

# Thinking before Doing:

## Wireframes, Mockups and Prototypes



Figure 1: building without planning

Have you ever seen the outcome of projects focused on action without at least a small amount of before-hand thinking and planning? Would you feel comfortable having your house built solely based on a quick oral description of what you're expecting? Chances are the final result won't match your expectations, especially if there were several people involved in the construction (Figure 1). In the long run, you will lose time and money swapping the upstairs kitchen and the master bedroom opening onto the garage...

That is the reason why we encourage you to take some time now, before we start programming, to think your application through, and maybe get feedback from perspective users, so you don't have to undo any of your future programming. There are different tools to help you keep your mind clear about your goal, to communicate within a team of developers (even if *a priori* you're not there yet) and to test user acceptance. These tools are wireframes, mockups and prototypes. You will often find the terms used interchangeably. Assuming wireframes and prototypes are the same thing is like mistaking the blueprint of a house for a display house: they represent the same product, the actual final house you consider buying, yet they are not exactly the same and they serve different purposes. The objective of this short document is to clarify the composition and the goal of wireframes, mockups and prototypes.

## Wireframes

A wireframe offers a simplified, low fidelity, visual representation of the layout of each screen of the application: which content goes where, what are the possible interactions. Wireframes are prepared quickly, and anything which takes too long to draw (a carefully crafted icon, a proof-read text...) is represented in a

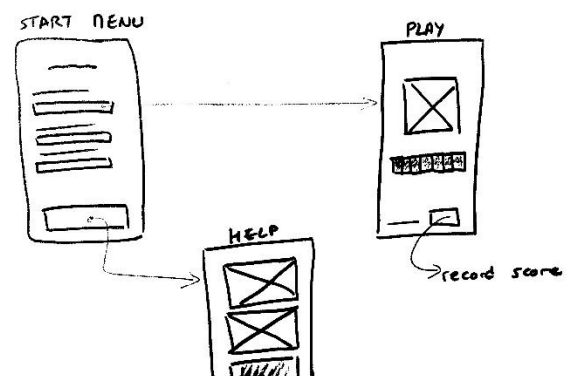


Figure 2: wireframe example

simplified way, using placeholders (often gray boxes). Interactions are represented as (usually blue) lines/links between screens (Figure 2). Wireframes are not interactive. A wireframe can be compared to the blueprint of a house: it specifies the architecture of the house but you can't use it to judge the beauty of the house and unless you're an architect it's difficult to imagine how the final house will "feel" like. Wireframes are used in the earliest stages of a project, when the design (layouts and workflow) still undergoes frequent changes because they are fast (thus inexpensive) to modify (you don't feel guilty if you trash them!). Wireframes are also an important part of the documentation.

## Mockups

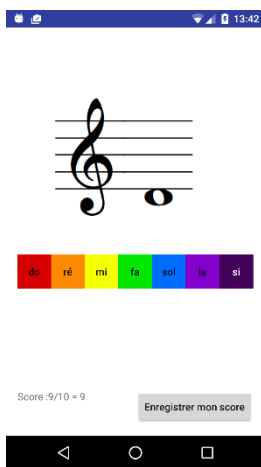


Figure 3: mockup example

A mockup offers a more refined, detailed version of the wireframe: it shows content like graphics and texts using a "look" (colors, fonts...) as close as possible to the one in the final application. A mockup is built on top of a wireframe to realistically represent what the application will look like (Figure 3). Mockups are sometimes called "middle or high fidelity wireframes". But just like a wireframe, a mockup is static, non-interactive. It can be compared to the 3D model of a house. Mockups are useful to test the user acceptance of the visual side of the application (it can be a key factor of the application's popularity!).

## Prototypes

While wireframes and mockups model the user interface (UI), prototypes model the user experience (UX). A prototype is an interactive wireframe ("mid-fi prototyping") or interactive mockup ("hi-fi prototyping"). The workflow of the application is simulated by working links and transitions: areas of the graphical representation are clickable, enabling a journey through the user interface. The prototypes can be previewed on a computer and/or on your smart-phone. Prototypes are used in user testing before the development begins. It can be compared to a display house: it provides a drive test to future residents. The number of prototypes is usually limited because they are more time-consuming to create. Yet some tools are able to exploit your prototype to automatically generate part of the final code of your application. This optimizes your time but is often reserved to relatively simple projects.

