Co-Creation Guide for inclusive tool development
Co-Creation Guide

Using design thinking methods to develop open source tools as an inclusive team.

Through our Open Health Hackathons, we have learned that any suitable team can develop assistive technology prototypes in about 6 weeks.

Here we share with you our best practice workflow so you can have a good flow in your collaboration and independently create a prototype for an open source assistive device (Careable).
Overview

Work together inclusively and implement ideas

This co-creation guide presents an exemplary design thinking-based workshop method for developing assistive technology innovations in an inclusive team. This guide itself has been developed in a co-creation process by an inclusive team as an open source guide.

The goal of the process is to provide you with the following experiences, among others:

- Inclusive collaboration: changing perspectives is central to the innovation process.
- Competence in collaboration: team development is an important basic building block. You will learn different methods to develop your team spirit.
- Structured idea generation and implementation: you will develop and unfold your creativity and transfer performance through design thinking methods.

Accessibility notes:
The explainer videos are also available with subtitles and audio description. Most of the templates are available as accessible table versions. You will also find information on how to work together with as few barriers as possible in the description text for each template.
Preparation
Tips on how to prepare yourselves

- Get an overview of the processes of the individual phases and familiarize yourself with the available work templates.

- Select a challenge for which you would like to carry out the co-creation process. The challenges can be determined by the participating case providers using the MatchMyMaker platform (or you can choose an existing challenge on matchmymaker.de). For more inspiration, visit welder.app.

- Select a challenge for which you would like to run the co-creation process. The challenges can be determined by the participating case providers using the MatchMyMaker platform (or you can select an existing challenge on matchmymaker.com). You can also find more inspiration on welder.app.

- Seeks reinforcement. Trying new things together is more fun and you can support each other. Ask maker friends or colleagues if they would like to support you with your project.

Just try it out.
We wish you a lot of fun!
Equipment
What you need to work really well.

Workspace & Machines
Is there a FabLab near you? Then that would be the best place to ask if they can provide space and machines and under what conditions.
On this MAP you can look up where there is a FabLab or open workshop near you.

Material
Especially when it comes to building materials, the needs can vary greatly depending on the project or challenge. But for a quick prototyping we recommend to work with very simple materials like paper, cardboard, wood, screws, hot glue gun, tape and ropes at first.
This way you can achieve quick results and develop different variations with little material.

Work templates
The templates for the activities can be edited digitally (on Miro or in table form) or printed out as a PDF on paper.

Remote Team
If you want to work as a remote team you need all computers with internet access, a teleconference program (e.g. Jitsi or Zoom) and a whiteboard tool (e.g. Miro).
The exciting journey

... through the co-creation process

Welcome to the starting point of your journey together! In the following, you will receive useful tips and work templates on the way to your assistive technology prototype. The goal is to support you in the development process in a fun and interactive way.

The development process consists of two strands: team development and product development. These are divided into different phases and steps and overlap during the process.

You can perceive the individual steps in the development process as islands. On each island you can rest as long as it is necessary for you. On the islands you will find videos and work templates to guide you through the process.
Product development
A process based on the design thinking method

The best assistive technology prototypes can be created when we put the future users at the center of the development process and work together to find ideas and test prototypes. In this way, we create low barrier solutions in an inclusive way.

The product development process is based on design thinking methods and procedures, which you will go through in four phases:
- UNDERSTAND PROBLEM
- DEVELOP IDEAS
- PROTOTYPE & TEST
- DOCUMENT & SHARE

You will not only work on the solution, but also on your team. Product development is intertwined with team development.
Product development
If you don't know much about Design Thinking yet, we’ll give you a brief introduction to the mindset and basic principles here.

TAKE AWAYS

Basic
• There is not one solution but one solution space (no wrong or right rather a better and worse)

Problem space and solution space
• Observe and Define deals with understanding the problem.
• Ideation, prototyping and testing help in finding the solution.

Change of focus
• Divergent → think broadly and wildly
• (Observe, Ideate, and Prototype phases).
• Convergent → focused and rational thinking (Define and Test phase)
Team development
Moving ahead successfully together

In a large-scale study by Google to find out what makes successful team projects, they were surprised to find that it is not teams with the most brilliant minds or the best skills.

Instead, they found that top performance can be attributed to a mix of five very different factors:
- Trust (psychological safety)
- Reliability
- Structure and clarity
- Meaningfulness
- Effectiveness

In order to work successfully on your ideas as a team, you also need to work on the team, especially at the beginning of your journey.

Therefore, team building activities are necessary throughout your journey. This will help you to work better and happier on your project.

SOURCE “What Google Learned From Its Quest to Build the Perfect Team”
(New York Times Magazine, 2016)
NOW IT STARTS

You've come a long way with your preparation up to this point. Get off to a good start in your teamwork. Together you can achieve a lot and learn from each other. Don't forget to celebrate!

Then pack, ready, go!
Team finding
Working on the team

In order to be able to work successfully on your ideas as a team, you also need to work ON the team. At the beginning of your journey it is important to get to know each other in the team, to build up initial trust among each other and to align together. The first activities are therefore aimed at creating a good basis for cooperation.

You will get to know each other, what your strengths & competencies are and what you need to work well together.

**Important:** Many who have little prior experience with agile and self-organized teamwork often feel uncomfortable with teambuilding activities. They prefer to skip the teambuilding activities and want to go straight into idea development.

