



**Oregon State**  
University

# Paper Prototyping



# Today's class

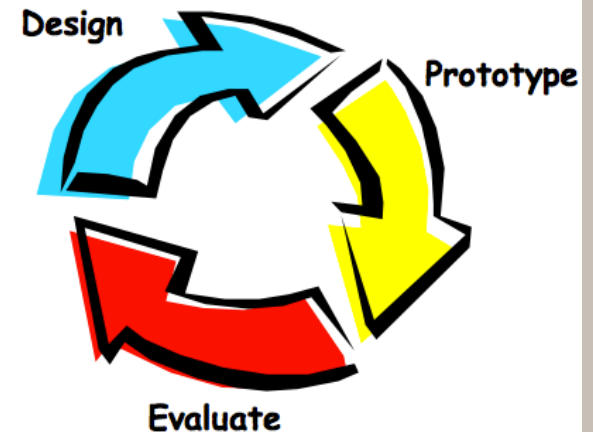
- What is prototyping?
- Paper prototyping
  - Why?
  - What?
  - How?
- Best practices in prototyping

# Prototyping?

- What is a prototype?
- Why do we prototype?
- What do we prototype?

# Paper Prototyping

- Depict what you think the system should look like
  - Experiment with alternate design
- Test the prototypes
  - Get feedback faster
- Fix the prototypes (repeat) then implement real system
  - Keep design centered on user



# What are paper prototypes?

- From **Hand drawn sketch** to realistic rendering of a user interface
- Doesn't need to be “pretty” or artistic, can be **simple**
- User interface reduced to only the **most important elements**

Sketch



Wireframe



Graphic design



Prototype



test & develop

test & develop

test & develop

<https://www.thoughtworks.com/insights/blog/providing-just-enough-design-can-make-agile-software-delivery-more-successful>

