
Designing Effective User Interfaces (UI)

Where usability meets design

— By Engr. Dr. Sidra Sultana —

HCI Outline

1. Introduction to HCI
2. Basic principles and guidelines of HCI
3. User-centered design and usability testing

4. Designing Effective User Interfaces

5. User interface design principles and guidelines
6. User interface prototyping
7. Prototyping through Wireframes
8. Designing for accessibility and mobile devices

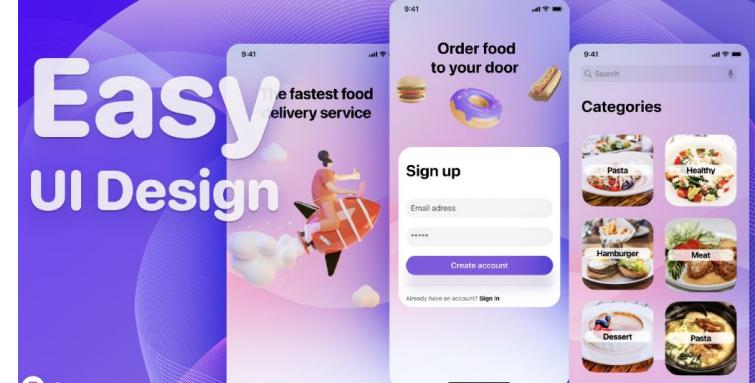
Designing Effective UI Outline

1. Introduction to UI Design
 - a. What is UI
 - b. UI vs UX
 - c. Why Good UI Matters?
 - d. Activity 1
2. Principles of Effective UI
 - a. 10 Usability Heuristics for User Interface Design
 - b. Visual Design Principles
 - c. Affordances & Signifiers
 - d. Feedback & Error Prevention
 - e. Activity 2
3. Designing for Users
 - a. Understanding Users
 - b. Accessibility & Inclusivity
 - c. Mobile-First vs Desktop-First
 - d. Activity 3
4. Common UI Design Mistakes
 - a. Cluttered Interfaces
 - b. Inconsistent Navigation
 - c. Poor Color Choices
 - d. Non-intuitive Icons
 - e. Mini Quiz
5. Prototyping & Evaluation
 - a. Low-Fi vs High-Fi Prototypes
 - b. Tools
 - c. Usability Testing
 - d. Activity 4

Introduction to UI Design

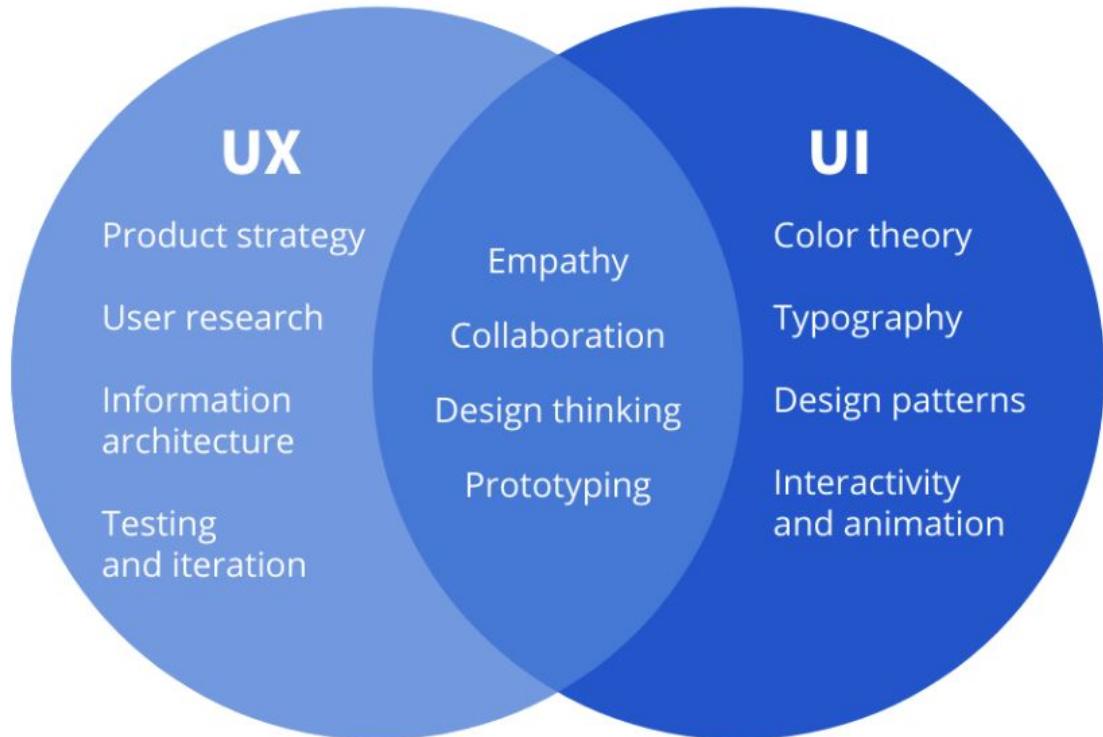
What is UI?

