Design Thinking
CERN Winter School

Dr. Julia Bauer
Hello!
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
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 → OBSERVE → DEFINE → IDEATE → PROTOTYPE → TEST

Understand problems

Create solutions
UNDERSTAND
Get a common understanding within your team.
OBSERVE

Develop empathy for your user.
Synthesize the **key insights** of your research.
IDEATE
Develop as many ideas as possible.
Test your prototype with your user.
TEAMBUILDING
Heterogeneity first!
Design Thinking

Experience a different way of solving problems

UNDERSTAND

Understand problems

OBSERVE

DEFINE

IDEATE

PROTOTYPE

TEST

Create solutions
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!
User Research

Learning about the needs of different stakeholders
Design Thinking

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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?
WHAT are we looking for?

Workarounds
Stories (quotations!)
Hidden messages (body language!)
Things that move people
Contradictions, tensions (do they really exist?)
Surprises
“Pain” …you should feel it too!
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.
Be curious!

An exemplary interview
DEFINE

Synthesizing the main learnings from user research
Design Thinking

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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?
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 \(\rightarrow\) Opportunity!)

• Viable
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.
IDEATION

Generate as many (crazy) ideas as possible
Design Thinking

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UNDERSTAND

OBSERVE

DEFINE

IDEATE

PROTOTYPE

TEST

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.
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

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Understand problems

Create solutions
TEAM CHECKOUT

I like – I wish
Design Thinking
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Design Thinking

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Understand problems  Create solutions
AGENDA

Nov. 22, 2017

Welcome back

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

Prototype
Create the first prototype

Testing
Get feedback for your prototype

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

Bring your ideas to life!
Design Thinking

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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
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 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
• Disposable
HOW DOES A PROTOTYPE EVOLVE OVER TIME?

Low-Fidelity

High-Fidelity

- Concept level prototype
- 'Looks like, feels like' prototype
- 'Works like' prototype

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
- Don’t spend too much time
- Just start building
- Keep the user in mind
Testing

“Fail early and often”
Design Thinking

Experience a different way of solving problems

UNDERSTAND  OBSERVE  DEFINE  IDEATE  PROTOTYPE  TEST

Understand problems  Create solutions
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 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
- Listen to user feedback
- Observe user behavior
- 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
It was a **pleasure** to work with you!

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