# Examples

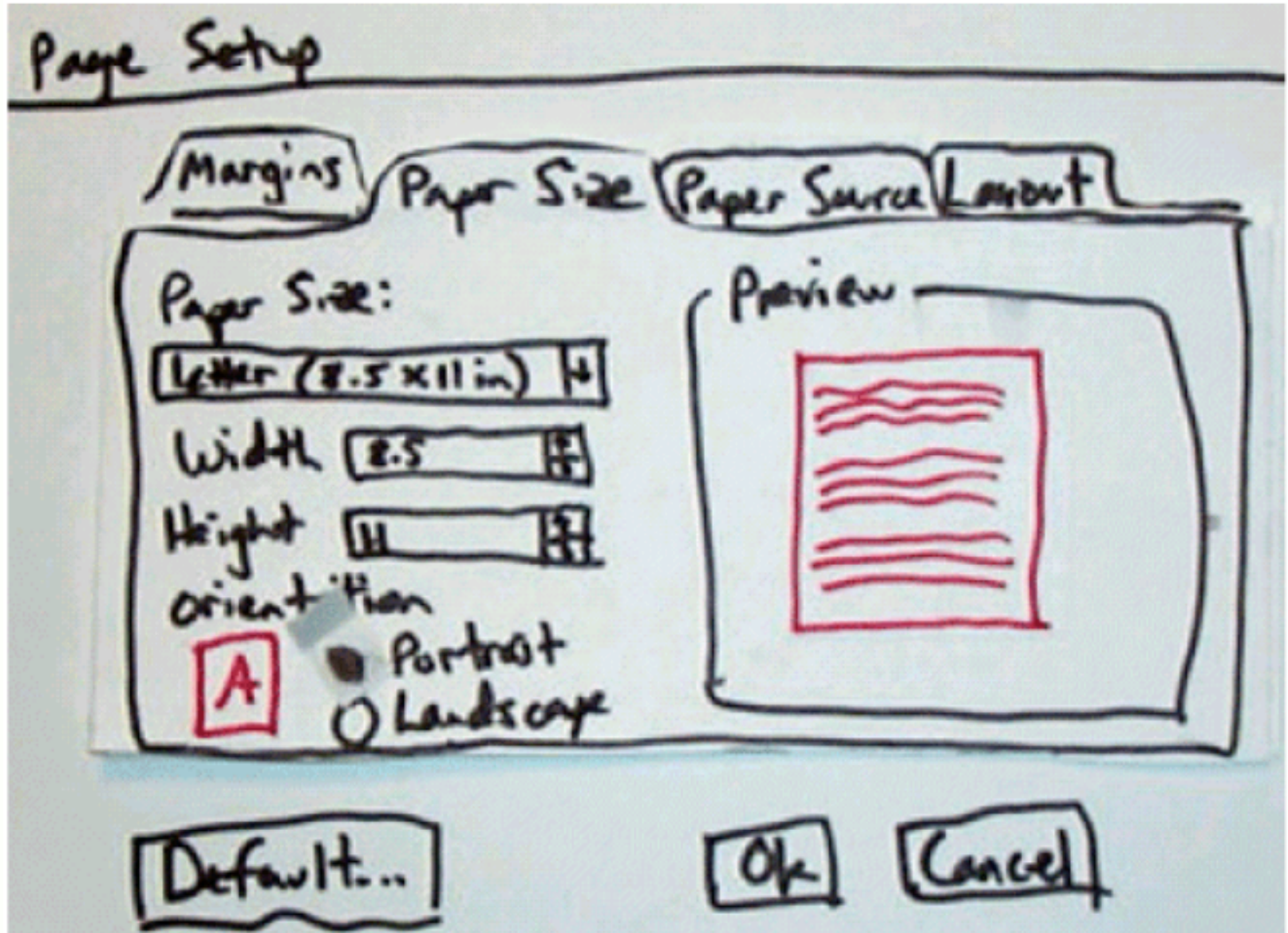




image: Caryn Vainio, Winnie Chang, Adrian Kosmaczewski





image: UXPin, Natalia Sourdis, iphonized

# Misconceptions

- I cant draw well enough to create a paper prototype
- Users behave differently with paper prototypes
- I cant prototype interactivity
- Drawing is a pain, I can photoshop something quicker/  
better/easier

# Tools for prototyping

- White poster board (11”x14”)
  - For background, window frame
- Big (unlined) index cards
  - For menus, window contents, dialog boxes
- White correction tape
  - For text fields, checkboxes, short messages
- Overhead transparencies
  - For highlighting, user “typing”
- Photocopier
  - For making multiple blanks
- Pens & markers, scissors, tape

