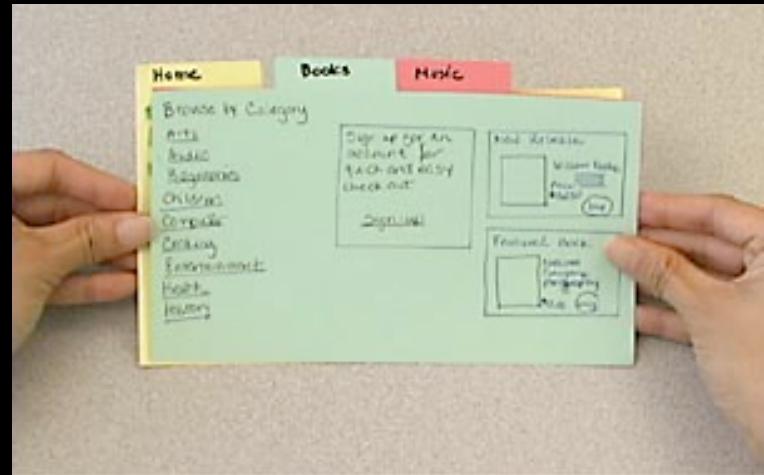


Paper Prototyping

CSCI 3002 Fall 2018



Today

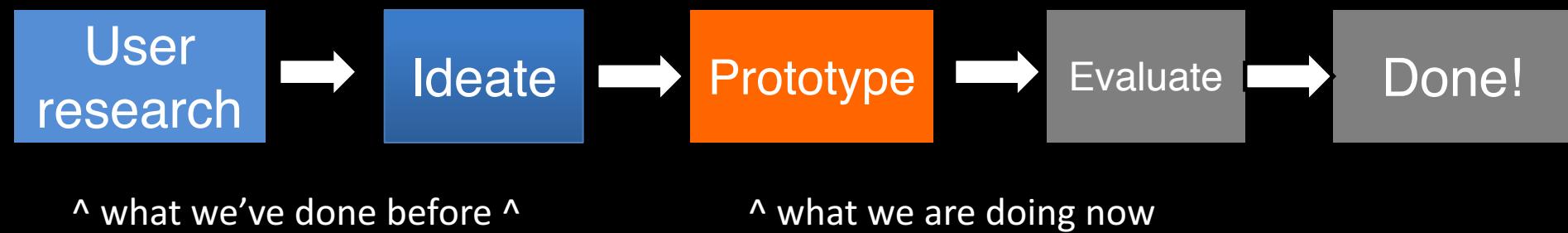
- Paper prototyping technique
- Tomorrow's recitation
 - Quiz 1
 - Paper prototyping activity
(bring paper & pencils)

Quiz

- Tomorrow in recitation section
- Some topics that may be covered:
the design process, brainstorming rules and methods, bootlegging, task analysis, personas, research methods, sketching, storyboarding, rules of visual design, color theory, type
- Emphasis on knowing high-level bits about these practices, and applying them

Paper prototyping

Putting this in context



Guiding questions

- How do we get the experience of an interactive system without building it?
- How do we “fail fast to succeed sooner”?

Ways to represent interaction

- **Sketches** -> show layout but not interaction or workflow
- **Storyboards and video** -> show workflow sequences, but only one scenario
- **Just build the app** -> shows everything, but takes a long time, and it may be too late to make changes
- We need ways to document and test out interactions

What is a prototype?

What is a prototype?

- First, rough draft version
- Something to get ideas out into the world
- Demonstrates functionality
- Minimum viable product
- Sketch: how it looks, how it is laid out
- Prototype: **how it works**

Benefits of prototyping

- Encounter (and solve) the difficult problems first
- Iterate quickly
- Have people **actually use** the system, rather than just talking about it



Questions we might answer with an interactive prototype

- Can someone figure out how to complete this task without help (and without reading the manual)?
- Which of these 5 password reset screens is the fastest?
- Are the buttons on this mobile app on a part of the screen that people can actually reach?

What makes a good prototype?

