



# Paper Prototyping

Oregon State  
University



# Today's class

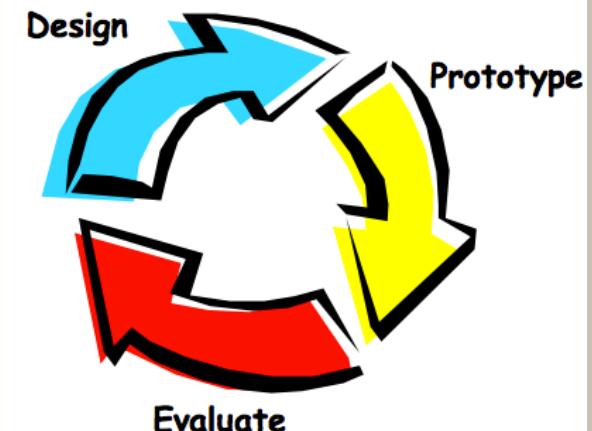
- What is prototyping?
- Paper prototyping
  - Why?
  - What?
  - How?
- Best practices in prototyping

# 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

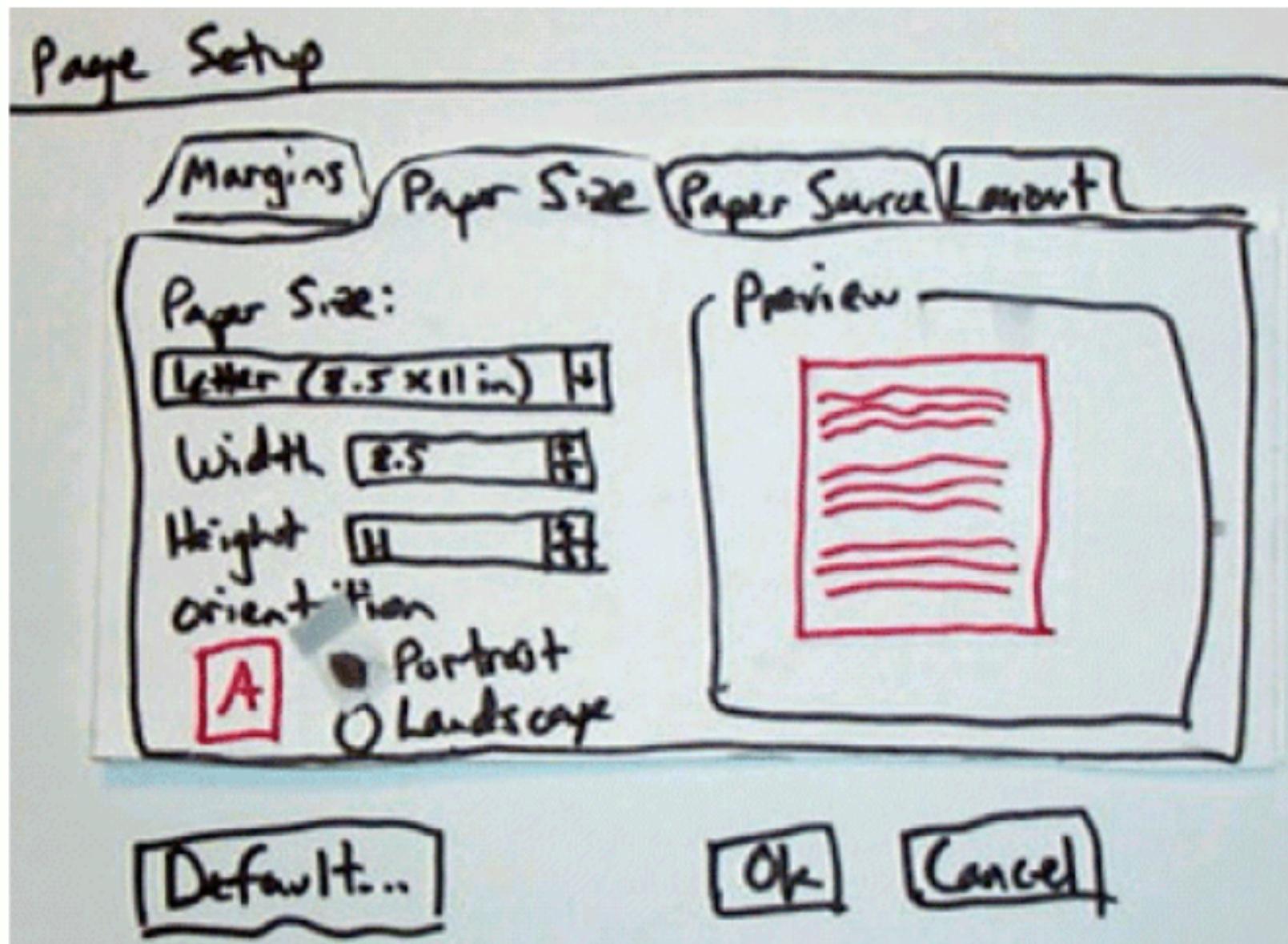




image: Caryn Vainio, Winnie Chang, Adrian Kosmaczewski



image: UXPin, Natalia Sourdis, iphonized

# Misconceptions

- I can't draw well enough to create a paper prototype
- Users behave differently with paper prototypes
- I can't prototype interactivity
- Drawing is a pain, I can photoshop something quicker/better/easier

<http://www.userfocus.co.uk/articles/paperprototyping.html>



# 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 shows a detailed wireframe of a web application interface. At the top left is a logo for "mySAP.com". The top right features the SAP logo. The main title "Start my Day" is centered above a toolbar with icons for Help, Back, Forward, Stop, Refresh, and Search.

**Toolbox:** A sidebar on the left contains several sections with links:

- Currently Active:** SAP Markets (selected), Developer
- My Workplace:** Start my Day, Developer
