

Human-Computer Interaction

2024/2025

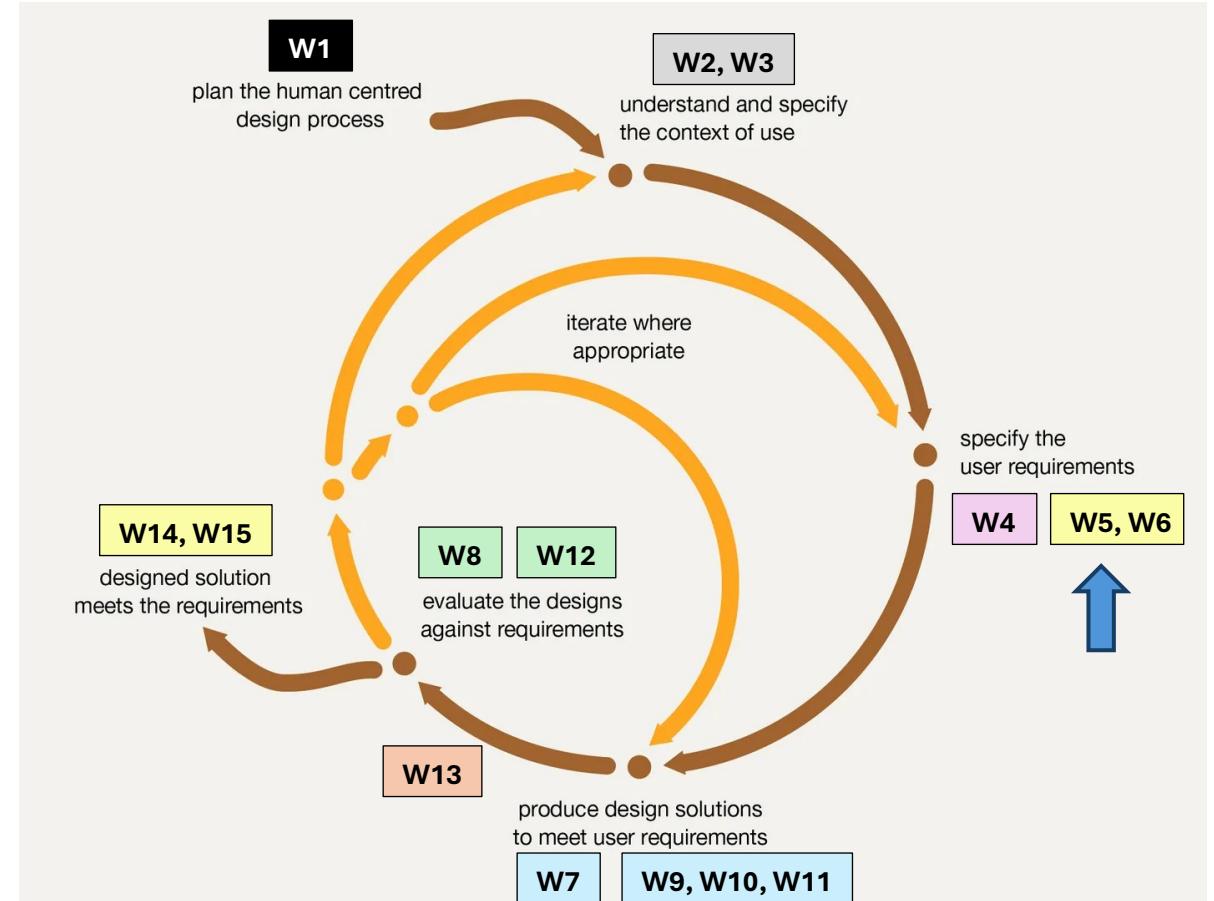
Lecture Class 5

Low Fidelity Prototyping

This week in HCI

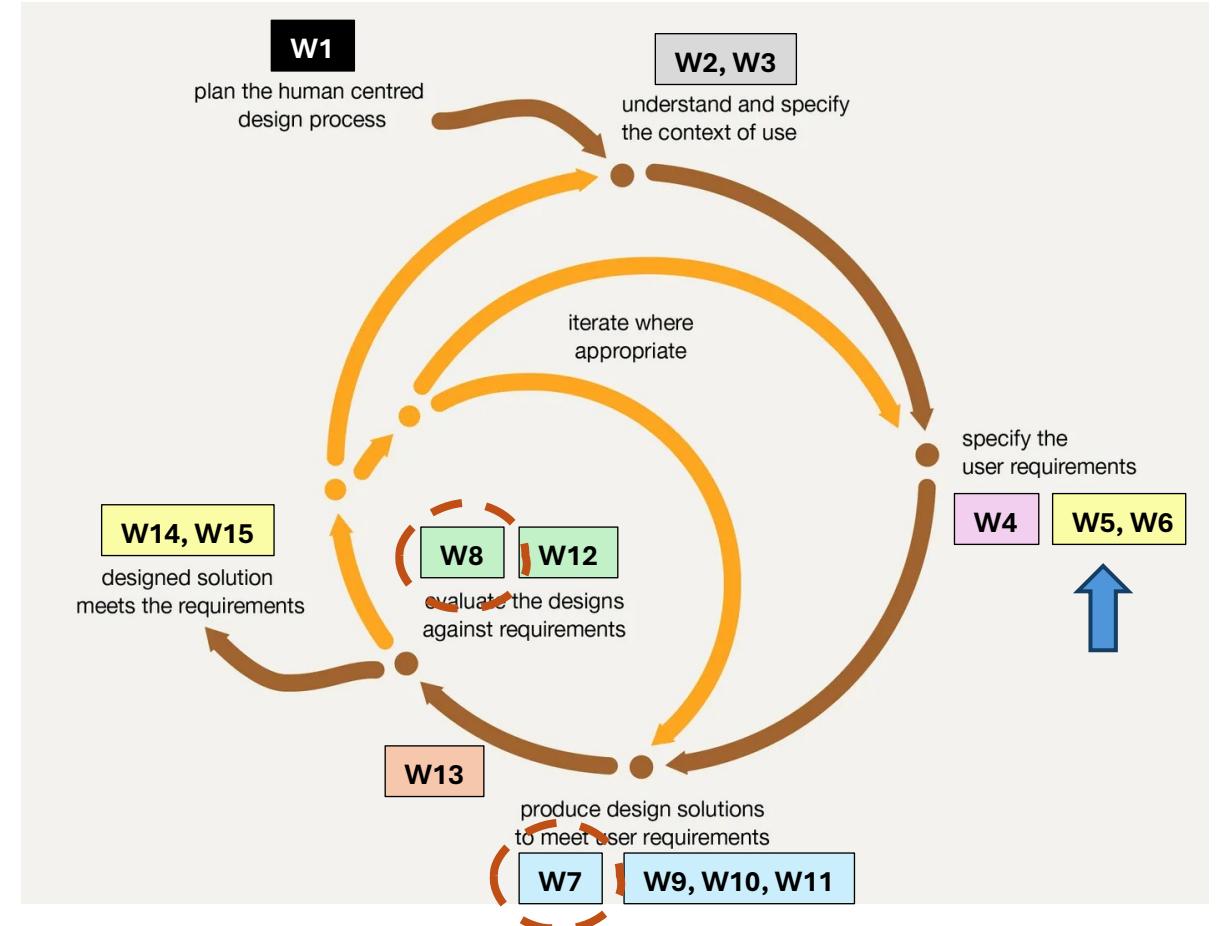
This week you present and receive feedback about the context analysis and requirements

In the meantime, you will start learning to prepare the next stage...

