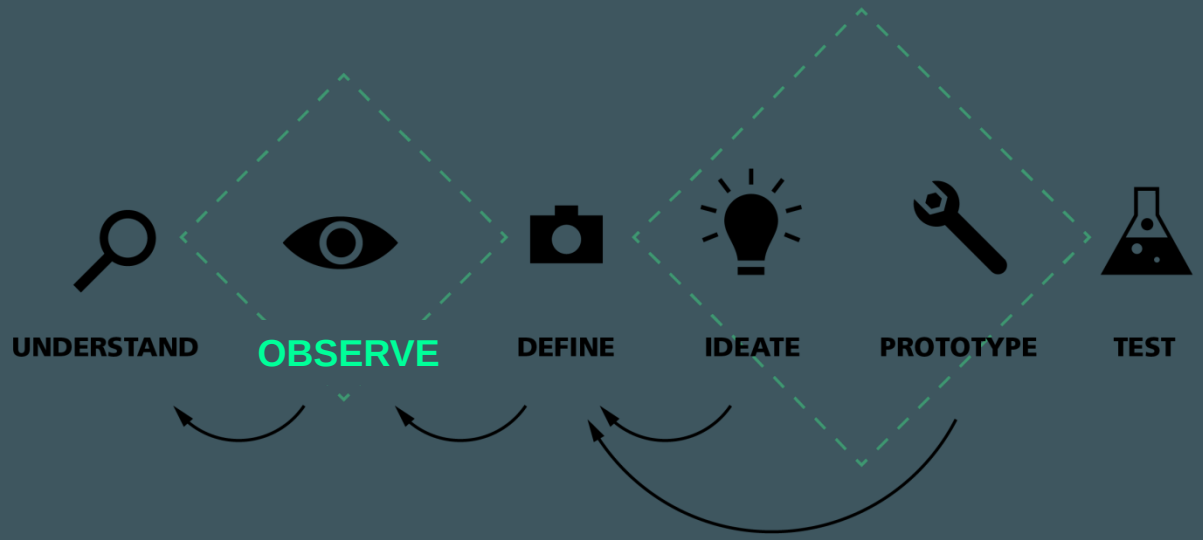
10 minutes

User Research

Learning about the needs of different stakeholders

Design Thinking

Experience a different way of solving problems



Understand problems

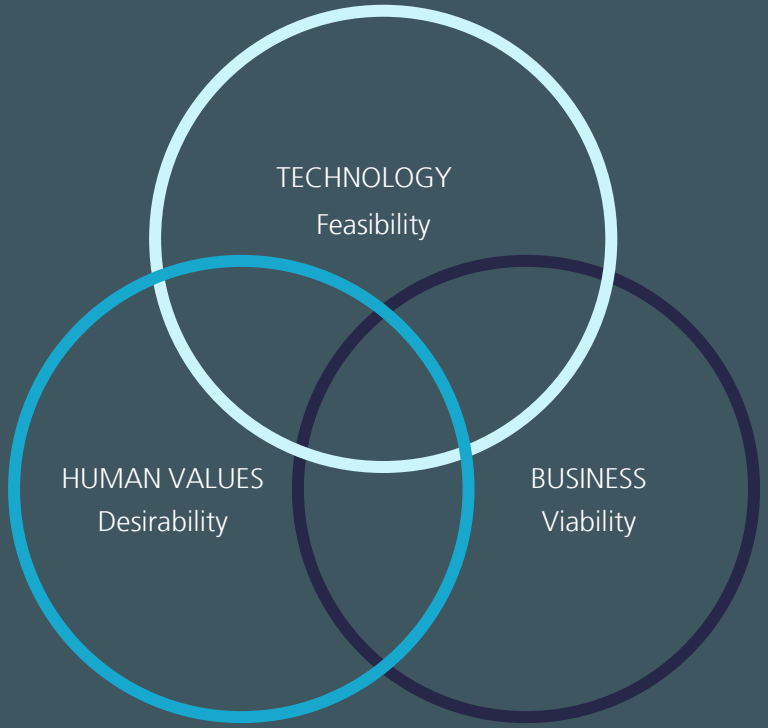
Create solutions

WHY
USER RESEARCH?

Develop something **meaningful**!

Further understand the **problem space,** meaning the underlying needs, motivations, pains of actual people

Iterative process between **tech and market development**



You need to get the right information! It’s about what people do, not what they say they do!

- Observation
- User Interviews
- Self-Immersion
- Analogies

HOW do we discover the underlying problems?

Workarounds

Stories (quotations!)

Hidden messages (body language!)

Things that move people

Contradictions, tensions (do they really exist?)

Surprises

“Pain”…you should feel it too!

WHAT are we looking for?

Non-Users: Consciously refrain from using a product or service

Extreme Users:

- Have special needs that other users might have later on
- Build workarounds to solve their problems

With WHOM do we want to speak?