- Information:** Developer, SAP Markets, Intranet, Muster Powerpoint
- Development:** Employee, SAP Markets, Intranet, Muster Powerpoint
- Testing:** Cost Manager, SAP Markets, Intranet, Muster Powerpoint
- Employee:** Information, Employee, SAP Markets, Intranet, Muster Powerpoint

**Outlook Inbox:** A central panel displays an inbox with four messages:

From	Subject	Received
Doll, Georg	SAP University Info Session: Die lernende Softwareorganisation	Do 19.10.2000 1...
Lessmann, Carsten	RE: Rebecca	Do 19.10.2000 0...
Gehring, Heidi	FW: !!!Important Information about ITS!!!	Do 19.10.2000 0...
Brito, Nelia	Neues Buch ABAP Objects erschienen	Mi 18.10.2000 14...

**Design Corner:** An advertisement for "Design More Effectively!" by Mark Rolston, Creative Director, Frogdesign, Inc. It includes text: "Learn How the Right Use of Text Can Design Better Websites in order to: Make the medium the message! Entice, involve, and excite users! Communicate information proactively!". A "Show Me" button is at the bottom right.

**News Headlines:** A section showing a top news story: "UN Workers to Quit East Timor". Below it are related stories: "Indonesia Rejects U.N. Force", "Bomb Blasted for Fatal Moscow Blast", and a small thumbnail image of two people.