However, it's worth overcoming you because the teams that worked on their team were less likely to fall apart early and worked together more fulfilling.

**DURATION**
1 activity / approx. 30 min

**PREPARATION (per team)**
- arrange a common date
- Download template “Get to know the team” as PDF for printing or use the digital version on Miro or in table version.
- Determine moderator who will prepare and moderate the meeting.
Team finding
Working on the team

Get to know each other  about 10 minutes
Make a short round. Each person says their name and what brought them here. Then introduce your skills. You can also do this playfully: If you were an X-Men, what would your mutant name and superpowers be?

What carries you as a team  about 15 minutes
Take 5 min and everyone silently writes points for themselves on postits to the following questions:
  • "What are your needs? What do you need from the others? What do you need as a team to be successful?"
  • "What is important to you? What should be common guiding values as a team and in working together?"
  • "What do you want to achieve as a goal?"

Place your post-Its on the spaces of the template for others to see. Then have a round where everyone presents their points.

Team mobile  about 5 minutes
Finally, paint or build a mobile on the template that lets you reach your goal. Let your imagination run wild as to what it could be like and what abilities it has.
Roles & Rules
Working on the team – Roles

In the previous team development step, you built initial trust among yourselves. Now it’s time to create more structure and clarity to know what you can expect from each other.

You create and assign roles in the team to the central areas of responsibility. You define your goals and first rules how you want to work together.

Clearly defined areas of responsibility are important for good collaboration.
- Who is responsible for which topics?
- Who has decision-making authority where?

Roles are a good way to illustrate this. Roles often emerge naturally from the collaborative work process, especially depending on the competencies of each person in the team. A good distribution of roles enables fast decision-making, fruitful discussions and optimal knowledge management.

On the following pages you will get some examples of roles in a prototyping team like moderator, time manager, host, prototyper, user-researcher, documentation role and rules.

DURATION
1 activities / 20-40 minutes

PREPARATION (per team)
- Arrange a common date
- Download template “Roles & Rules” as PDF for printing or use digital version on Miro or in table version.
- Determine moderator who will prepare and moderate the meeting.
Roles & Rules

Working on the team - Rule 1

An Ethiopian proverb says "When spiders weave together, they can bind a lion." Good collaboration in an inclusive team requires not only a clear distribution of responsibilities, but also a familiar environment. To work together effectively, certain rules are needed, and this is how a strong community is built.

Here are some tips for team rules to keep in mind as you work together:

• Give your collaboration a central place: set realistic goals and develop a shared vision of an end result. This will help you develop a shared understanding of the purpose of your collaboration. This understanding is especially important when you are not together in one place.
• Determine your mode of communication: which channels will be used for which information? What are emails, chat groups, minutes, etc. appropriate for? What days and times are best for meetings? Otherwise, an unclear definition of communication channels will lead to a lot of information falling by the wayside.
• Communicate openly and respectfully with each other: Clarity of expression is essential if you want to be understood. How would you resolve conflicts? How do you respond to disagreements? Share your thoughts and communicate your needs.

Typical roles

• The moderator: with her global view, this role influences both the team experience and the quality of the prototyping process. She structures relevant information, plans and introduces meetings, has an ear for every perspective in the room, and coordinates voting and decision-making processes. She moderates individual work steps and exercises, presentations, user tests and interviews.
• The time manager: Together with the moderator, she makes sure that there is a schedule in meetings and for the project and is responsible for helping the team to stick to it. She always keeps an eye on the clock and intervenes when the team gets lost in discussions or details. In idea development or short presentations she sets the clock for the team.
• The host: Prototyping processes can be intense, and very demanding on the mind. A sense of relaxation and exuberance in between is super important. The host keeps an eye on the environment. She plans activities during and after the individual prototyping sections that relieve and motivate the team. Whether it’s food, sports, music, observance of breaks or other creative activities, everything contributes to a relaxed team spirit.
Roles & Rules

Create a space for co-creation: an inclusive team only works if all perspectives are allowed to have their say. Engage in respectful dialogue, ask each other questions, be curious about other perspectives.

• Also work asynchronously: not everyone always needs to be in the same room to work on something effectively. As long as everyone has internalized the goal and the rules of communication, asynchronous working methods can be very productive.

• Schedule time for team building: just chat about ideas and thoughts in a relaxed way or to talk about simple things like childhood experiences, hobbies or food. When was the last time you had a great experience as a team? Team-building activities are often underestimated, especially when the collaboration is temporary. Yet most want to be happy during that time period.

• Be open to different ways of working: Change and expanding one’s comfort zone often costs overcoming. However, a happy team is flexible and tries out many things. This is how new impulses and creative methods emerge. Find the right rhythm between routine and trial and error.

• Take time for praise and appreciation: you want to work together in a motivated way, and appreciation is the most important basis for this. When you praise each other, do it from your heart. Try to find the right moments when a person needs praise and appreciation.

Typical roles 2

• The prototypers: this role includes people who have an eye on both the design and the implementation of the prototype. They distribute tasks, contribute relevant input and practically coordinate the construction of a testable prototype.

• The user-researcher: this role is responsible for the high quality of the prototype. They collect relevant data, looks for test subjects, deals very closely with the target group, prepare feedback forms and test environments, and are responsible for documenting and evaluating the test results.