Non-users vs. Extreme users

Research Plan

About what aspects do you want to learn more?

WHO? From whom do you want to learn?
Go back to your stakeholder map: where do you find the people? Are there extreme places or extreme users?

WHERE? Where do you want to go for interviewing?
Where do you want to observe?

User Interview

How to conduct a qualitative user interview

1. Talk about the life of your interview partner, NOT about your idea!

2. 95% listening, 5% talking!

3. Ask for specific events in the past!

- Ask why.
- Never ask for “usual” situations: ask about a specific instance (“the best”, “the worst experience”…)
- Look for stories!
- Look for inconsistencies.
- Pay attention to body language.
- Don’t be afraid of silence.
- Don’t suggest answers to your questions.
- Don’t ask leading questions. Don’t ask binary questions. Ask OPEN questions.
- Take notes! Capture everything you hear or see.

HOW do you ask in order to get the information you are looking for?

Example: The website is down.

- **why** was the website down? The CPU utilization on all our front-end servers went to 100%
- **why** did the CPU usage spike? A new bit of code contained an infinite loop!
- **why** did that code get written? So-and-so made a mistake
- **why** did his mistake get checked in? He didn't write a unit test for the feature
- **why** didn't he write a unit test? He's a new employee, and he was not properly trained in Test Drive Development

5 Whys – Example from Eric Ries

Assign roles for your interview

- Who is the lead interviewer?
- Who is taking notes?
- Who takes care of body language?

Develop an interview guideline

WHAT do you want to learn more about? What questions do you want to ask?

Brainstorm questions in your team and group questions to thematic clusters. Get them in a natural flow.

Hint:
Questions should only be the starting point of a conversation. They should not lead the conversation.

PRACTICE

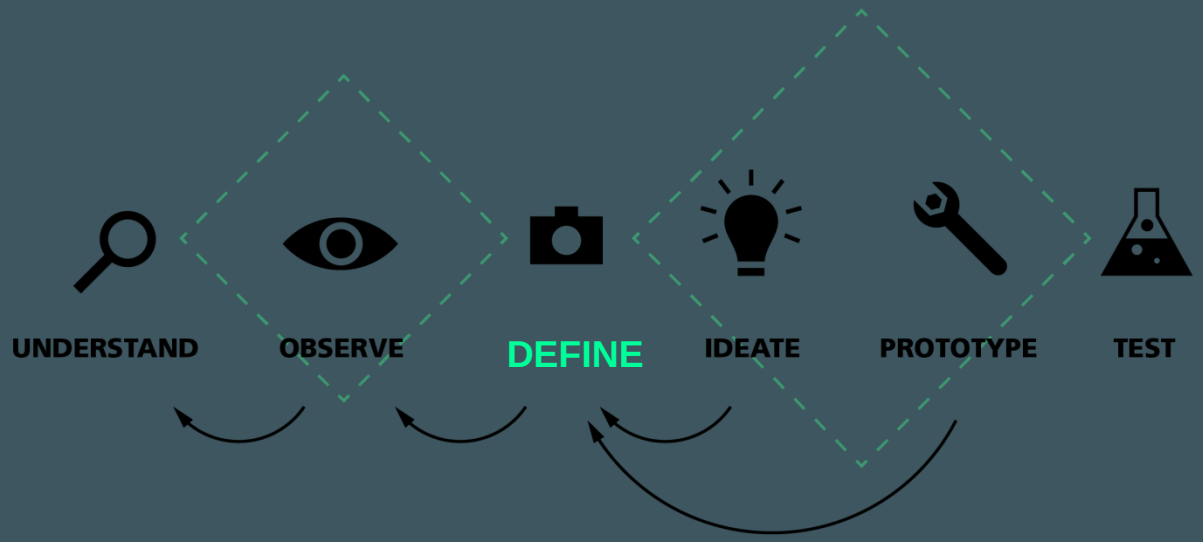
An exemplary interview

DEFINE

Synthesizing the main learnings from user research

Design Thinking

Experience a different way of solving problems



Understand problems

Create solutions

Story – Share and Capture

Who did you meet? What impression did you get? What did you find surprising?

Tell the others everything you heard from the people you were talking to. Collect all quotes, impressions, learnings and surprises on post-its.

The others dig deeper: did the person only say it but didn’t mean it? What body language was interesting?

Clustering – Saturate and group

Cluster your results.
Do you find similarities in your data? Things that more than one person said or meant?

Do you find patterns?

Nuggeting – Select the “golden” nuggets

What aspects do you find interesting to explore further?
What did you find really surprising?
Everyone picks his / her nugget, the aspect you find most interesting – it can be the same for more than one person.

Then think about the WHY in the group. What lies behind the quote? Please interpret. Put your thoughts around the selected nuggets on post-its.

Persona

Create a persona where you synthesize what you learnt from user research.

Who is the person you want to create a solution for? Who has a very interesting need you want to develop solutions for?

