Milestone 2

- Use requirements from Milestone 1 to create a paper prototype.
- 3 paper prototypes, each tested with 3 users.
- Keep notes like a sportscaster
- Write-up:
 - Additional requirements info
 - User testing results
- Presentation → Demonstration?
- Due July 5th at noon.

Design by Copy Parallel Design

Slides adapted from Caitlin Kelleher

Seriously?

- We shouldn't try to be new?
- What's the point of copying things that already exist?
- Revolution has happened in the past.

The Myth of the Lone Inventor

As a culture, we tend to attribute progress to one person.

Thomas Edison invented the light bulb.

If you dig in, the story is always more complicated.



Some of the Other Light Bulb Inventors

- In 1838 JBAM Jobard suggested in the Courier Liberal that "a small strip of carbon in a vacuum used as a conductor of current" could serve as a lasting light source.
- In 1844-1856, De Changy constructed the first carbon glow lamp. (note: it had some problems)
- 1845 John Wellington Starr 1) platinum strip in a glass enclosure 2) carbon strip in a vacuum over mercury – to allow for renewability
- Henry Woodward and Mathew Evans electric light bulb in 1874
- 1878 Sir Joseph Wilson Swan incandescent bulb better vacuum and carbonized thread as a filament

A DeChangy Design



Image from http://home.frognet.net/~ejcov/dechangy.html

An Edison Design



Image from http://en.wikipedia.org/wiki/Thomas_Edison

In the end...

- Edison took the core idea, the use of a vacuum, some potential filament materials, and physical designs from the work of others.
- He identified the biggest barriers to success current use and longevity and experimented to address them.

Telephone

- Elisha Gray and Antonio Meucci also developed the "telephone"
- Gray and Bell raced to file their patents.
- Alexander Graham Bell got the patent.
 - Some evidence to suggest Bell illegally acquired knowledge of Gray's liquid transmitter.
 - The idea of the "liquid transmitter" was Edison's "missing piece"

Why do we do this?

• My theory – the lone inventor is a much simpler and much more satisfying story.



Innovation Research

- Has largely found that innovations come about through a series of small changes in community of people.
- The things that seem like revolutions are often lots of people standing on the shoulders of those who came before and making a small contribution.

Computing Borrows Too: Xerox Star (1981)



Image from http://www.teach-ict.com/as_a2/topics/user_interfaces/as_userinterface/gui.htm

Xerox, Apple, and Microsoft

- 1979 Steve Jobs visits PARC and sees the Xerox Alto (Star's precursor)
- 1983 Apple releases the Lisa
- 1985 Microsoft releases Windows 1.0
- 1988 Apple sues Microsoft for copyright infringement
 - Apple can't get patent-like protection for the desktop metaphor or the idea of a gui
 - Apple lost all claims except the trash can and folder icons ruled infringing
 - Windows today still has a "recycle bin"
- 1988 Xerox sues Apple
 - Xerox claims apple "stole" the mouse and GUI
 - Recall, that Douglas Engelbart came up with the mouse.
 - The GUI was different... focused on direct manipulation.
 - Case was dismissed

Apple Lisa



Windows 1.0



http://en.wikipedia.org/wiki/Windows_1.0

Seriously?

- Don't try to reinvent the wheel.
- But, if you're in a space where a wheel is a bad choice, invent the gear.

One Example

- Consider a domain where we want
 - Novices to be able to pick up the interface easily
 - Experts to be able to use it with incredible efficiency.
- For example
 - Cell/smart phones or tablets
 - Gaming

Starting From Desktop Uls



We might think about some variation on this.