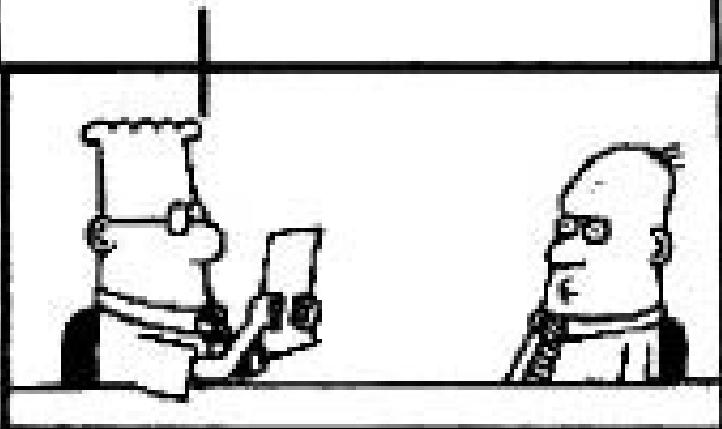


Today's Outline

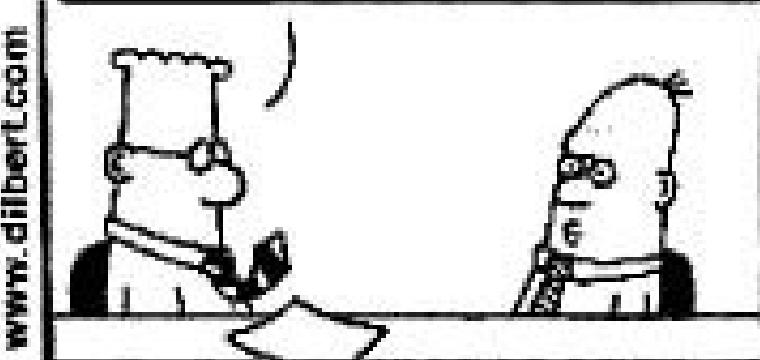
- What to do with requirements
- The usefulness of prototyping
- Article presentations



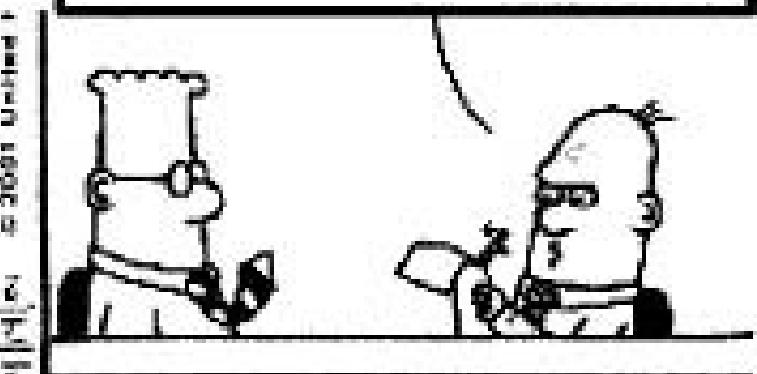
YOUR USER REQUIREMENTS INCLUDE FOUR HUNDRED FEATURES.



