Lecture 5 : Intro to Prototyping and Low-Fidelity Prototypes

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1. Introduction: What Is Prototyping?

- **Definition:**
  Prototyping is the process of creating *tangible* ملموس *approximations* of a system's behavior and appearance — before actual implementation — to explore, evaluate, and refine design ideas.
- **Purpose:**
  It allows designers, developers, and users to *see, touch, and interact* with early versions of a product idea without investing heavily in code.
- **Key idea:**
  You can't get a design right the first time — prototypes help you fail fast and learn quickly.
- **Real-world analogy:**
  Just as architects create scale models before building skyscrapers, UX designers build prototypes to visualize interfaces.

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2. The Process: From Needfinding to Prototyping

In the HCI design process:

1. **Domain Understanding:** Define target users, their context (where, when, with whom they act), and main challenges.
   Example: For a food delivery app, the domain includes busy urban في المدينة users ordering during lunch breaks.
2. **Needfinding:** Gather insights using:
   - Observations
   - Interviews
   - Focus groups
3. **Analysis:** Turn findings into tangible concepts:
   - Sketches
   - Storyboards
   - Paper prototypes
   - Interactive prototypes

💡 **Key principle:**
Avoid focusing on visual design too early. First understand *what tasks* users want to accomplish.

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3. The Goal of Prototyping

- Making ideas ***visible*** *and* ***testable*** before implementation.
- **Helps in:**
    - Generating new design ideas.
    - Evaluating ideas internally (within a design team).
    - Testing concepts externally (with users).
- **Depends on:**
    - The **stage of design** (early → low fidelity, advanced → high fidelity).
- **Common mistake:**
  Jumping to beautiful user interface before understanding user tasks.

💼 **Industry Example:**
Before Gmail was coded, Google designers tested dozens of paper prototypes to evaluate workflows like “compose,” “archive,” and “search.”

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4. The prototyping is based on “Exploring Alternatives”

- **Purpose:** Explore *different design alternatives* early and cheaply.
- **Exploration dimensions:**
    - **Devices and their roles:** How the interface behaves across desktop, mobile, tablet, etc.
    - **Interface layout:** What elements appear, and how users interact with them.
- **Philosophy:**
    - There’s *never just one correct design*.
    - Iteration helps identify the *best possible solution/design*.

⚙️ **Example:**
A team designing a audio app might prototype **many versions** of the “playlist creation” flow—one with buttons, one with drag-and-drop, … — to see which feels most natural.

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5. Techniques for Visualization and Prototyping

- **Sketches:** Early drawings to visualize ideas (like storyboards).
- **Maps:** Visual representations of how users **navigate** the product.
- **Prototypes:**
    - **Low-Fidelity (Paper)**
    - **Medium-Fidelity**
    - **High-Fidelity (Figma)**

🎯 **Purpose:** Turn abstract ideas into *visual, testable design*.

“If a picture is worth a thousand words, a prototype is worth a thousand meetings” — IDEO