Some good prototype qualities

- Fast to create
- Easy to change
- Easy to try out new ideas and variations
- Detailed enough that a user can interact with them and simulate the real thing

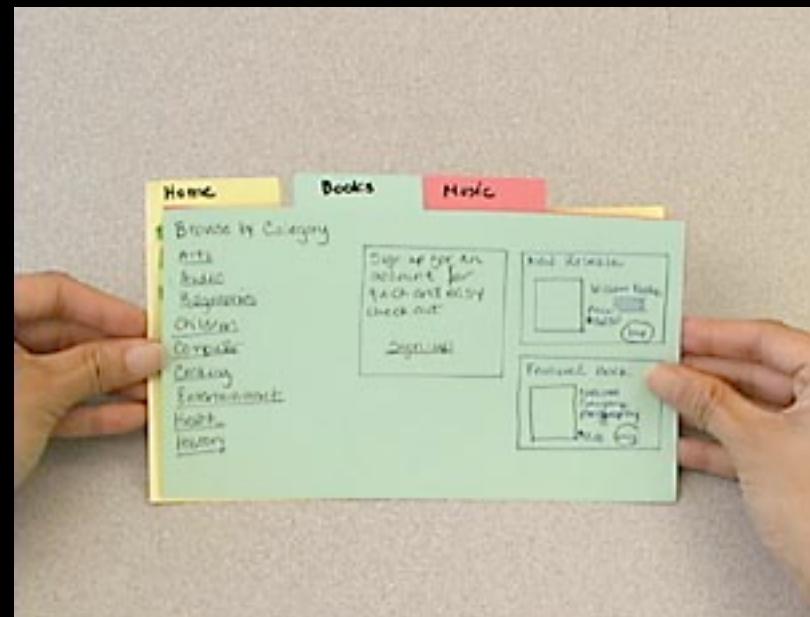
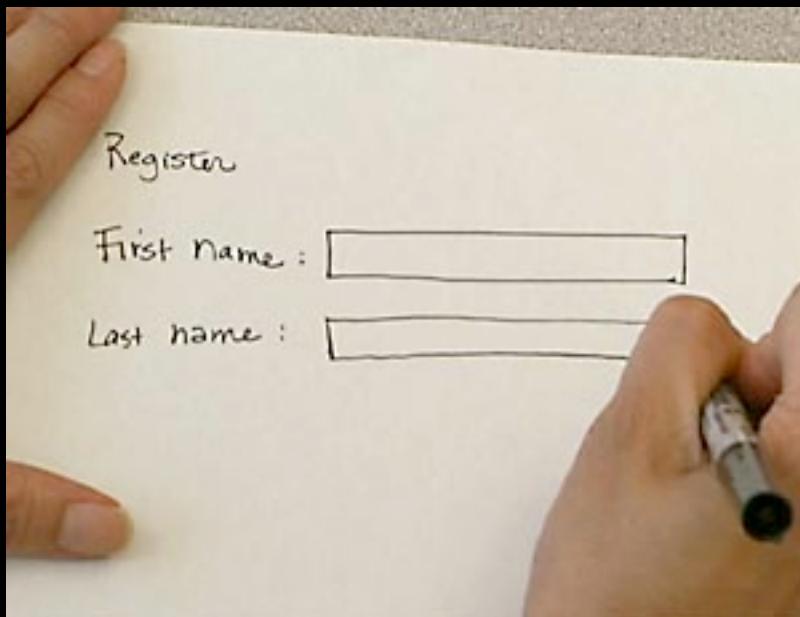
Tools for interactive prototyping

- Dedicated tools like [Figma](#), [Balsamiq](#), [Sketch](#)
- Slideware (PowerPoint and Keynote)
 - Use links and buttons to jump between screens
- Creating prototypes in code
 - Requires a lot of familiarity with coding tools, ability to quickly make and edit
- Paper and other low-fidelity materials

Low-fidelity (“lo-fi”) prototyping

- Use paper, index cards, markers, etc.
- This is different than a storyboard
 - Now, one “screen” per sheet of paper
 - A human switches between the sheets of paper (Wizard of Oz technique)

