
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

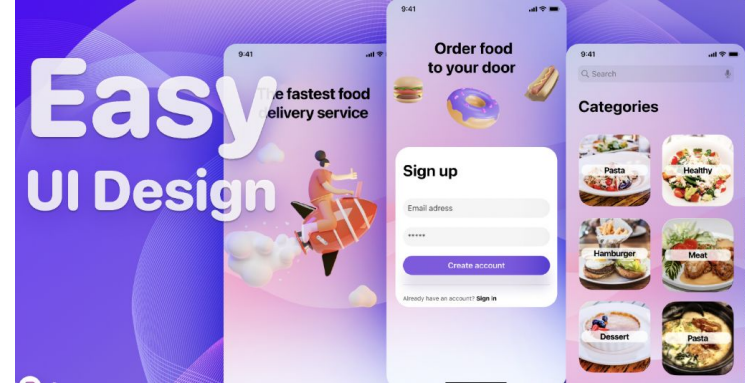
Designing Effective UI Outline

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

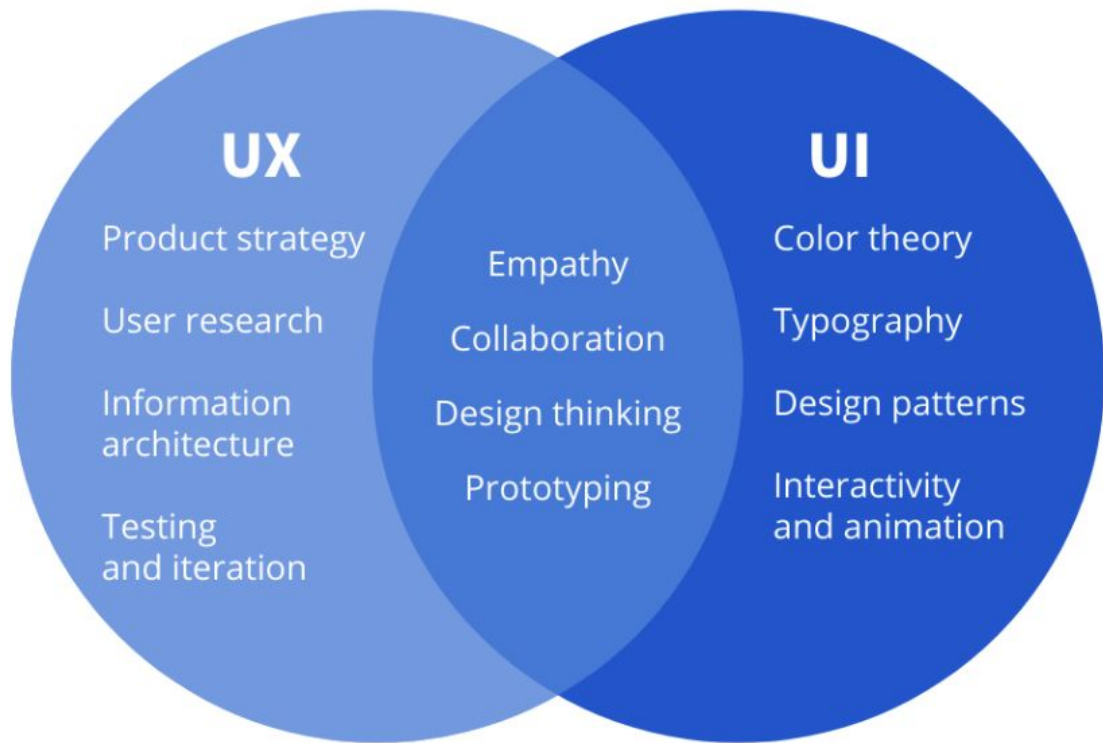
What is UI?

- 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



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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

2. Contrast

3. Balance

4. Hierarchy

5. Color

6. White space

7. Proportion

8. Repetition

9. Rhythm

10. Movement

11. Emphasis

12. Proximity

13. Unity



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.”

