4

PROTOTYPE

THE DESIGN PROCESS

DISCOVER  IDEATE  PROTOTYPE
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WORKSHOP PREPARATION

For Week 4: Prototype Workshop

**CHOOSE**

a Weekly Leader.

**COORDINATE**

with your team to bring supplies for the Week 4 workshop. If you don’t have all of these supplies, be creative and bring to class whatever you think might work. Prototyping supplies could include: paper (white & colored), tape, scissors, a stapler, foam core boards, X-acto knives, pipe cleaners, fabric, clay, colored markers, etc.

**READ**

required Week 4 Readings.

**WRITE DOWN**

three interesting takeaways you would like to discuss with your team related to the Week 4 Prototype readings or the Google+ community page. This could be a quick summary of what you read, connections you made regarding your prior knowledge, or inspiration from another design team pursuing your same design challenge.

**BRING**

printed Week 4 Workshop Guide.

**REMEMBER**

to hold the Week 4 workshop on the weekend if possible to best facilitate testing your prototypes with members of the community.
READINGS

01 Human-Centered Design Phase 3: Prototype
As part of the Prototype phase, your team will bring the best ideas to life that you created during the Ideate phase. Building prototypes is about making ideas tangible, learning while building, and iterating rapidly. Even with early and rough prototypes, you can receive direct feedback from the community and quickly learn how to further improve and refine your ideas.
Your design team has created some big ideas over the last three weeks. Now that it's time to prototype, the first step in this process is breaking apart your idea into smaller components that you can test.

Experience Mapping your Idea

It's very important to break your big idea into bite-sized pieces that can be easily made and tested. A great way to do this is by creating a user journey that maps how members of the community might interact with your idea over time.

Break down the user experience
Any idea or service that you create will have a beginning, a middle, and an end for a user experiencing it. How will a user find out about your idea? What will their first experience with the product or service be like? How does the experience end? Your design team will break down the user experience for your idea into several discrete parts.

Visualize the user experience
Next, you'll visualize the experience of your idea over time through a series of images, sketches, cartoons or even just text blocks. Stick figures are great—you don't need to be an artist. Use Post-it Notes or individual sheets of paper to create the storyboard so you can rearrange their order.

What do you need to learn?
Each step in the user experience that you've created has questions that your team needs to answer in order to understand how your idea might work in practice. For example: "How will people hear about your product? Will users be willing to pay in advance for your service?" Your team will identify these questions and then brainstorm prototypes to help you get answers from the community.

Create an order of operations
Your team will identify which questions are the most important to answer first and what form of prototype will best help you answer those questions. Once you begin receiving feedback from these prototypes, you'll iterate and refine your idea accordingly.

A friendly SmartLife sales agent comes to your home weekly to customize your orders and provide you with top quality service.

Order and pay for a personalized selection of water and products on a weekly basis.

Your order is sent to our treatment facility where we filter your water and fill your containers.

Your water and product order is delivered by truck and carried into your home by friendly SmartLife Delivery staff.

Mapping out the core offering helped the IDEO.org SmartLife team align around what the core of the user experience would be.
Great idea; Let's prototype

The best prototypes help to get you answers to very specific questions. Some new designers have great ideas, but create prototypes that are much too broad and don't give them good answers. As part of a recent workshop, a team of new designers was tasked with designing ways to help youth with alcohol addiction. The team had an idea involving mobile counseling centers that visited a different neighborhood in the city each day of the week. The team built a prototype that was a scale model of the mobile counseling center. This prototype helped the team get more clarity on what the center might look like and helped them better understand the activities that could take place at the center. However, the problem with this prototype was that it didn't help them answer any of the specific questions about how the users in the community might interact with their idea.

More useful prototypes might have helped the team answer some of the following questions related to smaller parts of the larger mobile counseling center idea:

<table>
<thead>
<tr>
<th>Question</th>
<th>What if we prototyped:</th>
</tr>
</thead>
<tbody>
<tr>
<td>How might a user learn about the alcohol counseling sessions offered by the center?</td>
<td>New ways of disseminating information. How about printing information about the center on the paper and plastic bags liquor stores require people to place their purchases in? How would members of the community respond to this prototype? Would it make them more likely to visit the mobile counseling center?</td>
</tr>
<tr>
<td>How might a user sign up for a counseling session at the mobile center?</td>
<td>Different places where people could sign up for counseling sessions. What about jails, in the hospital after a drinking related incident, after getting arrested? Would creating a hotline for friends or partners who know someone with a problem be another way to connect with potential users?</td>
</tr>
<tr>
<td>How might the counseling center help users stay sober once they are no longer in counseling?</td>
<td>Different ways to keep in touch with people. Do people prefer monthly check in calls? Emails? Buddy groups? Is there a way we might help people design their own support system?</td>
</tr>
</tbody>
</table>
STEP 2
MAKE PROTOTYPES

Prototypes enable you to share your ideas with other people, get feedback, and learn how to further refine them. Below are a few examples of different types of prototypes that you can create.