Paper prototypes

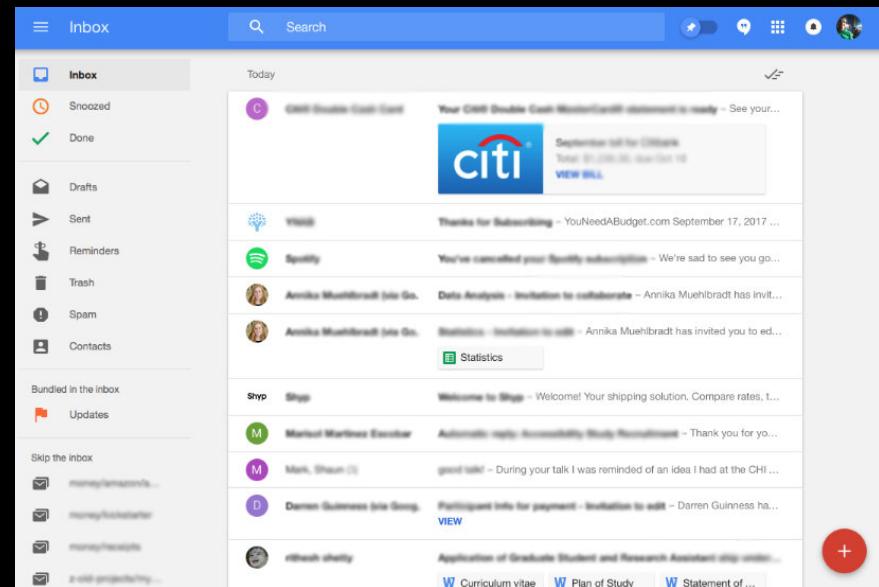
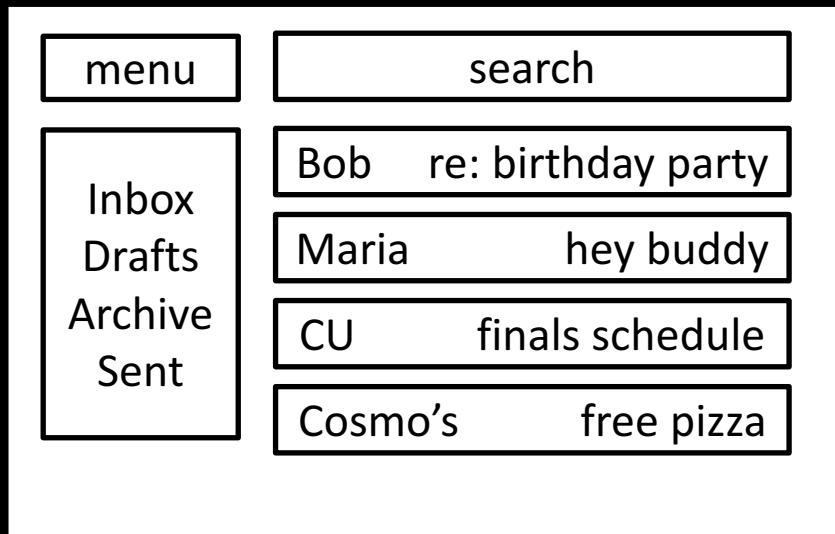


Benefits of lo-fi prototypes

- Fast – easy to make almost any kind of prototype, or make changes
- Can practice it (almost) anywhere
- Focus on the important factors right now
 - Structure of an application, layout, workflow
 - Don't get distracted by minor aesthetic details
- Users may be more comfortable giving feedback on paper prototypes

Discussing changes

- Prototypes that are too polished may discourage feedback; too difficult to change



Do low-fidelity prototypes result in better feedback?

- Designer lore says that low-fidelity prototypes allow users to provide high level feedback without getting distracted by details
- The jury is out on whether different types of prototypes really affect feedback

High-Fidelity or Low-Fidelity, Paper or Computer? Choosing Attributes when Testing Web Prototypes