Signifier

Icons for lock states
in image



Affordance

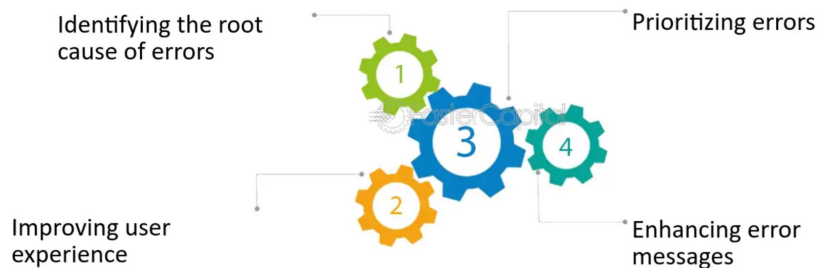
Thumb button and sliding
lock in image



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

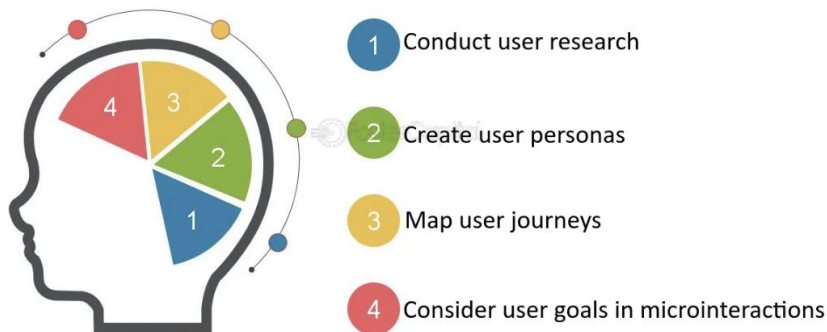


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Understanding Users

- 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.

BAD DESIGN	VS	GOOD DESIGN
<ul style="list-style-type: none">• Cluttered interface• Poor navigation• Complex tasks• Irrelevant user feedback• Inconsistent experience• Difficult content• Unpleasant color scheme		<ul style="list-style-type: none">• Transparent & visible• Problem solver• Simple• Relevant & usable• Effective to meet goals• Easy to understand• Fresh & pleasant color scheme