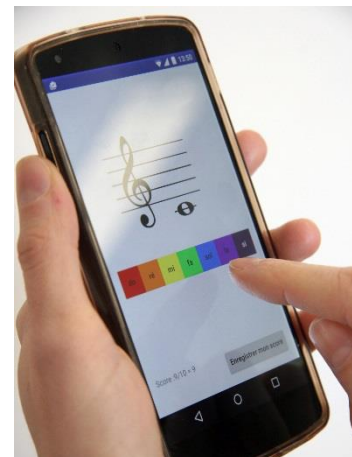


Figure 4: prototype preview

## Tools

Below we provide you with a list of wireframing and prototyping tools. Our objective is not to be exhaustive, neither to promote any of them but rather to introduce you to the variety of tools available. Most of the tools mentioned below are either free or offer a free trial. The website [prototypingtools.co](http://prototypingtools.co) helps you to compare design prototyping tools for apps. We encourage you to experiment with some tools and share your experience on the forum.

For those who love to start on paper, UI Stencils sells pads and stencils designed to help you create nice-looking wireframes quickly (Figure 5).

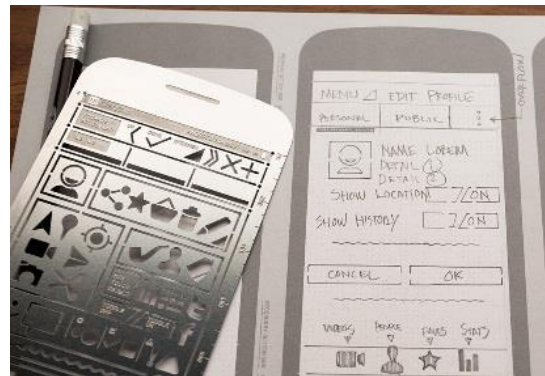


Figure 5: examples of items sold by UI Stencils

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|---|--|
|  | UI Stencils<br><a href="http://www.uistencils.com/">http://www.uistencils.com/</a> |
|---|--|

Once you're satisfied with this first design, you can turn it into a prototype using the marvel (Figure 6) or POP (Figure 7) applications: take a picture of each layout with your phone, then select part of a layout picture (for instance the box which represents a button) and add a link towards another layout picture. You can then play with the fake application (prototype) on the phone.



Figure 6: from marvel

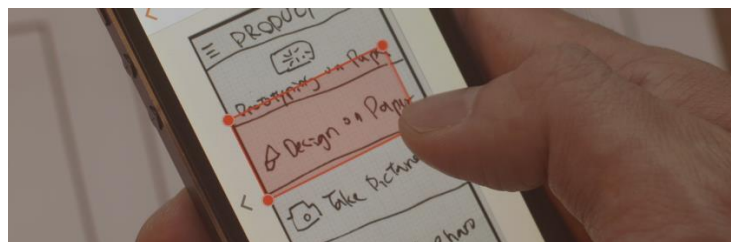


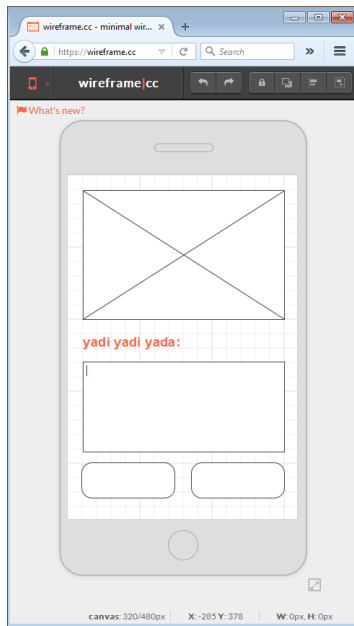


Figure 7: from POP

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|  | POP 2.0 - Prototyping on Paper<br><a href="https://play.google.com/store/apps/details?id=in.woomoo.pop">https://play.google.com/store/apps/details?id=in.woomoo.pop</a><br><a href="https://popapp.in/">https://popapp.in/</a> |
|  | marvel<br><a href="https://marvelapp.com/">https://marvelapp.com/</a>  |











If you only want to create wireframes and mockups, but prefer to draw them with a software tool for a less sketchy appearance and to share them more easily, you may try on-line tools such as wireframe.cc (Figure 8) or mocknow.