Novices vs. Experts

Novice

- Search for the menus
- Decide what to do
- Navigate to chosen option

Novices vs. Experts

Novice

- Search for the menus
- Decide what to do
- Navigate to the chosen option

Experts

- Decide what to do
- Navigate to the chosen option

Novices vs. Experts

Novice

- Search for the menus
- Decide what to do
- Navigate to the chosen option

Experts

- Decide what to do
- Navigate to the chosen option

Linear Menus



Good for Search

Relatively Slow for Navigation

One Possible Solution



- Shortcut Keys
 - Make it possible to learn a more efficient way to trigger an action.
 - But this learning doesn't just happen.

The Pie/Radial Menu



Effectively teaching users "gestures" to trigger commands which supports a natural transition from novice to expert.

First used in a system called PIXIE in 1969 – which I can't find anything about.

Formal Studies

- Comparing Pie vs Linear menus found:
 - 15% performance increase by novices on selection tasks.
 - For experts, the performance gains depend also on the response time of the system. But essentially, they remove:
 - The time for the system to draw the menu
 - The time to read the items
 - Expert task time = time to draw the selection gesture for their action.

Why aren't pie menus everywhere?

- Using marking menus for occasional selection isn't a big win, and it's going to make users uneasy.
- So, the place to consider it is in a space where efficiency really really matters.
- They've started to come in through application domains where the transition from novice to expect is critical.

SimCity (1986)

In gaming environments, the transition from novice to expert is critical. It's not enough to make it possible to learn, a game needs to make it essentially impossible to fail to learn the controls



Images from http://www.donhopkins.com/drupal/taxonomy/term/18

Pie Menus in Games



Command and Conquer

http://www.gamespot.com/forums/topic/26331110



Assassin's Creed http://www.smashingmagazine.com/2011/07/27/what-web-designers-can-learn-from-video-games/

Game of Thrones: The Game

http://globalmoxie.com/blog/radial-menus-for-touch-ui.shtml

Pie Menus on Handhelds



ELSE Mobile OS http://mobile.engadget.com/2009/10/23/access-and-emblaze-mobile -unveil-else-intuition-the-linux-based/



TWheel http://venturebeat.com/2012/08/06/twheel/

And moving on to the desktop





iTunes Radial Menu for Quicksilver

http://macamour.com/blog/2007/09/27/quicktip-itunes-radial-menu-for-quicksilver/

Take Home Message

- Uls are complex and the stuff that's out there has been refined.
- There is still lots of room for improvement.
- When you choose to deviate make sure you're solving a real problem (and know exactly what problem), rather than just doing it to be different.
- Using existing UI solutions/patterns where they are appropriate frees you to concentrate on the parts of your UI that are hard and new.
 - i.e. Find the problems that are critical to success in your domain and focus your creativity there.

Legalities

- Most of intelligent borrowing is in practice along the lines of a style guide.
 - <u>Apple</u>
 - <u>Microsoft</u>
- There are some crazy patents. But, in practice, there are often simple changes to address them(e.g. replacing the trash can with a recycle bin).
- It will be the job of your company's legal team to determine how they want to approach this.
- Your Instructor's Bias
 - "Intellectual Property" is bogus. The **evidence** based case is against it.
 - The lone inventor is a myth.
 - Ideas are not generated in a vacuum.
 - Ideas are a dime a dozen, execution is hard.
 - First to market matters more than protectionism.
 - It's also dishonest. All work is built on work that came before.
 - See "Against Intellectual Monopoly" for an detailed case studies.

http://levine.sscnet.ucla.edu/general/intellectual/against.htm

Parallel Design

• Create several Designs in Parallel.

- Time is money. Isn't this expensive too?
- Would large groups be just as effective?
- How should developers be included?

Parallel Design Example



Evaluating Ideas

- This is a little like group brainstorming.
- But, if you want to get more formal...
 - Task analysis
 - Paper prototyping w/ user testing are ways to evaluate competing ideas

Parallel Design

- In your project groups, pick a task (everyone should pick the same task) and sketch out the interface for that task as 3 or 4 independent people.
- When everyone's done compare designs. What aspects do all designs share? What don't they?
- Then, everyone separate and make a new design.