**ExternalLinks Linklist:** A list of available links:

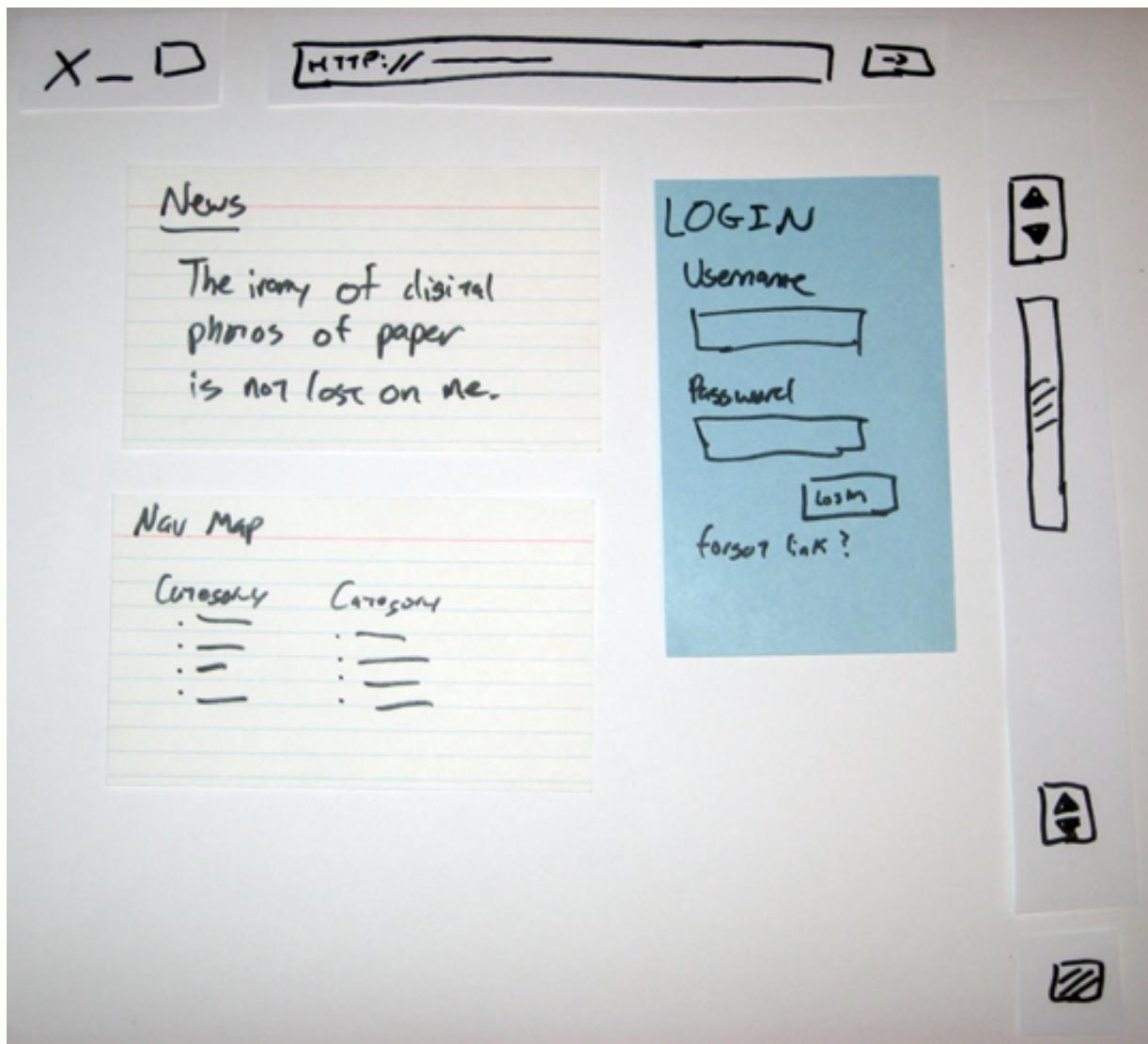
- Joe Cartoon
- SAP Markets
- Intranet
- Muster Powerpoint
- ... (with a small icon)

**Pocket Jukebox:** A media player interface showing "BBC - Radio1 Live" as the current channel, with a progress bar and a "Now Connecting..." message.

**Bottom Right:** A partial view of the "on State University" logo.

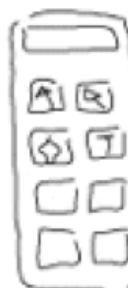
**Bottom Left:** A note: "Moving the mouse over the channel buttons displays the options for this channel."

# 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  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

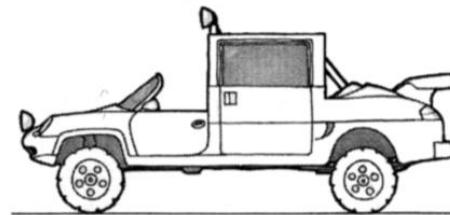
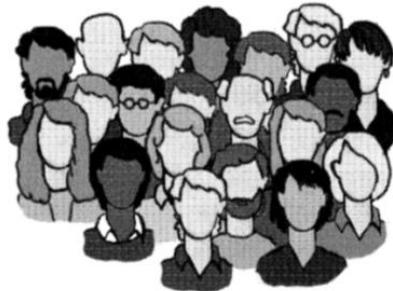
# Personas



# Personas

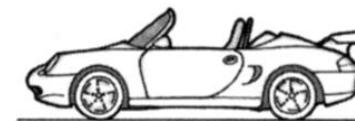
- A fictional character created to represent the different user types that might use a design
- A role played by a character
- Used to avoid self-centered design or design by committee

# Why do we need persona?



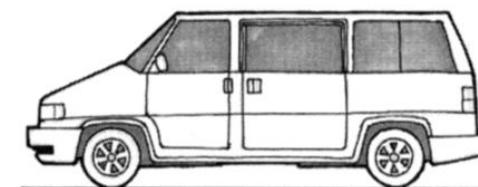
Alesandro's goals

- Go fast
- Have fun



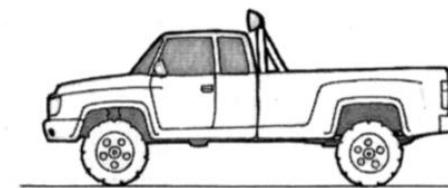
Marge's goals

- 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 know 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

A close-up, slightly blurred portrait of a young woman with dark brown hair and bangs. She has green eyes and is smiling. The background is a soft-focus green foliage.