Persona

Interests, hobbies

Needs, expectations, wishes, objectives

Name
Age

Profession

Living conditions, social environment

Personality

Point-of-view statement
User + need + insight

f.ex.
PoV-statement: “I am seven-years-old and I hate doing homework because it takes me forever to finish.“

PoV-statement: “I am a college student and I hate folding laundry because I can’t seem to fold it the right way.“

Point-of-view and “How might we…”
User + need + insight

f.ex.
PoV-statement: “I am seven-years-old and I hate doing homework because it takes me forever to finish.“
HMW-question: “How might we create a way for students to do their homework more efficiently?

PoV-statement: “I am a college student and I hate folding laundry because I can’t seem to fold it the right way.”
HMW-question: “How might we help college students fold laundry properly?”

Some tips for the HMW-questions

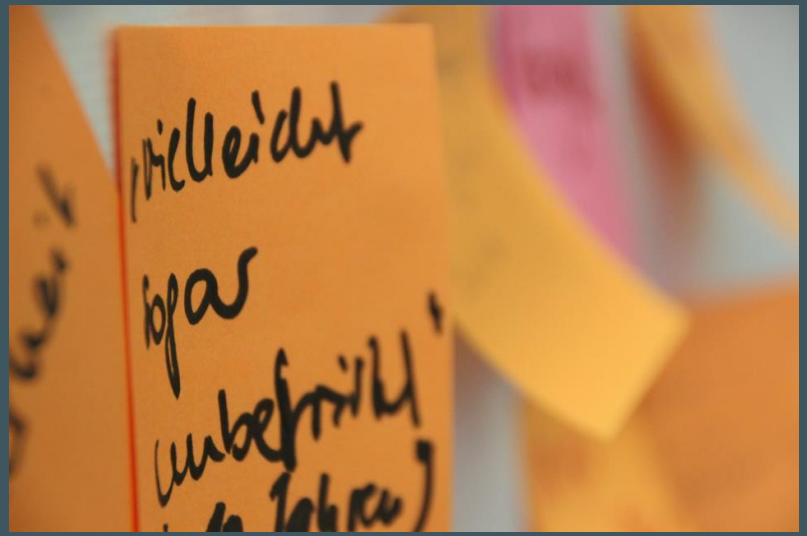
- Do not suggest a particular solution
- You have the chance to answer it in a variety of ways (not too narrow, but also not too broad)
- Is user-centric
- Optimistically (Problem → Opportunity!)
- Viable

Point-of-view statement and HMW-question

Formulate a PoV-statement in your team that you find interesting to create solutions for.

Then reformulate the statement into a viable HMW-question. Write it down.

IDEATE

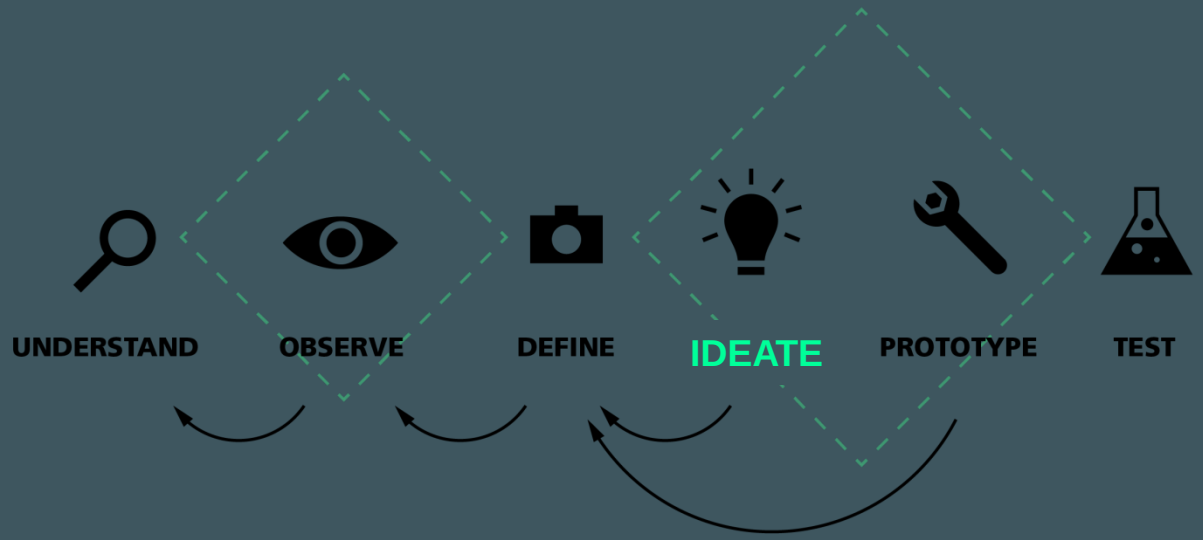


IDEATION

Generate as many (crazy) ideas as possible

Design Thinking

Experience a different way of solving problems



Understand problems

Create solutions

Go for quantity.

