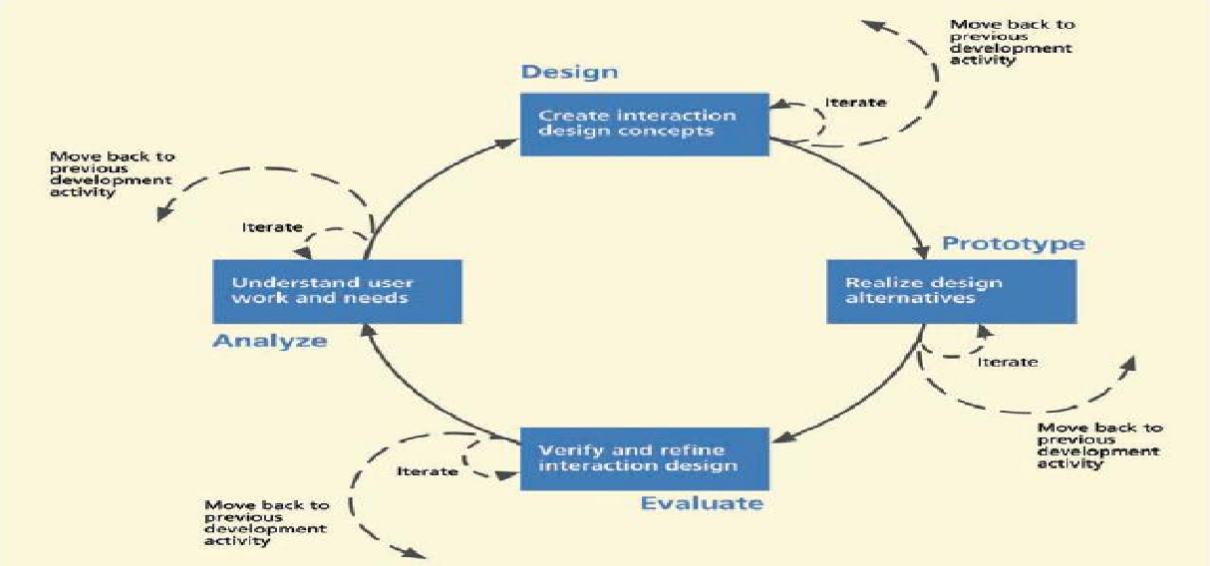
1. The UI Life Cycle



In our life cycle concept, specific to a UX process, analysis translates to understanding user work and needs. Design translates to creating conceptual design and determining interaction behavior and look and feel. Implementation translates to prototyping, and evaluation translates to ways to see if our design is on track to meet user needs and requirements.

In a larger system view, implementation includes a final production of hardware and software, including the user interface. However, in our UX lifecycle template, implementation is limited to the interaction design component and prototyping is the design manifestation we use for evaluation before it is finalized for production.

Each of the four UX process activities in Figure can have sub-activities, the major ways to do the basic activities. As an example, for the analysis activity, possible sub-activities include contextual inquiry, contextual analysis, requirements extraction, and contextual data modeling.

- **Analyze: Understanding the business domain, user work, and user needs**
  - The left-most of the four basic activity boxes in Figure represents the analysis process activity. Among the many possible sub-activities to support analysis are contextual inquiry and contextual analysis for studying customer and user work practice in situ, from which we can infer user needs for a new system design.
  - Extracting requirements from contextual data is another analysis sub-activity. The requirements, if you choose to use them, are interaction design requirements, inputs driving the design process and helping to determine its features and the look, feel, and behavior of the interaction design. These requirements are used as a checklist to ensure that they are covered in the design, even before any UX evaluation.
  - Finally, synthesizing design-informing models is yet another possible analysis sub- activity. Design-informing models are abstractions of different dimensions of the work activity and design space. If you choose to use them, these include models describing how work gets done, how different roles in the work domain interact, and the artifacts that are created, and so on.

- **Design: Creating conceptual design, interaction behavior, and look and feel**
  - The upper-most box in Figure represents the process activity for design, including redesign for the next version. Among the possible sub-activities to support design are design ideation and sketching, where the team does creative design thinking, brainstorming, and sketching of new design ideas.
  - Design ideation leads to the representation of mental models, conceptual design, and design storyboards.
  - Design production is a design sub-activity involving the details of applying requirements, design-informing models, and envisioned design-informing models to drive and inform the emerging interaction design.
  - Design production entails prototyping and iteration of the conceptual design, intermediate designs, and detailed designs.

- **Prototype: Realizing design alternatives**
  - The right-most of the four basic activity boxes in Figure represents the prototyping process activity. Prototype building is often done in parallel with, and in conjunction with, design.
  - As designs evolve in designers' minds, they produce various kinds of prototypes as external design representations. Because prototypes are made for many different purposes, there are many kinds of prototypes, including horizontal, vertical, T, and local.
  - Prototypes are made at many different levels of fidelity, including low fidelity (especially paper prototypes), medium fidelity, and high fidelity (programmed functional prototypes), and "visual comps" for pixel-perfect look and feel.

1. A horizontal prototype is very broad in the features it incorporates, but offers less depth in its coverage of functionality.
2. A vertical prototype contains as much depth of functionality as possible in the current stage of the project, but only for a narrow breadth of features.
3. In a "T" prototype much of the design is realized at a shallow level (the horizontal top of the T), but a few parts are done in depth (the vertical part of the T). A "T" prototype combines the advantages of both horizontal and vertical, offering a good compromise for system evaluation.
4. A local prototype represents the small area where horizontal and vertical slices intersect. A local prototype, with depth and breadth both limited, is used to evaluate design alternatives for a particular isolated interaction detail.

- **Evaluate: Verifying and refining the interaction design**
  - The process activity box at the bottom of Figure 2-2 represents the UX evaluation to refine an interaction design. For evaluation to refine, you can employ rapid evaluation methods or fully rigorous methods.
  - This evaluation is where we see if we achieved the UX targets and metrics to ensure that the design "meets usability and business goals"

2. Steps in UX Design Process

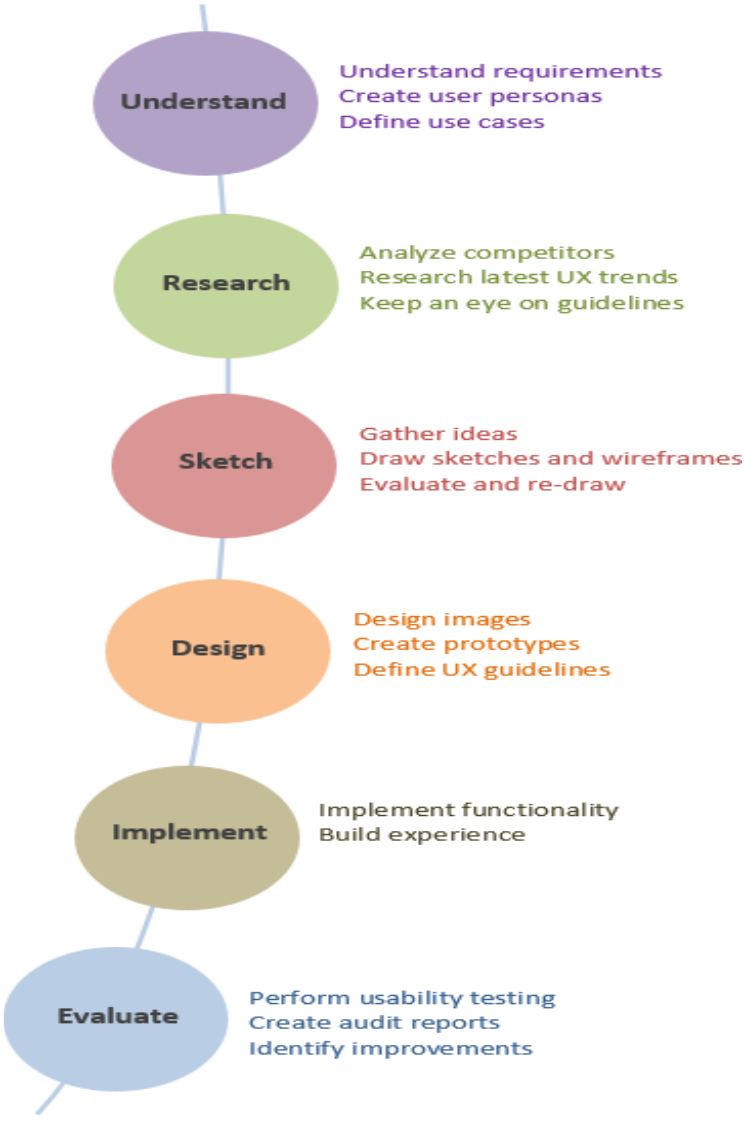
User Experience is the value that you provide to your user when he is using your product.

