DESIGN THINKING
WORKSHOP
design thinking

is about applying the typical design cycle to new domains. The design cycle moves from (user centered) research to creative thinking to prototyping to testing and implementing or indeed going back to the beginning of the design cycle to start again.
design thinking

- Human-centered
- Creative
- Team-oriented
- Iterative
- Proven and well researched

Why should I use design thinking?
What is design thinking?

Schweitzer, Groeger, & Sobol, 2015
What is design thinking?

- Personas
- Interviewing
- Observation
- Role-playing
- Immersion
- Do, Say, Think, Feel
Let’s try it out!
What is the problem?

Write

Sketch
What is the problem?

Write

Did you include the person or people for whom you’re designing in the problem statement?

Sketch

Did you immediately start thinking about potential solutions?
1. **Empathy**: Learning about the audience for whom you are designing.

2. **Define**: Redefining and focusing your question based on your insights from the empathy stage.

3. **Ideate**: Brainstorming and coming up with creative solutions.

4. **Prototype**: Building a representation of one or more of your ideas to show to others.

5. **Test**: Returning to your original user group and testing your ideas for feedback.
Focus

FLARE!

Empathize

Define

Ideate

Prototype

Test
**Goals:**
1. Learn about users and their contexts
2. Engage users in the process to build trust
3. Develop insights that inform problem definition and other project aspects

**Processes/Tools:**
1. Interviews, observation, immersion, simulation
2. Do, say, think, feel
3. Personas

**Mindsets**
- Empathetic
- Inquisitive
- Critical
- Make a difference

Empathize
empathy: what?

Affective
- Empathic distress
- Empathic concern/joy

Projection
- Perspective-taking

Cognitive

Self

Other

Action

• Users
• Clients
• Operators
• Indirect stakeholders
empathy: understanding users in context

I see a robot. He says no. Maybe I’m biased.

That’s interesting. What can we learn from him?

If we ask questions and get to know the world from his perspective, I’m sure we can make a difference.

I’m not a robot!

Empathetic
# Building a persona

- Identify a target user, client, or other stakeholder
- **Whose needs are most important to consider in your project?**
- A persona typically represents a composite of your users, but can refer to a single user
- Fill out the template as best you can. It’s okay if you don’t know something, you can learn this later (e.g., through interviewing the stakeholder).

<table>
<thead>
<tr>
<th>Demographic?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, gender, ethnicity, education, living situation, family, etc.</td>
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<table>
<thead>
<tr>
<th>Hobbies &amp; interests?</th>
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<tbody>
<tr>
<td>Weekend activities, jobs on the side, collections, etc.</td>
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<table>
<thead>
<tr>
<th>Work motivations?</th>
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</thead>
<tbody>
<tr>
<td>Money, family, child support, husband/wife unemployed, loves job, knows owner, etc.</td>
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<table>
<thead>
<tr>
<th>Personality &amp; emotions?</th>
</tr>
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<tbody>
<tr>
<td>Cheerful, shy, boastful, reserved, content, energetic, passionate, pessimistic, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Values?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family time, being outdoors, expensive things, relationships, religion, etc.</td>
</tr>
</tbody>
</table>
Goals:
1. Identify key user needs and core issues
2. Focus your engineering work on a specific target
3. Reframe the problem to reflect new knowledge, information, and perspectives

Processes/Tools:
1. Abstraction laddering
2. Point of view statements

Mindsets
Inquisitive   Critical   Make a difference   Empathetic
A 10-year old girl who just moved into a new house. She needs a way to play and explore in her new home. While she likes to read, she enjoys the adventurous aspect of reaching books on the higher shelves as she becomes accustomed to her new home (surprising finding rooted in empathy work).

User
- girl

Need
- book, lower shelves, a safety device, etc.

Insight
- she commonly reaches for books on high shelves without paying much attention to balance.
needs...

are human physical and emotional necessities

capture the goals and motivations of the person for whom you are designing (which may be different than you initially think)

are verbs, not nouns (opportunities, not solutions: ladder vs to reach)
What does your user need?

__________ needs (a way) to ___________ because ___________.

Insert your user’s name

For example... meet a goal, perform some activity, alleviate a challenge, etc.