Inconsistent Navigation

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

Inaccessible ❌

Page 1

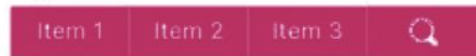


Page 2



Accessible ✅

Page 1

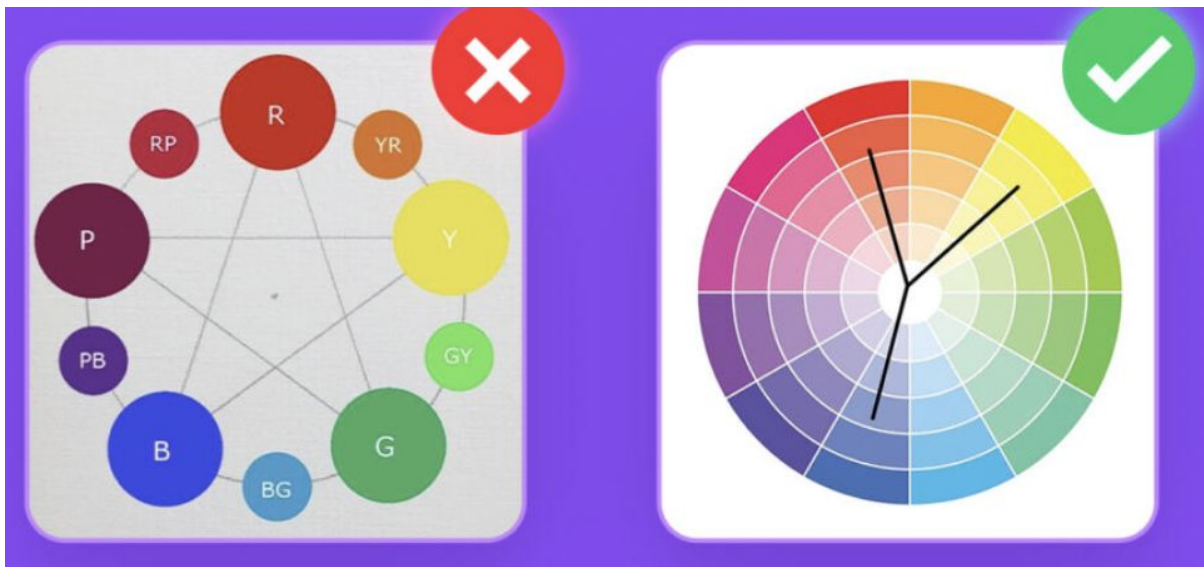


Page 2



Poor Color Choices

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



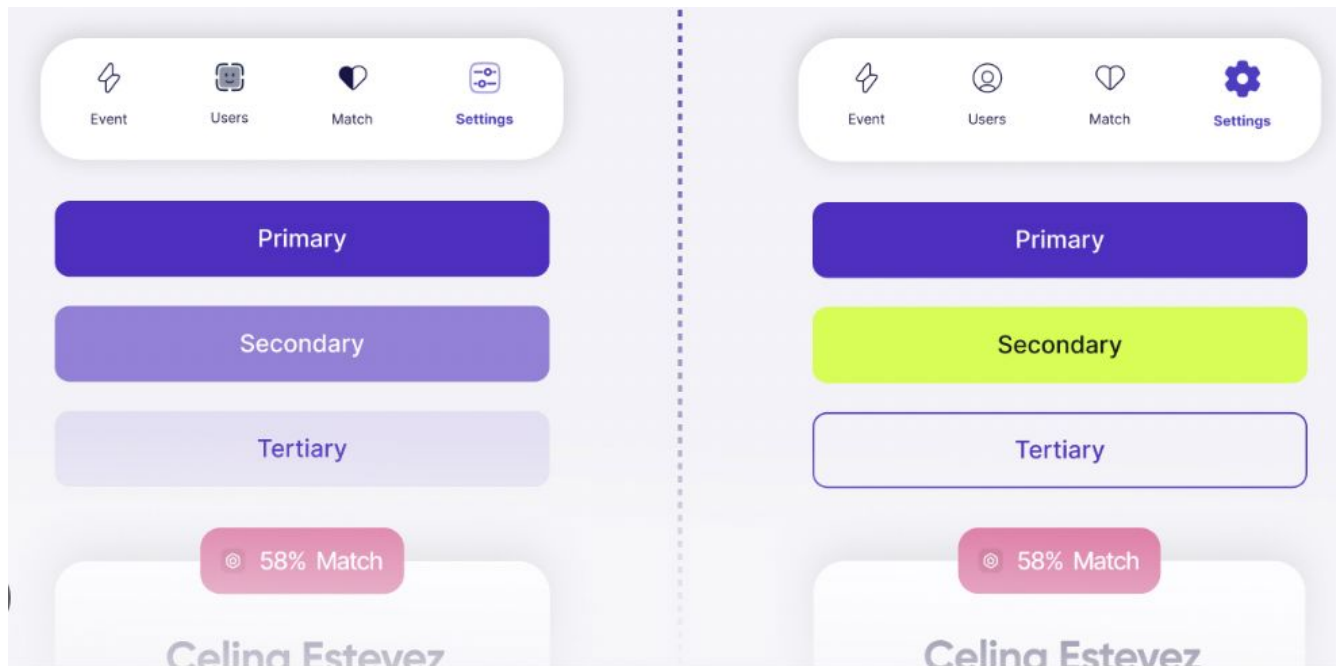
Non-intuitive Icons

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



Mini Quiz

Spot at least 2 mistakes in each.



Name



Please enter your name.

Name



You didn't enter a name.



Upload and verification failed. Please try again.

Email address

 Incorrect format.