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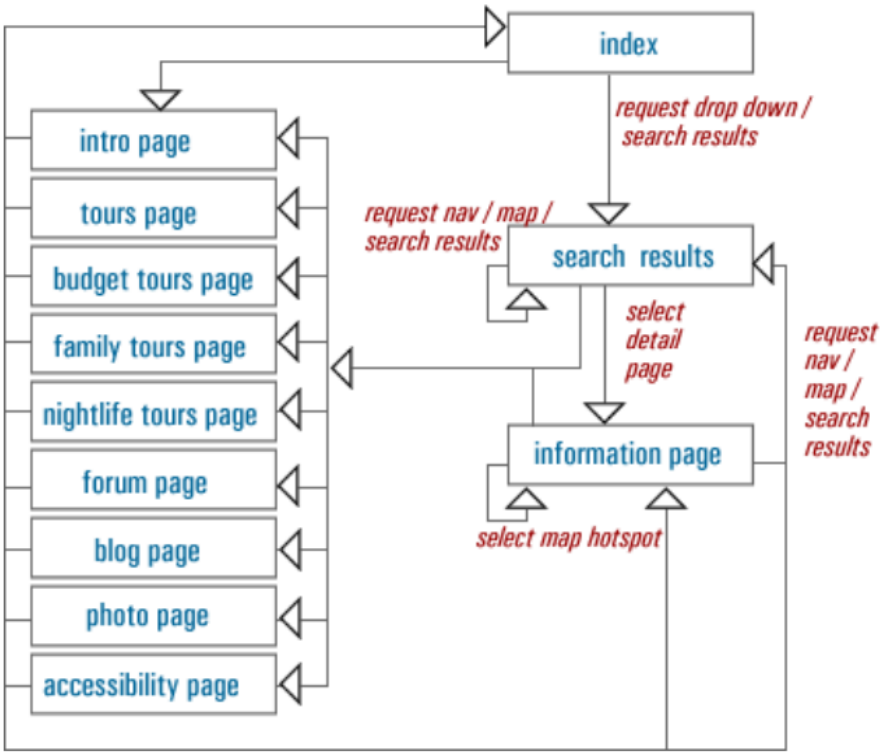
6. Maps and Navigation

- **Maps** show *how users navigate* across screens or features.
- **Purpose:**
    - Provide a *high-level overview* of app structure.
    - Focus on user movement and logical flow, *not screen details*.
- **Example:**
    - Website sitemap showing links between pages.

Website 'sitemap'



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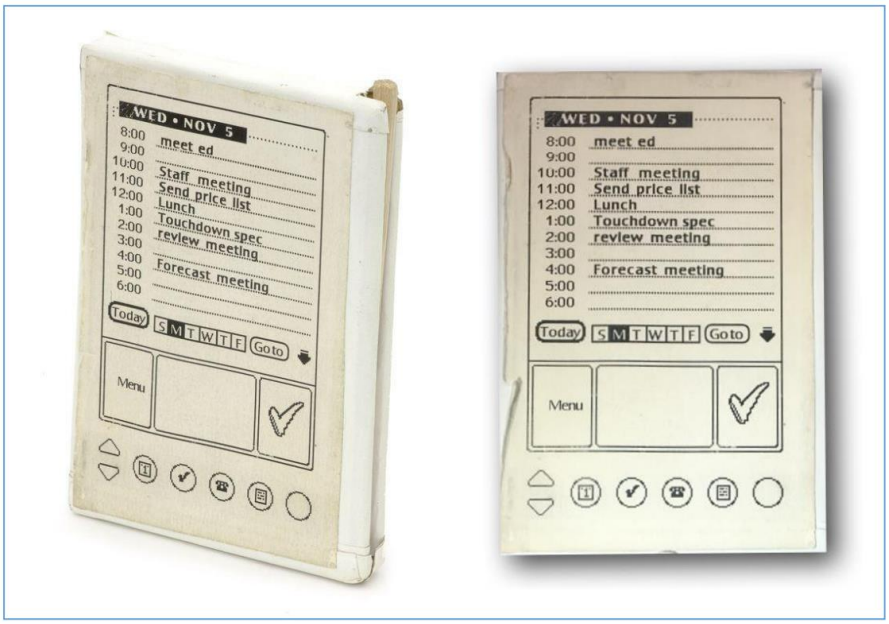
7. Prototypes: The Core of Design Iteration

Definition:
A *partial representation* of a system design.