• The documentation role: In order to make your development open source for replication, the result needs documentation. The documentation role is responsible for compiling and publishing the information. It ensures that documentation material is created and organized during the entire development process. These are e.g. photos, video material, drawings, possibly construction plans depending on the type and complexity of the prototype.
Roles & Rules

Role clarity
- Like a soccer team where everyone has a role and supports each other
- Through roles you know who is responsible for what
- Team members can have multiple roles (they don’t have to be solely responsible for one task)
- Roles can be shared

Good understanding in the team
- Set your own team rules (deadlines, communication channels, etc.)
- Discuss risks and barriers (e.g. vacations, etc.) and make arrangements

Common goals
- Discuss your common goals and record them in the template
Roles & Rules

Working on the team

Give role names approx. 5 minutes
Ask yourselves: which activities do you need to achieve your project goals?
Name and distribute the roles you want to use in the team and discuss how you understand their responsibilities in your team.
Pro-tip: Give each role a purpose to define what the role is needed for. For example, “Moderation- All meetings are well prepared, efficient, and fun.”

Distribute roles approx. 5 minutes
Assign roles to people now. “Who wants to fill which role?” “Who has the highest competence to do this?” Many role holders:inside are obvious based on their skills. Ensures that the central roles are distributed and recorded in the template. Roles can also be changed in the process and/or filled by a tandem of two people.

Structure approx. 10-30 minutes
Think about a common structure and rules for the collaboration.
What do you expect from each other? – Ask yourselves:
• “When and where do we meet? What channels or tools do we use?”
• “What is your motivation? What do you need from your teammates to be inspired and thrive?”
• “Where do you see hurdles or risks?” How will you address them?”
• “What team rituals do we want to do?”
Understanding the problem
Design Thinking: Observe

The basis for any good solution is to ask good questions and get a deep understanding of the problem. That’s what you do in this phase.

You try to put yourself in the shoes of the person who has posed the problem as a challenge. You try to look at the problematic situation through their glasses and share your discoveries later.

Important: Here you don’t want to think of a solution yet, because that narrows your thinking, and don’t analyze or critically evaluate (yet). This step is about discovering with open senses and childlike curiosity. Imagine you are a reporter, for example, and you have no prior knowledge, only curiosity and want to find out things you don’t know yet.
Always visibly record your observations so you can share them with the team later.
→ See more in the video

DURATION
1-2 activities / 30 - 120 minutes

PREPERATION (per team)
• make a common appointment
• Download template “Empathy Map“ as PDF for printing or use digital version on Miro or in table version.
• Identify facilitator to prepare and moderate the meeting
Understanding the problem

Design Thinking: Observe

TAKE AWAYS

Shared understanding
- Semantic analysis: unite your knowledge and perspectives
- Research: Gather information

Methods
- Observation
- Immersion
- Interviews

Gathering insights
- Empathy Map
- Post-Its

"Unpack" insights
- Share the needs and content that stand out
- Create an initial overview together
Understanding the problem
Design Thinking: Observe

Shared understanding of the problem
In order to develop a shared understanding of the challenge and the context, talk about the problem, for which the semantic analysis method is helpful.

Understanding the user and needs
The best way to understand the problem is to understand the users and put yourself in their perspective. For this we present three approaches:

- Observation - observe people using
- Immersion - put yourself in the situation
- Interviews - interview people about their experience of the problem

Interview with the case provider
For the interview and to gather your insights you can use the
you can use the Empathy Map Template where you record important and interesting points on Post-Its.

- What does the person's (case provider) everyday situation look like?
- What is the person thinking / seeing / hearing / feeling?
- What is the person doing so far?

Think of this exercise more like a conversation than a formal interview. You are interested in developing a deeper understanding of the case provider’s challenge together with the case provider.

TIPS for the interview
- Ask open questions
- Listen 80/20
- Pay attention to body language
- Follow up on ambiguities
...understand - conduct interview
Design Thinking: Observe

Distribute roles approx. 5 minutes
If there are several of you, decide who will conduct the interview and who will take notes. You can use the empathy map for this.

Conduct the interview approx. 30 minutes
In the first few minutes it is important that the interview partners, in this case case providers with a team, warm up. Introductions, small talk, eye contact. If you want to record the interview, ask for consent.
You can ask the Case Provider to introduce themselves and the challenge, then slowly get into the conversation.
As the Case Provider, you can introduce the following topics:
• I encounter my challenge in the following everyday situations ....
• I help myself so far by ...
• When I encounter my challenge, I feel ...
• Most of all, I would like to ...
• I wish ...
• I have already tried ...
• In your notes, record observations or statements, not interpretations.
If thoughts and ideas come to you, mark them, e.g. by using different colored post-its.

Review notes approx. 5 minutes
Directly afterwards, go over your notes again, add to them and highlight the most important observations or findings.

TIPS for the interviewer
• Ask open questions
• Listening questions 80/20
• Let person talk, ask questions to go deeper
• Follow up on ambiguities
• Note interesting quotes
• Pay attention to body language
• If the conversation hangs and feels weird at the beginning, that’s normal – ask easy questions to release the pressure.
• When the answers become stories, you’re in the flow.
• Silence is Gold - allow silence, often something will come.
• Doorknob Phenomenon – At the very end, when you are already in the process of closing and leaving, important information often comes.
Define point of view

The goal is to create a common pool of knowledge, to critically classify and evaluate the observations and to transfer them into a team point of view. This viewpoint will serve as your starting point when you later go into solution finding.

You will share and organize your collected observations together. You will derive insights about the key needs and problem areas and formulate your team point of view ("POV").