"User Experience Design (UXD or UED) is the process of enhancing user satisfaction with a product by improving the usability, accessibility, and pleasure provided in the interaction with the product." Developing a user experience to the level of customer satisfaction is not a single person or team's responsibility, instead it is a company's vision.

User experience design process is an iterative method that helps you continuously improve and polish your designs.

In the process, you go through different stages repeatedly while evaluating your designs on each stage.

Each stage involves relevant stakeholders in your organization that take part in the process to make your products highly efficient and usable.



The design process involves following six stages.

1. Understand

Design solves a problem. In order to provide a solution, you first need to understand the problem.
"Before beginning the design work, let your Design team understand the requirements clearly."

To analyze requirements, follow industry standard user research methods including contextual and individual interviews, while observing the users in real environment.

Conduct brainstorming sessions with clients and show them your existing products (if any) to get their feedback.

Business Manager is the role in an organization that works directly with clients and gets requirements from them. Design team can work closely with Business Manager to understand users

This knowledge about user and his environment helps you to provide a clear direction to your design.

"To be a great designer, you need to look a little deeper into how people think and act." — Paul Boag

Stakeholders

- Design Team
- Business Manager
- Product Manager

Activities

- Meet, talk, observe and understand users in their environment
- Analyze requirements to understand and clarify them
- Define user personas and use-cases

Outcomes

- User Personas
- User Stories
- Use Cases, User Flows

2. Research

Research is the basic key step to design user experience.

"It took me a few seconds to draw it, but it took me 34 years to learn how to draw it in a few seconds" — Paula Scher. Design team does their research work to explore how the outer world is working on such features.

Sherif Amin, Product Designer called it as UX Competitive Analysis. He listed three purposes of this analysis:

- Understand market competition
- Learn about your domain
- Get inspirations and ideas from your competitors

Stakeholders

- Design Team

Activities

- Study of competitors' approaches
- Research on similar features in the world
- Analysis of latest UI/UX trends, design principles and rules
- Keep an eye on your own UX guidelines

Outcomes

- A bunch of ideas and material on which you can build your actual design work

3. Sketch

This stage involves UI definition of required feature. Design team drives this activity which is based on the last two stages of the process.

Draw paper sketches, white board flows and wireframes to share your ideas with stakeholders. This stage itself is an iterative process. "Designing is not something that you just create and start using it. Draw and draft and redraw and redraft, thus creating an unmatched experience." Testing and evaluation of wireframes is part of this stage. Design team builds initial mockups and share with stakeholders to get their input.

Throughout the process, it is important to keep your goal in mind — make a usable design to achieve end user satisfaction.

Stakeholders

- Design Team
- Product Managers
- Technical Experts

Activities

- Generate ideas and work on basic sketches
- Brainstorming sessions with stakeholders to get their feedback from technical perspective
- Re-draw sketches and re-test them with stakeholders

Outcomes

- Sketches
- Wireframes, Mockups
- User flows

4. Design

Now you have finalized layout and flow of the required interface with you, the next step is to work on final graphics. Turn the initial mockups and wireframes to great-looking images with theme and styles applied to them.

Preparing and sharing of design specifications (principles, guidelines, colors, typography, and iconography) to Development team is also part of this stage.

Stakeholders

- Design Team
- Product Managers
- Business Manager
- Technical Experts

Activities

- Design UI images
- Define final theme, specs, and guidelines required for implementation
- Design icons to display on screens
- Sessions with stakeholders to get their feedback from business and technical perspective

Outcomes

- Design images

- Detailed design specs like colors, theme, styles, and guidelines
- Icons

5. Implement

Since technical people participate in early stages of the process, they can start implementation while Design phase is in progress. Development team builds back end functionality first and connects it with UI when they get design artifacts.

It is better that Design team involves in this step to help development phase. While implementing, it is possible to raise the need of minor changes in design.

Stakeholders

- Development team
- Design Team

Activities

- Implement back-end functionality and front interface

Outcomes

- Developed UI with complete functionality and experience following the designed theme and style

6. Evaluate

When product features are implemented, the end product is evaluated based on few factors:

- Whether the system is usable?
- Is it easy to use for end user?
- Is it flexible and easy to change?
- Does it provide the desired solution to user's problems?
- Does the product have the credibility that makes someone want to use it because of the experience it provides?

Design team validates the product in terms of user flow and experience and identify areas where improvements are needed.

Stakeholders

- Design Team
- Product Manager

Activities

- Go through the flow and feel the experience
- Perform a comparison of implementation and defined interface

Outcomes

- User feedback
- UI audit reports
- Areas marked where improvement is required

After this last stage, the process will iterate itself and depending on the required changes, you may go to stage 2, 3 or 4.

The process goes on until the desired experience and customer satisfaction is achieved.

3. Study of UX Open-Source Tools

Sketch is the industry standard for High-fidelity UI/UX design, It is also my favorite tool for the past 4 years, I love the plugins, and the integration with other tools (InVision, Zepplin, etc). But as a UX designer, I also use Adobe products (for design related tasks), and Axure RP (for low-fidelity wireframes, UX architecture, and mockups).Many freelance designers, small businesses, and Startups tried open source alternatives, not only because they needed cheap or free alternatives, but because they needed Cross-Platform solution, doesn't matter if they are freelance designers, small design studios, or even Lean Startups with designer- developer workflows. But can a professional designer rely on Free and Open-Source software?There are some open source UI design tools coming up, not to mention professional online tools that are already available, and some of them are even for free.

Some of the UX Open Source Tools are:

- **Krita** — Professional and FOSS alternative to Adobe Photoshop (Available for Windows, Mac, and Linux).
- **Gimp** — FOSS alternative to Adobe Photoshop (Available for Windows, Mac, and Linux).
- **Inkscape** — Professional and FOSS alternative to Adobe Illustrator (Available for Windows, Mac, and Linux).
- **DarkTable** — Professional and FOSS alternative to Adobe LightRoom (Available for Windows, Mac, and Linux)
- **LightZone** — FOSS alternative to Adobe LightRoom (Available for Windows, Mac, and Linux).
- **Scribus** — FOSS alternative to Adobe Indesign (Available for Windows, Mac, and Linux).
- **Ardour** — Professional and FOSS alternative to Adobe Audition (Available for Windows, Mac, and Linux).
- **Synfig Studio** — FOSS alternative to Adobe Animate / Flash Pro (Available for Windows, Mac, and Linux).
- **Fusion** — Professional and Free alternative to Adobe After Effects (Available for Windows, Mac, and Linux).
- **Natron** — Professional and FOSS alternative to Adobe After Effects (Available for Windows, Mac, and Linux).
- **Kdenlive** — Professional and FOSS alternative to Adobe Premiere (Available for Windows, Mac, and Linux).
- **DaVinci Resolve** — Professional and free alternative to Adobe Premiere (Available for Windows, Mac, and Linux).
- **Blender** — Professional and FOSS alternative to 3D Studio / Maya (Available for Windows, Mac, and Linux).
- **Pencil** — The only FOSS alternative to Axure RP (Available for Windows, Mac, and Linux).
- **quickMockup** — FOSS alternative to Balsamiq / Axure RP / Invision (Available online).
- **Wireframe** — Free alternative to Axure RP (Non Open-Source, Available online).
- **Figma** — It's the best alternative to Sketch, and just like Google Docs, it's a web based and powerful cloud solution! It's a collaborative interface design tool. Enables you to keep the team focused and on the same page with real-time communication and collaboration featuring commercial quality. You have to sign-up in order to use Figma.