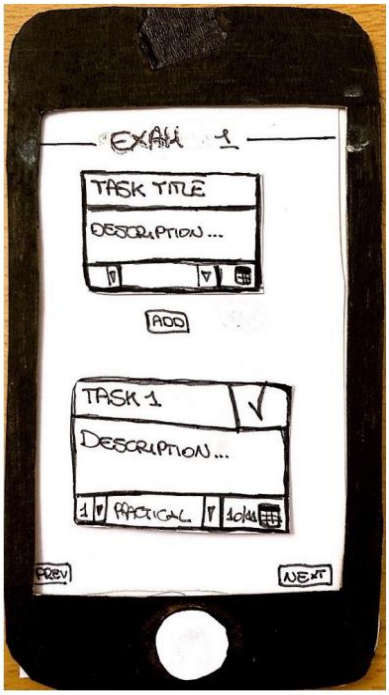
- **Purpose:**
  - Explore and visualize ideas.
  - Simulate interactivity.
  - Collect feedback early.
- **Advantages:**
  - Tangible (you can "see" and "feel" the design).
  - Easily modifiable.
  - Encourages feedback.

💡 **Real Example – Palm Pilot Story:**
Before building the Palm Pilot, Jeff Hawkins carried around a wooden block simulating the device's

size and interface. He mimicked operations with a pen — a *low-fi prototype* that led to a billion-dollar product.



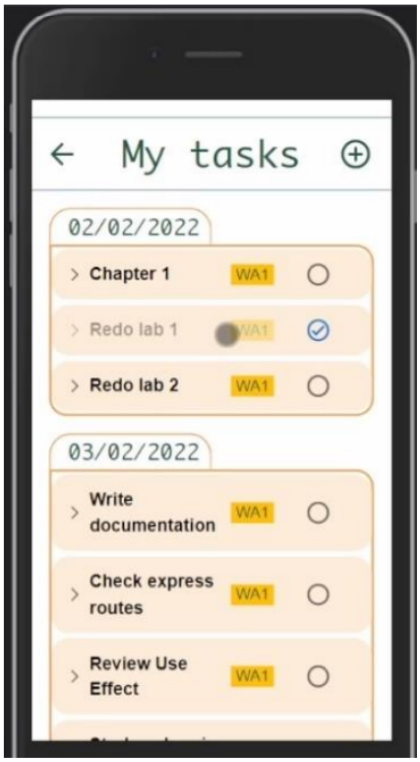
Low to High Fidelity Prototypes



Low-fi

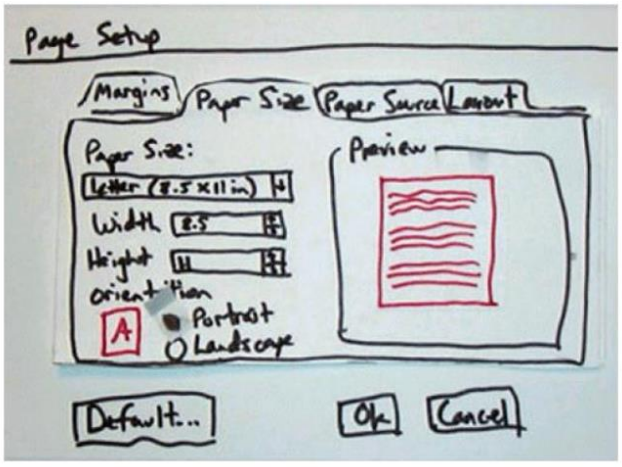
- Lays out the *main* information, interactions, and design choices
- With many missing details

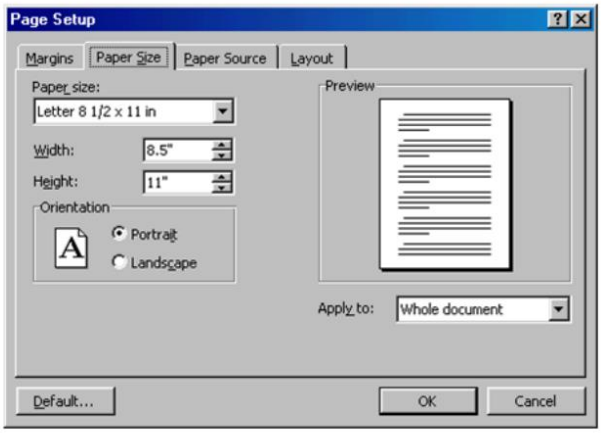
- **Purpose of Low-Fidelity Prototypes (Low-Fi):**
  - Evaluate structure and navigation.
  - Identify usability problems early.
  - Facilitate team discussions.