Figure 8: wireframe.cc screenshot

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|---|---|
|   | Wireframe.cc<br><a href="https://wireframe.cc/">https://wireframe.cc/</a> |
|  | mocknow<br><a href="http://mocknow.com/">http://mocknow.com/</a>          |

There is a lot of tools to model your application from wireframes to prototypes. Most of them require you to work on-line. They offer monthly to yearly payment plans. They provide rich functionalities, with ready-to-use templates for instance. They also allow for team cooperation. And models can be exported for demonstration to the client as clickable PDF, PNG files, HTML pages or prototypes which can be previewed with a specific off-line application. To name just a few:

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|---|---|
|  | moqups<br><a href="https://moqups.com/">https://moqups.com/</a>             |
|  | UXPin<br><a href="https://www.uxpin.com/">https://www.uxpin.com/</a>        |
|  | Axure RP<br><a href="http://www.axure.com/">http://www.axure.com/</a>       |
|  | Fluid UI<br><a href="https://www.fluidui.com/">https://www.fluidui.com/</a> |
|  | Proto.io<br><a href="https://proto.io/">https://proto.io/</a>               |

|   |   |
|---|---|
|  | Xiffe<br><a href="https://xiffe.com/">https://xiffe.com/</a>                      |
|  | Flinto<br><a href="https://www.flinto.com/">https://www.flinto.com/</a>           |
|  | InVision<br><a href="http://www.invisionapp.com/">http://www.invisionapp.com/</a> |

If you prefer working offline, and if you're on a budget you might want to try the Pencil Project, which is an open-source tool which runs inside Firefox or as a standalone version available for all platforms (Figure 9).

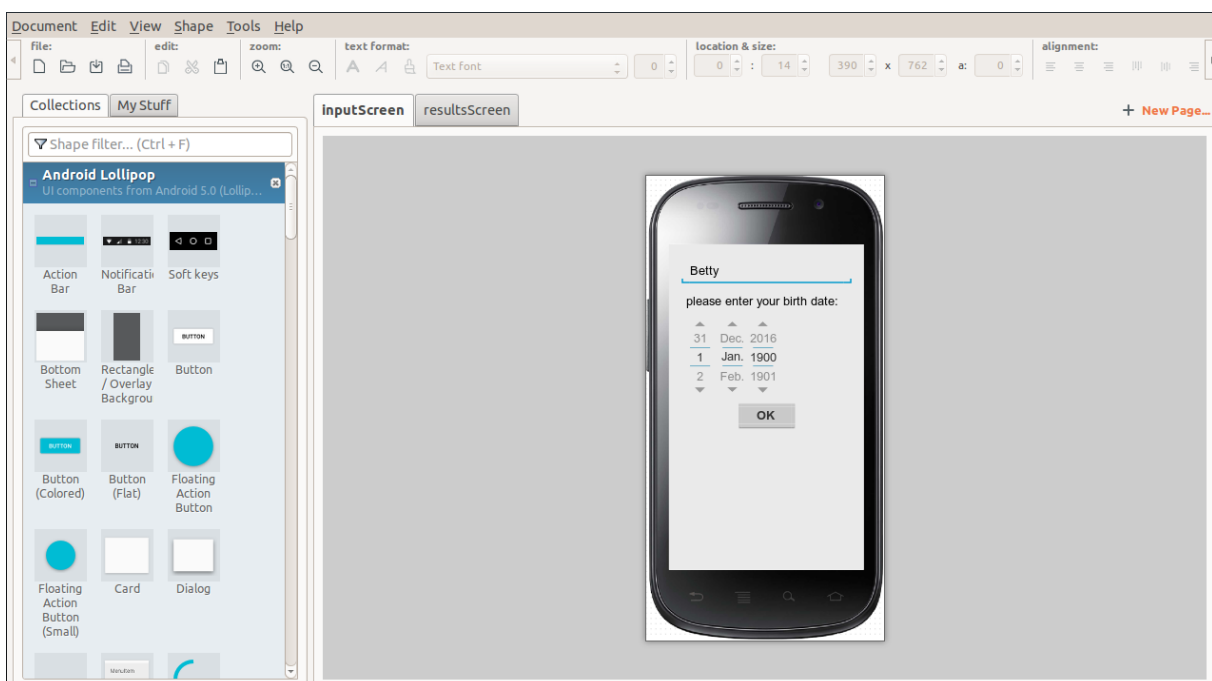


Figure 9: Pencil Project screenshot

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|  | Pencil Project<br><a href="https://github.com/prikhi/pencil/blob/develop/README.md">https://github.com/prikhi/pencil/blob/develop/README.md</a> |
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Android Studio offers a tool called “Android Navigation Editor” which allows you to graphically design your layouts and workflows (Figure 10), try the resulting prototype on your phone and also generate part of the code of the application!