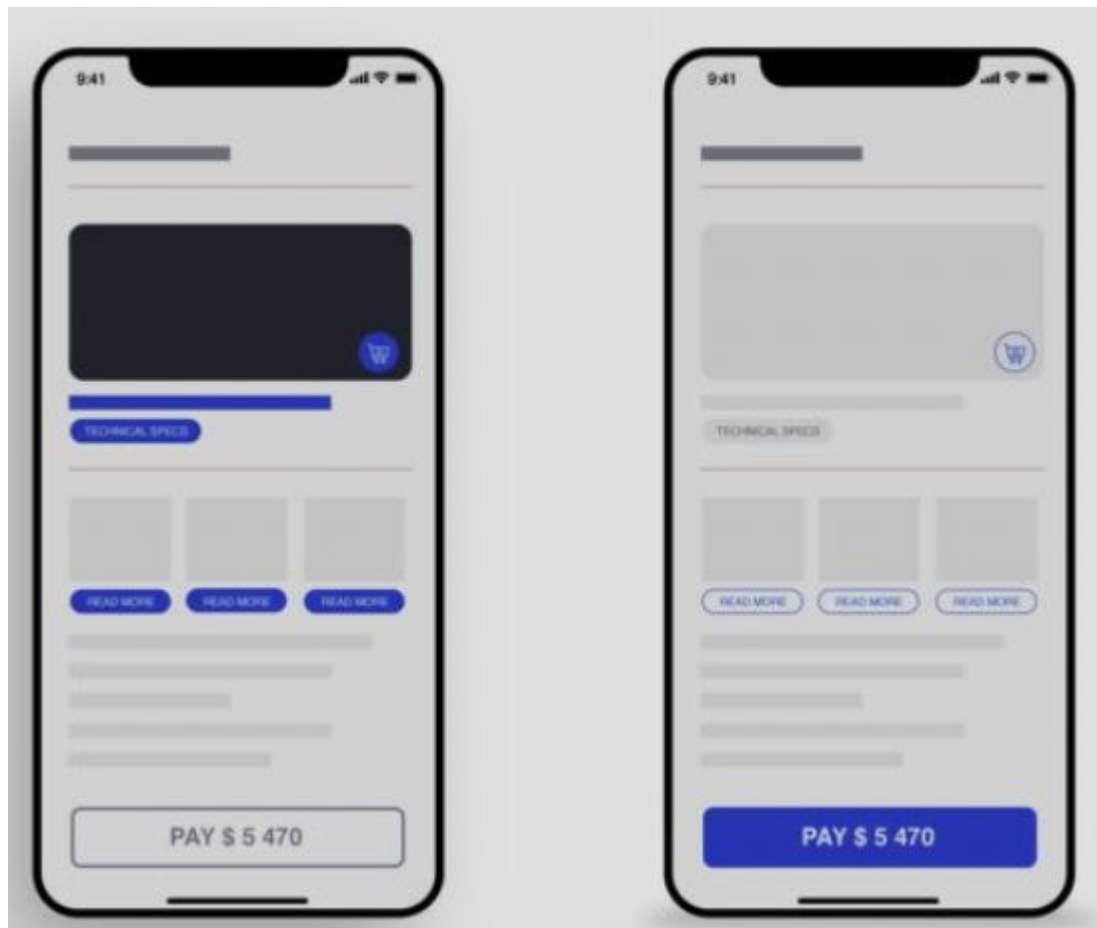


Enter a valid email address to use as your Apple ID.

This will be your new Apple ID.