Create a model
Put together simple three-dimensional representations of your idea. Use paper, cardboard, pipe cleaners, fabric and whatever else you can find. At the start, keep it rough and at a low fidelity. Evolve the resolution over time.

Create a mock-up
Build mock-ups of digital tools or websites with simple sketches of screens on paper. Paste the paper mock-up to an actual computer screen or mobile phone when demonstrating it.

Create a role-play
Act out the experience of your idea. Try on the roles of the people that are part of the situation and uncover questions they might ask. Consider making simple uniforms and assembling simple props to help users experience your product or service as real.

Create a diagram
Map out the structure, network, journey or process of your idea. Try different versions. Diagrams can be great simple prototypes to show to members of the community if you are designing a service.

Create a story
Tell the story of your idea from the future. Describe what the experience would be like. Write a newspaper article reporting about your idea. Write a job description. The purpose is to have people experience your idea as if it were real and then respond to it.

Create an advertisement
Create a fake advertisement that promotes the best parts of your idea. Have fun with it, and feel free to exaggerate shamelessly. Now change the tone of the advertisement to appeal to different types of customers (your grandmother versus your cousin the college student).

EXAMPLES
Quickly creating faux marketing materials is one way to help you explain your idea to potential customers and give them something tangible to respond to. You can easily use this approach for technology related products or services too.
Ways to Prototype

Prototyping is not about getting it right the first time: the best prototypes change significantly over time. Try challenging your team to come up with at least three different versions of your idea to test multiple aspects of the possible solutions your team has come up with.
STEP 3
GET FEEDBACK

Feedback is one of the most valuable tools in developing an idea. Sharing prototypes early in the design process helps you see what really matters to people and which aspects need improvement.

Identify Sources for Feedback

As part of your Week 2 Discover research, you spoke with many people in the community and used what you learned to brainstorm new ideas as part of the Ideate phase. As part of the Prototype stage, it’s time to return to the community and begin getting feedback on your ideas.

Consider the setting
Decide what context you want to share your idea in. Is it helpful to first show a rough idea in an informal setting you are familiar with (such as the workshop room where your team has been meeting)? Or will you learn the most from seeing your prototype in the context it will be used in (aka, in the community)?

Define what to test
With your team, determine what kind of feedback you are looking for: do you want to get feedback on the first impression of your idea? Are you trying to learn whether people would participate in a new activity you designed? Are you wondering whether people will change behaviors over time because of your concept? Capture your thoughts and create a list that will remind you of the goals of your research.

Define feedback activities
Based on what you are trying to learn, carefully plan your feedback activities. Arrange for a conversation if you are interested in a first impression. Set up an activity or service as if it were real if you want to observe peoples’ actual behaviors. Consider letting people use a prototype over a period of time if you are interested in its longer-term impact.

EXAMPLE
A design team looking to reimagine a hotel suite to better meet the needs of customers built a mock-up room using foam core. They asked potential guests to tour the space on their own and write down their observations as they walked through. What things did they like? Was there something missing? This activity allowed the team to get very neutral feedback because people felt anonymous and were less shy about stating their true feelings.
Facilitate Feedback Conversations

The most important ingredient in a feedback conversation is honesty: people may feel shy about telling you what they really think of your idea if they know that you are very invested in it. Create a setting that encourages an open conversation.

**Invite honesty and openness**
Introduce your prototype as a work in progress. Make it clear that the development of your idea is still in progress, and that based upon their feedback, you will continue to make further changes and improvements to the prototype.

**Stay neutral**
Present all concepts with a neutral tone. Don’t be defensive—listen to all the feedback and take notes both on the positive and negative comments.

**Adapt on the fly**
Encourage participants to build on the idea, and change your prototype right away. Be ready to eliminate or change parts of the idea.

**Provide multiple prototypes**
If time permits, or if you have a prototype that is easily adaptable, consider preparing various versions of your prototype to encourage people to compare and contrast.