Miriam Walker², Leila Takayama³, James A. Landay⁴

First Published September 1, 2002 | Research Article

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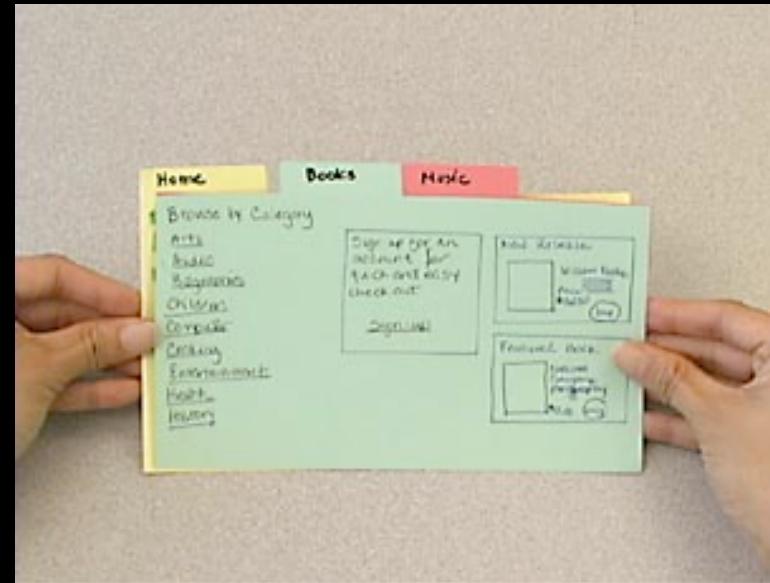


Abstract

Interface designs are currently tested in a mixture of fidelities and media. So far, there is insufficient research to indicate what level of fidelity and media will produce the best feedback from users. This experiment compared user testing with low- and high-fidelity prototypes in both computer and paper media. Task-based user tests of sketched (low-fidelity) and HTML (high-fidelity) website prototypes were conducted in each medium, separating the testing medium from other factors of prototype fidelity. We found that low- and high-fidelity prototypes are equally good at uncovering usability issues. Usability testing results were also found to be independent of medium, despite differences in interaction style. Designers should choose whichever medium and level of fidelity suit their practical needs and design goals, as discussed in this paper.

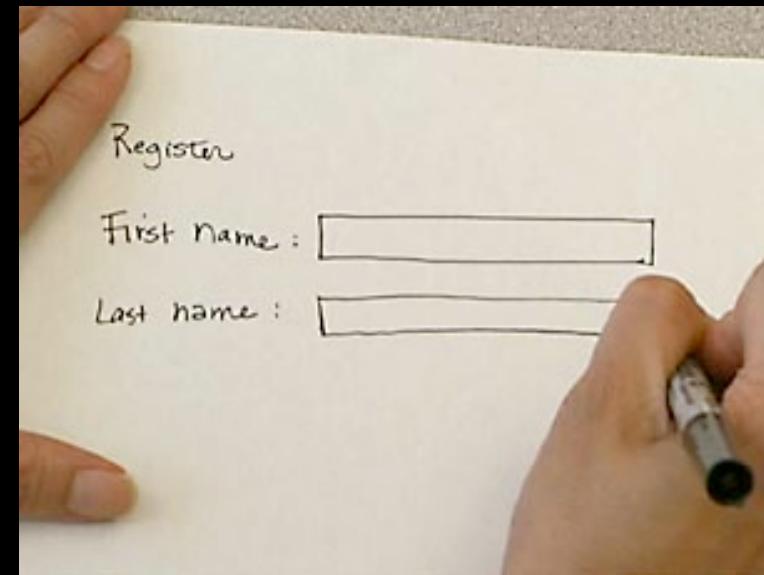
Paper prototyping toolkit

- Paper, pen/pencil, scissors, tape
- Lots of paper
- Index cards can be a good proxy for smaller screens
- Can use fancy materials: transparencies, post its, etc.



Constructing the prototype

- One sheet of paper per UI screen
- Draw all necessary UI elements (this should be a complete version of your app)
- Draw every screen of the app
- Keep notes (on a separate sheet) describing how the pages link to each other



Q: Do we have to draw everything?