Hi-fi

- It *looks like* the final product





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11. Paper Prototypes

Definition:
Hand-drawn mockups of the user interface on paper — quick, cheap, and modifiable.

🖍️ **Materials Needed:**

- Paper, pens, markers

- Post-it notes, scissors, glue
- Photocopies, printouts, UI stencils

💼 **Industry Example:**
IDEO (one of the top design firms) uses paper prototyping in almost every project to ensure ideas are human-centered before they're coded.

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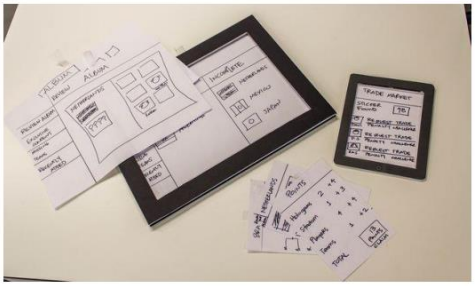
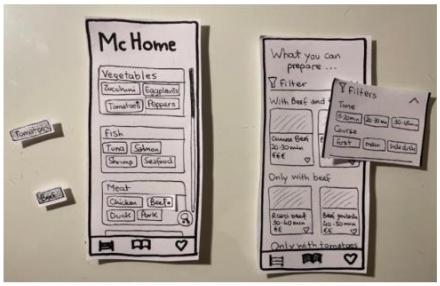
12. Why Paper Prototyping?

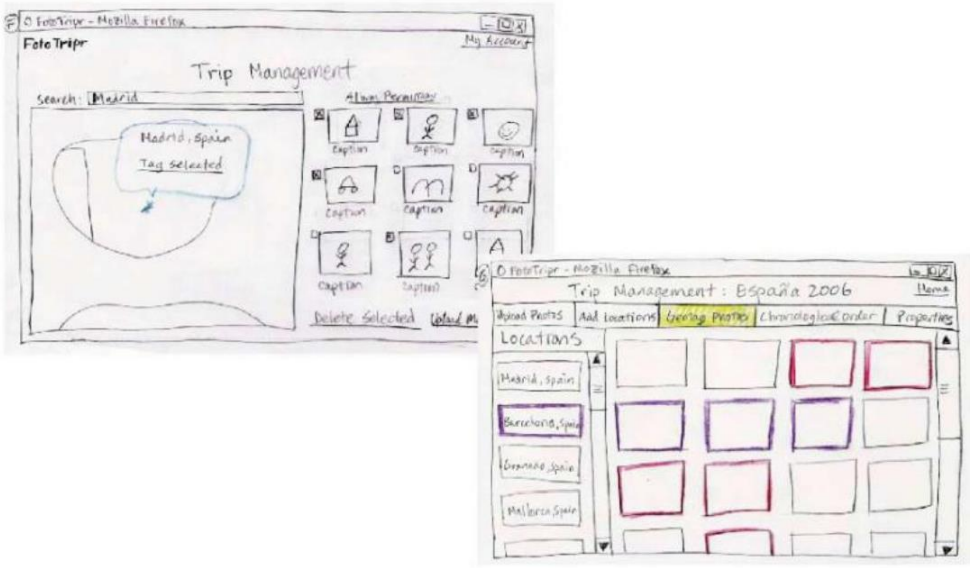
- **Speed:** Sketching is faster than coding.
- **Flexibility:** Easy to modify between user tests.

- **Low Cost:** No code or design software investment.
- **Encourages Creativity:** Users and non-programmers can contribute.
- **Focuses on the Big Picture:** Avoids early obsession هوس with fonts, icons, or colors.