Important: In this step, it is important to narrow your mind through analytical thinking and critical evaluation and focus on the essentials to draw your conclusion. By doing so, you move from thinking mode to action mode.

→ See more in the video

DURATION
1 activity / 40-60 minutes

PREPARATION (per team)
- arrange a common appointment
- Download template “Challenge Profile” as PDF for printing or use digital version on Miro or in table version
- Identify facilitator to prepare and moderate the meeting
Define point of view
Design Thinking: Define

**Take Aways**

**Basic**
- Common focus on the problem
- What do you want to solve and what don’t you want to solve?
- Needs in the center
- What is a POV

**Share observations**
- Choose a few individual outcomes from the observation (e.g., what is most surprising / confusing / contradictory)
- Explain why these points are important to you

**Findings: What do you derive from the observation?**
- What do you know about the users
- What are the most salient needs and problems?
- What do you know about the context of the issue

**Define your design point of view**
(Template Challenge Profile)
- Who exactly are you designing for?
- What do you think she needs?
- Why does she need it?
Define point of view
Design Thinking: Define

"Unpack" insights
Make a round to share the salient observations and insights that you captured on the Empathy Map during the interview.
What do you know about the user?
What are the most salient needs and problems?
What is it that motivates the person? What does she want to achieve and why?
What do you know about the context of the topic?

Discuss which ones and why you think they are essential and cluster them into themes. Mark the key insights and themes (e.g., with dot voting).

Formulate your point of view (POV) in one sentence.
You can first try different formulations until you choose one that fits best for the challenge and the team.
As a ...(WHO? User)... I would like to ...(WHAT? Action)... to ...(WHY?)

Formulate “How can we” questions
Rephrase the POV into a good problem question that starts with "How can we".
Again, you can try variations first.

You can record further information in the field “Challenge description”

TIPS on POV
- Recognize patterns in the needs of users
- Understand needs at all levels
- See opportunities where others see problems
Develop ideas together
Design Thinking: Ideate

Innovations come about when you think beyond the obvious. And that’s exactly what we’re trying to do at this stage.

You try to develop many and extraordinary ideas. All ideas are allowed. The more perspectives and ideas, the better. Build ideas on each other to exhaust the possibilities.

Important: Here you should develop as many ideas as possible, it is not yet about how an implementation can look like. Evaluate your ideas only at the end of the brainstorming. Let your thoughts run free even if the ideas seem crazy to you at first.

→ More on this in the video

DURATION
2-3 activities / 1.5 - 3 hours

PREPARATION (per team)
• arrange a common appointment
• Download templates "Brainstorming" and "Idea Dashboard" as PDF for printing or use digital version on Miro or in spreadsheet version.
• Determine moderator who will prepare and moderate the meeting.
Develop ideas together
Design Thinking: Ideate

TAKE AWAYS

Brainstorm rules
- No criticism
- Mass instead of class
- Build on the ideas of others
- Free thinking and associating

Brainstorm methods
- Silent brain dump
- Superpower brainstorm

Idea selection and differentiation
Together, select one or two that you want to develop further together using the ideas Dashboard template.
Brainstorming
Design Thinking: Ideate

Brainstorming approx. 30 minutes
After you have a shared understanding of the challenge, the goal is to generate lots of ideas.

Methods

• **Silent brain dump** 5 minutes
Everyone writes silently to themselves, as many ideas as come to them on post-its. Also ideas you had before can find a place here. (1 idea per 1 post-it). Then share your ideas.

• **Superhero brainstorm** 5 minutes
Everyone picks a superhero, e.g. Catwoman, Homer Simpson, ALF, ET, James Bond, MacGyver, Wonder Woman Everyone puts themselves in that role and thinks “What would ....... do?” (1 idea per 1 post-it).

Select ideas
Each person gets to pick three ideas. The idea with the most points is your starting point for the next step. You can use the voting function of Miro or set dots.

---

**TIPS for finding ideas**

- Mass instead of quality
- Build ideas on each other
- Think crazy
- Criticism comes later

---

Low-barrier version of the template (GDocs)
Developing best ideas
Design Thinking: Ideate

Developing idea approaches
After you have selected a solution approach, you formulate it using the Ideas Dashboard template. Then you can do the same with other ideas.

You can use this template again later in the process. When you have tested your ideas and want to improve them or try out new ideas.

So formulate your idea and how the idea can be implemented. Sketches help you to explain to each other what you mean. Also think about what the possible hurdles could be:
• What are you missing?
• What do you not yet have a solution for?

Think about what the next steps could be and whether there are tasks to be distributed.
Check-in and Check-out

Team rituals

To create a safe, trusting and productive atmosphere, short check-in rounds at the beginning and check-outs at the end of each meeting are suitable. Among other things, they help you to better classify the reactions of others. We relate negative reactions (too) quickly to ourselves, but if you know that the other person is currently having family problems, for example, you can take the reaction differently. You will feel more relaxed and connected to each other if you know from each other where you stand right now.

At check-in, classically, each person tells you how they are doing and what they expect from the meeting. At check-out, how they feel after the meeting and what they think about the outcome of the meeting.

Important: Make sure that everyone can participate, because you want to be able to perceive yourselves as a team. To have impact, the attitude of being transparent and honest about yourself is essential. To open yourself up to the others (instead of just mechanically saying phrases, e.g. "I'm fine").

