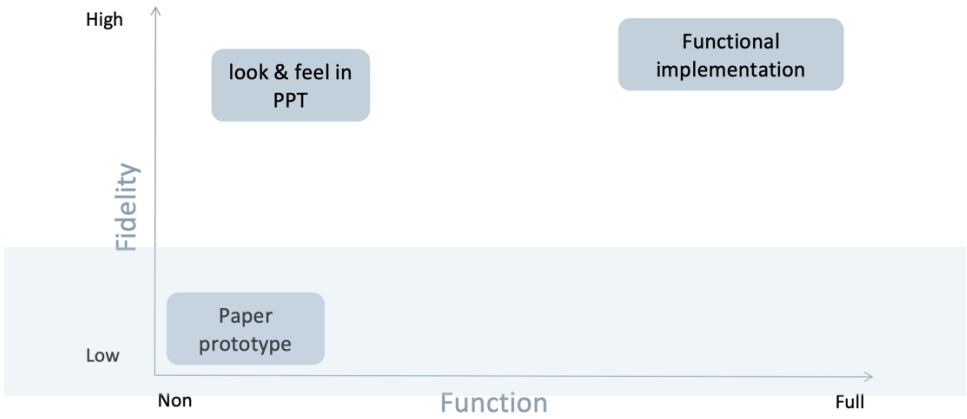
Chapter 8:

Low-Fidelity Prototypes

Overview

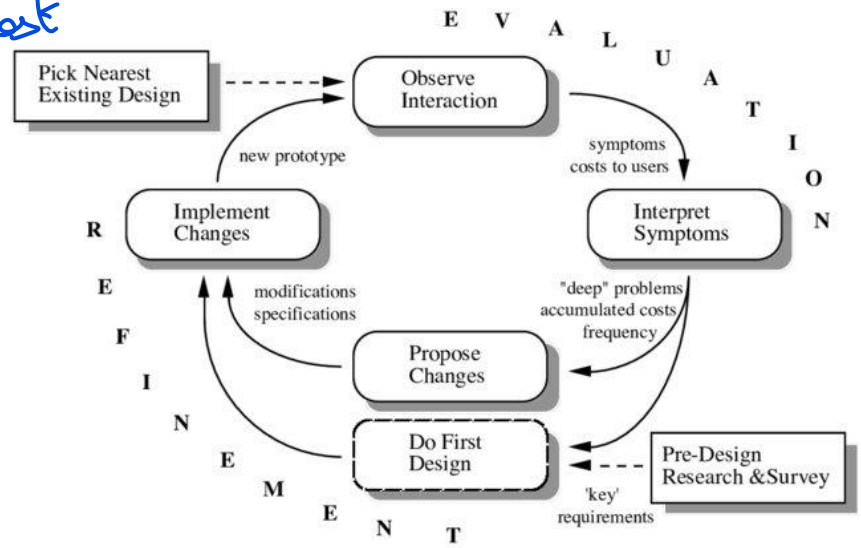
1. What is low fidelity-prototyping?
2. Common techniques for low-fidelity prototyping
3. Examples of low-fidelity prototypes
4. When to use low-fidelity prototypes?

What is low-fidelity prototyping?



Low-Fidelity prototypes can be created **very quickly**. Several iterations can be done within an hour because you focus more on the **overall concept** rather than the details. You sketch the **essential components of the main screens** to explore how understandable the navigation is. It is fast, cheap, and easy to change.
This type of prototype gives you the chance to **include the user very early** and effectively in the design process. The user is asked to use the low-fidelity prototype to identify "hard to understand" parts of the system. They can also easily manipulate the prototype. You can check several ideas as well as the interaction flow of the user.

Prototyping is usually performed in iterations and several prototype ideas are created and discard before obtaining the final result. Especially at the beginning of a design process, low-fidelity prototypes are a helpful way to visualize and text broad ideas and the main relations of functionalities.