A: yeah, pretty much

- Generally you should draw **every** screen of your prototype
- Otherwise, easy to miss some important parts of the prototype
- Include even standard UI components (like File Save dialogs), as they are needed for testing

A/B testing in your prototype

- Sometimes you may have a question about **one part** of your design
 - What's the right way to display the shopping cart? Should the menu be on top or bottom?
- In these cases, you may create alternatives for that part of the prototype, and insert them into your test

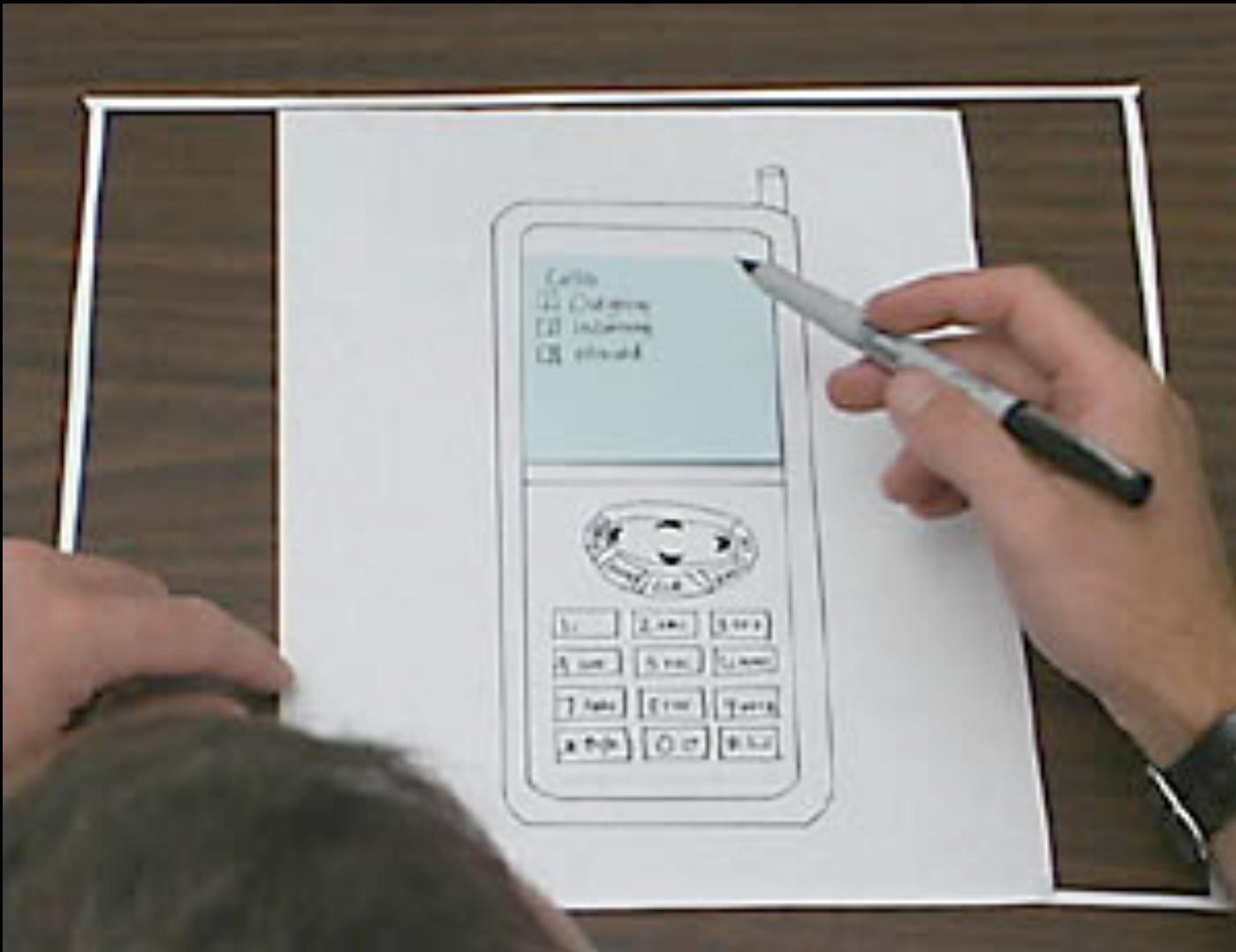
The paper prototype test

- Once you have completed your paper prototype, you will test it with users
- Don't just show the prototype and ask for feedback
- Instead, think of this as a usability test where users will “use” your prototype without help
 - Testing to see if the interface makes sense, is learnable, etc.