DO YOU REALIZE THAT NO HUMAN WOULD BE ABLE TO USE A PRODUCT WITH THAT LEVEL OF COMPLEXITY?



GOOD POINT.
I'D BETTER ADD
'EASY TO USE'
TO THE LIST.



DILBERT © UFS. Reprinted by permission.

How can we move from the requirements and start designing the interface?

We prototype!

Thinking About Prototyping

What is a prototype?

something to test, explore, or communicate design ideas for a thing that is being designed.



What for?

It lets you create and refine an interface based on user feedback before implementing it.

Why Should We Prototype UIs?

- Test and communicate user interface designs
- Save time and money
- Bring users into the design process
- Design across devices and platforms

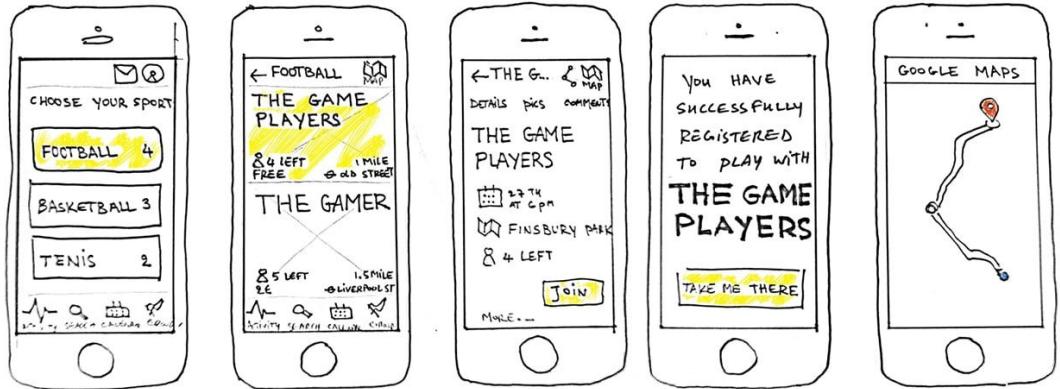
What Can Prototypes Provide?

- Usability Issues
- Missing (or misspecified) functional requirements
- Preference for one design alternative
- Priorities

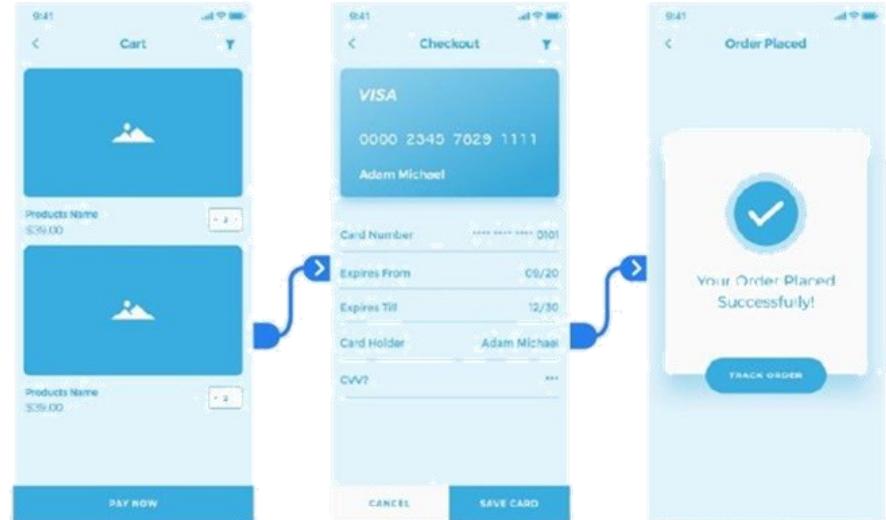
Fidelity Levels

Visual Design, Content, Interactivity

- Low Fidelity



- High Fidelity



How to Choose



- Type of prototype should match current stage of project and the questions needing an answer
- If you are just starting to think about the interface, it is probably better to go low fidelity, to have a first insight on how users react
- Go high fidelity when you already got some good feedback to back the extra investment or interaction patterns need more detail



Lo-Fi Prototyping

Usefulness of Lo-Fi Prototypes

- Fast and inexpensive
- Elicit users feedback concerning general aspects
- Easy to modify even during user tests
- Valuable to test the UI conceptual model
- Estimated to allow detecting up to 80% of the usability issues

Usefulness of Lo-Fi Prototypes

Suitable to collect data for:

Concepts and terminology

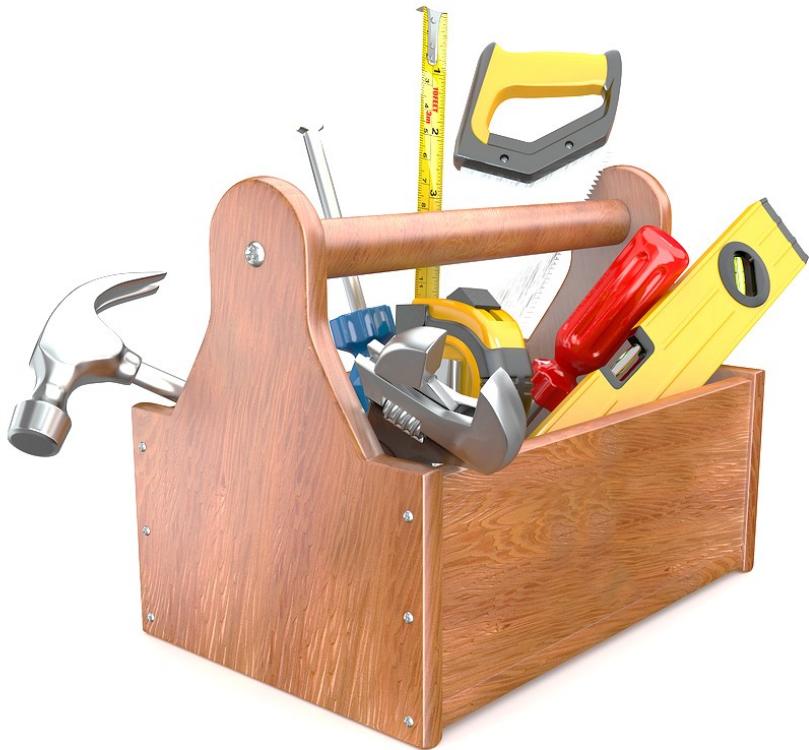
Navigation

Contents

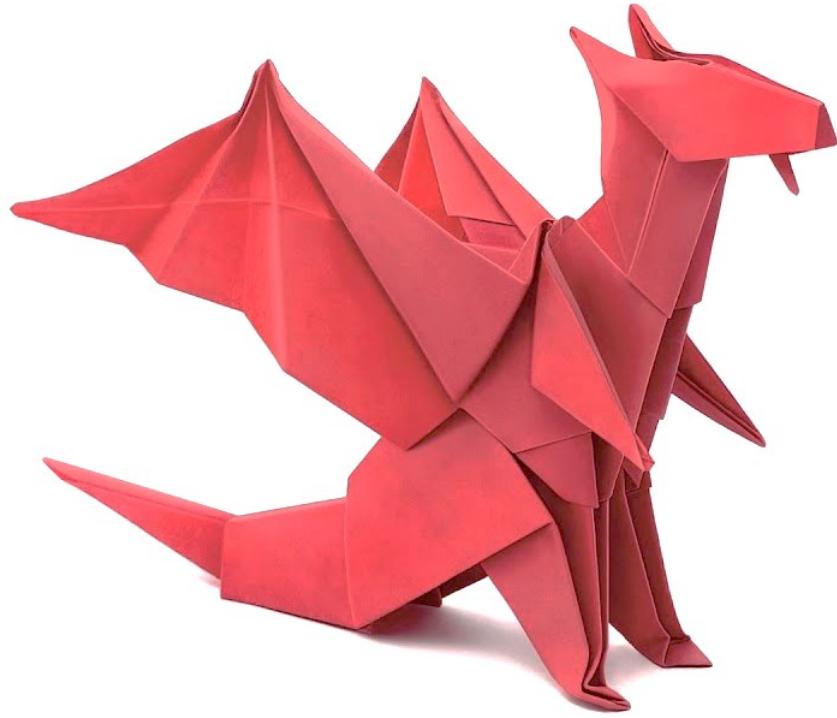
Structure

Functionalities

Common Techniques and Tools



- Paper Prototypes
Simple, hand-drawn representations of interfaces that allow for easy visualization and testing of navigation and functionality with minimal effort
- Wireframes
Digital blueprints of web pages or app screens that outline the structure and layout without incorporating detailed design elements
- Digital Tools
Software solutions enabling designers to create low-fidelity prototypes that can be easily shared and modified for collaborative feedback



Paper Prototyping

Paper prototyping is a variation of usability testing where representative users perform realistic tasks by interacting with a paper version of the interface that is manipulated by a person “playing computer,” who doesn’t explain how the interface is intended to work.

- Carolyn Snyder, “Paper Prototyping”, ch 1

Usefulness of Paper Prototypes

Provide a good compromise for obtaining first feedbacks and rapidly iterating over design choices



Advantages of Paper Prototypes

Quick and Cheap

Suited to Collaborating
and creating a shared
understanding

No training

No technical constraints



Advantages of Paper Prototypes

More Creative Feedback

Unfinished designs encourage open discussion and creativity.

Paper prototypes signal that ideas are still evolving.

Paper prototypes remove the intimidation factor of technology. They will not break anything...

Users may feel empowered to suggest changes when they see a work in progress.

Advantages of Paper Prototypes

No Nitpicky Feedback

High-fidelity prototypes invite feedback on minor visual details.

Users tend to focus on flaws when something looks "finished."

Unwanted feedback: "Those fields don't line up" or "I don't like that shade of green."