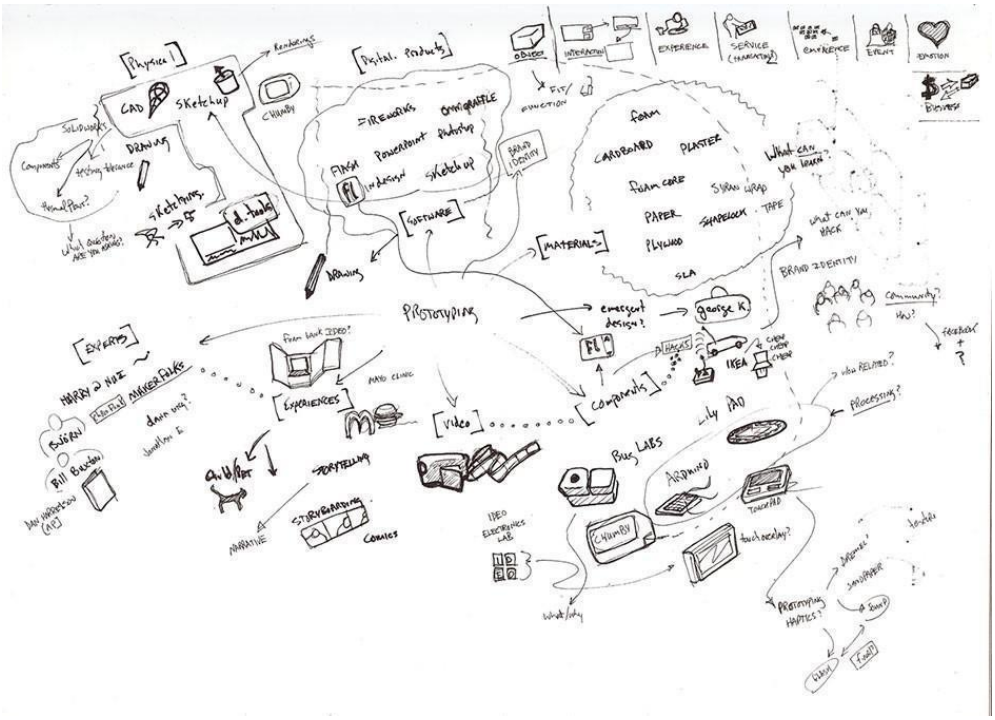


Randall, Dave & Harper, Richard & Rouncefield, Mark. (2007). Fieldwork for Design: Theory and Practice. 10.1007/978-1-84628-768-8.

Common techniques for low-fidelity prototyping

There are six common techniques, that you can use in your low-fidelity prototyping process. The choice of an adequate technique depends on the given context of the project and its requirements.

1. Sketches



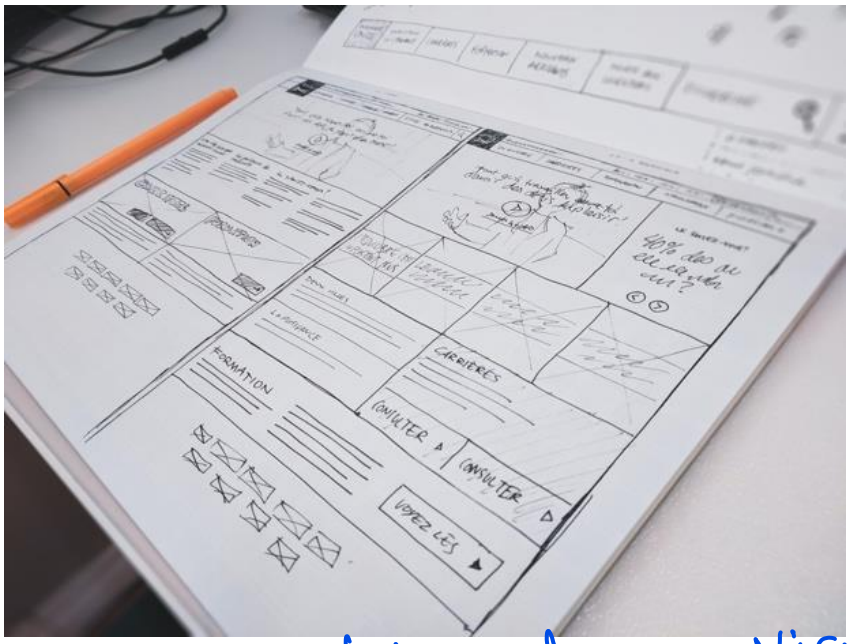
Sketches can be very helpful for making decisions, mostly because they are very easy to create and furthermore, easy to discard.

They are fast and cheap to create, you can create them anywhere and they are disposable. Use them in early and divergent stages of your design process.

But: Sketches are ambiguous by design, as they lack detail – thus, they are not suitable to convey complex interactions of an app. Besides, they are almost never of high enough fidelity to be useful with people outside of the team, since they rarely have the context to understand what the sketch is meant to convey.