# Abby Jones

new job 1 week ago

“numbers person”  
enjoys numbers & logic

A close-up photograph of a young woman with dark brown hair, looking directly at the camera with a slight smile. The background is blurred green foliage.

# 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?

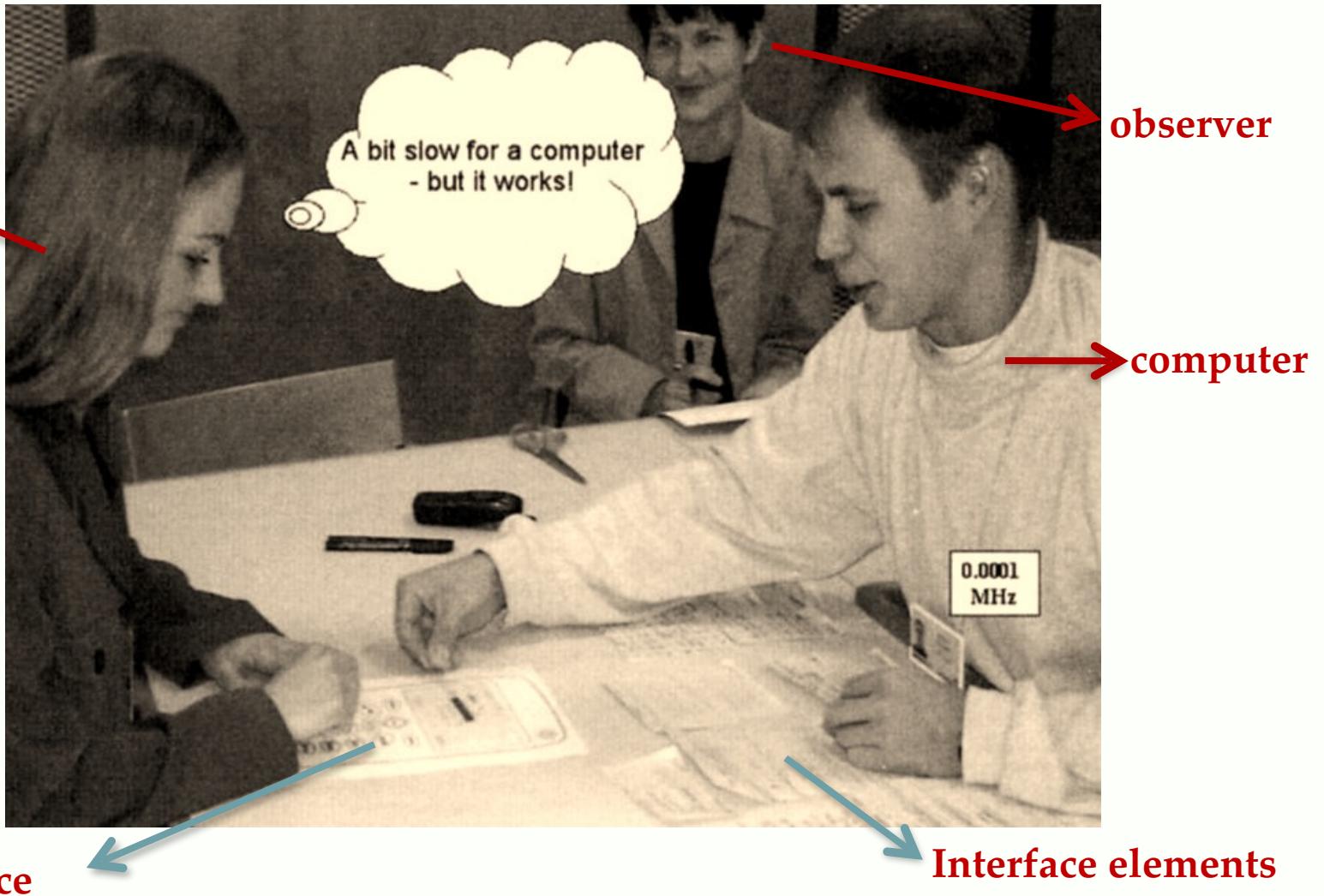
- Build Empathy
- Develop Focus
- Communicate and form consensus
- Make and defend decisions
- Measure effectiveness
- Get out of our own “head”