**EXAMPLE**
A design team looking to get feedback on multiple prototypes invited a group of community members into their space and made them feel comfortable by arranging couches chairs and providing snacks. One person facilitated the conversation and made sure to keep the session on track. Participants were encouraged to join into the discussion but also had a clipboard for notes they could write discreetly if they had them.
THIS GETS YOU
A summary of new ideas and perspectives on how to improve your concept.

KEEP IN MIND
Don’t shy away from changing your prototype in between feedback conversations. Test your iterations right away.

Capture Feedback Learnings
Feedback conversations are rich in information, and the subtle impressions of a participant’s reactions are often the most important to remember. Take some time right after your session to capture what you have observed.

Find a space and time
Plan for some extra time after a feedback session so you can share your impressions right after your conversation when they are still fresh in your mind.

Capture your ideas and design iterations
Discuss how to improve your prototype and capture ideas for a next iteration immediately.

Share your impressions
Discuss the conversation with your team. Compare each other’s learnings. Take notes on your conversation. Consider using the following prompts:

» What did participants value the most?
» What got them excited?
» What would convince them about the idea?
» Which parts would participants like to improve?
» What did not work?
» What needs further investigation?

Immediately after sharing their prototype with a user, this team met to review feedback while it was still fresh in their mind and quickly iterate the prototype for their next feedback session.
Integrate Feedback

Feedback is invaluable to developing an idea, but can also be quite confusing. It may be contradictory, or may not align with your goals. Sort through the responses you receive and decide on what to integrate in your next iteration.

Cluster the feedback
As a team, discuss the reactions you received to your prototypes. Start by sharing the impressions you captured right after your feedback conversations. Take notes on Post-its. Sort and cluster the feedback: what was positively received? What concerns came up? What suggestions and builds did you find?

Evaluate the relevance
Take a moment to revisit where you started. Look at your earlier learnings and ideas. What was your original intent? Does it still hold true, based on the feedback you have received?

Prioritize the feedback
As a team come to an understanding about the feedback that is most important to making your idea a success. Sort your notes and create an overview of which feedback you want to respond to.

Iterate your prototype
Incorporate valuable feedback into your concept. Make changes where people saw barriers. Emphasize what was well received. Then, create a new prototype that you can share. Go through feedback cycles repeatedly and continue to improve your concept.

EXAMPLE
A team redesigning a desktop phone iterated on their prototype hundreds of times. After each round of feedback the team would incorporate what they heard and observed into their designs.
READINGS

02 IDEO.org stories from the field:

Rapidly Prototyping a Business Model

Understanding Demand for a Potential Service
IDEO.org partnered with Unilever, Water and Sanitation for the Urban Poor, and the Global Alliance for Improved Nutrition to design a scalable business in Kenya selling water alongside hygiene and nutrition products in Nairobi. In just a few days of prototyping, the team was able to iterate and improve upon the three core components of its business model and sell 520 liters of clean drinking water!

We designed our water, nutrition and health business to have three components: a door-to-door salesperson who would advertise the water subscription and products; a local kiosk where people could subscribe for water delivery and purchase health and nutrition products and, finally, a delivery service that would bring people clean and safe water to their doorstep.

Here are some of the key questions we needed to answer with our prototypes:

- Do people only want drinking water, or would they like enough clean water to accomplish other tasks as well (such as washing, cleaning, and cooking)?
- Are people willing to pay for something in advance without being able to see it (i.e. paying for water that will only be delivered the following day)?
- Does it make sense to sell health and nutrition products alongside water? What is required of the brand we’re designing to keep all of these elements tied together coherently?

We opened our kiosk for business at 10am by hanging our SmartLife sign outside the door. James, our kiosk manager, began announcing our free water samples and did an amazing job of selling subscriptions and health & nutrition products. Carol, meanwhile, went door-to-door in the neighborhood, explaining our service and our brand and handing out vouchers for people to redeem at our kiosk. By the end of the day, in addition to all of our sales at the kiosk, we had ten orders and sixteen 20-liter jerry cans of water to deliver to paying customers the following day!

The next morning another team member, Clinton, went around the neighborhood delivering water. People were delighted and somewhat surprised that the water showed up! And many of the neighbors who witnessed the transaction then wanted to subscribe to SmartLife as well.

The amount of learning and progress we were able to make in only ten days in the field was amazing. The power of integrating fast prototyping in our initial learning phase got us light years ahead.

