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Prototyping

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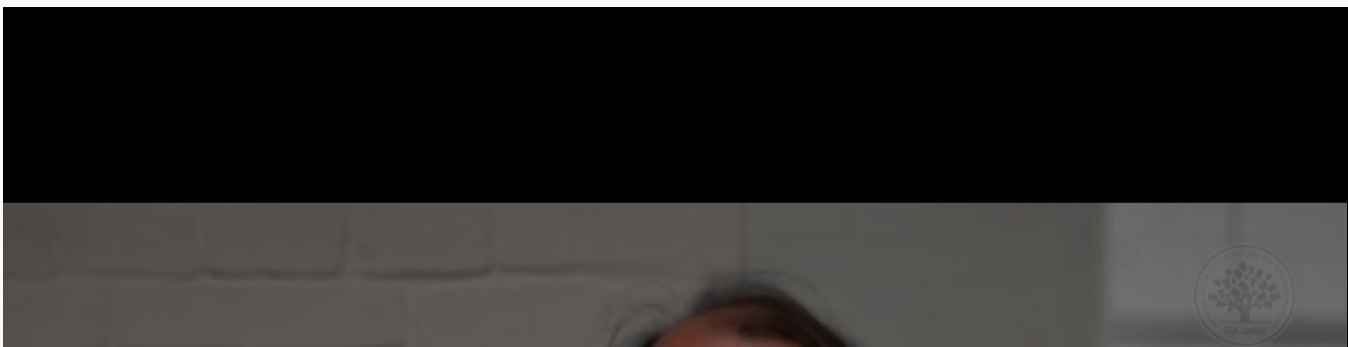
What is Prototyping?

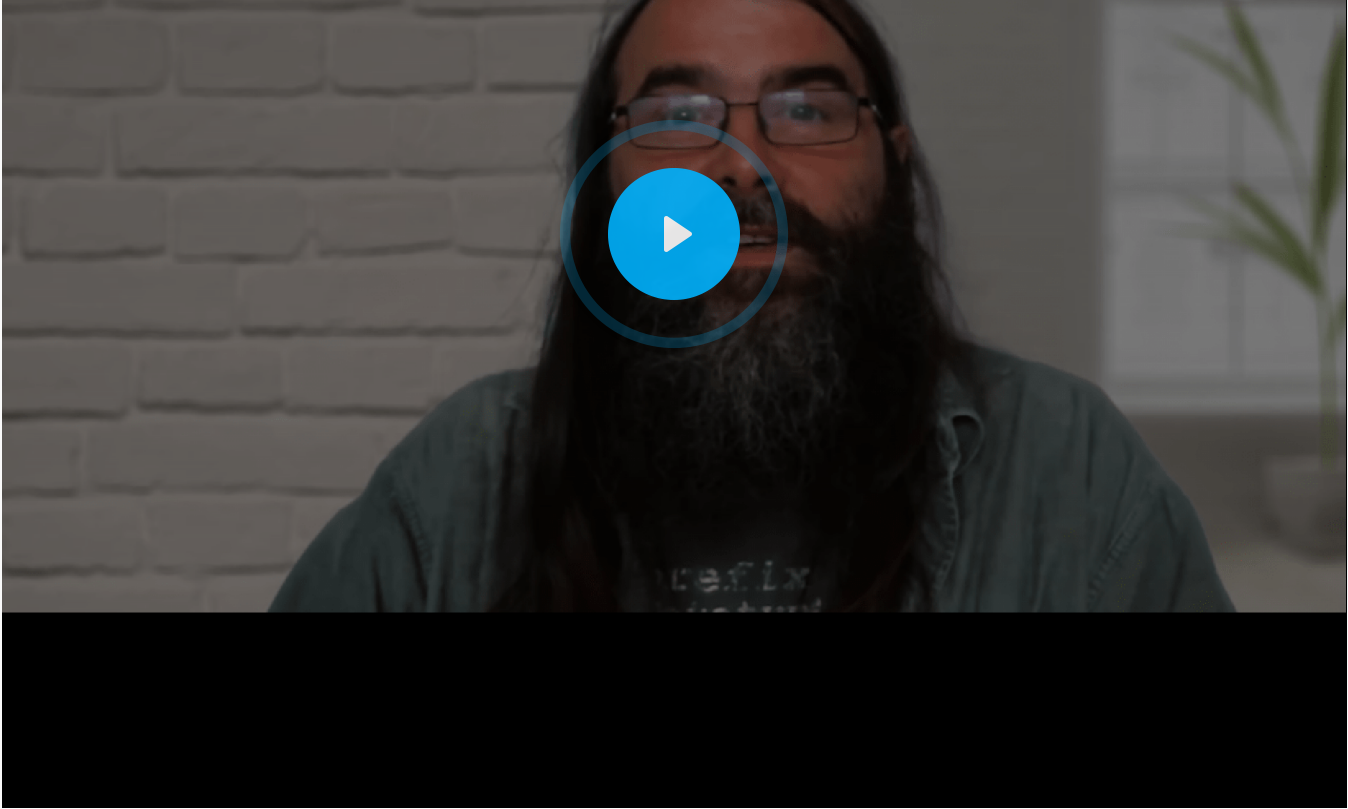
Prototyping is an experimental process where design teams implement ideas into tangible forms from paper to digital. Teams build prototypes of varying degrees of fidelity to capture design concepts and test on users. With prototypes, you can refine and validate your designs so your brand can release the right products.