Defer judgement.

Go for wild ideas.

Be visual.

Stay focused on the topic.

Build on the ideas of others.

One conversation at a time.

Everyone and every idea is valuable.

Brainstorming

Silent Brainstorming

Brainstorming with the team

How would X solve the problem?

Cluster ideas

Can you find similarities between the ideas?
Cluster your ideas into topics.

Then select one idea:

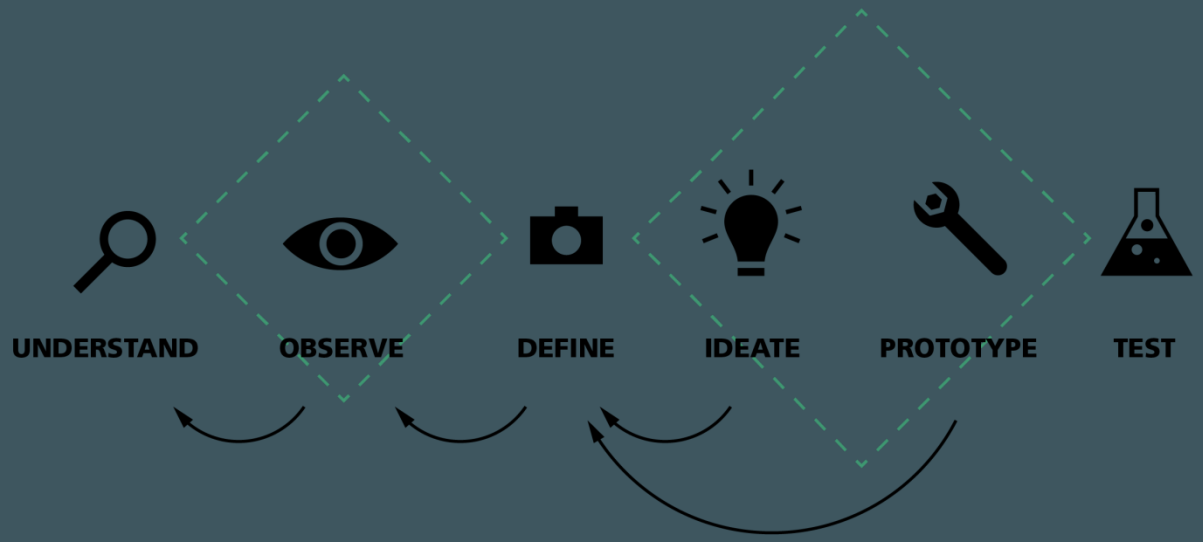
Which idea do you further want to explore?
Which idea do you find the most promising?
Which idea solves the user need the most?

REFLECTION

Take-aways from day 1

Design Thinking

Experience a different way of solving problems



Understand problems

Create solutions

TEAM CHECKOUT

I like – I wish

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Design Thinking

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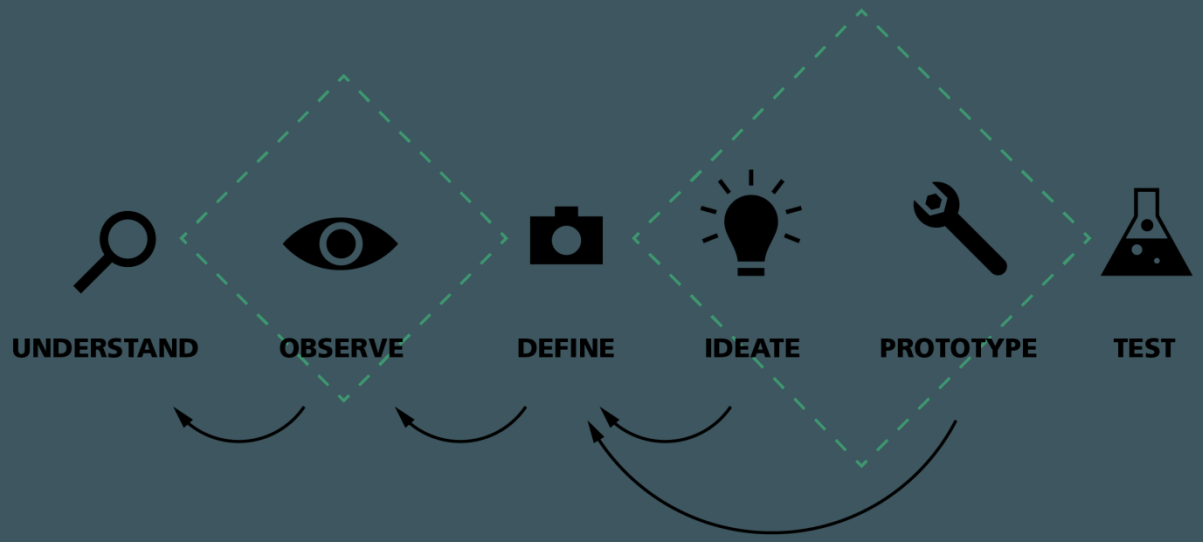