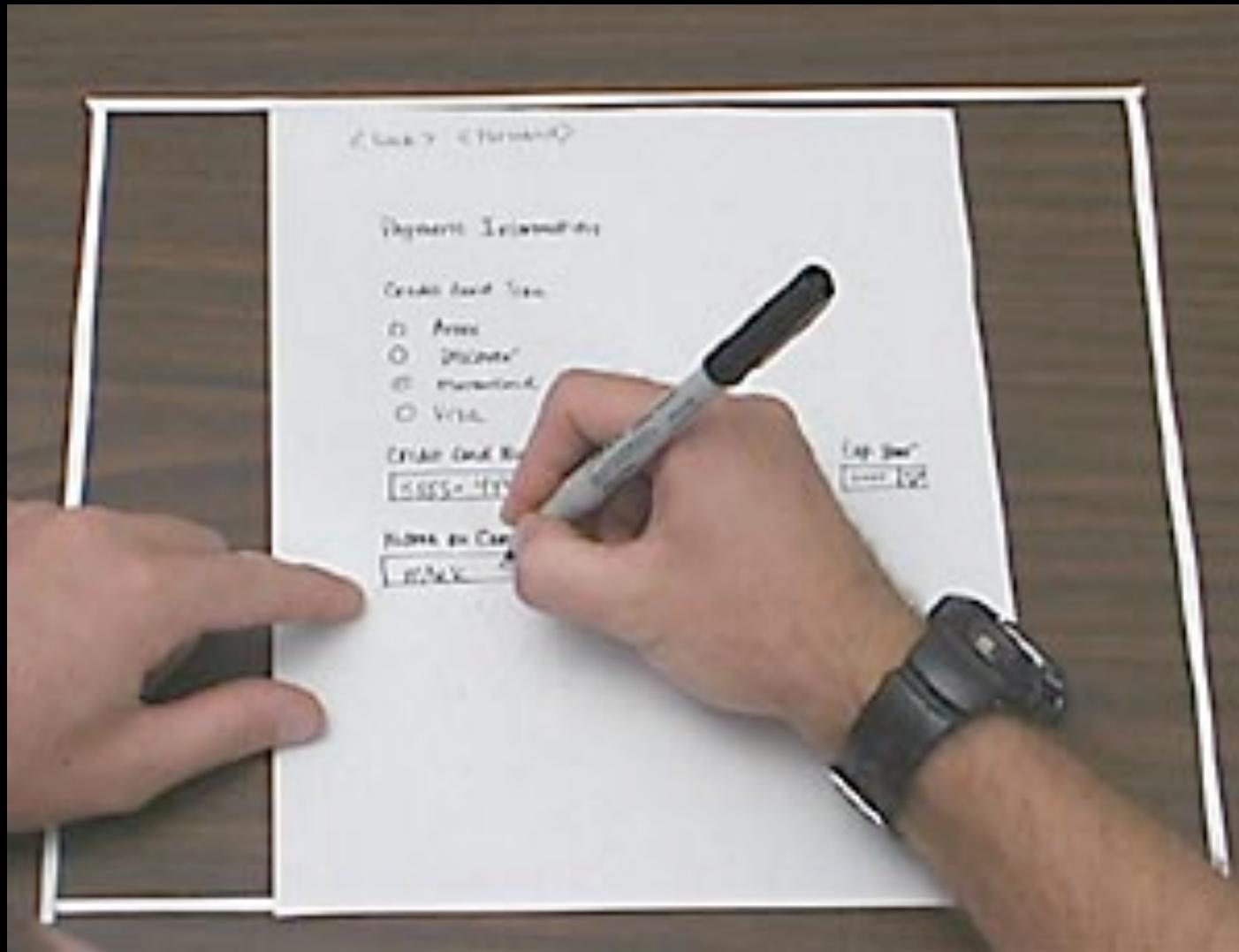
How to run a paper prototyping test

1. Introduce yourself to the participant and describe what you are testing (“a pet finder app”)
2. Present the user with 3-5 tasks (one at a time)
 - Don’t describe how to complete the task, describe the goal (“report a lost pet”)
3. The test user interacts with the user interface by touching buttons on paper, writing or speaking text inputs
 - The tester switches the paper sheets as necessary

Clicking a button



Entering text



More on testing

- Ideally, one person acts as the “computer” and someone else takes notes and instructs the test user (it’s hard to do both at once)
- You may ask the test user to “think aloud” and describe their thoughts as they are using the interface
- Don’t help the test user unless they are stuck for a long time (several minutes)
 - Seeing where they get lost is one of the most useful parts of this method