# Fidelity in prototyping

- The level of detail

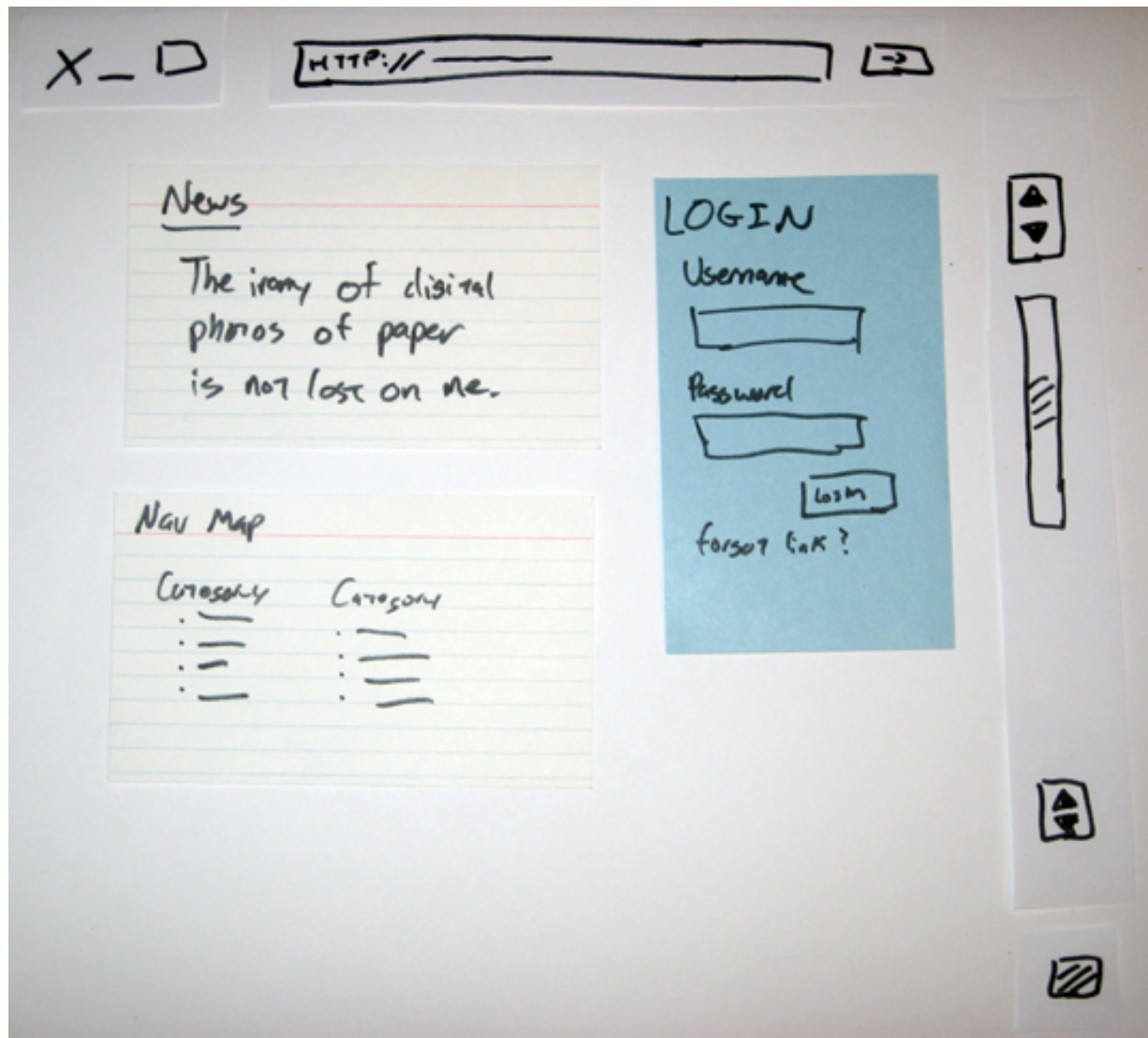
# Hi-Fidelity – looks like the real thing

The screenshot displays a complex web application interface for mySAP.com. The top navigation bar includes the mySAP.com logo, a search icon, and the SAP logo. Below the navigation bar, the main content area is divided into several sections:

- Start my Day:** Features an Outlook inbox with a table of messages. The table has columns for From, Subject, and Received. Messages include "SAP University Info Session: Die lernende Softwareorganisation" and "RE: Rebecca".
- Design Corner:** A promotional banner for "Design More Effectively!" by Mark Rolston, Creative Director of Frogdesign, Inc. It includes the text "Learn How the Right Use of Text Can Design Better Websites" and "in order to: Entice, involve, and excite users! Communicate information proactively!".
- News Headlines:** A section titled "UN Workers to Quit East Timor" with a sub-section for "Related Stories" including "Indonesia Rejects U.N. Force" and "Bomb Blamed for Fatal Moscow Blast".
- External Links Linklist:** A section titled "List of available links in this section" with a list of links: "Joe Cartoon", "SAP Markets", "Intranet", and "Muster Powerpoint".
- Pocket Jukebox:** A section for music playback, currently showing "BBC - Radio 1 Live" and a progress bar.

The left sidebar contains a "Toolbox" with a search bar and "Currently Active" channels: "SAP Markets" and "Developer". Below this are sections for "My Workplace", "Information", "Development", "Testing", and "Employee", each with a list of sub-items.