4. Introduction to Figma Tool

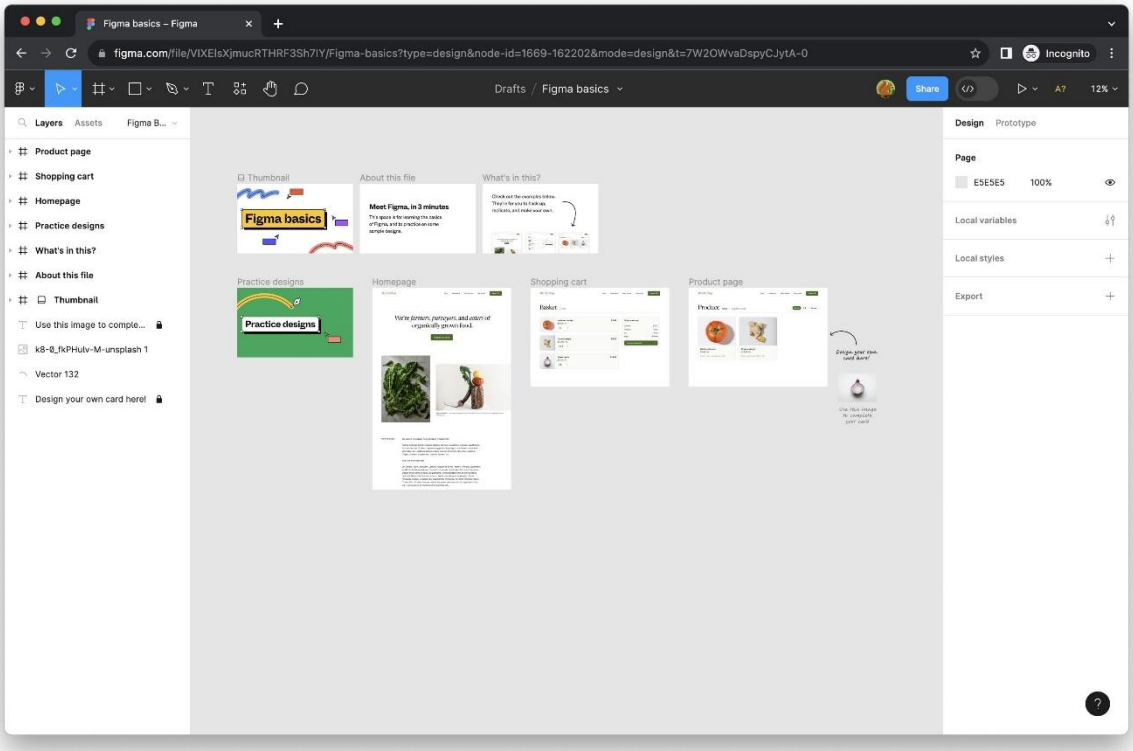
Figma is a collaborative interface design tool that's taking the design world by storm. Unlike Sketch, which runs as a standalone MacOS app, Figma is entirely browser-based, and therefore works not only on Macs, but also on PCs running Windows or Linux, and even on Chromebooks. It also offers a web API, and it's free!

Another big advantage of Figma is that it allows real-time collaboration on the same file. When using conventional "offline" apps like Sketch and Photoshop, if designers want to share their work, they typically have to export it to an image file, then send it via email or instant message.

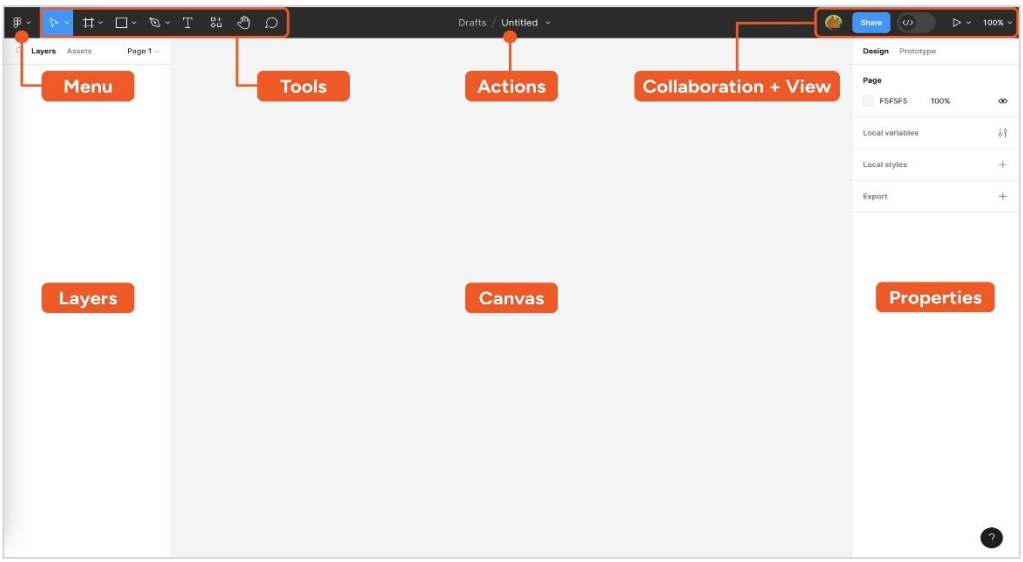
In Figma, instead of exporting static images, we can simply share a link to the Figma file for clients and colleagues to open in their browser. This in itself saves significant time and inconvenience in a designer's workflow. But more importantly, it means that clients and colleagues can interact more richly with the work, and review the latest version of the file. We'll also use Figma's prototyping functionality to link the screens together, meaning that you can experience how the screens will behave when they're built as an app.

Set up your Figma account

Getting started in Figma is as simple as going to www.figma.com, clicking "Sign up", and entering your details. Once you've done that, Figma will open up with a start screen like this. Click on "New File" and we'll get started!



Take a look around the Figma interface



The look and feel of the Figma interface is quite minimal, but it belies a set of powerful features. Here's an explanation of the interface's main areas (labeled above):

Menu:
Unlike regular desktop design apps, Figma's menus can be found by clicking the hamburger button in the top-left of the screen. Take a minute to browse around these menus and see what's there! You can also search for the specific command you need. Start typing in "rectangle" and you'll quickly find the Rectangle Tool, complete with a handy reminder of its keyboard shortcut (it's R, by the way).

Tools:
Here you can quickly access the tools you're likely to use most often: frames, shapes, text, etc.

Options:
This area shows extra options for whichever tool you have selected. When no object is selected (as shown above), Figma displays the file name. When an object is selected, contextual options appear here.

Layers:
Where every element in the file is listed, organized into Frames and Groups.

Canvas:
This is where you create and review all your work.

Inspector:
The Inspector shows contextual information and settings for whatever object is selected. In the image above, we're seeing options for the Canvas itself. Note that Figma gives us separate tabs in the Inspector (Design, Prototype, and Code)

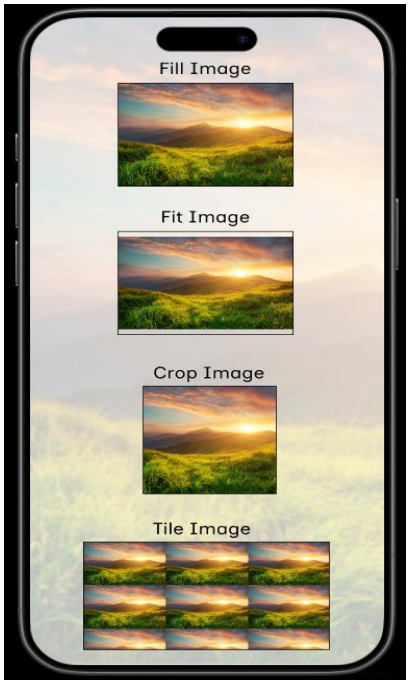
Create a Frame
In Figma, a Frame is essentially a container for other elements. If you've used Sketch or Adobe Illustrator before, it functions in the same way as an Artboard. Press F to select the Frame Tool. Alternatively, you can click the Frame Tool icon in the Options panel at the top of the window. Equally, if you're used to Sketch, you can also hit A (for "Artboard").