## 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



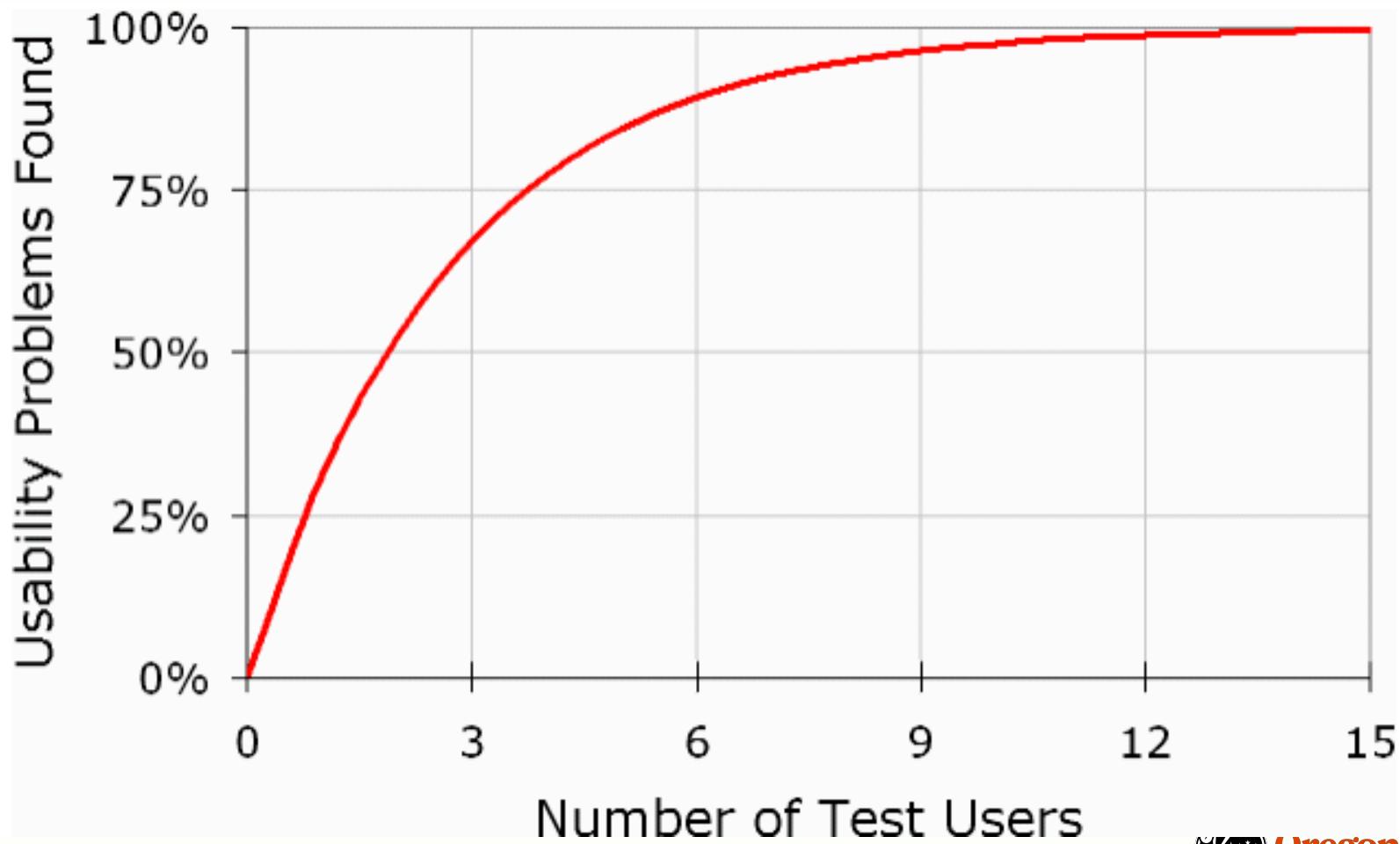
# Roles

- Facilitator:
  - Gives instructions
  - Encourages user to speak
- Computer
  - Simulates response of system
  - Can't 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