“They slow us down to speed us up. By taking the time to prototype our ideas, we avoid costly mistakes such as becoming too complex too early and sticking with a weak idea for too long.”

— *Tim Brown, CEO & President of IDEO*

Discover how prototyping can help you access your users to fine-tune ideal products.





Remarkable Reasons for Prototyping

Prototyping is the fourth phase of both [design thinking](#) and [design sprints](#). It's an essential part of [user experience \(UX\) design](#) that usually comes after [ideation](#), where you/your team have created and selected ideas that can solve users' needs. In prototyping, you craft a simple experimental model of your proposed product so you can check how well it matches what users want through the feedback they give. You should consider prototyping from early on—using [paper prototyping](#), if appropriate—so the feedback you gather from users can help guide development.

The advantages of prototyping are that you:

1. Have a solid foundation from which to ideate towards improvements—giving all stakeholders a clear picture of the potential benefits, risks and costs associated with where a prototype might lead.
2. Can adapt changes early—thereby avoiding commitment to a single, falsely-ideal version, getting stuck on [local maxima of UX](#) and later incurring heavy costs due to oversights.

3. Show the prototype to your users so they can give you their feedback to help pinpoint which elements/variants work best and whether an overhaul is required.
4. Have a tool to experiment with associated parts of the users' needs and problems—therefore, you can get insights into less-obvious areas of the users' world (e.g., you notice them using it for additional purposes or spot unforeseen [accessibility](#) issues such as challenges to mobile use).
5. Provide a sense of ownership to all concerned stakeholders—therefore fostering emotional investment in the product's ultimate success.
6. Improve time-to-market by minimizing the number of errors to correct before product release.

The 1-10-100 Rule: How Early Prototyping Prevents Costly Errors in Advance



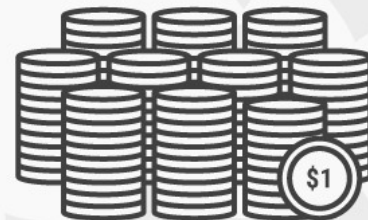
Prevention Cost: \$1

E.g., evaluating usability through early paper prototypes



Correction Cost: \$10

E.g., fixing usability errors discovered through usability tests with hi-fidelity prototypes



Failure Cost: \$100

E.g., fixing the code and lost revenue from an error in the final product



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Prototyping can help catch potentially costly errors well in advance.

