Prototyping for Physical and Digital Products

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Prototyping for Physical and Digital Products

There seem to be hundreds of new smart objects and apps reaching the market every day. With all of this competition, how do you know that your idea will be influential and that people will buy it? You've done the market research and found a viable sector, or you're working with a team that has an idea and is rushing toward a minimum viable product (MVP). But how can you truly know that your ideal customer will benefit from your new product or app?

Prototyping and user testing is the best way to make viable products that are impactful for your users. By creating incrementally better prototypes throughout your process, you can get valuable feedback to improve your product. By using real people, instead of merely trusting your gut, and observing how they interact with your prototypes, you'll see exactly where they get stuck, what they don't understand, and their visceral reaction to the entire experience. Prototyping is a key to developing a good experience and good user experience design.

In this report, I'll begin with the basics of what prototypes are, with examples from different industries. Then I'll explain why prototyping is important, including the many reasons for and value of prototyping. I'll dig into current approaches and more specifics for prototyping for physical and digital products. Finally, I'll explain how to set up and run user tests with these prototypes.

Physical products in the context of this report means physical-computing, electronics-based products, including smart objects, wearable technology, and Internet-connected devices, whereas digi-

tal products are software and apps that we use on devices that are usually screen-based. This report focuses on the abundant opportunities that we have designing for the Internet of Things and how to get started in electronics. It does not cover how to prototype for industrial design or product manufacturing.

By the end of this report, you'll understand how to create cheap, fast prototypes at a variety of different fidelity levels and how to user test them to get the best insights to improve your product. You'll feel empowered to take the next step in prototyping for your current project, and I hope that you do!

What Is a Prototype?

Prototypes are created every day for all sorts of situations. Even if you haven't consciously been making prototypes, they have most likely intuitively been part of your process or even your daily life. A prototype is "a first, typical or preliminary model of something, especially a machine, from which other forms are developed or copied."[1] This "preliminary model" can be anything that takes an idea that's in your head and gives it a form to test. As long as your goal is to always improve your idea, everything is a prototype. They can be sketches, sculptures, or intricate drawings. Or they can be coded, soldered, and fully functional products.

All sorts of industries create prototypes of their work to test and try out different ideas, as you'll read in the following sections.

Architecture

In architecture, prototypes include floor plans (which are drawn and redrawn based on user input and needs), form studies, aesthetic models (Figure 1-1), air-flow models (testing ventilation throughout a space by showing how air will move through the rooms), and daylight models (improving window design by testing how much light they let in at any point in the day or year—see Figure 1-2). Each of these prototypes has a specific use and improves the building based on the testing of the models.

1 "Prototype," Merriam-Webster, accessed January 10, 2016, *http://www.merriam-webster.com/dictionary/prototype*.