Understand problems

Create solutions

AGENDA

Nov. 22, 2017

9:00 am

12:00 noon

Welcome back

News of the future
Present the future press release of the idea

Prototype
Create the first prototype

Testing
Get feedback for your prototyye

Iterate

NEWS OF THE FUTURE

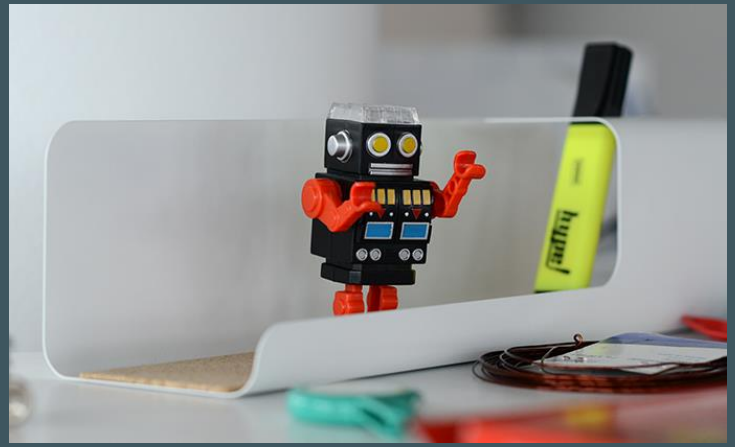
How does the press release look like when your idea is introduced in the year 2020?

Image

Headline

Intro

PROTOTYPE

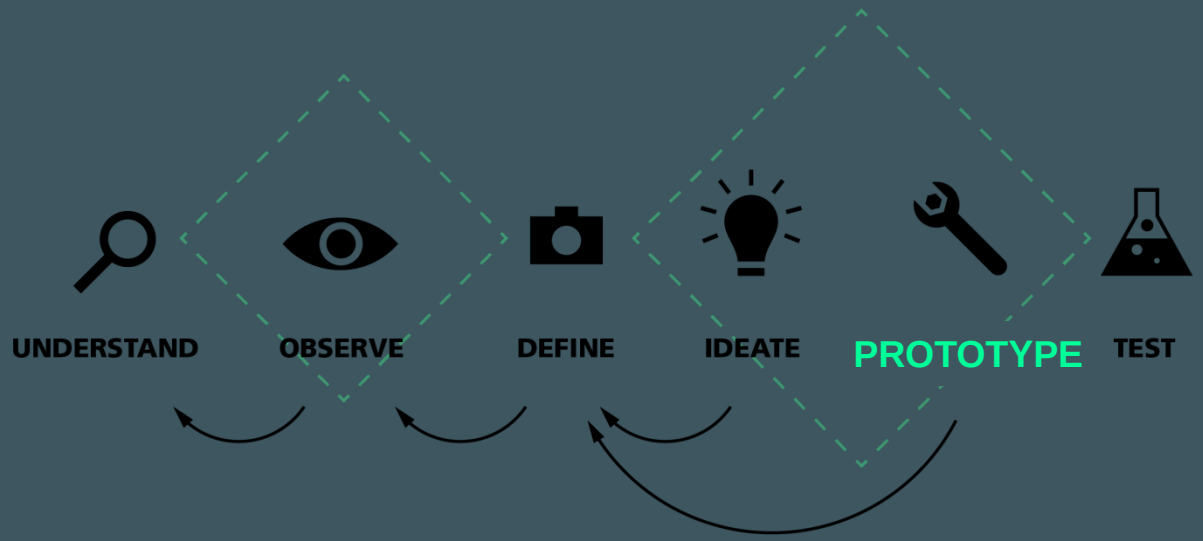


Prototyping

Bring your ideas to life!

Design Thinking

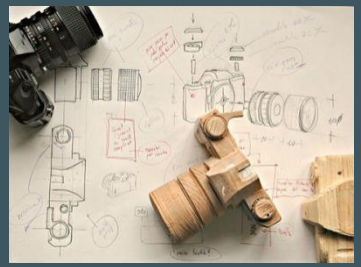
Experience a different way of solving problems



Understand problems

Create solutions

WHY PROTOTYPING?



BRING YOUR IDEAS
TO LIFE

IDENTIFY PROBLEMS
AND RISKS
THROUGH TESTING

LEARN MORE
ABOUT YOUR USERS

WHAT IS A PROTOTYPE?

A prototype is a **draft version of a product** that allows you to explore your ideas and test your concept with users before investing time and money into development.

An ideal prototype is

- rough and unfinished
- quickly produced
- tangible

TYPES OF PROTOTYPING

High

Fidelity

Low

The **fidelity** of the prototype refers to the **level of details and functionality** built into a prototype.