DURATION

2 activities / 5-10 minutes each

PREPARATION (per team)

- Download templates “Check-In” and “Check-Out” as PDF for printing or use the digital version on Miro or in table version.
- Establish ritual in team meetings
Check-in and Check-out

Team rituals

What is important for check-ins and check-outs approx. 5-10 minutes
• connect personally
• trusting and open
• arrive together
• 1-2 questions to be answered by all

Check-In
• 1-2 questions that all answer
• 1st question: get in touch with each other and share something personal with each other
• 2nd question: can already refer to the meeting

Check-Out
• Reflect on meeting
• Honest feedback
• 1-2 questions to be answered by all
Check-in
Team rituals

Check-in rounds occur in order, with each speaker naming the next person when they have finished speaking. If you are skilled, you can also use the popcorn principle (each person takes the floor when they decide to). Duration 5-10min

Each person briefly answers 2 questions:
• How am I personally feeling right now?
• What do I expect from the meeting?
Then they nominate the next person in the round. approx. 2 minutes / per person

The next person repeats the step.

TIPS for check-In
You can also vary the questions, we have compiled examples on the template.
The only important thing is: The first question should serve as a personal connection between you. The second question is about the goal, the expectations of the meeting or the focus of your work. Be creative and try different check-ins.
Human connection and shared focus are the nuts and bolts of successful teamwork.
Check-out

Team rituals

Check-out rounds are likewise done in order, with each speaker naming the next person as they finish speaking.

Duration 5 minutes

Each person briefly answers 2 questions:
e.g.:

- How am I personally feeling now after the meeting?
- How satisfied am I with the outcome of the meeting?

Afterwards, they nominate the next person in the round.

approx. 1 min / per person

The next person repeats the step.

TIPS for the check-Out

You can vary the questions again with examples from the template. If you have more time, you can also say two sentences about "How satisfied are you with the teamwork in the meeting". If you don't have much time, you can each say just one word at the end, e.g. "tired", "inspired", "eager to get started".

If you want to express dissatisfaction, it helps to stay with yourself, i.e. to speak only about your feelings and wishes (instead of blaming and you-messages). This will help others to accept your criticism more easily, without getting defensive, and increase the chance that things will go better next time.
Prototype building
Design Thinking: Prototype

Slowly, the ideas will emerge, grow, roll and find their way out of the head onto the paper or Miroboard in the form of sketches and drawings - and want to become three-dimensional.

Much more than you think can be made with cardboard and tape, roof battens, screws and cordless screwdrivers, household gummies, cut-up T-shirts and hot glue guns.

Important: Create a good framework or setting for prototyping. Depending on your capacities, you can build two designs (different strategies for solving the challenge) in parallel, for example, in order to have a comparative value. You can sometimes acquire material money through grants. Otherwise, when ordering materials and components, keep your money and time budget in mind!

Remember: a prototype is for testing - it is not a finished product. To exaggerate: If you are not ashamed of the first prototype, you have made a mistake and have already done too much.
Prototype building
Design Thinking: Prototype

TAKE AWAYS

Proto... what??
- Prototype as 3D sketch, see as tangible design in space
- Experimental process
- Failure is not a failure but a gain of knowledge
- Fast prototyping enables early learning steps

Different types of prototypes
- paper, digital techniques, 3D printing
- role plays, mockups, cardboard prototypes

Location in the design thinking process
- Stands between and connects ideate and testing
- A picture is worth 1000 words -
- A prototype gets you further than 1000 discussions
Testing Prototype
Design Thinking: Prototype

It’s a common syndrome among designers to “fall in love” with their own prototypes - and lose critical distance. The best antidote: testing!

Put your prototype in as many different hands as possible. Not only is the feedback from your case provider valuable, but also non-direct target groups can bring surprising and unexpected impulses to your process during testing.

Important: In order to keep the statements comparable and structured, use our “Testing Ideas” template or create a “Criteria Catalog” yourself, which you can use to put the prototype through its paces again and again.

DURATION
1 activities / 30 minutes

PREPARATION (per team)
- arrange common appointment
- Recruit test persons
- Download template “Testing Ideas” as PDF for printing or use digital version on Miro or in spreadsheet version.
- Identify facilitator to prepare and moderate the meeting.
- Designate one person to document the meeting, and possibly another as an observer.
Testing Prototype

Design Thinking: Prototype

Co-Creation Guide

Testing früh und clever scheitern

TAKE AWAYS

Locating in the design thinking process
- Step 5/5 - traveled once through the design process....
- Ideas in mind, sketches on paper/miro, prototypes in hand.

Why testing?
- Without testing no insight, without insight no improvement
- Involve as many different test persons as possible, observe, take notes
- Think with your hands - touch it baby!

Feedback culture
- Feedback is gold - be brave to rethink the prototype!
- Think in loops: after the test is before the test
- Arrange and conduct feedback meetings, helps and is fun!
Testing Prototype
Design Thinking: Prototype

Set up the test setting
Try to select an everyday situation setting if possible, because the context also has an influence on usage. However, this can vary greatly depending on the case. When prototyping and testing, "Fake it 'til you make it" and "Not yet good is good enough" apply.

The test - observe instead of explain
Try as little as possible to give instructions, criticize or explain. Keep an open mind and stay curious - it is normal that the test subjects may come up with completely different ways of using the software than you had thought. First observe how the intuitive handling works and ask the test person to think out loud while testing.