Sketches are not very helpful in convergent processes where you want to select a few best ideas—other forms of prototypes, such as paper prototypes or wireframes, are more helpful.

2. Paper Prototypes



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testing idea > visual execution.

Paper prototypes are cheap and easy to create as well as modify. They are used to give users a more realistic idea of how the interface will work and can test, if users will understand the proposed solution.

Paper prototypes ignore superficial details of an interface, such as the color of a button. This allows the testing of an idea, rather than its visual execution.
While it is fairly easy to make small changes, sometimes larger, more structural changes are more difficult because they can require completely recreating whole sections of the prototype.

Paper prototypes are less helpful to test commonly used user interface patterns. That's because users are likely to already know how the user interface works.
While better than sketches, paper prototypes still require imagination from users. This means some users might struggle when they try to understand how the interface works.

3. Physical prototyping: Lego prototypes

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Lego bricks allow to quickly create rough physical prototypes. They are relatively cheap and can be used for a brainstorming process, as they encourage experimentation and fun. Lego prototypes are versatile and easy to modify and dismantle.

Lego prototypes are not suitable for digital products, such as mobile apps or websites. However, they can still be used to create user journey stories for such intangible products.

Lego prototypes are relatively expensive low-fidelity prototype. Like sketches, Lego prototypes don't require any level of artistic talent. Thus, this is an opportunity to involve non-designer team-mates and stakeholders. Lego prototypes can be used to mimic the final height and weight of a project and thus be included in early user-testing.

4. Physical prototyping: 3D Printing

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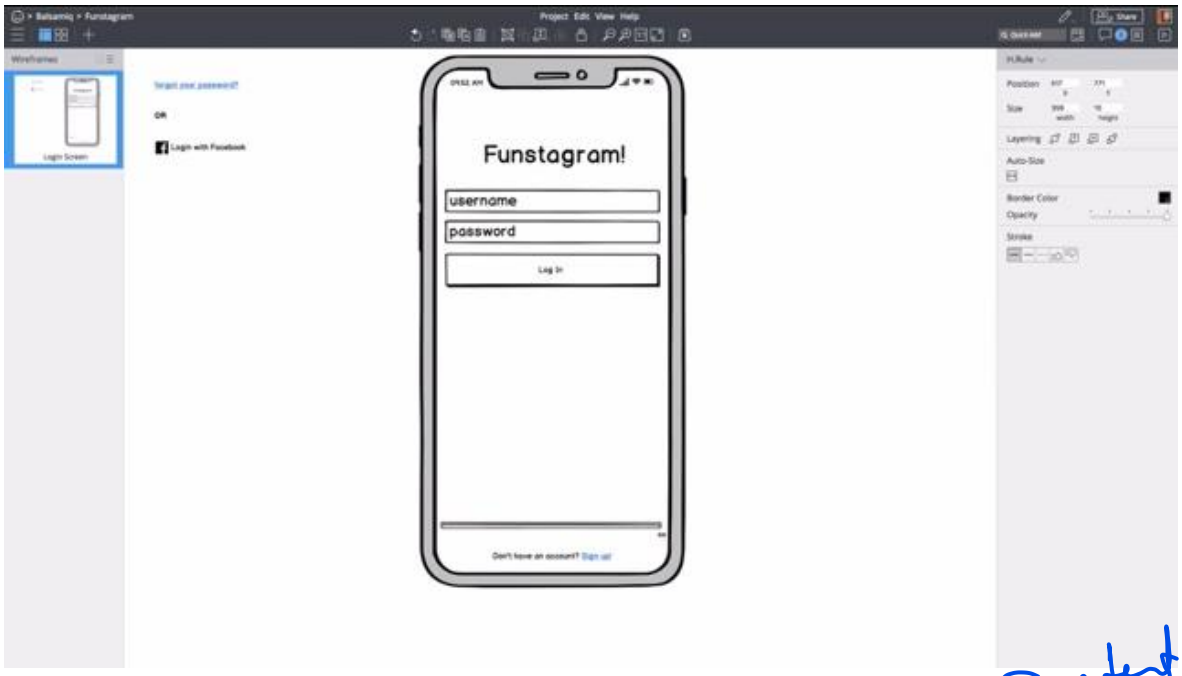
For some products, that have a high complexity, lower-fidelity models can be created with a 3D printer.
Thanks to digital fabrication technologies, it is now possible to do rapid prototyping relatively quickly using a variety of materials with differing properties, such as cheap PLA, impact-resistant ABS, durable nylon, and more.
3D printing can be very useful for prototyping in jewelry design, architecture, or engineering to make mechanical parts, cases, architectural models, props, and functional consumer products.