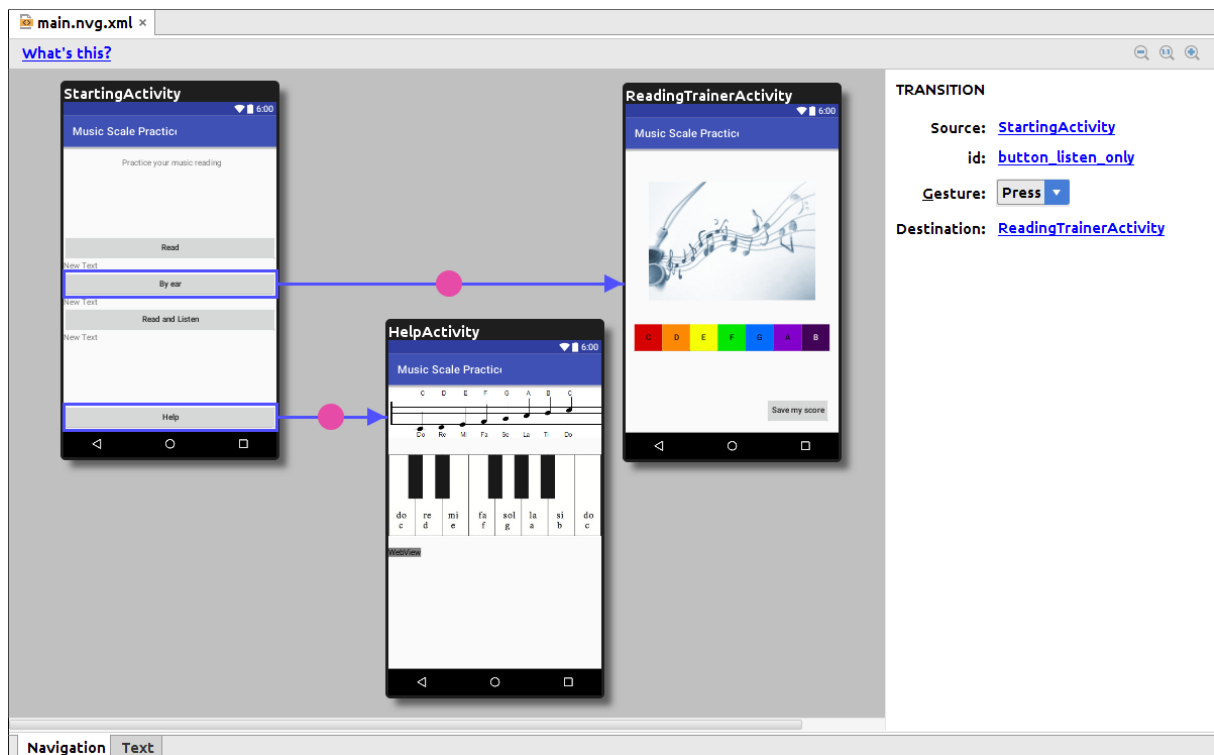


Figure 10: Android Studio Navigation Editor screenshot

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|  | <b>Android Navigation Editor</b><br><a href="http://tools.android.com/navigation-editor">http://tools.android.com/navigation-editor</a> |
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Lastly, let's mention that some app designers rather use non-dedicated tools such as Photoshop for instance, to produce visuals and add interaction and animations.

Others tools:

- <https://balsamiq.com/>
- <https://gomockingbird.com/home>
- <http://www.justinmind.com/>
- <http://concept.ly/>
- <https://www.gliffy.com/>
- <https://www.lucidchart.com/>
- <http://www.invisionapp.com/>
- <http://www.pixate.com/>
- <http://facebook.github.io/origami/>