In a second step you can ask explicit questions and test functions.
Take notes
Instead of intervening or explaining - take notes and enter them on the Ideas Testing Template:
- What works?
- What doesn’t work?
- What is unclear? What questions came up?
- What are new ideas that came up?

Lightning Review
Afterwards, do a short round where you record final observations and each tester shares their 2-3 most important observations and findings. Record these under “Learnings.” Celebrate yourself for your (first) successful test 🎉

IN LOOP - next iteration
Improve your prototype based on the new findings in a second iteration. Then test again and improve. Until you are satisfied, run out of time or don’t know what to do.

TIPS for testing
- The focus of prototyping is always on learning
- When asking questions about how something works, for example, instead ask yourself counter-questions “What would you think? Operate it the way you think it’s meant to be operated.”
- Don’t intervene, help or criticize - you are now no longer “makers” but “testers”
- Stay open and curious - e.g. take the role of a reporter who wants to collect interesting information
- Test (if possible) with several people
Building and testing - Work Iteratively
Design Thinking: Prototype

"Don't fall in love with your prototype!"
Experimenting and iterating a lot is essential to the process. The focus here is not on prototypes that are as good as possible, but on prototypes that are as fast as possible and that you improve for the next test.

The quality of your project will be achieved through as many iterations as possible - and you will learn much more about the weaknesses of the ideas, the problems you didn’t even think of before, and the potential users and their context.

Therefore, plan as much time as possible for as many iterations as possible. If you can.

So let’s move on to the next iteration - Ideate - Prototype - Test.
Reflection and next steps
Structure & process

Team reflections provide an opportunity to look at yourself, the team, and your processes to learn from the past. The goal is to figure out how you can learn and grow as a team and release your tensions. The focus is on the team and their members, the work processes and your tools.

Note: There are different ways you can do this. We present you two variants: "Reflection and planning next steps" and at the end of the process a "Closing reflection".

DURATION
2 activities / 25-45 minutes

PREPARATION (per team)
• plan your time at the end of a work session e.g. after testing and before the next iteration
• Download templates "Reflection and Next Steps" as PDF to print or use digital version on Miro or in spreadsheet version.
• Designate moderator to prepare and facilitate the meeting.
Reflection and next steps
Structure & process

Take at least 20 minutes for the reflection. It's also worth taking a look at the final "Reflections" template if you're not doing it for the first time.

- Take three minutes in silence to make notes on the four front boxes.
- Then share your thoughts on them.
- Derive tasks from the next steps and distribute responsibilities within the team.
- Discuss what is still missing, what still needs to be clarified, what you still need support with.
- Think about when and how you want to meet next time (time, technology).

Low-barrier version of the template (GDoc)
Documenting
Design Thinking: Share

It’s time to get your project out into the world and make it open source. On the one hand you don’t have to work for the drawer and on the other hand you enable others in the Careables Community to build on your ideas, to rebuild them or to develop them further. Then it’s official: Welcome to the Careables Maker Community!

You will create a how-to documentation for rebuilding your resource solution and upload it to the Welder platform of Careables.

Important: On Welder you can choose from different licenses. We recommend the Creative Commons License CC-BY-SA.
Documenting
Design Thinking: Share

Why document it and put it online?
- Publishing and sharing your solution for free makes it open source.

Think about documentation from the beginning
- Appoint a documentation officer in the team to keep track of the documentation.
- Collect the material e.g. in your Miroboard.

Publish on Werlder or Careables
- Familiarize yourself with the input mask.
- Think of the documentation as a step-by-step guide.
- Keep the texts simple - not for technical professionals.
- Visualize your solution and the steps to it with drawings, photos and videos.
- Make a list of materials and tools.
- Please document in English.

This video does not need audio description

"Documenting Careables projects on Welder"
This video shows you how to use Welder.app to document your projects on Careables.
Documenting Brainstorm approx. 20 minutes
Sit down together and think: What material do you need for the documentation of your prototype, so that it can be easily reproduced? What do you already have? What still needs to be created? If you don't know how to get started, make a rough storyboard for a how-to manual. Use the Welder mask on the template as a reference for what you need to prepare as texts, images and files.

Distribute roles and responsibilities approx. 10 minutes
Divide WHO is responsible for WHAT and until WHEN. Remember that one role can be filled by 2 or more people.

Get to work

Feedback approx. 15 minutes
Before you upload it, show your instructions to someone who doesn't know the project. What is self-explanatory, what remains unclear?

TIPS for documenting
- Incorporate illustrations: Photos, CAD drawings and renderings sometimes help more than many words when rebuilding or further developing.
- Formulate comprehensible: Short texts in clear (English) language without a lot of technical vocabulary.
In addition to sharing the build instructions with the Careables and Maker community, it is also important to communicate the idea of your aid solution. You can use it to show the rest of the world (outside of the Careables and Maker community) your great idea. When you feel ready, you can also use it to apply for grants to further develop the idea and take it to the next level.

You shoot a short pitch video and publish it on YouTube. In it, you communicate your idea clearly and entertainingly.

Important: You can find inspiration among the videos of previous teams on the be able YouTube channel.

You may want to apply to the Open Knowledge Foundation’s Prototype Fund for funding. They are fans of the Careables community projects and it’s a straightforward application process.
Sharing – pitch your idea as a film
Design Thinking: Share

**TAKE AWAYS**

**Make something watchable:**
- Communicate your idea clearly and entertain your audience.

**Content:**
- Communicate what your idea is.
- What problem do you want to solve. For who?
- What kind of impact does your video have?
- Show your solution (prototype).
- Visualise your user journey.
- Keep it short.
- Have a hook in the first seconds.