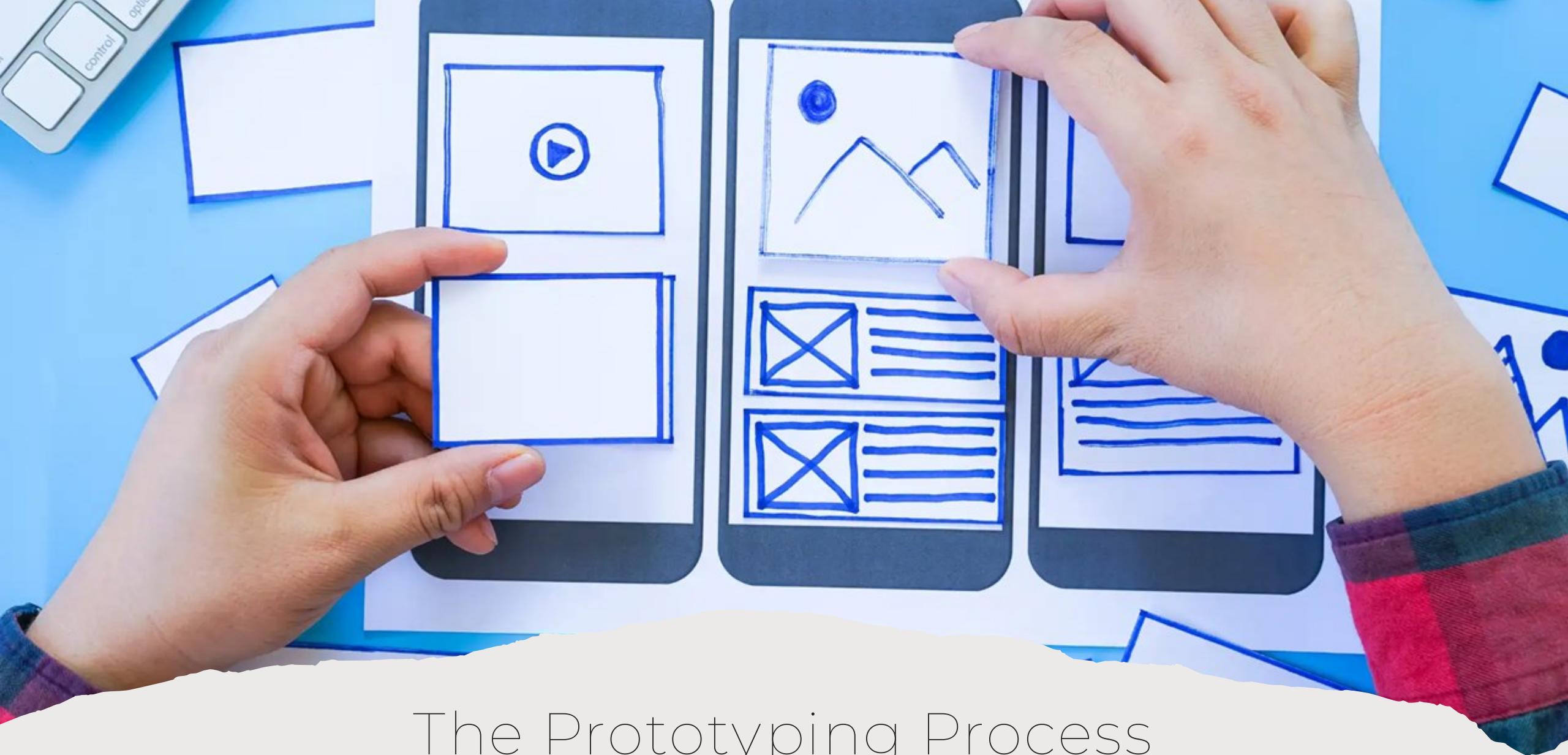
Encourages feedback on concepts and functionality rather than aesthetics.

Remember...

If you show a nonprogrammer a 100% beautiful UI,
they will think the system is almost done

Disadvantages of Paper Prototypes

- Lack of Realism / unresponsive
- In-person testing with moderator
- Interpret results carefully



The Prototyping Process

Ch 5 -7

Task Design

- Before starting to design a prototype, think about the tasks it will support
- When asking someone to use your prototype you do not just watch them do what they want

Guidelines to Choosing Tasks

Tasks should:

- Be based on Persona goals
- Cover questions important to the success of your system
- Have appropriate scope (not just one per screen)
- Have a finite and predictable set of possible solutions
- Have a clear end point that the user can recognize
- Elicit action, not just opinion

Choosing Tasks

Guides design decisions

- Ensures the prototype supports real user actions.

Prevents unnecessary details

- Focus on essential interactions.

Reveals missing elements

- Helps identify gaps in the workflow early.



Bad Task Examples

- Explore the website and tell us what you think.
- Use the app to complete a financial transaction.
- Pretend you are a new user and navigate through the entire platform.
- Find and read all terms and conditions on the website.
- Go to the Account Settings and change your billing address

Good Task Examples

- Find and purchase a pair of Asics running shoes under \$100.
- Schedule an appointment with a dermatologist for next Tuesday at 10 AM.
- Upload the latest report in your archive and share it with Mary Poppins
- Change your default billing address to “R. da Casa, 3810 Aveiro”

Guidelines to Choosing Tasks

- Think about the order of the tasks
- Avoid wording that reveals the method
 - Bad: Go to the File Menu and Export the file to PDF
 - Good: Save the current document as a PDF
- Sometimes an image may help...