- Definition: The layer where users interact with technology.
- Examples: ATM screen, Mobile apps, Web dashboards, Smartwatch.
- Scenario:
 - You're at an airport self-check-in kiosk that freezes after you insert your passport → What's failing here, UI or backend?



UI vs UX

- UI = Look & Feel, UX = Experience & Flow
- Analogy: Car dashboard (UI) vs driving experience (UX).
- Scenario:
 - An app has beautiful visuals but takes 5 clicks to complete a task — good UI, poor UX.



Why Good UI Matters?

- 88% of users won't return after bad experience (Forbes stat).
- Good UI → higher conversion, less training.
- Case: Amazon's 1-Click checkout increased sales massively. (ref: <https://news.cornell.edu/stories/2023/02/one-click-checkout-increases-spending-and-engagement>)



Activity 1

- Q: “Name an app/website you love using — why?”
- Q: “Which one frustrates you?”
 - Discuss themes (simplicity, speed, clarity).

10 Usability Heuristics for User Interface Design

ref:<https://www.nngroup.com/articles/ten-usability-heuristics/>

1: Visibility of System Status

2: Match Between the System and the Real World

3: User Control and Freedom

4: Consistency and Standards

5: Error Prevention

6: Recognition Rather than Recall

7: Flexibility and Efficiency of Use

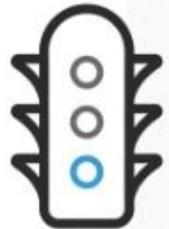
8: Aesthetic and Minimalist Design

9: Help Users Recognize, Diagnose, and Recover from Errors

10: Help and Documentation



10 Usability Heuristics



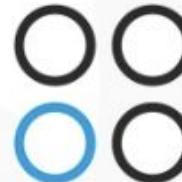
Visibility of
System Status



Match Between System
& the Real World



User Control
& Freedom



Consistency & Standards



Error Prevention



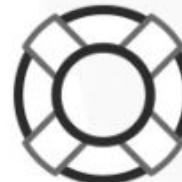
Recognition Rather
than Recall



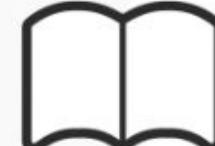
Flexibility &
Efficiency of Use



Aesthetic &
Minimalist Design



Help Users Recognize, Diagnose
& Recover from Errors



Help &
Documentation

Visual Design Principles

- Contrast (make important things stand out)
- Alignment (grid layouts → readability)
- Proximity (group related items)
- Consistency (fonts, colors, buttons)
- White space (avoid clutter)
- Example: Google homepage (minimalist, focused).