There are a couple of ways of creating a Frame. We can either click and drag in the canvas area, or we can select a pre-set Frame size from the Inspector on the right hand side of the window.

5. Figma Tool Basics

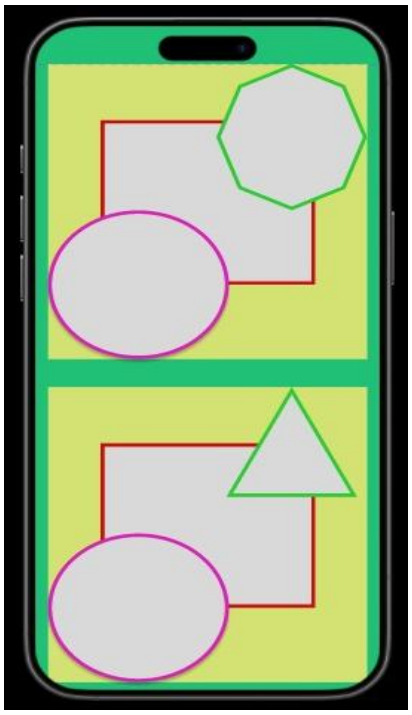
Text and Font, Alignment, Effects, Strokes

Image



Creating Effects and Styles

Components and Masks



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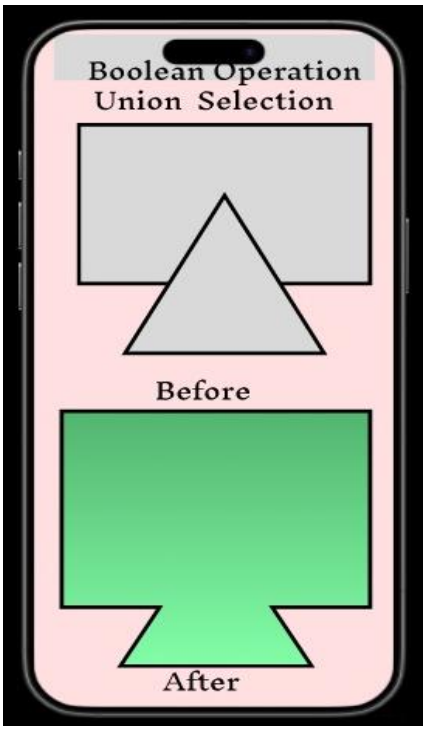
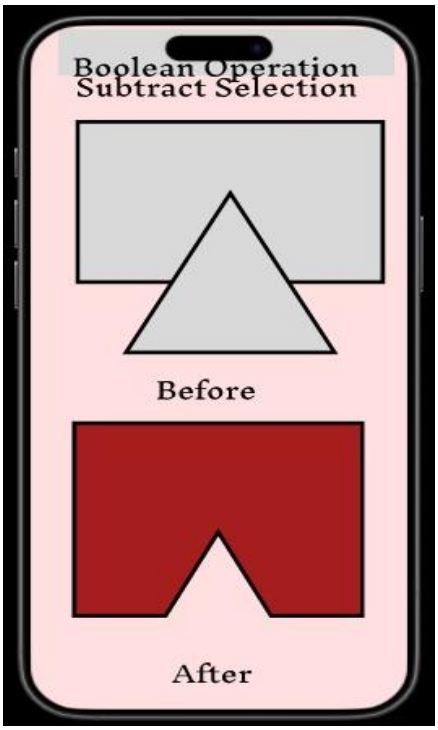
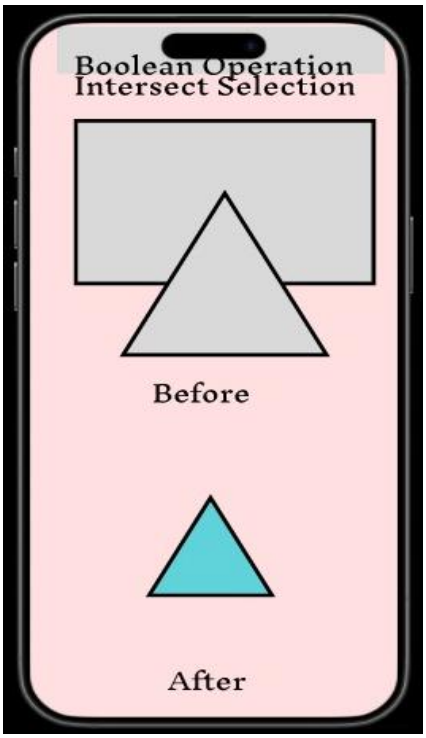
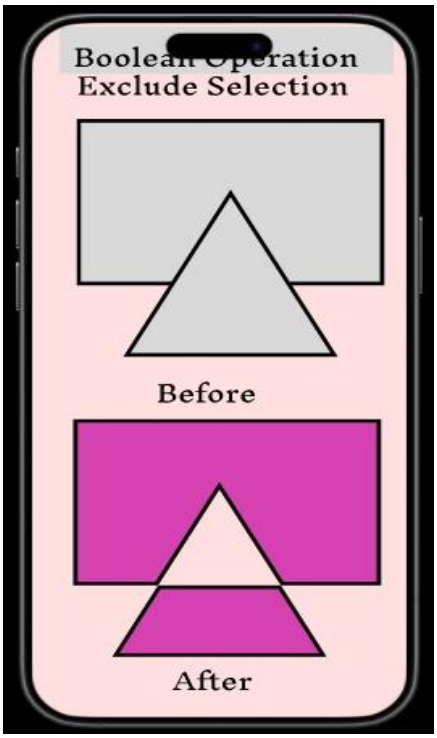