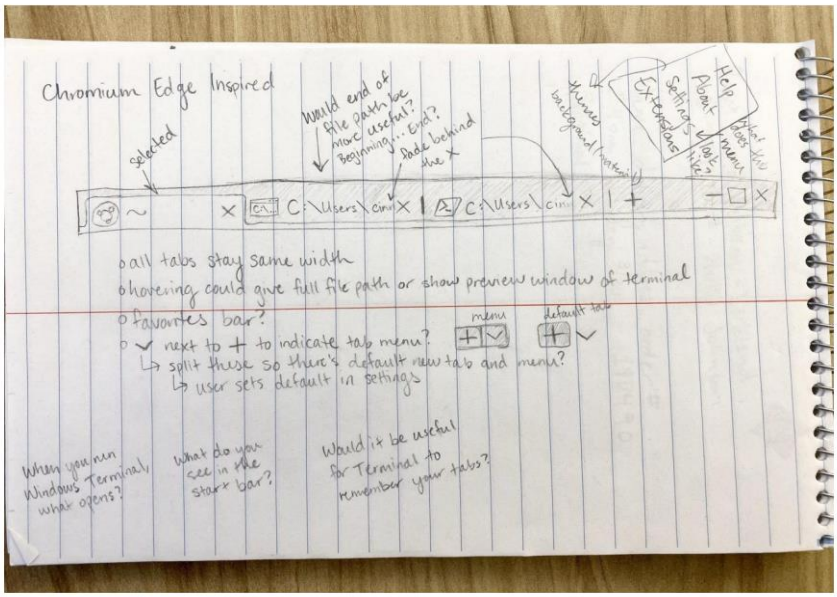
Paper Prototypes: Examples







First Ever Mockup of the Windows Terminal Tab Bar



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13. How to Test a Paper Prototype

Team Roles:

- **Computer Actor:** Simulates prototype behavior during a paper prototype test.
    - **Example in Practice:** Suppose you are testing a mobile banking app.
        - The user points at a “Transfer Money” button on paper.
        - The *Computer Actor* immediately replaces the current paper screen with another sheet showing the “Transfer” page.
        - If the user types an amount, the actor writes it in the input field or says, “Amount entered: 500.”
- **Facilitator ميسر :** Guides users, asks them to “think aloud,” keeps session on track.
- **Observer:** Silent note-taker, records feedback and body language.

Testing Steps:

1. Present tasks to the user (“Book a flight from Paris to Rome”).
2. Observe user actions on paper screens.
3. Make real-time changes if needed.
4. Record confusion, comments, or workarounds حلول بديلة .

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14. What You Can Learn from Paper Prototypes

✅ **Can Learn:**

- **Conceptual model clarity:** Do users understand the system?
- **Functionality:** Are key features present? هل الميزات الرئيسية موجودة؟
- **Navigation & task flow:** Can users complete tasks smoothly?
- **Terminology:** Are labels and icons meaningful?
- **Layout & content needs:** What goes on each screen?

❌ **Cannot Learn:**

- **Aesthetic جمالي aspects:** Color, animations.
- **Performance:** Response time.

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15. Real Examples & Resources

- Google's *Rapid Prototyping* playlist: **how big teams test and iterate quickly**.
- MIT's *HCI Prototyping Lecture:* practical exercises in paper UI testing.
- Scott Klemmer's *Storyboards & Paper Prototyping* course.
- Twitter's *Windows Terminal mockup* shows early low-fi design in action.

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16. Key Takeaways and Lessons Learned

🧠 **Core Insights:**

- Low-fi prototypes are *thinking tools*, not just drawings.
- They encourage feedback before you commit to expensive design work.
- Every prototype — even on paper — brings you closer to a better user experience.

💬 **Best Practices:**

- Start ugly — perfection slows learning.
- Test early.
- Involve users continuously.
- **Iterate** collaboratively — each sketch can trigger better ideas.