13 core graphic design principles

1. Alignment

8. Repetition

2. Contrast

9. Rhythm

3. Balance

10. Movement

4. Hierarchy

11. Emphasis

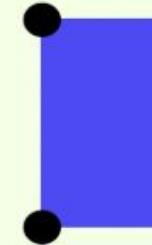
5. Color

12. Proximity

6. White space

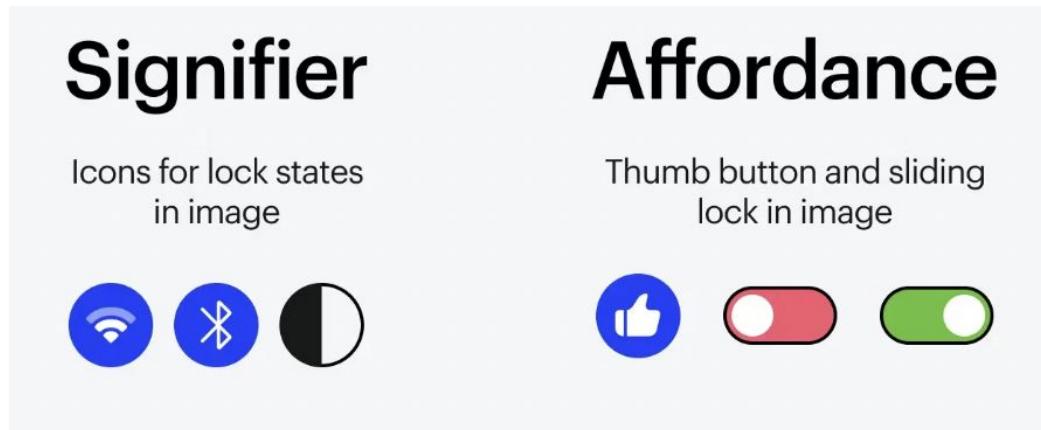
13. Unity

7. Proportion



Affordances & Signifiers

- Affordance = what can be done (button suggests pressing).
- Signifier = clue (icon, label).
- Scenario:
 - A “download” arrow icon confuses users who think it means “refresh.”



Feedback & Error Prevention

- Good: progress bar, “saved” notification.
- Bad: nothing happens after clicking.
- Scenario:
 - Online form lets you submit with empty fields, then shows error after 5 minutes.

The Importance of User Feedback in Error Handling



Activity 2

This image is a dense collage of numerous small screenshots and links from various websites, primarily focusing on political activism and social issues. Key elements include:

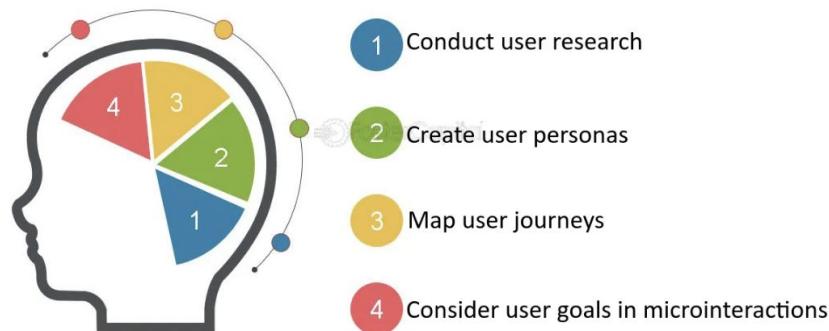
- A top banner for "OpenOffice.org" with a "JUSTICE" section.
- A "QuickBooks Consultant" advertisement.
- A "Linux Online!" logo.
- A "KISSING BABY" image.
- A "Religion = Business (Capitalism/Hollywood)" link.
- A "JOHN PEOPLES SAYS REPARATIONS NOW..." box.
- A "Hermann Goering, Hitler's Reich-Marshal at the Nuremberg Trials after WWII" image.
- A "JOHN PEOPLES SAYS REPARATIONS NOW..." box.
- A "We will not EXONerate Saddam Hussein" image.
- A "Hussein for his actions. We will Mobilize to meet this threat to vital interests in the Persian Gulf until an EXCELLENT solution is reached. Our best strategy is to BP prepared."
- A "Failing that, we ARCO mining to kick your ass."
- A "Suggested use of tape as a means for increasing levels of Homeland Security..."
- A "I heard you say Fascist Dictatorship Bushy Bush!!!!!!" image.
- A "We appreciate your support! Donate now to keep this site online." box.
- A "Anti Corporate Internet Radio" link.
- A "LIVE" radio station link.
- A "Some of Bella's personal topical pics/issue/assays/etc..." link.
- A "Coming soon... Please click on the upper tab Gallery for my written text, and links to other sources.... While Imperialism has tried to destroy Socialism through Communism, it will reign and propagate throughout the globe some not too distant day..." link.
- A "Planting Seeds..." link.
- A "In this India Page, hear, see/hear Audio & Video clip" link.
- A "Religious leaders who have been killed for their beliefs" link.
- A "The following material is from my up coming future book... An expose on the US presidency, that all those taken the oath to defend the US Interests has been a well ill farce... Are all US presidents criminals?????" link.
- A "On July 4th, 1776, The Western Northern lands (Later to be known as The US), signed a Declaration of Independence from Great Britain's colonizing/tyrannical/having & economic systems that was being imposed on these lands, due to their long time land conquests."
- A "JOHN PEOPLES SAYS REPARATIONS NOW..." link.
- A "OK, but what needed to happen next for these lands to have a collective social, commercial, tax and more importantly for the things being done to them?" link.
- A "Hamas' armed rebellion of Palestine 1770 and 1780, many states had utilized"

The collage is a mix of political statements, historical references, and calls to action, reflecting a variety of protest and awareness movements.