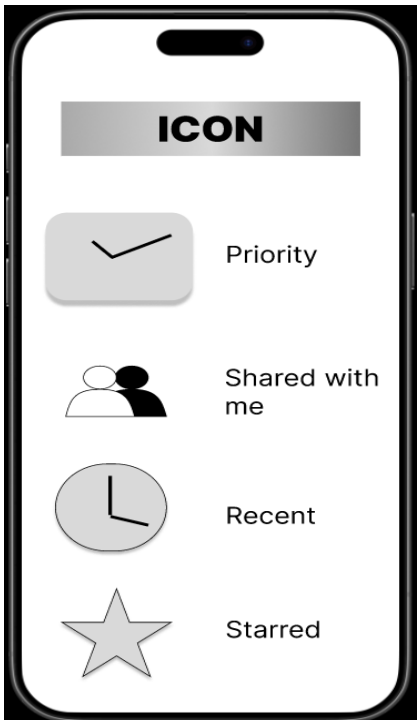




6. LOGOs and ICONs

LOGOs

ICONs



7. Screen Transition

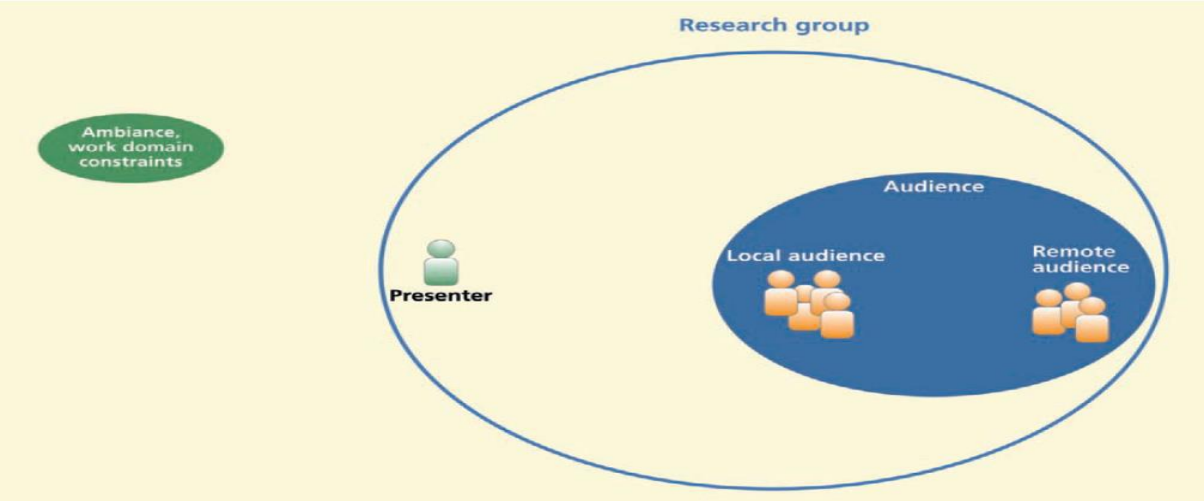
8. Social model

A social model is a diagrammatic description that captures the social aspects of the users' organizational workplace, including the overall flavor, philosophy, ambiance, and environmental factors as well as thought processes, mind-sets, policies, feelings, attitudes, concerns and influences, norms of behavior, attitudes, and pressures that affect users.

In Figure we show the beginnings of a social model. We start by identifying the entities. In the social models for the cases studied in contextual inquiry for the Slideshow Commander, there were two main roles: one or more people in the presenter role and a group called the audience. In turn, the audience was sometimes composed of subgroups, local audience and remote audience(s).

To represent these entities as nodes in our diagram of Figure, we have drawn a circle labeled "Presenter" on the left and a large circle for "Audience" on the right. Two smaller circles inside the main audience circle are labeled for the subgroups "Local Audience" and "Remote Audience." We also added "Ambiance" as a nonhuman entity.

Each presentation potentially included one or more other subsidiary roles in the social model, including technical support, the host (to welcome the audience and introduce the speaker), advisory committees (in the case of student presentations), and members of the presenter's immediate research team. All of the people filling these roles worked toward making the communication between presenter and audience as smooth and as informative as possible.



The social model in UX design recognizes that users are social beings and that their interactions and experiences are shaped by their social context. By incorporating social features and principles into the design process, designers can create more engaging, user-friendly, and impactful products and services.

1. Social Proof:

- Definition:
  Social proof refers to the tendency of users to follow the actions of others when making decisions. In UX, this means incorporating features that demonstrate the popularity or success of a product or service, such as ratings, reviews, and testimonials.

- Impact:
  Social proof can increase user trust, encourage adoption, and provide a mental shortcut for users when making decisions. For example, on e-commerce sites, reviews and star ratings are powerful examples of social proof.
- Example:
  A restaurant app might use user ratings and reviews to influence diners' choices, or a social media platform might display follower counts to encourage new users to join.

2. Sociability and Collaboration:

- Definition:
  This aspect focuses on creating opportunities for users to interact with each other and engage in collaborative activities within the product or service.
- Impact:
  Adding social features can enhance user engagement, create a sense of community, and provide users with social support.
- Example:
  A fitness app might allow users to connect with friends, share workout progress, and motivate each other. An online learning platform might facilitate discussion forums and collaborative projects.

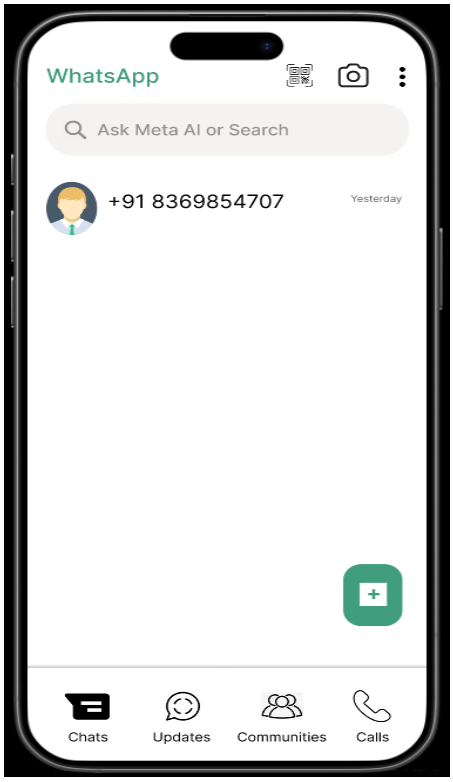
3. Empathy and Accessibility:

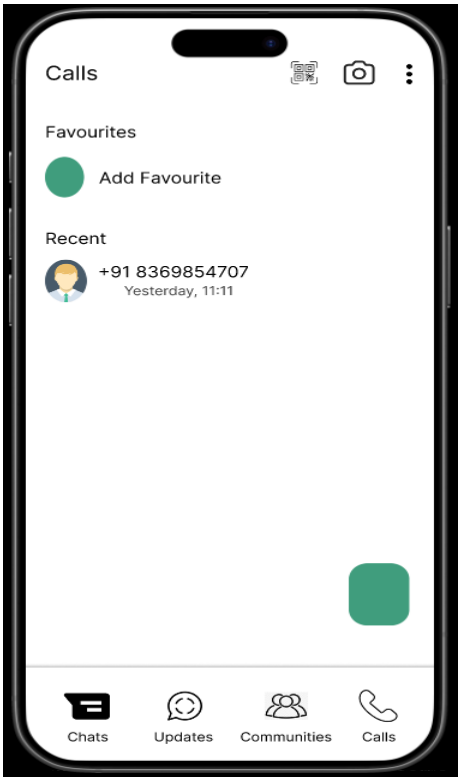
- Definition:
  Understanding and addressing the needs of diverse users, including those with disabilities, is crucial.
- Impact:
  Designing for inclusivity ensures that the product or service is usable by everyone, regardless of their abilities or background.
- Example:
  A website should be accessible to users with visual impairments, and a mobile app should be designed with consideration for users with motor impairments.

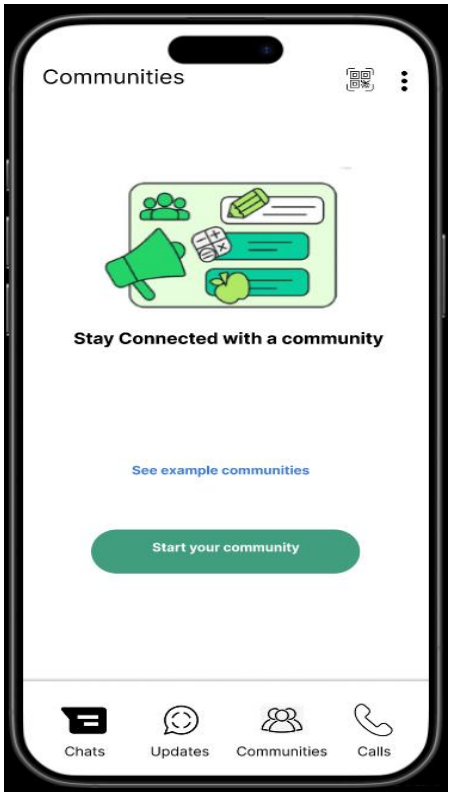
4. Social Impact and Design for Good:

- Definition:
  Leveraging UX design to address social issues and create positive change in the world.
- Impact:
  Design can be used to empower individuals and communities, promote sustainability, and create a more equitable society.
- Example:
  A non-profit organization might use UX design to create an accessible online learning platform for students with disabilities.