5. Digital wireframes



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wireframes

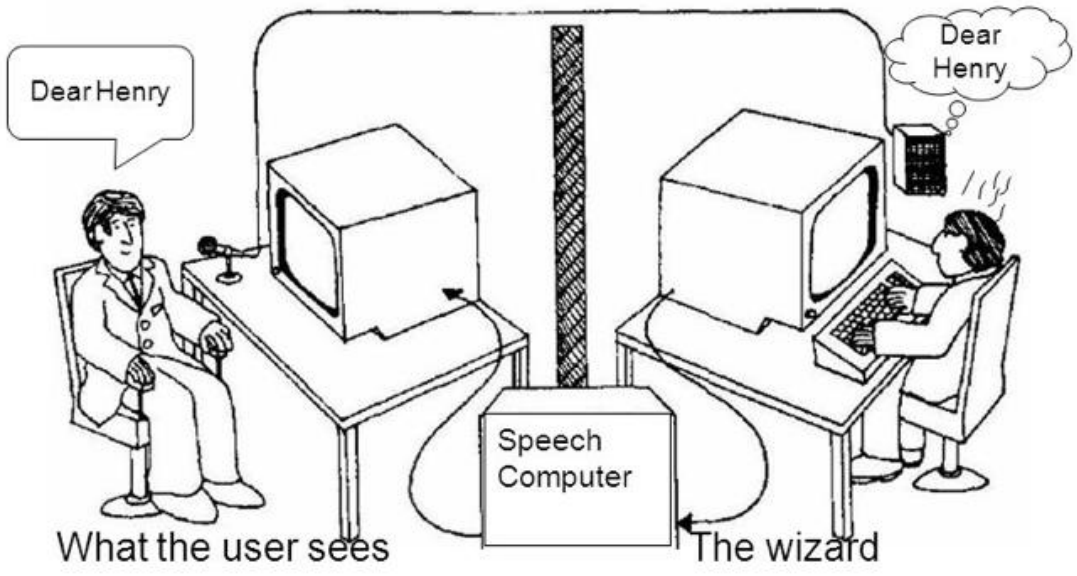
Content, structure
functionality

Wireframes are simple, bare-bones illustrations of an app or website. They allow to ignore visual and interactive aspects and focus on content, structure and functionality. Technically, paper prototypes (which are mentioned above) are low-fidelity wireframes.

Wireframes can be changed very quickly, as they don't contain details such as images and colors.
Thus, they focus on the functionality and content structure of the product, thus users also focus their feedback on the functionality and content structure of the product.

Wireframes enable the visualization of the relation between different pages in the product. Users and team-mates can easily see where each page leads and what clicking each button does. However, as wireframes are still quite bare-bones, users might struggle to understand how what the applications works.

6. Wizard of Oz prototypes



Gould, Conti & Hovanvecz, Comm ACM 26(4) 1983.

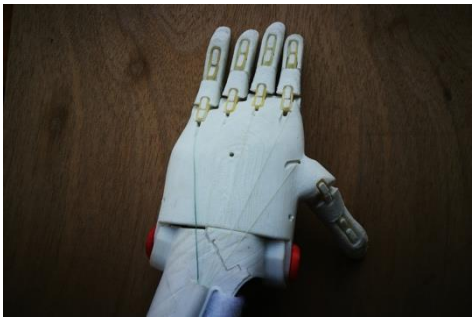
Wizard of Oz prototypes are prototypes with fake functions. Like the Wizard of Oz in the story (who generates an ominous and deceptive appearance from behind a curtain), some aspects of the product are mimicked. They're a kind of low-to-medium-fidelity prototype, where the key functions are not functional at all while other aspects such as visuals are fully designed.

The idea of Wizard of Oz prototypes is to get users to believe that the prototype is fully functional, so you can test it while saving time and resources. For example, you can create a Wizard of Oz prototype for a smart assistant, where your team-mate types out responses to trick the user into thinking that the smart assistant is fully functional.