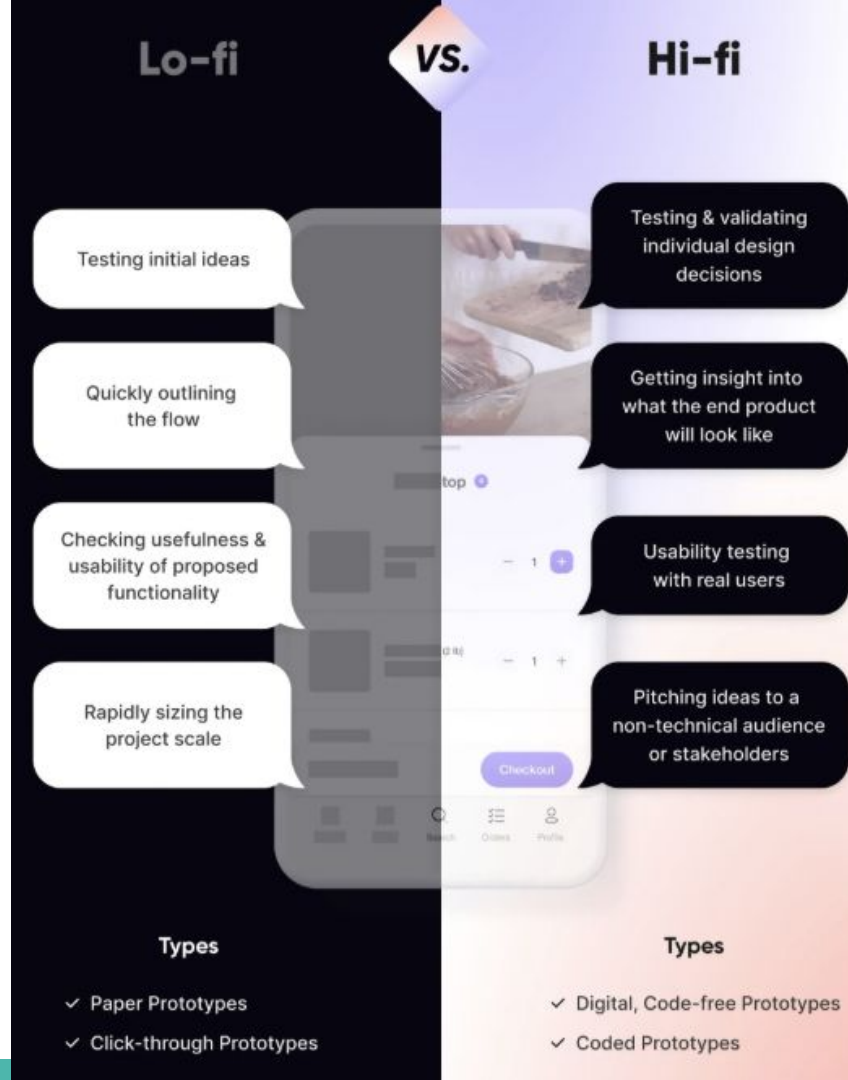


Sorry, that password isn't right. We can help you recover your password.



Low-Fi vs High-Fi Prototypes

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

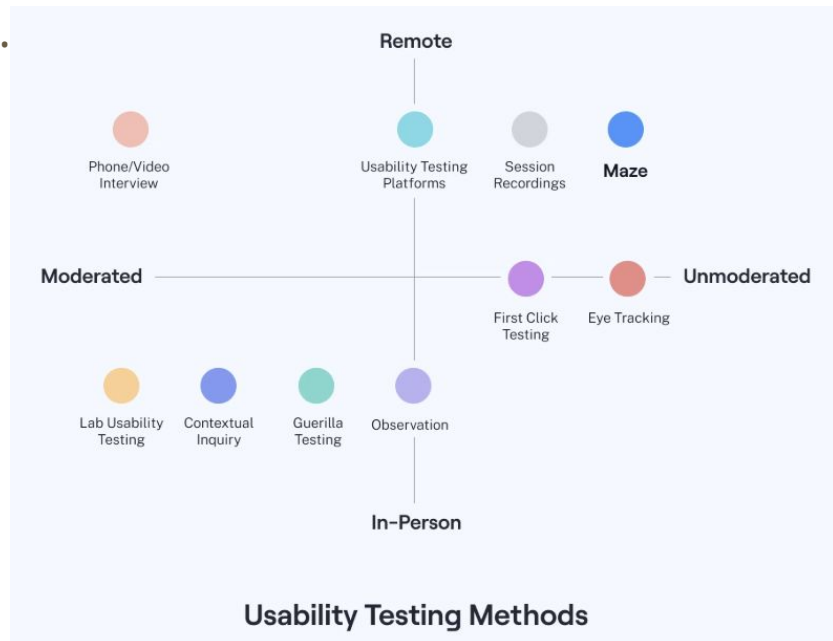


Tools

- 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