WE DIFFER BETWEEN LOW- AND HIGH-FIDELITY PROTOTYPES

High

Fidelity

Low

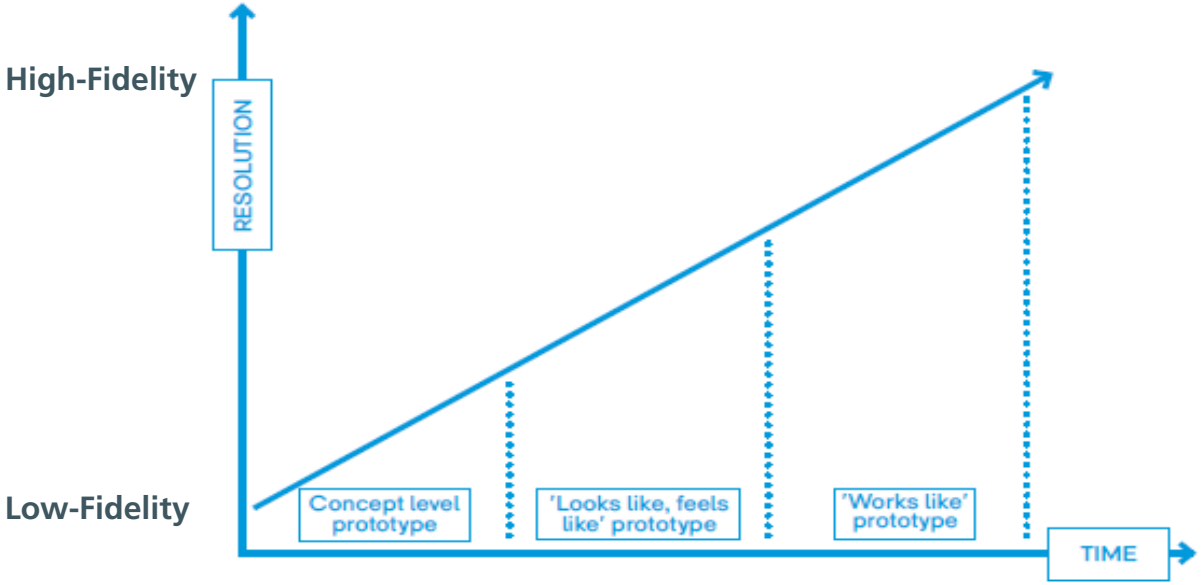
HIGH FIDELITY PROTOTYPES

- Closer to the final product
- More time and cost-intensive
- More visually appealing

LOW FIDELITY PROTOTYPES

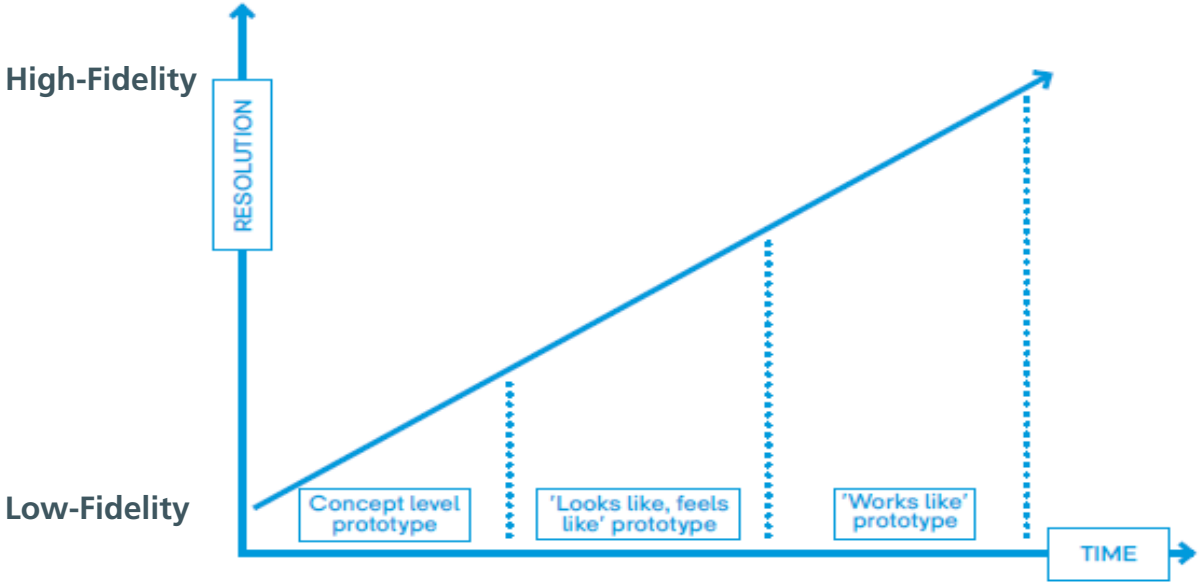
- Rough
- Quick and inexpensive
- Possible to make instant changes
- Disposible

HOW DOES A PROTOTYPE EVOLVE OVER TIME?