Create social model





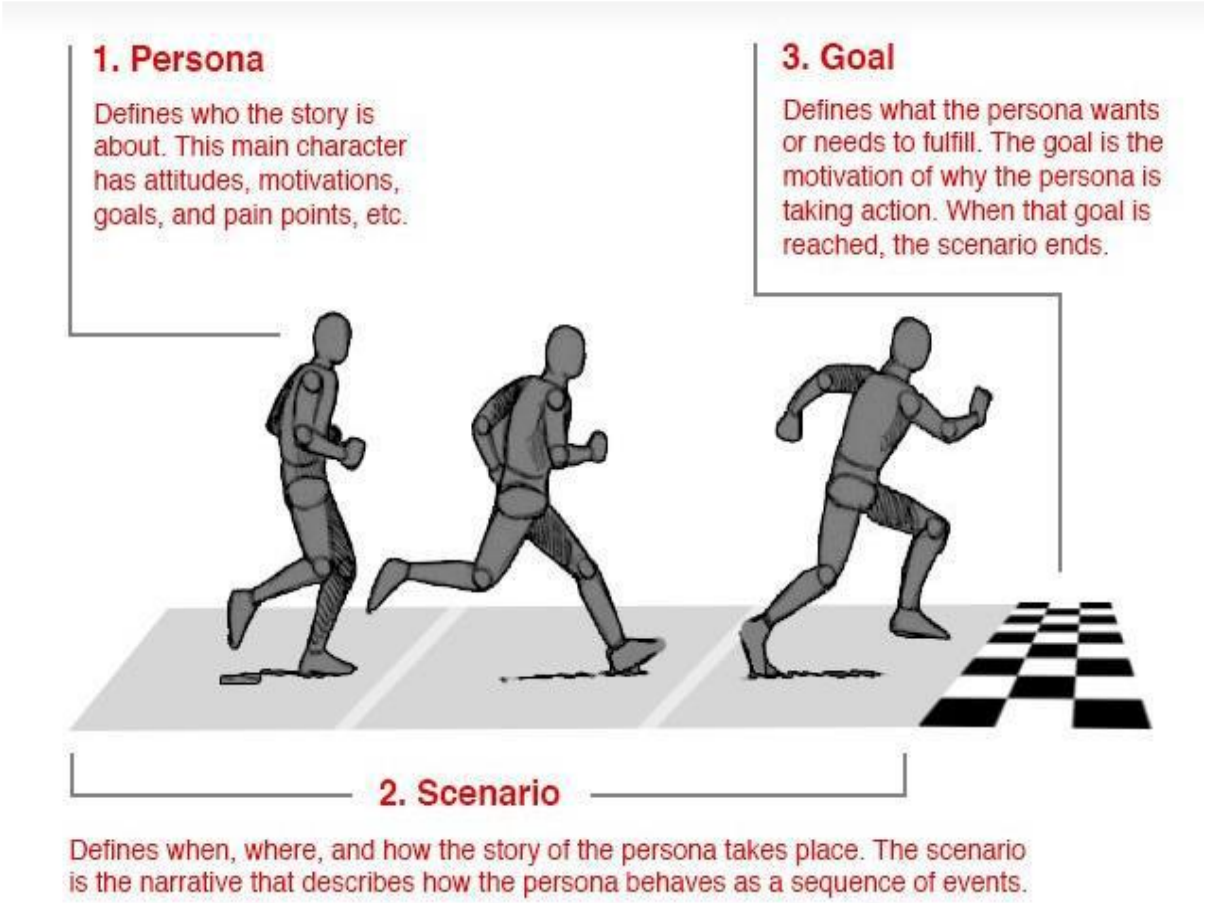


9. User persona

User Persona:

Personas are fictional characters, which you create based upon your research in order to represent the different user types that might use your service, product, site, or brand in a similar way. Creating personas will help you to understand your users' needs, experiences, behaviours and goals. Creating personas can help you step out of yourself. It can help you to recognise that different people have different needs and expectations, and it can also help you to identify with the user you're designing for. Personas make the design task at hand less complex, they guide your ideation processes, and they can help you to achieve the goal of creating a good user experience for your target user group.

As opposed to designing products, services, and solutions based upon the preferences of the design team, it has become standard practice within many human centred design disciplines to collate research and personify certain trends and patterns in the data as personas. Hence, personas do not describe real people, but you compose your personas based on real data collected from multiple individuals. Personas add the human touch to what would largely remain cold facts in your research. When you create persona profiles of typical or atypical (extreme) users, it will help you to understand patterns in your research, which synthesises the types of people you seek to design for. Personas are also known as model characters or composite characters.



Picture & Name	Details	Goals
 Roshan Sharma	Age: 29 years old Occupation: Sales Executive Location: Mumbai, India Tech Comfort: High	Roshan wants to stay in touch with family and friends easily. Roshan uses WhatsApp to share media, make video calls, and organize group trips. He needs fast, reliable communication with minimal setup.

Picture & Name	Details	Goals
 Siya Mehta	Age: 21 years old Occupation: College Student Location: Delhi, India Tech Comfort: Very High	Siya wants to quickly share study notes, coordinate college events, and stay socially connected. She needs fast group chats, easy media sharing, and simple privacy settings.

Picture & Name	Details	Goals
 Imran Sheikh	Age: 40 years old Occupation: Bakery Owner (Small Business) Location: Hyderabad, India Tech Comfort: Moderate	Imran wants to communicate with customers, handle orders, and send updates about new products. He uses WhatsApp Business features like auto-replies, catalogs, and labels to grow his bakery business.

10. Scenario Storyboard

Storyboard is a sequence of visual “frames” illustrating the interplay between a user and an envisioned system. Storyboards bring the design to life in graphical “clips,” freeze-frame sketches of stories of how people will work with the system.

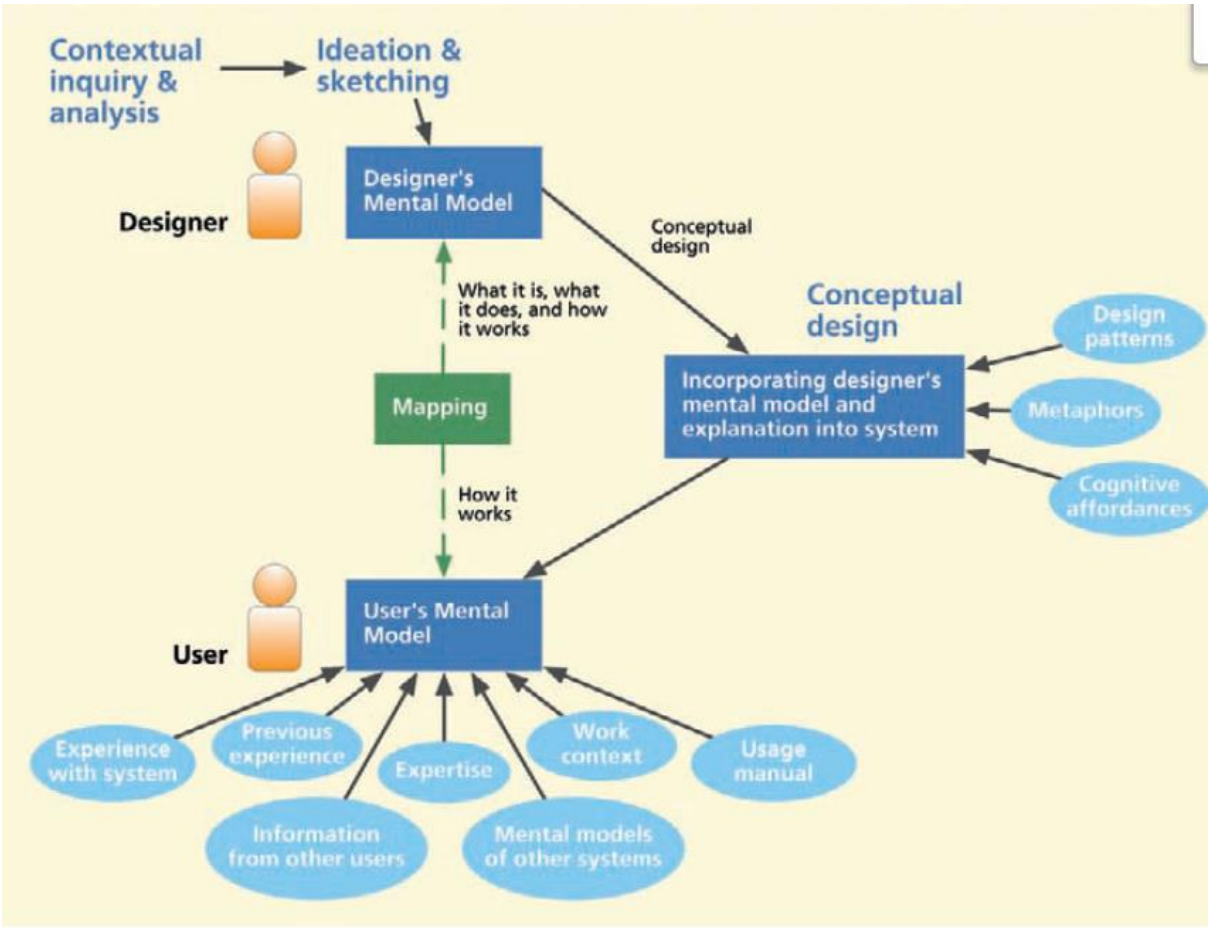
This narrative description can come in many forms and at different levels. Storyboards for representing interaction sequence designs are like visual scenario sketches, envisioned interaction design solutions.