Paper prototyping setup



Test user



UI pages



“Computer”



Observer

Paper prototyping setup



Designing study tasks

- Choose tasks that your app should be able to perform
- Describe them to test user at a high level, as goals rather than instructions
 - Do: “Search for nearby apartments that have 2 bedrooms and cost less than \$1500/month”
 - Don’t: “Click the search button, now type in 1500 in the box marked max”

Another example study task

- “You are making a birthday card for your nephew, who loves robots. The other day you downloaded some pictures of robots that you would like to include in the card. Locate the images you downloaded and add a picture with a red robot to the card.”

Tasks and questions

- 5-10 tasks is typical for a user test
- After all tasks are completed, you may ask the test user for feedback or suggestions

What to look for

- Is the prototype organized in a reasonable way?
- Do users understand wording of labels, buttons, etc.?
- Are procedures easy to understand and follow?
 - Are there unnecessary steps?
- Will users act in unexpected ways?

Disadvantages of paper prototypes

- Our prototype may miss some issues that will come up later
 - Text size, resizable windows
- This method was designed in keyboard and mouse era; there may be issues integrating new forms of interaction (gesture, voice, etc.)

How do we know if we did our job?

- Finding a potential design problem before it ships
- Decide between two similar approaches
- Come away with concrete changes

Paper prototyping examples

- Pieces of paper

<http://www.youtube.com/watch?v=ykJ60H4Qkvg&feature=related>

- Simulated screen with paper

<http://www.youtube.com/watch?v=oITeUEjrY3Q&feature=related>

- Cell phone testing

<http://www.youtube.com/watch?v=Bq1rkVTZLtU&feature=related>

- Prototype usability testing

<http://www.youtube.com/watch?v=L7oPR2aTGIM&feature=related>

- Complete prototyping process

<http://www.youtube.com/watch?v=5Ch3VsautWQ>

- Kid's game design

<http://www.youtube.com/watch?v=L3yl9vaJuFE&feature=related>

Finishing up type & text

Using type in your designs

- Does the text in our prototypes matter?
 - Placeholder text
 - Formatting text

Placeholder text

- Often we leave this out because we don't have the text yet
- It's important to choose representative placeholder text

Otherwise the real text might not fit

Choosing placeholder text

- Try to match types of words, number of words, etc. of final content
- Consider unexpected text content
 - Other languages (including left-to-right)
 - User adjusted font size
- Avoid repetitive text patterns
 - Can cause confusing optical patterns
 - Instead, use *lorem ipsum* or other nonsense text

Placeholder text

test test test test test test test test test

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Lorem ipsum

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Placeholder text

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Lorem ipsum

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Where to get placeholder text

- When possible, use real content
- If not, use lorem ipsum
 - Online generator at lipsum.com
 - hipsum.co
- Even with lorem ipsum, worth figuring out what size content will be

Readability

Choosing readable type

- Mixed case may be more readable than UPPERCASE
- Avoid small type (and let users change font size)
- Use lightweight fonts sparingly
- **Ensure sufficient contrast**
- Serif vs. sans-serif – the jury is still out

How we read



- We read in an F-shaped pattern, so:
- Use adequate margins
- Use centered alignment sparingly
- Increase line spacing as text length increases,
ideal ratio may be around 1.6
- Column width 45-75 characters

Margins

Text without margins can feel very claustrophobic or cluttered. Place a margin around text and between blocks of text to improve readability.

Center-aligned text

Tyger! Tyger! burning bright
In the forests of the night:
What immortal hand or eye
Could frame thy fearful symmetry?

In what distant deeps or skies
Burnt the fire of thine eyes?
On what wings dare he aspire?
What the hand dare seize the fire?