**Tech:**
- Stick to what you know. Check the Audio quality.

**Performance:**
- Look directly into the camera like you would talk to a person.

This video does not need audio description
Sharing – pitch your idea as a film
Design Thinking: Sharing – storyboard

Determine goal and target audience approx. 5 minutes
Together, note who you want your target audience to be and what your core idea is that you want to communicate.

Make a rough outline approx. 10 minutes
Example outline for the story:
- Why? What is the challenge?
- What is the solution?
- How? How does the solution work?
- Call for action! What should be done?

Tell it as a story approx. 15 minutes
Make an outline for the plot. Each short scene gets a space. Describe what happens with a sketch and a sentence. Use as many fields as you need or start your own storyboard template as you need it.

Shoot and edit the film approx. 60 minutes
Use simple tools like your cell phone camera and keep it short, e.g. 90 sec.

Share the film with the world
You can share the film at presentations, with your documentary and via social media. Or use it for grant applications.

TIPS on the storyboard
- Communicate your core idea clearly, simply and entertainingly to your audience
Good team finish

Structure & process

At the end of your journey to the assistive device prototype, we encourage you to celebrate your team achievement! Regardless of the outcome, no matter what happens along the way, a shared journey bonds you together and makes everyone smarter in the end.

DURATION

2 activities / 1 - 2 hours

PREPARATION (per team)

- arrange a common date
- Download templates "Final Reflection" and "Sugar Cubes" as PDF for printing or use the digital version on Miro or in table version
- Determine moderator who will prepare and moderate the meeting
Good team finish
Structure & process

This video does not need audio description

TAKE AWAYS

Celebrate your journey through the co-creation guide and you.

With the Suger Cubes template
  • you can give each other compliments on the way ahead.

The template Conclusion Reflection
  • helps you to look back on your highlights, challenges and insights.
  • Or you can invent your own closing ritual.

In the different videos you have seen us, the team of the co-creation guide. Creating the guide was our journey to a prototype, so to speak.

Take care!
Good team finish- reflection

Structure & process

Silent journey of thoughts with notes on post-its on the template approx. 10 minutes
Each person in silence, review the collaboration of the project. Think about the highlights and the challenging parts, the “aha” moments and the questions and wishes that came up.
Note the points you want to share with the others on Post Its on the template.

Sharing round approx. 10 minutes
Do a round where each person in turn presents their points out loud to the others. Everyone who is done passes on to the next person.

Exchange round approx. 25 minutes
Share what you heard and where you resonate with. How can you grow from this?
If you want to pursue the project further together, gather ideas about what you want to do differently or better in the next round.

TIPS for final reflection
- The retro is a protected space that you create.
  (Las Vegas Rule = “What happens in Vegas, stays in Vegas.”)
- Be grateful for the sharing and communication
- Avoid repeating statements
- Approvals are good to say

Low-barrier version of the template (GDoc)
Good team finish – Sugar Cubes
Structure & process – Sugar Cubes

**Gratitude round** approx. 15 minutes
What are you grateful to others for? In what have they inspired you? What makes the individual unique? What perspective or strength did they bring to the team?
Finally, express your appreciation to each other and celebrate each individual and, in turn, you as a team.

**Applause**
Celebrate yourselves again Out loud, be proud and give yourselves applause for all you have accomplished in this project.

**TIPS on Sugar Cubes**
This is about "raining down" recognition, praise and gratitude. Here you have time to put compliments to the other team members into nice words. Sounds strange at first? Try it out!
APPENDIX

Here you will find more, further links and hints for your journey and a successful process.
Miro is a big online whiteboard
... and platform for collaborative work

- All your templates are built so that you can work in them on Miro.
- Don’t forget to set whether you use a mouse or a trackpad.
- Also have a look at the templates.
- If you work with frames, you can also use areas in your Miroboard as a presentation.
- There is a timer, a note and a voting function. These are accessible.

If you don't know Miro yet, we've created a short video introduction and built a test board so you can familiarize yourself with the features in advance.

DURATION
Continuous text small ...

PREPARATION (per team)
- Continuous text small as list (?) ...
Miro is a big online whiteboard
... and platform for collaborative work

This video does not need audio description

**TAKE AWAYS**

**What can Miro do?**

- In Miro you can work with different colored stickynotes, shapes, videos and graphics.
- There is also a timer and there are many other templates.
- First of all, don't forget to set whether you use a mouse or a trackpad.
- To get acquainted and practice, you can use this practice board:

  ✔️ Training board
Tips ...

... for accessible collaboration with Miro and screen readers
(Status: October 2022)

Since there are unfortunately still sharp limits to barrier-free collaboration in Miro, we have compiled some tips for working with a screen reader.

- The templates are available in parallel as a table version, which can be edited in an alternative screenreader-friendly program. You can then easily import the results from the spreadsheet into Miro if that is the central place of your collaboration.

- In Miro, people who use a screen reader can interactively take notes using the Note feature if the areas in the Note are written down in parallel.

- Polls and surveys can also be edited in Miro using screen readers.

- When exporting Miroboards, they can be saved as .csv files. If the CSV files are opened in Google Sheets, then the content that is displayed as a table on the Miroboard can also be read with the screen reader.

continue >>
• A text description for the visual representation of the individual templates can be read in the handbook, so that a blind or visually impaired person can imagine the templates and thus logically approximate the real template structure to make their own notes.