A storyboard might be thought of as a “comic-book” style illustration of a scenario, with actors, screens, interaction, and dialogue showing sequences of flow from frame to frame.

11. Mental Model

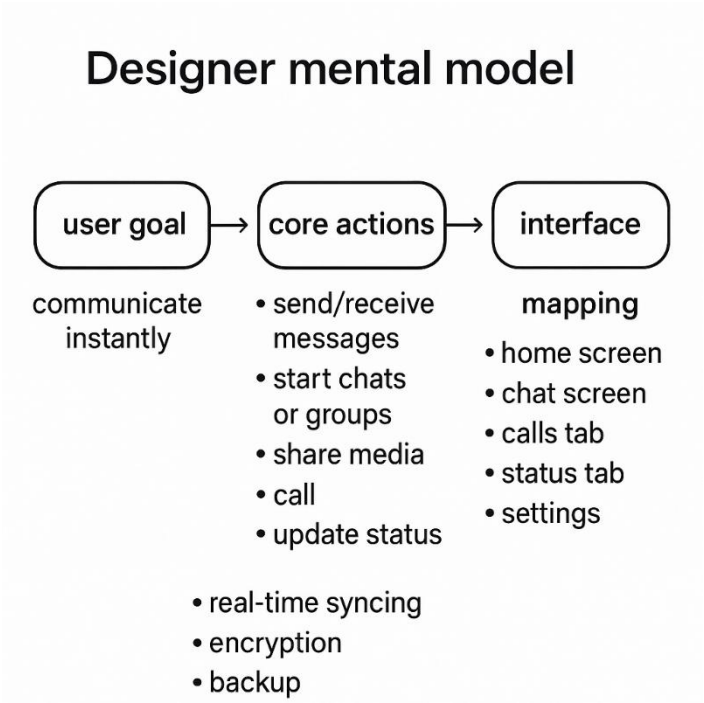
"A mental model is an explanation of someone's thought process about how something works in the real world." A designer's mental model is a vision of how a system works as held by the designer. A user's mental model is a description of how the system works, as held by the user.

The designer's mental model is the designer's conceptualization of the envisioned system—what the system is, how it is organized, what it does, and how it works. The designer's mental model is created from what is learned in contextual inquiry and analysis and is transformed into design by ideation and sketching.

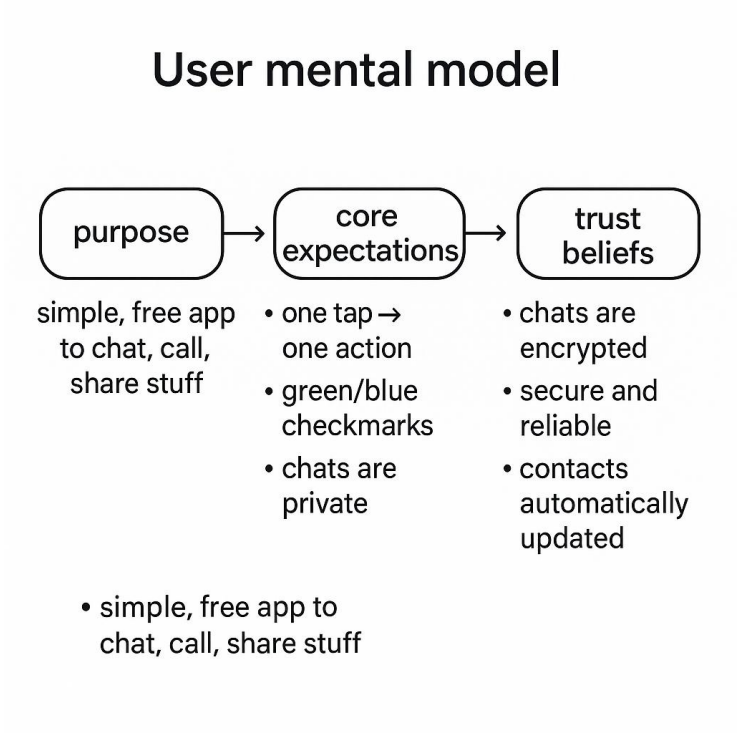


A user's mental model is a conceptualization or internal explanation each user has built about how a particular system works. It is a natural human response to an unfamiliar situation to begin building an explanatory model a piece at a time. We look for cause-and-effect relationships and form theories to explain what we observe and why, which then helps guide our behavior and actions in task performance.

Screenshot of designer mental model:



Screenshot of User Mental model:



12. High-Fidelity prototype (Wire Frame)

Wire framing is a way to design a website service at the structural level. A wireframe is commonly used to lay out content and functionality on a page which takes into account user needs and user journeys. Wireframes are used early in the development process to establish the basic structure of a page before visual design and content is added.

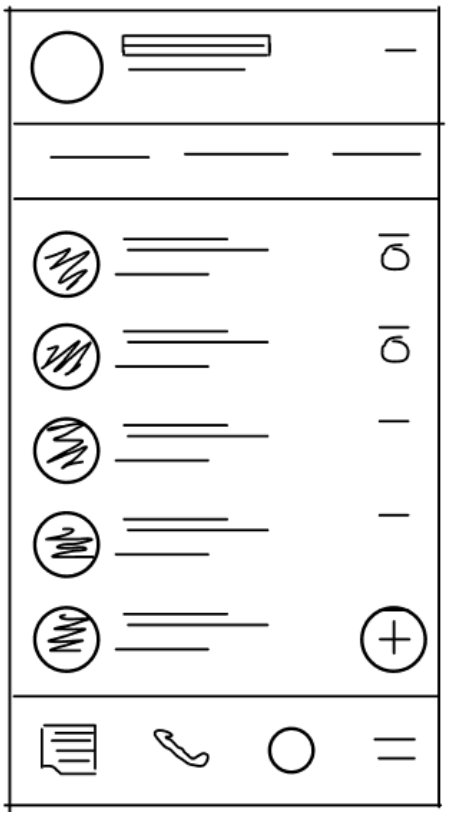
A wireframe is a layout of a web page that demonstrates what interface elements will exist on key pages. It is a critical part of the interaction design process.

The aim of a wireframe is to provide a visual understanding of a page early in a project to get stakeholder and project team approval before the creative phase gets under way. Wireframes can also be used to create the global and secondary navigation to ensure the terminology and structure used for the site meets user expectations.