# Low-Fidelity – keeps only the essence



# Use fidelity to focus on the kind of feedback you need/want



## Rough Sketch

Scanned from a hand-drawing, made with a drawing app and a tablet, or using the Napkin Look and Feel skin.

"Maybe the tools should be context-specific...  
Let's kill the toolbar and bring up only the tools that make sense at that moment.."

**Feedback:** higher-level features are questioned, bigger changes possible.

---



## Visio, Powerpoint, etc.

Illustrated using a professional drawing or Feedbackimage ion tool.

"I don't like the two-column layout for tools.  
Can we have them go across the top?"

**Feedback:** tweaks to the 'screen' or page as a whole. Incremental improvements.

---



## Looks Done

Mocked up in Photoshop, a multimedia program (Director, Flash, etc.), or a GUI builder (NetBeans, Visual Studio, etc.)

"Can you change the font on that 'T'?"

Not sure I like the bevel line weight.."

**Feedback:** detailed tweaks to specific features. Very focused and incremental.

---

# Brainstorming





## 4 rules

1. **Go for Quantity:** “quantity breeds quality”
2. **Withhold Criticism:** by suspending judgment, participants will generate unusual ideas
3. **Welcome Wild Ideas:** if you are not generating bad ideas, you are not doing a good job brainstorming
4. **Combine and Improve Ideas:** “1+1=3”

# Brainstorming Needs

- We need a way to quickly and cheaply generate ideas, yet still be able to communicate them clearly.
- Pencil and paper is
  - Fast
  - Cheap
  - Clear

## Class Exercise - 10 minutes

Create 3 paper prototypes for a mobile movie review site that lets you buy tickets.

User is already registered and has payment info in site.

Must include some “bad” out of the box ideas

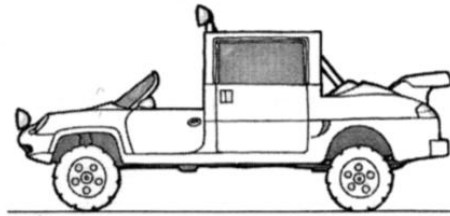
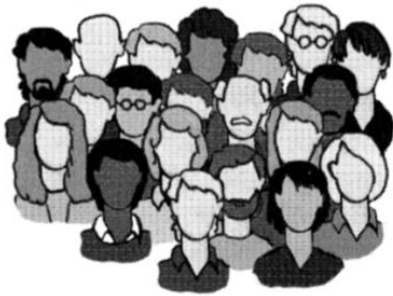
# Personas



# Personas

- A fictional character created to represent the different user types that might use a design
- A role played by a character
- Used to avoid self-centered design or design by committee

# Why do we need persona?



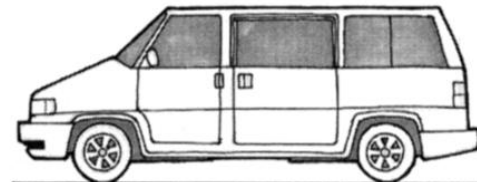
## Alessandro's goals

- Go fast
- Have fun



## Marge's goals

- Be safe
- Be comfortable



## Dale's goals

- Haul big loads
- Be reliable



# Abby Jones<sup>1</sup>



- 28 years old
- Employed as an Accountant
- Lives in Cardiff, Wales

Abby has always liked music. When she is on her way to work in the mornings, she listens to music that spans a wide variety of styles. But when she arrives at work, she turns it off, and begins her day scanning all her emails first to get an overall picture before answering any of them. (This extra pass takes time but seems worth it.) Some nights she exercises or stretches, and sometimes she likes to play computer puzzle games like Sudoku.

## Background and skills

Abby works as an accountant. She is **comfortable with the technologies she uses regularly**, but she just moved to this employer 1 week ago, and **their software systems are new to her**.