Understanding Users

- Personas: profiles of typical users.
- Example Persona:
 - Fatima, 65, retired teacher → prefers simple layouts, large fonts.
 - Ali, 19, gamer → likes fast, customizable interfaces.

Understanding User Needs and Goals



Accessibility & Inclusivity

- Color contrast (for color-blind users).
- Keyboard shortcuts. Screen reader compatibility.
- Example: Twitter added alt text for images.



Mobile-First vs Desktop-First

- Mobile: thumb zones, responsive design.
- Desktop: wide screens, multiple panels.
- Scenario:
 - Banking app with 8 tiny menu icons → works on desktop, unusable on phone.



Activity 3

- Sketch a login screen for:
 - Elderly user (larger buttons, clear labels)
 - Teen gamer (fast login, maybe “login with gmail”)
- Compare → highlight differences.

Cluttered Interfaces

- Too many options overwhelm users.
- Example: Old Yahoo homepage vs Google search.



Inconsistent Navigation

- Menus moving around between screens.
- Scenario:
 - E-commerce app where “cart” icon switches sides randomly.

Inaccessible ❌

Page 1



Page 2



Accessible ✓

Page 1

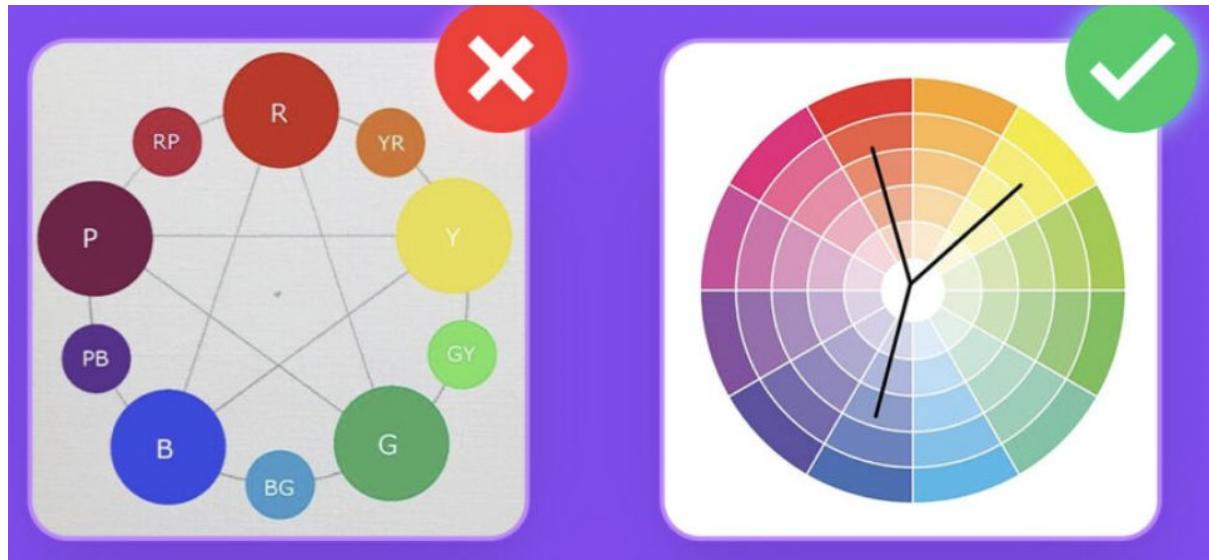


Page 2



Poor Color Choices

- Red text on black background → unreadable.
- Scenario:
 - Error message in light grey → user misses it.



Non-intuitive Icons

- Hamburger menu vs “3 dots” confusion.
- Scenario:
 - Users don’t realize ‘trash can’ means archive, not delete.



Hamburger



Oreos



Kebab



Candy box



Chocolate



Cheeseburger



Hot Dog



Veggie Burger



Strawberry



Fries



Stairs



Cake

Mini Quiz

Spot at least 2 mistakes in each.