What insight(s) about the user from your research and discussions helped you identify the need?

How is this different than your initial problem statement?

Side note: As you move forward, you can work to convert your user’s needs into design specs
Abstraction laddering

1. Start with a needs statement
2. Ask ‘why’ questions to identify deeper, broader problems
3. Ask ‘how’ questions to identify more specific issues to address
4. Build a ‘ladder’ with as many problems as you can identify (ideally with users)
5. Select a problem to address

Try it out with half of your team acting as users (as defined in the personas you’ve created)!
Goals:
1. Generate a lot of (crazy) ideas
2. Defer judgment
3. Engage everyone in the process

Processes/Tools:
1. Brainwriting
2. C-sketch
3. Creative matrix
4. And many more!

Mindsets
Consciously creative  Risk tolerant  Collaborative  Experiential
„The best way to get a good idea is to get a lot of ideas“

Linus Pauling, Nobel Price winner for Chemistry (1954) and Peace (1963)
ideate: how?

- Defer judgement
- Go for volume
- One conversation at a time
- Be visual
- Headline
  - Build on the ideas of others
  - Stay on topic
  - Encourage wild ideas
Quick Sketching Tips

- Use bold strokes
- Combine basic shapes
- Make & reuse icons
- Use arrows as verbs
- Add text annotations
- Try some special effects
### Creative Matrix

#### Categories related to people

- **Outdoor Enthusiasts**
- **Business Commuters**

#### Categories for enabling solutions

- **Social Media**
- **Wearable/Mobile Tech**
- **Wildcard**

#### New products and services for luggage systems

1. Identify your users and others who will interact with your design.
2. Identify potential categories, approaches to your solutions.
3. Generate many ideas and place them on the grid.
4. Update the grid as needed.

**NOTE:** If you’re having trouble getting started, identify a few ideas and generate the categories from there.
Importance/Difficulty Matrix

- Place ideas on the graph based on the importance of problems they address and the difficulty you will have developing and implementing them.
- Combine or synthesize ideas that fit together.
- Add new ideas if they come up.

Ideally, you’ll find an idea of high importance and low difficulty.
Goals:
1. Develop rough models to share with users
2. Iterate and improve
3. Learn from “failure”

Processes/Tools:
1. Rapid prototyping
2. Modeling and simulation
3. User testing

Mindsets
- Experiential
- Risk tolerant
- Action-oriented
- Inquisitive
prototype: **fail** early and often

cost of failure vs. project time
Prototypes come in many forms

- Product simulation
- Labeled sketch
- Physical model
- Storyboard
Rapid Prototyping and Testing

Choose the most promising solution to develop.

Describe a *scenario* where the solution would be used.

Add *details* that demonstrate functionality and features

*Share* with members of your team acting as users.

*Iterate* on the solution as you prototype.
What has this test shown me about my understanding of users? What more do I want/need to learn about users?

What new ideas did testing inspire?

What new ideas or concepts arose from prototyping?

What new insights about users did I gain while building my prototype? What more do I need to learn about users and their contexts to build my prototype?

How might I modify my prototype to improve the user experience?

What new users did I identifying through testing? Did testing change the way that the design problem should be framed?

What new ideas did testing inspire?

What new understanding about user issues have I developed?

What have I learned about users? What more do I need to learn?
**Design Thinking – User Dimension**

- **Understand**: What are the experiences, feelings, and perspectives of those for whom I am designing?
- **Define**: What user needs will I address?
- **Ideate**: What various concepts could address these user needs?
- **Prototype**: What would my design look like in the user context?
- **Test**: How do users interact with and experience my design?

**Design Thinking – Technical Dimension**

- **Understand**: What do I know about embedded systems?
- **Define**: What are the functional requirements of the design?
- **Ideate**: What hardware and techniques could I use to meet those functional requirements?
- **Prototype**: What models, simulations, and physical artifacts can I build to test the functionality?
- **Test**: How well does my design meet the functional requirements?
Some things to think about...

How did it go?
• E.g., what was surprising? Why?

Think
about the question

Pair
with your partner

How might you use design thinking in your project?

Share
your ideas with others
Any questions or final thoughts?