Abby says she's a "numbers person", but she has **never taken any computer programming or IT systems classes**. She **likes Math** and knows how to think with numbers. She writes and edits spreadsheet formulas in her work.

In her free time, she also **enjoys working with numbers and logic**. She especially likes working out puzzles and puzzle games, either on paper or on the computer.

## Motivations and Attitudes

- **Motivations:** Abby uses technologies **to accomplish her tasks**. She learns new technologies if and when she needs to, but prefers to use methods she is **already familiar and comfortable with to keep her focus** on the tasks she cares about.
- **Computer Self-Efficacy:** Abby has **low confidence about doing unfamiliar computing tasks**. If problems arise with her technology, she often **blames herself for these problems**. This affects whether and how she will persevere with a task if technology problems have arisen.
- **Attitude toward Risk:** Abby's life is a little complicated and she **rarely has spare time**. So she is **risk averse about using unfamiliar technologies that might need her to spend extra time** on them, even if the new features might be relevant. She instead performs tasks using familiar features, because they're more predictable about what she will get from them and how much time they will take.

## How Abby Works with Information and Learns:

- **Information Processing Style:** Abby tends towards a **comprehensive information processing style** when she needs to more information. So, instead of acting upon the first option that seems promising, she **gathers information comprehensively to try to form a complete understanding of the problem before trying to solve it**. Thus, her style is "burst-y"; first she reads a lot, then she acts on it in a batch of activity.
- **Learning: by Process vs. by Tinkering:** When learning new technology, Abby leans toward **process-oriented learning**, e.g., tutorials, step-by-step processes, wizards, online how-to videos, etc. She **doesn't particularly like learning by tinkering with software** (i.e., just trying out new features or commands to see what they do), but when she does tinker, it has positive effects on her understanding of the software.

<sup>1</sup> Abby represents users with motivations/attitudes and information/learning styles similar to hers. For data on females and males similar to and different from Abby, see <http://eusesconsortium.org/gender/gender.php>



**Abby Jones**

**age 28**  
**accountant**  
**Springfield**





# Abby Jones

proficient with technology  
learns what she needs,  
uses what she knows  
gathers information  
before acting



**Abby Jones**

new job 1 week ago

“numbers person”

enjoys numbers & logic



# Abby Jones

comfortable with familiar  
technology

uses “the safe way” to

get things done

step-by-step tutorials



# Abby Jones

doesn't "waste time

learning new features"

doesn't try stuff out for fun

not confident at new tasks

gives up & blames herself

# Why do we need persona?

- Build Empathy
- Develop Focus
- Communicate and form consensus
- Make and defend decisions
- Measure effectiveness
- Get out of our own “head”

## Specifying persona

- Identify major clusters from multiple user interviews/ inquiries
- Synthesize their goals
- Check for completeness and specificity

# Usability Testing

- Paper prototypes can also be used perform usability testing
- It is a low-cost way to help figure out if your design is suited to perform specific tasks
- Often includes a sequence of sketches
- Use as a tool to manage risk

**user**

**observer**

A bit slow for a computer  
- but it works!