Low-Fidelity vs. High-Fidelity Prototyping

Fidelity refers to the level of detail and functionality you include in your prototype. Usually, this will depend on your product's development stage. You can construct one that gives a wide view of the entire system or subsystem (called a horizontal prototype – e.g., an entire website) or one that gives a detailed view of just one feature (a vertical prototype – e.g., a checkout process). The level of fidelity you choose should be appropriate for presenting to users in user testing so they can give focused feedback. Consider the differences:

- **Low-fidelity**

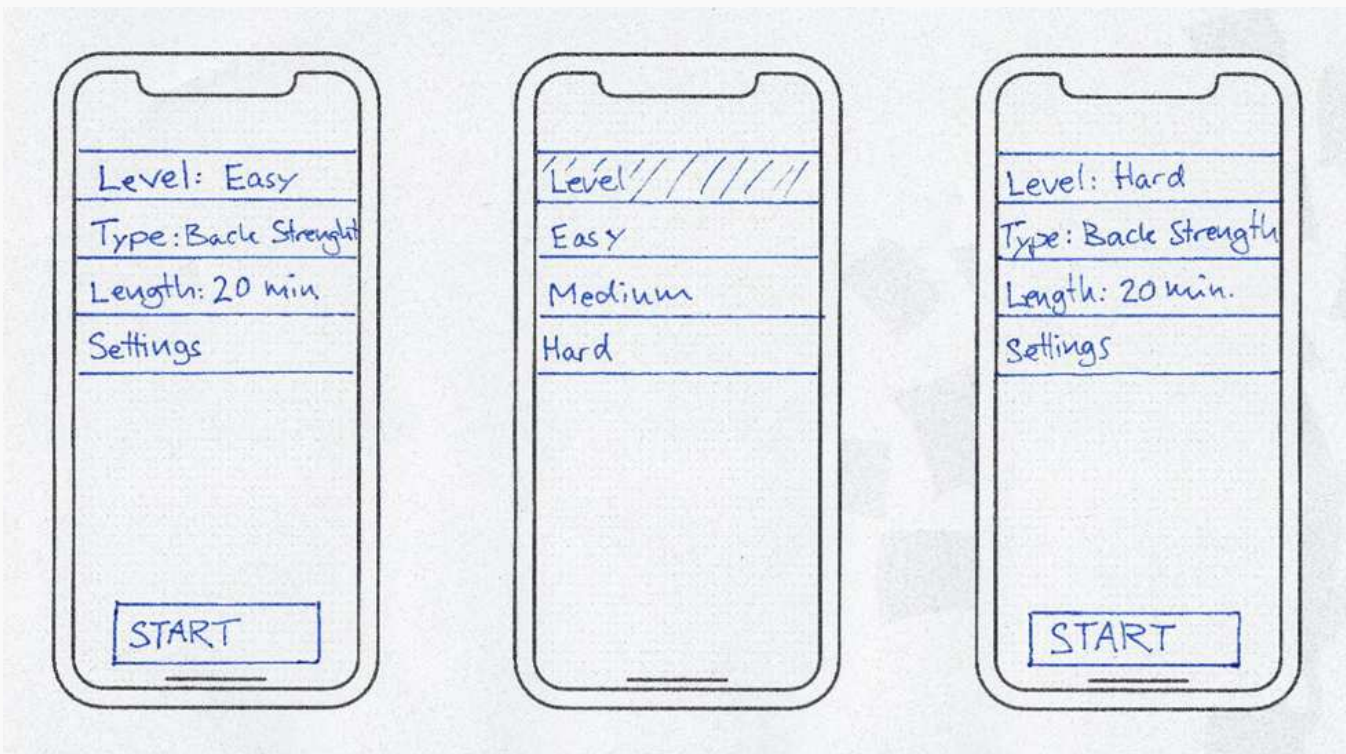
- **Example:** Paper prototypes
- **Pros:** Fast and cheap; disposable; easy to make changes and test new iterations; allow a quick overall view of the product; anyone can produce them; encourage design thinking since prototypes are visibly not finalized.
- **Cons:** Lack of realism, so users might have a hard time giving feedback; hard to apply results from crude early versions; may be too basic to reflect the user experience of the finished product; can oversimplify complex issues; lack of interactivity deprives users of direct control; users must imagine how they would use the product.