The image displays two identical mobile application interfaces side-by-side, separated by a vertical dashed line. Both screens show a navigation bar at the top with four items: Event (lightning bolt icon), Users (person icon), Match (heart icon), and Settings (gear icon). Below the navigation bar are three colored buttons: Primary (dark blue), Secondary (purple), and Tertiary (light blue). At the bottom of each screen is a pink rounded rectangle containing the text '@ 58% Match'. The name 'Celina Estevez' is displayed at the very bottom of both screens.

Event

Users

Match

Settings

Primary

Secondary

Tertiary

@ 58% Match

Celina Estevez

Name



Please enter your name.



Upload and verification failed. Please try again.

Email address

v

Incorrect format.

Name



You didn't enter a name.

07/09/1987

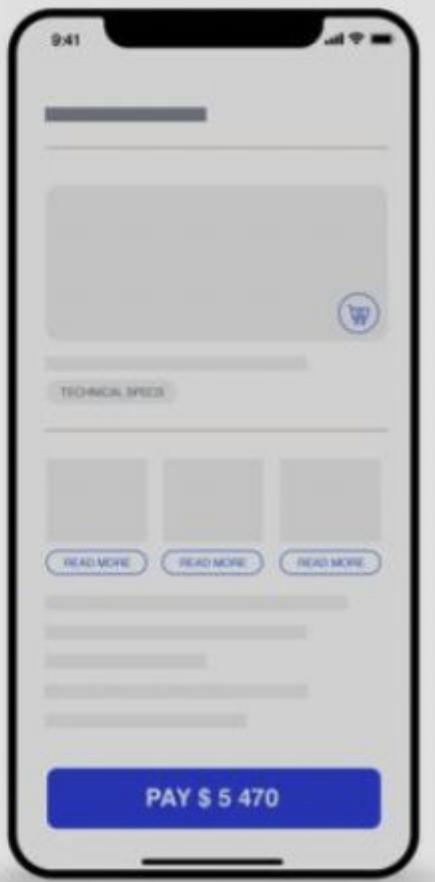
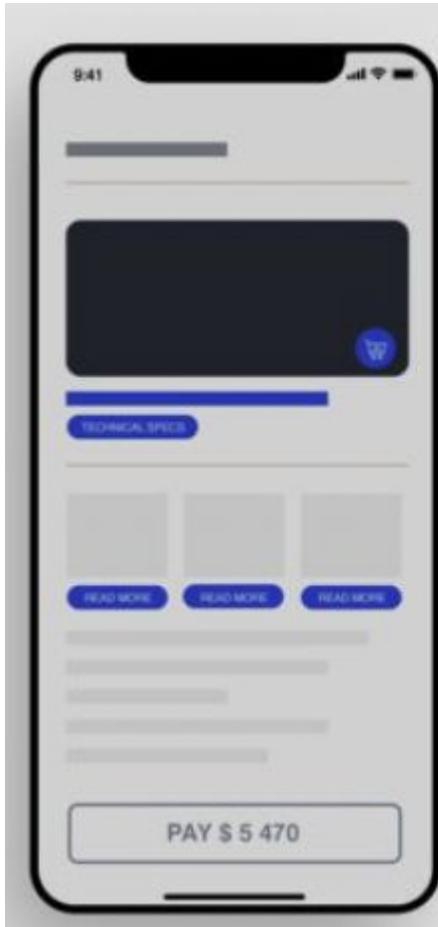
Enter a valid email address to use as your Apple ID.

name@example.com

This will be your new Apple ID.