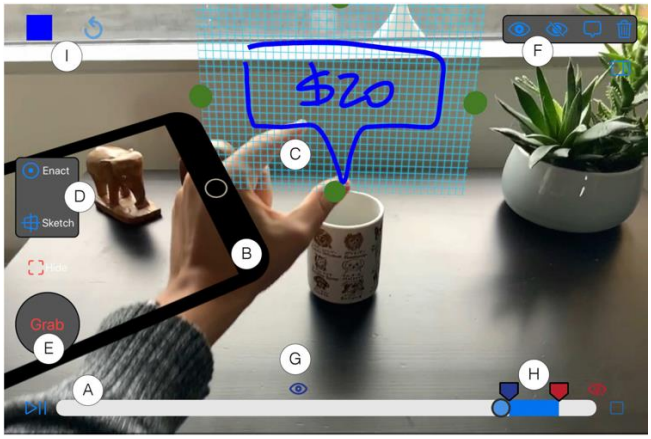
This mimicking of particular functionalities enables to test particularly complex parts of the design without having to build it. However, the testing of a wizard of Oz prototype might take the same resources for testing as a final product.
Users tend to provide realistic feedback, since Wizard of Oz prototypes are more believable and interactive.

Examples of low-fidelity prototypes?

Examples of low-fidelity Prototypes are sketches, paper prototypes and mock-up screens. The left image shows a block of wood. It was used as a low-fidelity prototype of a smartphone in order to show people what the size and the weight of the smartphone look like. Sometimes, a piece of plastic with a mock-up screen on it (right image) is used to show the users what it would look like.



This is a prototype of an arm prothesis, that is printed in a 3D printer. The configuration files are online and can be downloaded under a Creative Commons Attribution-NonCommercial-Share Alike 4.0 International License.
https://wikifactory.com/@rebel/prosthetic-arm-prototype



Many designers use video prototypes—non-interactive illustrative movies with overlay motion graphics—to explore and communicate new design concepts instead of creating interactive augmented reality prototypes.

Germán Leiva, Cuong Nguyen, Rubaiat Habib Kazi, and Paul Asente. 2020. Pronto: Rapid Augmented Reality Video Prototyping Using Sketches and Enaction. Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3313831.3376160

Do you know other examples of low-fidelity prototypes from your daily life?

When to use low-fidelity prototypes?

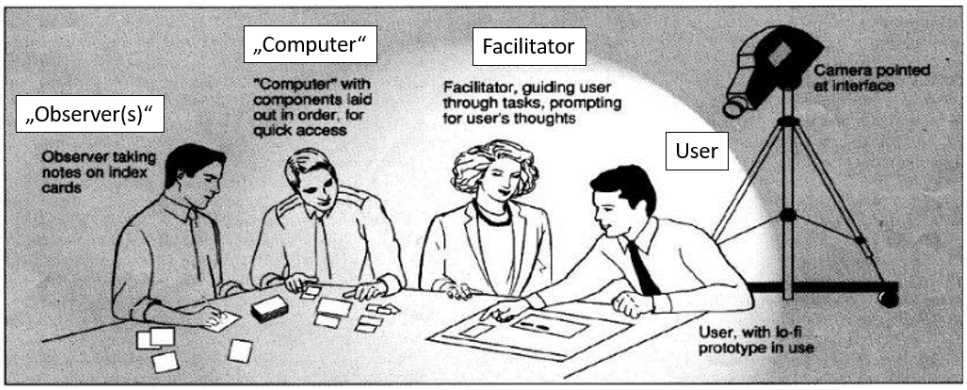
In the early stages of GUI design, it is important to think through different ideas and **quickly discard bad ideas** - the first idea is not always the best. If a lot of time has already been invested in describing an idea, you are less willing to discard it if it turns out not to work.
Low-fidelity prototypes are **quickly created** and just as quickly discarded. That's why they are the optimal means to communicate, discuss, and further develop a solution idea during ideation. They also make it easier to involve other stakeholders (e.g., customers, users, software developers) in the design of the interface, because the **demand for perfection of the result is lower.**

Advantages

- Cheap, easy and quick to implement
- Users are keen to criticize
- Users concentrate on abstract dialog concepts
- Fast turn-around

Disadvantages

- No real functionality, difficult to identify errors
- Difficult to display dynamic interface behavior
- Reuse and extending difficult to impossible
- Not all ideas can be realized



This is a typical scene of how low-fidelity testing could look. You prepare several test scenarios. These are typically drawn from the task analysis specific things that you want to test, to present familiar data and realistic tasks to the user. The selected user works with the low-fidelity prototype. The facilitator guides the user through the tasks while the “computer” gives the interface components to the user. The observer takes notes and writes down the design problems. The whole testing might be videotaped to learn from the testing later.

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