Center-aligned text



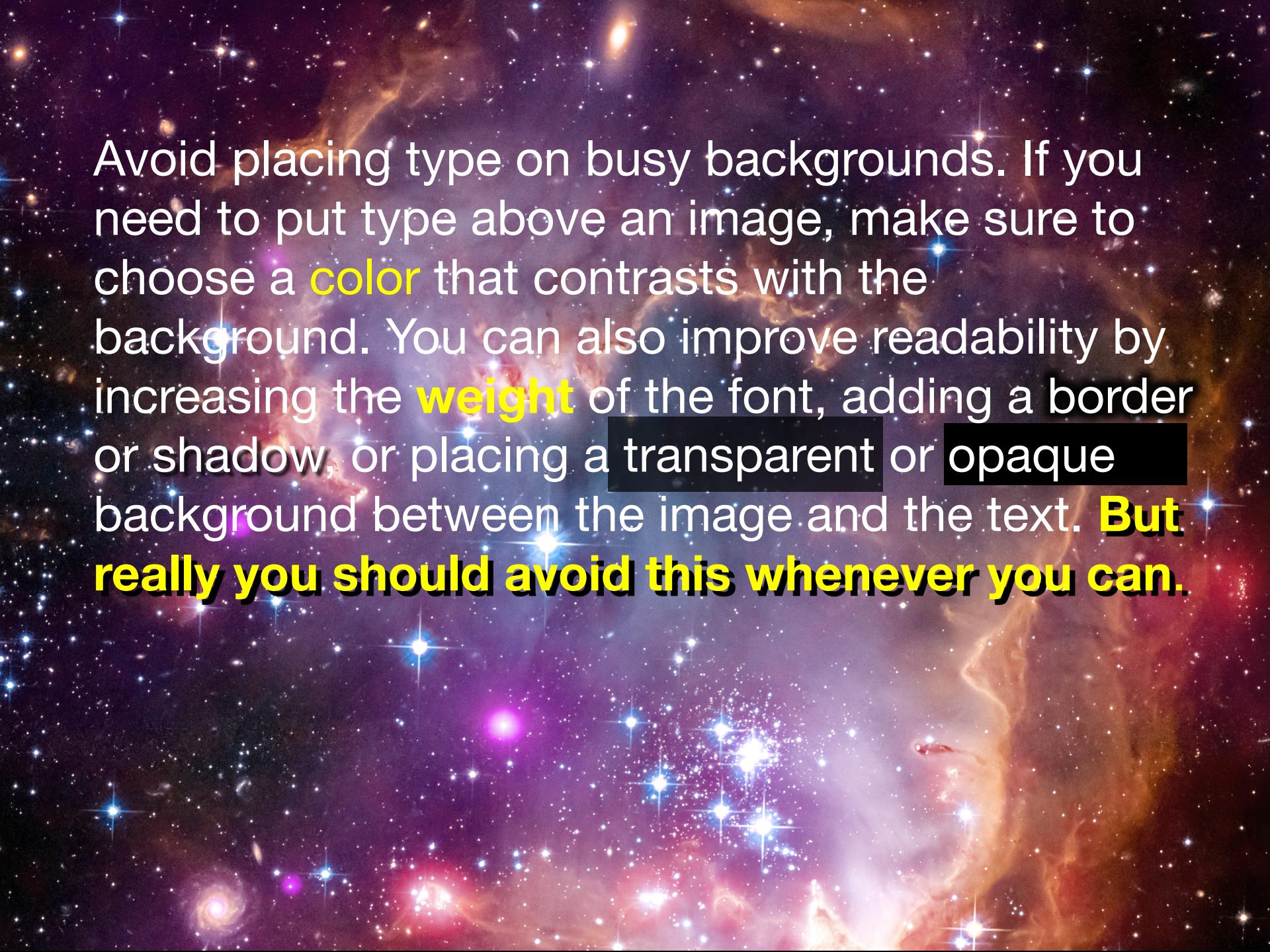
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What the hand dare seize the fire?

Center-aligned text block

And what shoulder, & what art
Could twist the sinews of thy heart?
And when thy heart began to beat
What dread hand? & what dread feet?

What the hammer? what the chain?
In what furnace was thy brain?
What the anvil? What dread grasp
Dare its deadly terrors clasp?



Avoid placing type on busy backgrounds. If you need to put type above an image, make sure to choose a **color** that contrasts with the background. You can also improve readability by increasing the **weight** of the font, adding a border or shadow, or placing a transparent or opaque background between the image and the text. **But really you should avoid this whenever you can.**