Building the Prototype

Prototype Background



Prototype Content

It does not need to have much detail, nor to be very realistic, e.g.:

Text may be replaced by some lines

Images may be replaced by words

In general, no colour is needed

Sizes of windows, fonts, etc. don't need to be final



Examples

Top Prototype (Outfit: Classic):

- Header: NEW OVERVIEW GALLERY CONTACT
- Section: Create your account
 - Form fields: Enter your email, Choose a password (Min 8 characters)
 - Text: Your usual outfit: **Classic**
 - Buttons: SIGN UP, SIGN IN
 - Checkboxes: Receive promo emails, I've read the terms & conditions
- Text: Howdy! It's been forever but you haven't aged a day.
- Text: Or sign in with: Facebook, LinkedIn, Google

Bottom Prototype (Outfit: Minimalist):

- Header: NEW OVERVIEW GALLERY CONTACT
- Section: Create your account
 - Form fields: Enter your email, Choose a password (Min 8 characters)
 - Text: Your usual outfit: **Minimalist**
 - Buttons: SIGN UP, SIGN IN
 - Checkboxes: Receive promo emails, I've read the terms & conditions
- Text: Howdy! It's been forever but you haven't aged a day.
- Text: Or sign in with: Facebook, LinkedIn, Google

Wireframe of a Task Management Application:

- Header: NEW OVERVIEW GALLERY CONTACT
- Section: Create your account
 - Form fields: Enter your email, Choose a password (Min 8 characters)
 - Text: Your usual outfit: **Minimalist**
 - Buttons: SIGN UP, SIGN IN
 - Checkboxes: Receive promo emails, I've read the terms & conditions
- Text: Howdy! It's been forever but you haven't aged a day.
- Text: Or sign in with: Facebook, LinkedIn, Google

The background wireframe shows a task management system with various screens for creating tasks, setting due dates, filtering tasks by priority and category, and managing groups and categories.



e-DOCTOR

System Logo

Patient n° XXXXX

Name

Address

Phone Number Email

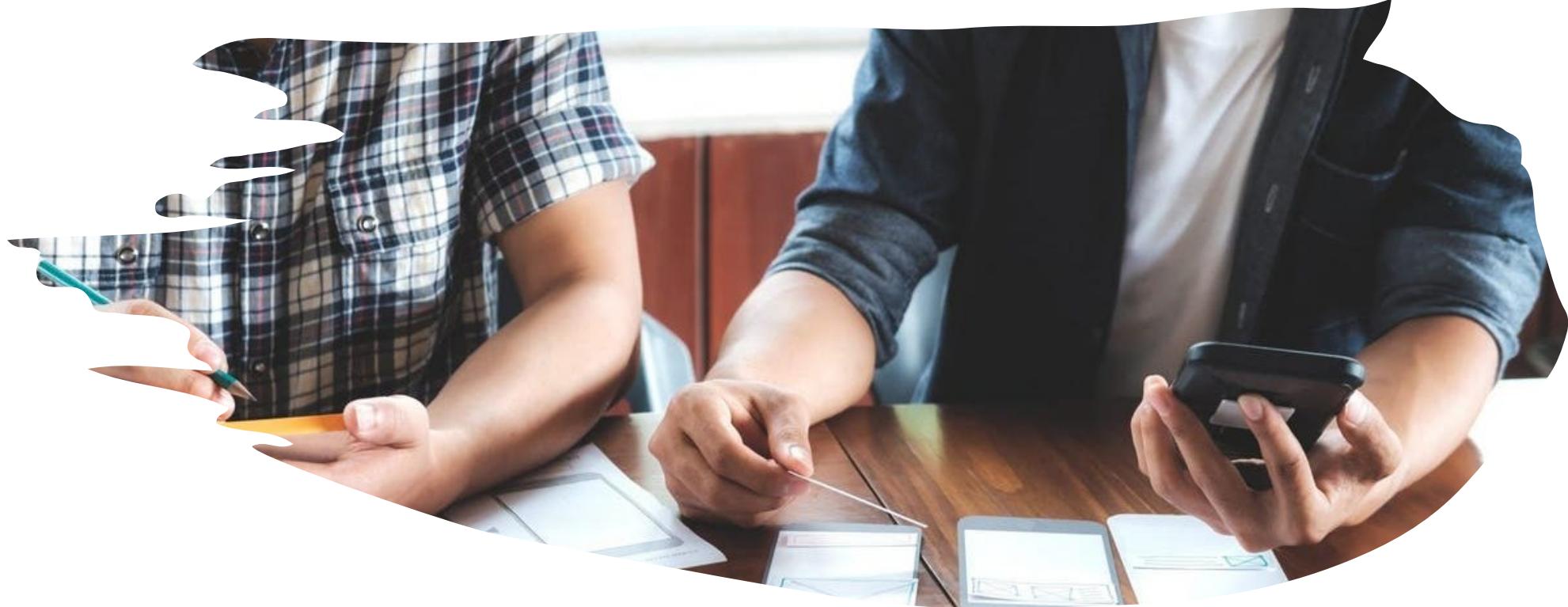
Identify Card Health System
No

Birth Date

Gender Height weight
Blood Group Notes

Foto Photo upload

Continue >



Evaluating a Prototype

Remember the Tasks?

The tasks considered for designing the prototype are very useful for testing:

- Improves usability testing
 - Users interact meaningfully instead of guessing functionality.
- Encourages realistic feedback
 - Users evaluate based on practical use cases, not abstract ideas.