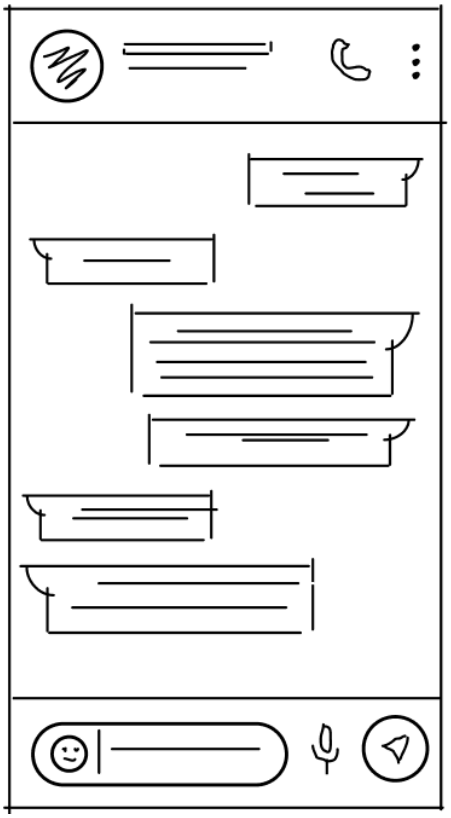
Wireframes should be used early in a project to get user and client approval on the layout of key pages and the navigation. This will provide the project team, specifically the designers, confidence in moving forward. Wireframes will also save considerable time and money in the testing and amends phase later in the project.

Create wireframe

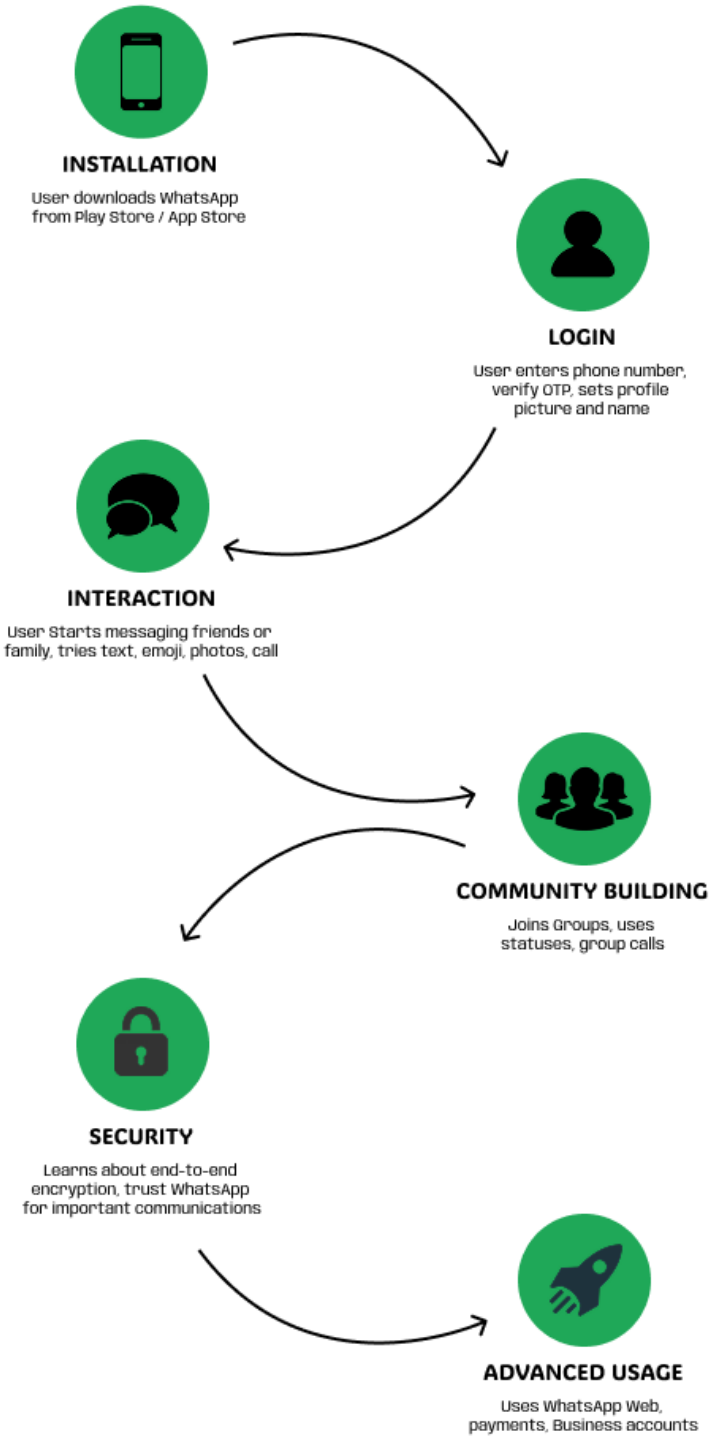
Wireframe 1



Wireframe 2



13. Journey Map



14. Usability-Testing Process

Usability Testing

Evaluation of WhatsApp (Based on Nielsen's Usability Heuristics)

1. **Visibility of System Status:** WhatsApp always keeps users informed about ongoing activities. For example, while sending a message, users see a ticking system - one tick (sent), double ticks (delivered), and blue ticks (read). Upload progress, call connecting, and backup status are also clearly shown. Feedback is given within a reasonable time, maintaining user trust.

2. **Match between System and the Real World:** WhatsApp speaks the user's language very well. It uses common terms like "Chats," "Calls," "Status," and "Groups" which are easy to understand even for non-technical users. It avoids technical jargon, keeping the experience familiar and friendly.

3. **User Control and Freedom:** hats app gives users good control over actions. Users can delete sent messages, exit groups anytime, mute notifications, and block contacts easily if needed. Emergency exits like "Clear Chat," "Delete for Everyone," and "Exit Group" are clearly marked and accessible.

4. **Consistency and Standards:** WhatsApp maintains consistency throughout the app. Icons like the attachment clip, call buttons, and text input behave similarly in every chat. The app follows standard design patterns, reducing confusion for users switching between chats, groups, and calls.

5. **Help Users Recognize, Diagnose, and Recover from Errors:** WhatsApp uses plain language to alert users, such as "Message not sent, tap to try again" or "This call couldn't be completed." It helps users quickly understand problems and suggests simple recovery options like retrying or reconnecting to the internet.

6. **Error Prevention:** WhatsApp effectively prevents many errors by adding confirmation prompts for critical actions (like exiting a group or deleting a chat). It also warns users when they are about to message an unknown contact or click on suspicious links.

7. **Recognition Rather Than Recall:** WhatsApp minimizes memory load. Options like attachments, emoji, and call buttons are always visible on the chat screen. Users don't have to remember steps; everything important is presented clearly with easy icons and menus.

8. **Flexibility and Efficiency of Use:** WhatsApp offers shortcuts and features like starred messages, quick reply from notifications, swipe to reply, and voice typing, which make the app more efficient for experienced users while still being simple for new users.

9. **Aesthetic and Minimalist Design:** WhatsApp follows a clean and minimalist design. There is no unnecessary clutter. Only important elements like chats, call logs, and settings are shown. Even in media sharing and group chats, the design remains lightweight and focused.

10. **Help and Documentation:** WhatsApp provides easy-to-search help documentation under "Settings > Help." It offers FAQs, troubleshooting guides, and links to customer support. The help content is short, direct, and explains steps clearly, which is beneficial when users face issues.

Test Scripts

1. **Send a Text Message**
   Open a chat with a contact → Send a simple text message

2. **Send a Multimedia Message**
   Open a chat → Send an image from the gallery

3. **Create a Group Chat**
   Start a new group with at least 2 contacts → Set a group name and group icon

4. **Voice Call a Contact**
   Initiate a voice call with a selected contact

5. **Change Profile Picture and Status**
   Update the profile photo → Change the About/Status message.

6. **Search for a Message**
   Use the search bar to find a specific message in a conversation

7. **Mute a Group**
   Mute notifications for an existing group for 8 hours

Observations:

Ease of Navigation: All participants found WhatsApp's layout intuitive. Core features like messaging, calling, and media sharing were easy to locate.

Performance: Sending messages, images, and calling had no significant lag.

Error Recovery: Users easily corrected mistakes (e.g., sending the wrong image) through available options like "Delete for Everyone."

Aesthetic and Minimalist Design: Users appreciated the clean, uncluttered interface.