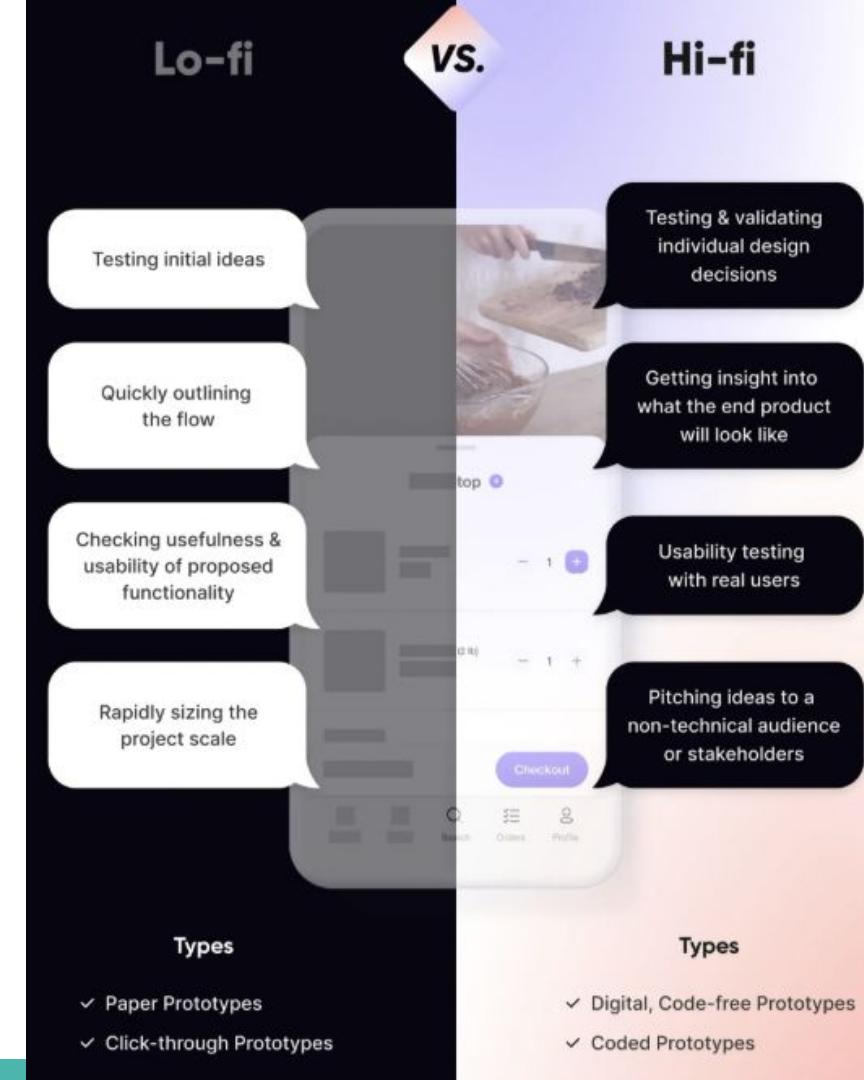


Sorry, that password isn't right. We can help you recover your password.



Low-Fi vs High-Fi Prototypes

- Low-fi: paper sketch, quick, cheap.
- High-fi: polished, clickable mockups.

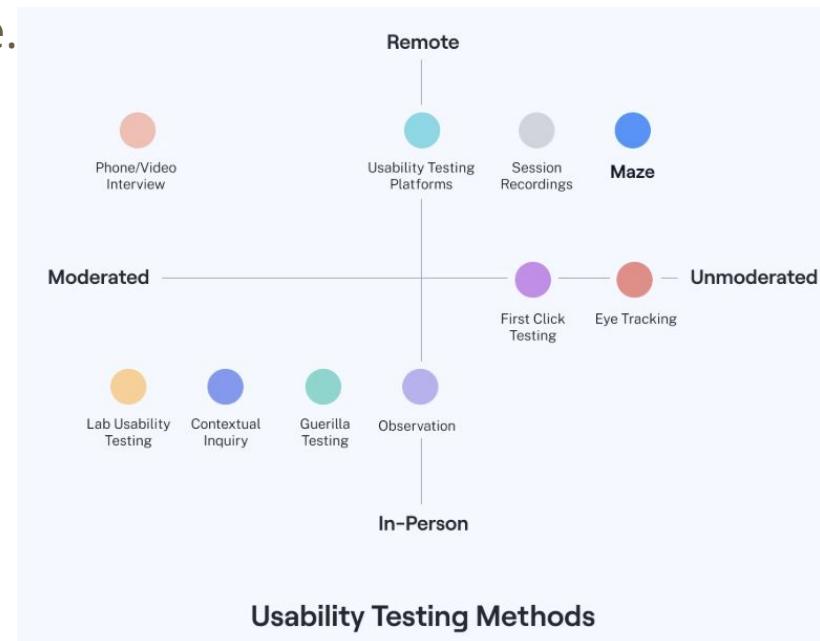


Tools

- Figma, Sketch, Adobe XD, Balsamiq.
- Scenario:
 - Startup builds high-fi app first → wasted 3 months before realizing users hate the flow.

Usability Testing

- Think-aloud protocol (observe user narrating actions).
- A/B testing (compare two versions).
- Metrics: task completion time, error rate.



Activity 4

LMS feedback based on heuristics.

Thanks

Any Question