Using Tasks during Testing

- Be attentive to task order
 - Think about a logical order. Sometimes tasks provide a narrative/flow that can help users understand the logic
- Present tasks in written form, not orally
 - This allows users to get back to the task and analyse it further or remember some detail
- Present one task at a time
 - If you present several tasks, it is possible that users start reading next tasks before doing the current one, and this may influence their actions

Who is at the Test Session?

- The computer
- The facilitator
- The observer

... and the user



Anatomy of a Test Session

- Receive the participant and explain the overall context of your system
- Give the participant the different tasks, one by one
- Observe the participant using the prototype and collect their feedback
- Encourage thinking aloud
- Discuss opinions and ideas at the end

Prototype Evaluation Example



- https://www.youtube.com/watch?v=OlbdIXLunt4&t=7s&ab_channel=NNgroup



Tools for Prototyping

Beyond sketched paper prototypes

Prototyping beyond paper

- The procedures mentioned for paper prototypes can be performed beyond rough sketches
- Sometimes, the use of tools beyond pen and paper can yield increased interactivity and improved look and feel

Balsamiq

The screenshot shows the Balsamiq Mockups interface with the following components:

- Header:** Balsamiq logo, "balsamiq", "My product", "Dashboard", and a toolbar with "Edit" and "Delete" icons.
- Toolbars:** "UI Controls", "Icons", "Images", "Templates", "Common", "All", "Android", "Big", "Buttons", "Containers", "Forms", "iOS", "Layout", and "More".
- Components:**
 - UI Controls: Arrow, Breadcrumbs, Browser Win..., Button, Button Bar, Calendar, Callout, Chart: Bar, Chart: Col.
 - Position: Squiggly, Position, 1014.
 - Size: Size, 184.
 - Layering: Layering, You can hold, Learn.
- Wireframe:** A detailed wireframe of a banking application. It includes:
 - A sidebar with navigation links: Home, Payments, Balance, Customers, Analytics, AI Bot, Connect (Accounts, Transfers, Collected fees, Settings), Orders, Developers, View test data, and Business settings.
 - A main header with a search bar.
 - A "Connected account" section with a green VERIFIED button.
 - A "Personal info" section with fields for Name, Date of birth, SSN, and Identity document.
 - A "Bank balance" section with fields for Total balance (\$150.00 USD) and Lifetime volume (\$550.00 USD).
 - A "Send funds" button.
 - A "Payments" section with tabs for Payments, Transfers, Payouts, and Collected fees.
 - A table showing transaction details with columns: AMOUNT, BANK ACCOUNT, ESTIMATED ARRIVAL, ID, and DATE INITIATED.

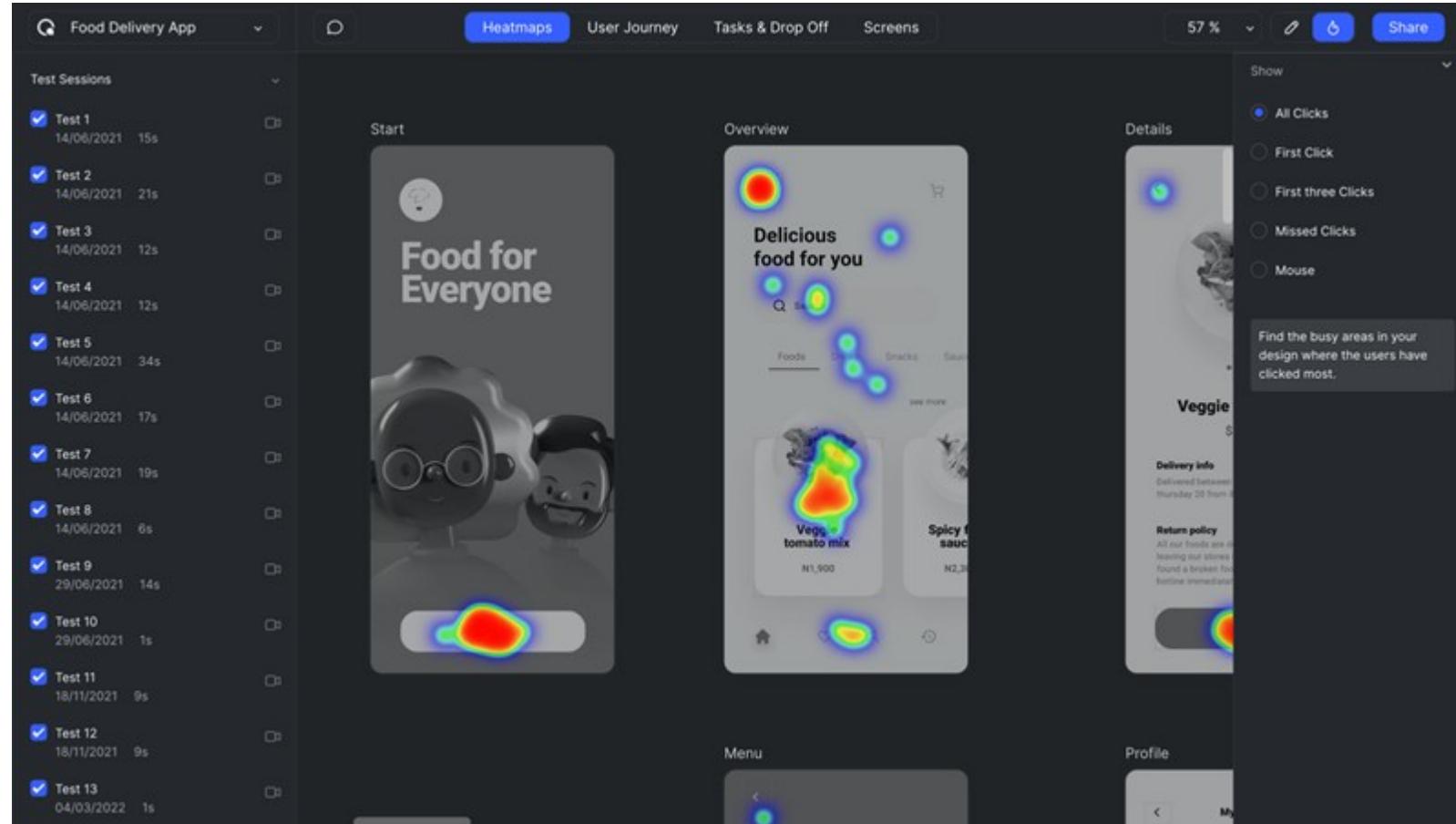
The image shows a wireframe of a web application for ticket booking. At the top, there's a header with a back/forward button, a search icon, and the URL 'http://cine-teatro-estarreja.pt/ticket'. Below the header, on the left, is a sidebar with various buttons for 'layout', 'Mark', 'Chart: Colu...', 'Squiggly L...', 'Position', '1014', 'Size', '184', and 'Layering'. The main content area has several sections: a 'LOGO DO CINE-TEATRO' placeholder, a 'search' input field, a 'Bilheteira' section with a seating chart grid where seats A2 and A3 are selected, and a 'Bilhetes' dropdown menu showing options like 'A2 - 10\$', 'A3 - 10\$', 'Seguro', and 'Preço 20\$'. To the right of the seating chart are fields for 'Nome', 'Email', 'Teleovel', and payment methods ('Modo Pagamento' dropdown with 'MultiBanco', 'Paypal', 'CTT', and a blue 'Finalizar Compra' button). A tooltip at the bottom left provides instructions for drawing lines of text by holding the Y key and dragging. On the far right, there's a vertical toolbar with icons for selection, zoom, and other editing functions.