To read the whole story and learn more about this project visit: https://www.ideo.org/stories/prototyping-a-business

Robin Bigio
Industrial Designer
UNDERSTANDING DEMAND FOR A POTENTIAL SERVICE

IDEO.org partnered with Water and Sanitation for the Urban Poor to design a new pit latrine emptying business in Zambia. The team designed a service called PumpAway, and needed to learn if the service would be desirable to consumers in Lusaka. So the team created a rapid prototype to answer some of its unanswered questions.

After a few days in the field in Zambia, we learned more than we ever thought we would know about pit latrines in Lusaka. Although we were getting smart quickly, we had many unanswered questions about our business model:

- Is there actual demand for a new pit latrine emptying technology in Lusaka?
- Can we sign up several people in one neighborhood to save on transport costs?
- How do we reach customers?

Unable to answer these questions, we built a prototype to test them. It was rough around the edges, but in less than 24 hours we built and launched a hypothetical business. Two translators served as salesmen for the day—we created name tags, clipboards, brochures, receipts and a sales pitch—and we went door-to-door in a compound of Lusaka to talk with residents about whether they would purchase a pit latrine emptying service called “Pump Away.” We expected large parts of our prototype to fail, but, much to our surprise, the potential service was a huge hit. Seven of the ten families we spoke with said they would be willing to sign up for the service.

Many of the potential customers we met were unhappy that we weren’t yet offering a real pit latrine emptying service and were instead prototyping a hypothetical service. A prototype, as last year’s IDEO.org Fellow Sarah Lidgus says, is “a tangible answer to a theoretical question.” As we continue to refine and improve our work in these communities, we’ll continue asking—and prototyping—our way to the answers. In the meantime, we’ll continue building Pump Away—we have seven customers waiting patiently for us to arrive.

To read the full story about the PumpAway project in Zambia, visit: http://bit.ly/112UVbE
READINGS

03 Case Study: Sanergy
Sanergy is an organization that’s addressing the challenge of providing adequate sanitation to some of the 2.6 billion people worldwide who do not have access to it. They used a human-centered design approach to tackle the following design challenge when launching their Fresh Life branded toilet business in Nairobi: How Might We increase regular usage of clean, hygienic Sanergy toilets?

At the start of the project, Sanergy generated many ideas, then quickly prototyped several of them to understand which direction was most promising. Emily Durfee, a member of the Sanergy team, tells the story:

“We continue to test and evolve ideas on the ground, not only regarding the physical design of the toilets but more interestingly around communication, marketing and the business model itself.”

“Through conversations with both our users and our toilet operators, we learned that children are scared to use our toilets because they are so clean, and that children don’t want to dirty the toilet. Therefore, we developed training for operators to educate children on proper use of the toilet, and rolled the training out to increase our child usage and our overall social impact.”

“One of our more unique successes with human-centered design was with our ‘edutainment’ campaigns. We partnered with local theater groups to perform educational skits about sanitation and Fresh Life at local public events. This edutainment frames essential social messages in local contexts, by using local characters and jokes and asking the crowd to participate in improvisation. Our edutainment campaigns have both increased our brand reputation in the community, and increased usage of our toilets by key vulnerable populations.”
“In one surprising prototyping experiment, we tested different pricing and membership models with our toilet operators. We assumed that memberships would be overwhelmingly popular...because it was an easy way to pay and it guaranteed unlimited use of the toilet. However, during our prototype we learned that our operators dislike memberships because they are difficult to keep track of, it’s frustrating to track down neighbors for membership fees, and in general it cost them more stress than it saved them. Because of this feedback, we are looking into alternative membership and payment models.”

If you’re curious to learn more about Sanergy and their Fresh Life toilet project in Nairobi, please visit: http://saner.gy/.
Optional Articles & Videos

Read
HCD Connect "Deliver" Methods
The "Deliver" methods on HCD Connect correlate to the "Prototype" methods that you’re learning about as part of this Week 4 Workshop. [http://www.hcdconnect.org/methods](http://www.hcdconnect.org/methods)

The Prototype Stage in Action
The Pepper Eater Team is working in rural Ethiopia to create a simple tool that dramatically improves pepper processing. Learn more about the prototyping methods the team is using as part of the human-centered design process: [http://bit.ly/MiJSC4](http://bit.ly/MiJSC4)


Watch
The IDEO Toy Lab Prototypes a New Elmo App
[http://www.youtube.com/watch?v=-SOeMA3DUEs](http://www.youtube.com/watch?v=-SOeMA3DUEs)

Download
HCD Toolkit p. 121–151

Prototyping the IDEO Aqueduct
[https://www.ideo.org/downloads/aquaduct_casestudy-pdf](https://www.ideo.org/downloads/aquaduct_casestudy-pdf)