Source: IDEO

PROTOTYPE EXAMPLES ALONG THE PROCESS



- Paper prototype
- Role plays
- Wireframes
- Storytelling
- Sketches …

- Interactive prototypes
- Storyboards
- Simulations …

- Mock ups
- Minimum viable product (MVP)

…

Source: IDEO

GUIDELINES FOR PROTOTYPING

- Remember what you are prototyping for
- Just start building
- Don’t spend too much time
- Keep the user in mind

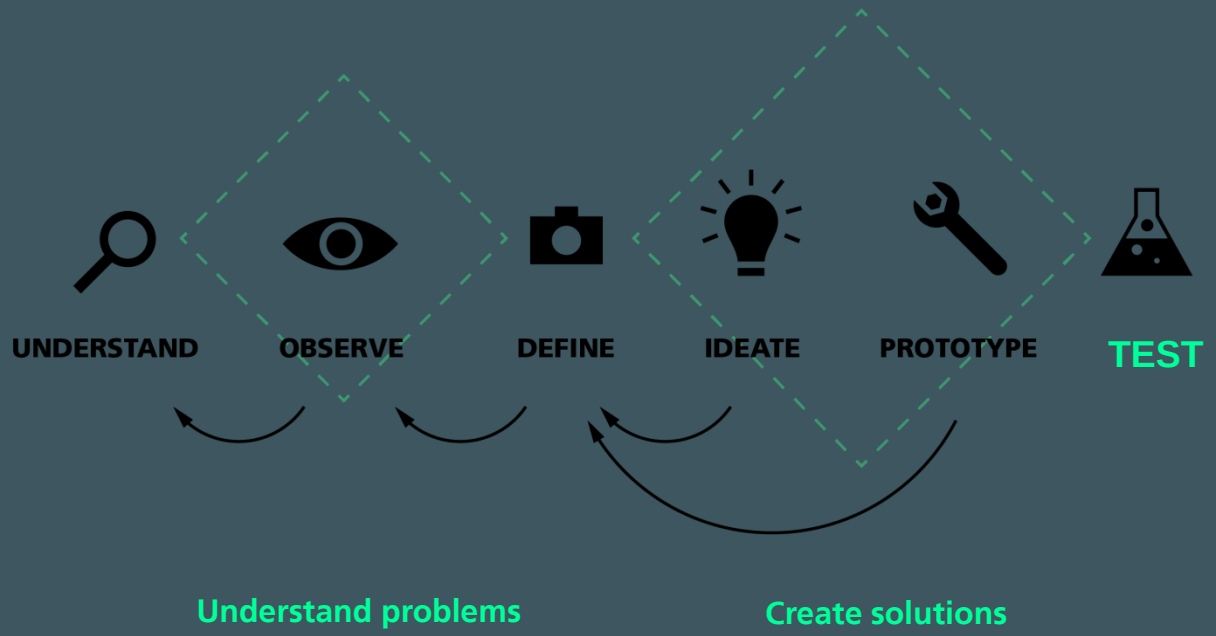
TEST

Testing

“Fail early and often”

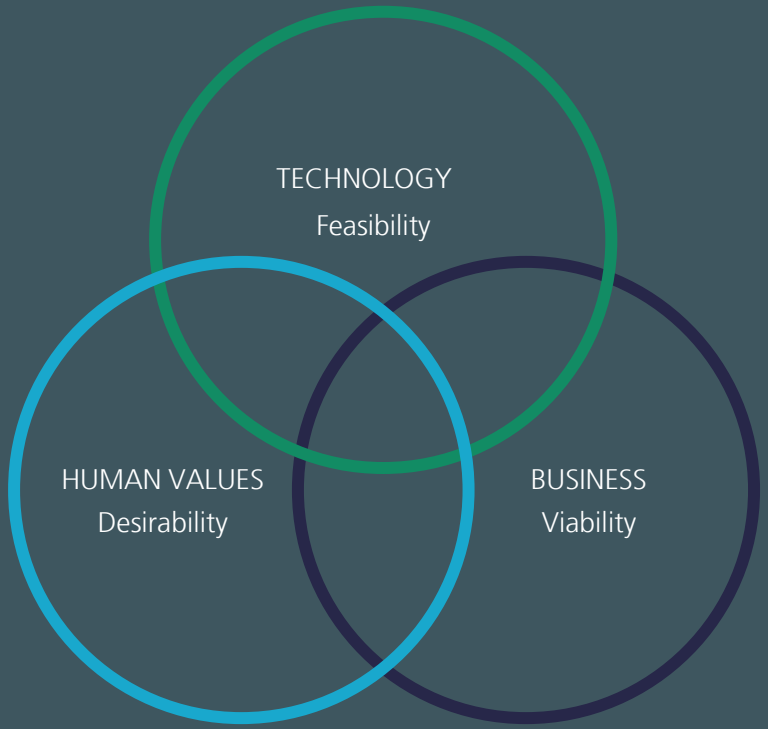
Design Thinking

Experience a different way of solving problems



TESTING

The goal of a Design Thinking project is to design a solution that is desirable, feasible and viable.