• If you display the board areas as frames, then the screen reader can be used to target the areas.

• The screen reader can only display the miroboard as a vertical axis. To a blind person, it looks like the board is a list of items with a single column. Therefore, a blind person can only navigate through the items from top to bottom (no matter how far to the left or right they are from each other).

• You can also get more information about accessible Miroboards from Miro's Accessibility Improvement or Help Center.
The goal of this guide was to give you, as a team, a practical guide to bring open source tools into the world on your own, without a moderating org team.

This is a Minimal Viable Product (MVP) in which we want to share the knowledge we have gathered after five Open Health Hackademies. But our journey is also far from over and we are curious and grateful to hear about your experiences and feedback. Write to us at projekt@be-able.info

Our template materials are inspired by the HPI School of Design Thinking templates and are licensed under Creative Commons BY/NC/SA.

A thank you goes to all Co_Creators! Especially to:
Adriani Botez, Alina Weber, Antonia von Reden, Christin Ursprung, Florian Huss, Isabelle Dechamps, Kate Kagioglidi, Kyra Albrecht, Beatrice Barth, Yi-Cong Lu, Karl Blütchen, Laura Pelizzari, Ferdinand Pechmann, Daniel Wessoleck, Tasso Mulzer, Lisa Djabarpour, Nike Michel-Soth, Thien Thi Nguyen, Vlad Georgiev, Johannes Marx, Claudia Nicholai, Scott Bolden, Joni Zaza, Amelie Cayré

Thanks to our partners
Careables.org, HPI D-School Potsdam, Berliner Hochschule für Technik (BHT), Technische Universität Berlin (TU), Alice Salomon Hochschule (ASH), Machbar FabLab Potsdam,

Thanks to our sponsors
Deutsche Stiftung für Engagement und Ehrenamt (DSEE), Stiftung Bildungschancen

APPENDIX

A lot of good things have come together here
Material for the journey
all templates

TEAM DEVELOPMENT I
1. Getting To Know (Teambuilding) (PDF | GDoc)
2. Roles & Rules (Teambuilding) (PDF | GDoc)

PHASE 1 - UNDERSTANDING PROBLEM
3.1 Empathy Map (PDF | GDoc)
3.2 Research Field (PDF | GDoc)
4. Challenge Profile (PDF | GDoc)

PHASE 2 - DEVELOPING IDEAS
5.1 Brainstorming (PDF | GDoc)
5.2 Ideas Dashboard (PDF | GDoc)

TEAM DEVELOPMENT II
6.1 Check In (PDF | GDoc)
6.2 Check Out (PDF | GDoc)

PHASE 3 - PROTOTYPING & TESTING
7. Prototyping Notes (PDF | GDoc)
8. Testing Ideas (PDF | GDoc)

TEAM DEVELOPMENT III
9. Reflections & Next Steps (PDF | GDoc)

PHASE 4 - DOCUMENTING & SHARING
10. Record Results (PDF | GDoc)
11. Storyboard (PDF | GDoc)

TEAM CONCLUSION & CELEBRATION
12.1 Final Reflection (PDF | GDoc)
12.2 Sugar Cubes (PDF | GDoc)

ANNEX
3.3 Empathy Journey (OPTIONAL) (PDF | GDoc)
5.0 Research Gallery (OPTIONAL) (PDF | GDoc)
Materials for the Journey

all videos

**Video playlist**

**ONBOARDING**
0. Intro video | (no audio description)
0. Design thinking video | (with audio description)

**TEAM DEVELOPMENT I**
1. (no video)
2. Team-Building video | (no audio description)

**PHASE 1 - UNDERSTANDING PROBLEM**
3. Observe video | (with audio description)
4. Define video | (with audio description)

**PHASE 2 - DEVELOPING IDEAS**
5. Ideate video | (with audio description)

**TEAM DEVELOPMENT II**
6. Check-in/Out video | (no audio description)

**PHASE 3 - PROTOTYPING & TESTING**
7. Prototyping video | (with audio description)
8. Testing video | (with audio description)

**TEAM DEVELOPMENT III**
9. (no video)

**PHASE 4 - DOCUMENTING & SHARING**
10. Document Video | (no audio description)
11. Video Pitch Video | (no audio description)

**TEAM FINISH & CELEBRATION**
12. Good Team Finish Video | (no audio description)

**APPENDIX**
8. Miro Introduction Video | (no audio description)
More useful links

- **HOW TO: Open Source Hardware by Lars Zimmermann**
  (Audio talk leads through a website with tips and tricks for open sourcing of hardware)
- About [The Careables platform](#) you can find papers as well as videos and already developed tool prototypes published as Careables.
- For example, here is a [guide to organizing co-creation events](#) around the development of open source tools (Careables) in English.
- And here is a [video explaining Welder](#), the platform you can use to publish your open source tool.
- Here are also [video lectures on using design and 3D technologies](#) to develop innovations for HEALTH&CARE.
- Here is a [guide to help you collaborate in Miro with fewer barriers](#).
- And finally, here's a [Help post from Miro on collaborating with fewer barriers](#).
THANK YOU & GOOD TRAVEL

It's great that you have gone through this process with us. We are happy if you were able to take away a lot for you and your team and maybe even develop a really good solution for your case provider.