**computer**

0.0001  
MHz

**Interface**

**Interface elements**



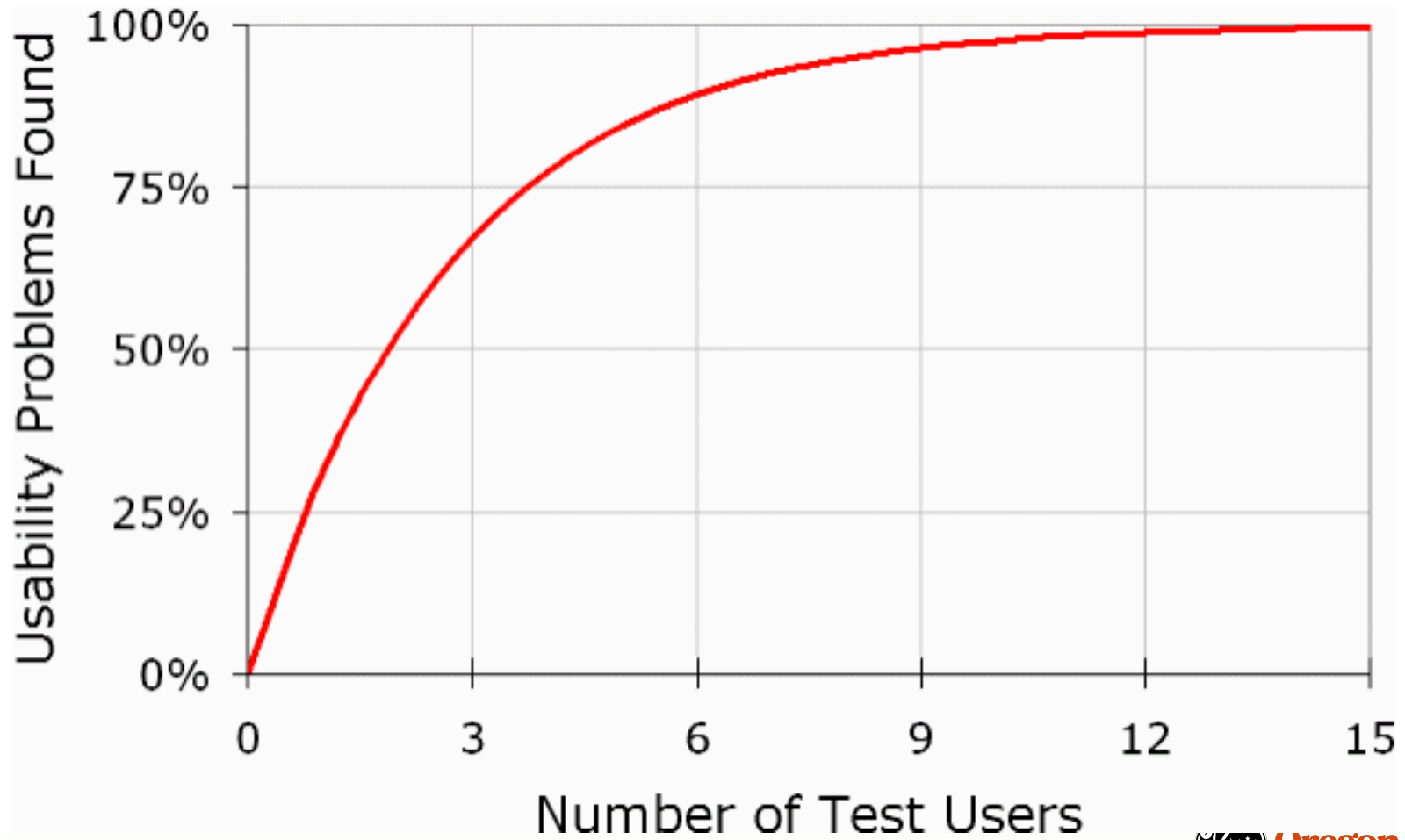
# Roles

- Facilitator:
  - Gives instructions
  - Encourages user to speak
- Computer
  - Simulates response of system
  - Cant speak / help the user
- Observer(s)Take notes

## Questions we can answer

- Are end-users doing **what you want** them to be doing?
- Are they doing **what you expected** them to do?
- Did they become **confused** while trying to reach their goals?
- Did you really think through **all possible paths** through the application?
- Did they have a **preferred path**?
- Are some **paths unused**?
- Are some paths used in ways that **weren't intended**?

## Does user testing really work?



<https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/>

## Class Exercise

In groups of four:

Review each other's prototypes with Abby in mind - will she be able to use it?

**Abby:**

- Learns tech to get things done, not for fun
- No spare time to learn things she doesn't need
- Gathers information before acting
- Learn through process and not tinkering
- If tech goes wrong blames herself