Figma

The screenshot displays the Figma application interface, which includes:

- Left Sidebar:** A navigation panel titled "Trivet" containing sections for "Pages" (Overview, Copy Iterations, Design Crit Feedback, Archive), "Layers" (Mobile / Landing, Card, Nav, Welcome, Profile, Follow, Row, Profile tile), and "Assets".
- Central Canvas:** Three mobile screens are shown side-by-side:
 - Screen 1:** "Hi Chef" landing page featuring a "Ube Layer Cake" card with a photo of a slice of cake.
 - Screen 2:** "Yasmin" profile page showing a video thumbnail for "Tomato-Habenero Salsa" and a step "2. Chop and add vegetables".
 - Screen 3:** "Back" view of a user profile for "Flor" with a photo of a man wearing a hat and glasses, and a bio: "Always chopping garlic."
- Bottom Navigation:** A toolbar with icons for selection, layers, assets, search, and other design tools.
- Right Sidebar:** A detailed panel for "Frame 1" with sections for "Position" (X: 0, Y: 0, H: 200, W: 200), "Layout" (W: 200, H: 200), "Appearance" (Fill: E4FF97, Stroke, Effects), and "Tools" (Design, Prototype, Share).

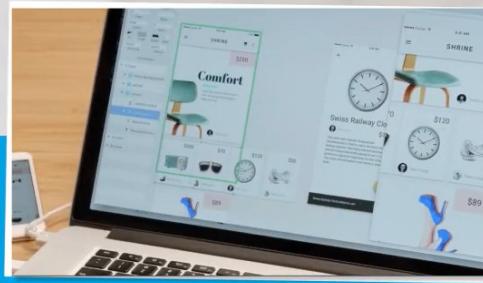
Quant UX



Rapid Prototyping



Sketching &
Paper
Prototyping



Digital
Prototyping



Native
Prototyping

Rapid Prototyping by Google for Startups:

<https://www.youtube.com/watch?v=JMj0zqJS44M>

<https://www.youtube.com/watch?v=KWGBTGryFk>

<https://www.youtube.com/watch?v=lusOgox4xMl>

Bibliography

- Preece et al., "Interaction Design: Beyond Human Computer Interaction", 6th ed, ch. 12: Design, Prototyping, and Construction, Wiley, 2023
<https://learning.oreilly.com/library/view/interaction-design-6th/9781119901099/c12.xhtml#head-2-250>
- Carolyn Snyder, "Paper Prototyping", Morgan Kaufmann, 2003
<https://learning.oreilly.com/library/view/paper-prototyping/9781558608702/>
- Dan Goodwin, Ben Coleman, "Designing UX: Prototyping", 1nd ed., SitePoint, 2017
<https://learning.oreilly.com/library/view/designing-ux-prototyping/9781492019251/>
- Interaction Design Foundation, "Prototypes",
<https://www.interaction-design.org/literature/topics/prototypes>
- Prototyping 101: The Difference between Low-Fidelity and High-Fidelity Prototypes and When to Use Each,
<https://theblog.adobe.com/prototyping-difference-low-fidelity-high-fidelity-prototypes-use/>