WHY TESTING?

REFINE A PROTOTYPE

SPARK NEW IDEAS

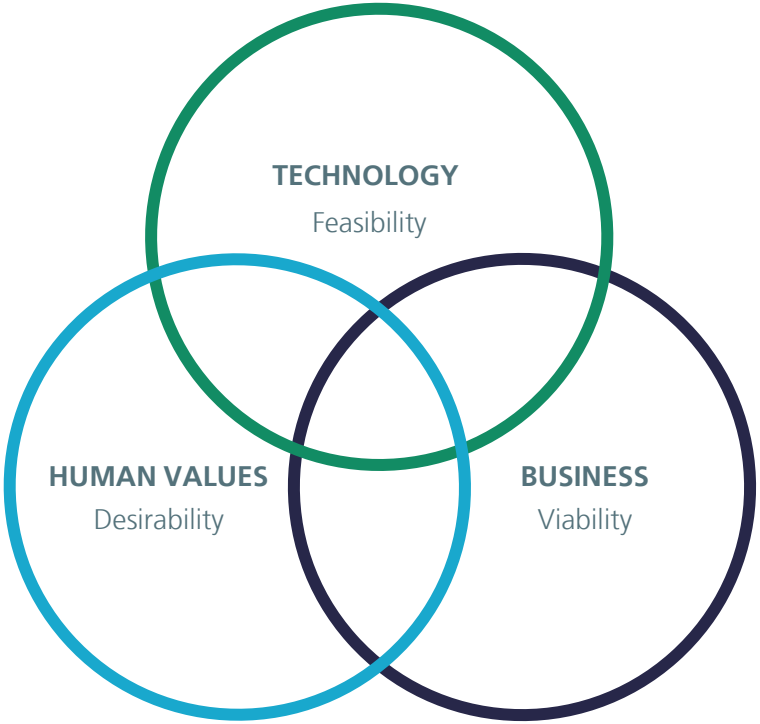
REDEFINE A PROBLEM

TESTING GOALS

Testing helps you to move from:

- Opportunities to use cases
- User needs to product offerings
- Concept level to feature level

1. DECIDE WHAT TO TEST
2. WHO ARE YOUR TEST USERS?
3. HOW CAN YOU TEST?



GUIDELINES FOR TESTING

- Dry run prior to testing
- Observe user behavior
- Listen to user feedback
- Test one user at a time

TESTING

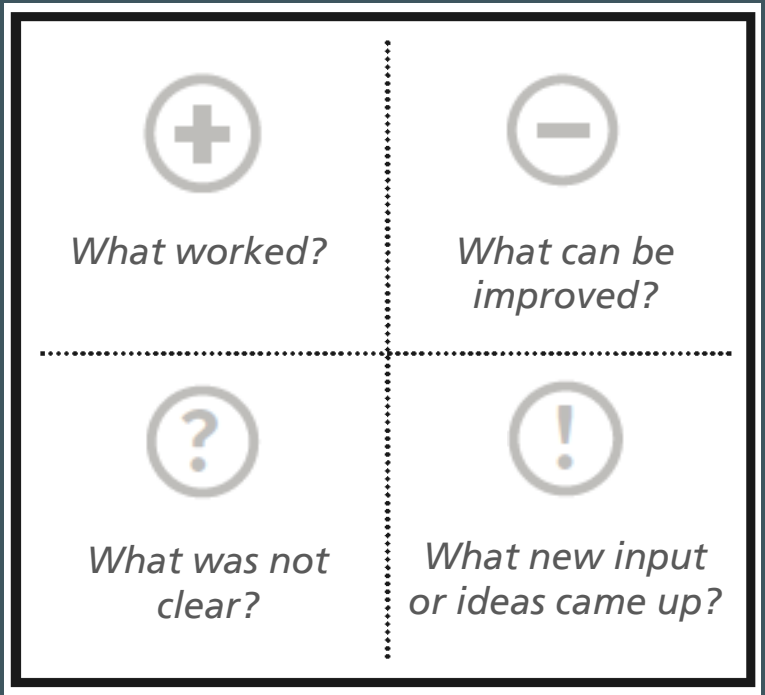
Decide what and how to test (f.ex. develop questions)

Prepare and organize testing

TESTING

Test with another group.

Collect feedback and observe how they interact with your prototype



Show, don’t tell!

ITERATE your prototype

PREPARE your pitch

TIME TO PRESENT YOUR PROTOTYPES & FEEDBACK

REFLECTION

Take-aways

It was a pleasure to work with you!

DR. JULIA BAUER

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