- **High-fidelity**

- **Example:** Digital prototypes created on software such as Sketch or Adobe XD
- **Pros:** Engaging—all stakeholders have the vision realized in their hands and can judge how well it matches users' needs and solves their problems; testing will yield more accurate, more applicable results; versions closest to the final product enable you to predict how users will take to it in the marketplace.
- **Cons:** Longer/costlier to create; users are more likely to comment on superficial details than on content; after hours of work, you the designer are likely to dislike the idea of making changes, which can

take considerable time; users may mistake the prototype for the finished product and form biases.

Some designers split high-fidelity prototyping into “mid-fidelity” (where prototypes can have basic digital interactivity or be slick wireframes) and “high-fidelity” (where they’re far closer to the final version). Interactive prototypes yield far more useful results in user tests. However, fidelity is *relative*—a static mockup of a landing page, for example, is of higher fidelity than sketched cut-outs users can move. Overall, you should always commit to prototyping with the users’ needs in mind, particularly with an eye for [user flow](#).



Learn More about Prototyping

Take our Design Thinking course to see how prototyping works best:
<https://www.interaction-design.org/courses/design-thinking-the-beginner-s-guide>

Read about the various types of prototyping and when to use which:

<https://www.uxmatters.com/mt/archives/2019/01/prototyping-user-experience.php>

Find some eye-opening points about what prototyping involves:

<https://uxdesign.cc/prototyping-what-can-a-team-learn-5db78d7da912>

Explore several additional dimensions of prototyping here:

<https://qpsoftware.net/blog/pros-and-cons-prototyping-complex-projects>

Literature on Prototyping

Here's the entire UX literature on Prototyping by the Interaction Design Foundation, collated in one place:

Featured article

Prototyping: Learn Eight Common Methods and Best Practices



There can never be an exhaustive list of prototyping methods, since there is quite literally an endless number of ways you can build prototypes. What we can do, however, is provide a useful list of the eight most common prototyping methods, together with best practice tips that help you maximise your prototyping and

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Learn more about Prototyping

Take a deep dive into Prototyping with our course [Design Thinking: The Beginner's Guide](#).

Some of the world's leading brands, such as Apple, Google, Samsung, and General Electric, have rapidly adopted the design thinking approach, and design thinking is being taught at leading universities around the world, including Stanford d.school, Harvard, and MIT. What is design thinking, and why is it so popular and effective?

The overall goal of this design thinking course is to help you design better products, services, processes, strategies, spaces, architecture, and experiences. Design thinking helps you and your team develop practical and innovative solutions for your problems. It is a human-focused, prototype-driven, innovative design process. Through this course, you will develop a solid understanding of the fundamental phases and methods in design thinking, and you will learn how to implement your newfound knowledge in your professional work life. We will give you lots of examples; we will go into case studies, videos, and other useful material, all of which will help you dive further into design thinking.

This course contains a series of practical exercises that build on one another to create a complete design thinking project. The exercises are optional, but you'll get invaluable hands-on experience with the methods you encounter in this course if you complete them, because they will teach you to take your first steps as a design thinking practitioner. What's equally important is you can use your work as a case study for your portfolio to

important is you can use your work as a case study for your portfolio to showcase your abilities to future employers! A portfolio is essential if you want to step into or move ahead in a career in the world of human-centered design.

Design thinking methods and strategies belong at every level of the design process. However, design thinking is not an exclusive property of designers —*all* great innovators in literature, art, music, science, engineering, and business have practiced it. What's special about design thinking is that designers and designers' work processes can help us systematically extract, teach, learn, and apply these human-centered techniques in solving problems in a creative and innovative way—in our designs, in our businesses, in our countries, and in our lives.

That means that design thinking is not only for designers but also for creative employees, freelancers, and business leaders. It's for anyone who seeks to infuse an approach to innovation that is powerful, effective and broadly accessible, one that can be integrated into every level of an organization, product, or service so as to drive new alternatives for businesses and society.

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