Human-Centered Design

Scott Klemmer
Autumn 2009
Recap: Course Overview

- Project-based course
- Weekly assignments, due Thursday noon
- Two weekly lectures, studio
- Final project presentations: Tuesday 12/8, 7p-10p
Human-Centered Design

• Users’ tasks and goals are the driving force behind development
• Users are consulted throughout development
• All design decisions are taken from within the context of the users, their work, and their environment
• Attentive to human abilities, goals, and desires
Why is HCI Important?

• Major part of work for “real” programs
  - approximately 50%
• Bad user interfaces cost
  - money
    • 5%↑ satisfaction ⇒ up to 85%↑profits
    • finding problems early makes them easier to fix
  - reputation of organization (e.g., brand loyalty)
  - lives (Therac-25)
• User interfaces hard to get right
  - people are unpredictable
  - intuition of designers often wrong

Studies have shown that the design, programming, and evaluation of the UI can take up to 50% of the project time and cost for a wide range of commercial and in-house software

Nearly 25% of all applications projects fail. Why?
  overrun budgets & management pulls plug
  others complete, but are too hard to learn/use
Solution is user-centered design. Why?
  easier to learn & use products sell better
  can help keep a product on schedule
    finding problems early makes them easier to fix!
  training costs reduced
User Interface Development Process

Design Discovery

- Customers, Products, Business, Marketing
  - Roles (Who)
  - Tasks (What)
  - Context (Stories)

Design Exploration

- Storyboard

Evaluate

- Proposal:
  - Demos/Lo Fi Prototypes (How)
  - Based on customer feedback
  - Foundation in product reality
  - Refined Design description

Production

- Specification:
  - Hi Fidelity, Refined Design
  - Work together to realize the design in detail

Customers, Products, Business, Marketing

Marketing:
- Business Priorities
- Messages

Technology:
- Products
- Architecture

Design:
- Leading/competing technologies

Design Definition:
- Design Problem Statement
- Targeted User Roles (Who)
- Targeted User Tasks (What)
- Design Direction Statements

Review & Iterate

Evaluate with Customers

based on slide by Sara Redpath, IBM & Thyra Trauch, Tivoli
Usability

According to the ISO:

The effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in particular environments

• This does not mean you have to create a “dry” design or something that is only good for novices – it all depends on your goals
Usability/User Experience Goals

- Set goals early & later use to measure progress
- Goals often have tradeoffs, so prioritize
- Example goals

  - Learnable
    - faster the 2\textsuperscript{nd} time & so on
  - Memorable
    - from session to session
  - Flexible
    - multiple ways to do tasks
  - Efficient
    - perform tasks quickly
  - Robust
    - minimal error rates
    - good feedback so user can recover
  - Discoverable
    - learn new features over time
  - Pleasing
    - high user satisfaction
  - Fun
Who Creates UIs?

• A team of specialists (ideally)
  - graphic designers
  - interaction / interface designers
  - information architects
  - technical writers
  - marketers
  - test engineers
  - usability engineers
  - software engineers
  - customers

In this course you will wear the hats of many of these specialists.
There are multiple strands, sometimes in parallel, sometimes cross-fertilizing.

* Goal is not to advocate, but explain.
Walter Gropius
“Form Follows Function”
Design for People, design for manufacturing.
Le Corbusier’s assertion that “a house is a machine for living in.”
http://en.wikipedia.org/wiki/Bauhaus
Among other things, famous for modernist typography. (directed by Jan Tschichold)

Then, in 1933, the Nazi party comes to power, forcing the Bauhaus to close. many such as Walter Gropius, eventually land in the US, especially at Harvard and in Chicago.

Asymmetric, san serif typography.
Vannevar Bush
As We May Think

WWII is ending
Capturing, Storing, Retrieving, Sharing Information
Interactive!
Human-Centered
Founds NSF/DARPA
  - was Fred Terman’s advisor
  - Sets up the notion of Gov’t funding (NSF/DARPA)
  - and of University research at scale as forming the leading edge of applied research
A year later, on Feb 14, 1946 ENIAC was unveiled. ENIAC “was the first large-scale, electronic, digital computer capable of being reprogrammed to solve a full range of computing problems”

Unveiled on Feb 14, 1946. Designed by John Mauchly and J. Presper Eckert. It weighed almost 30 tons. Input was possible from an IBM card reader, while an IBM card punch was used for output.
Now, this idea of creating tools to empower users has a long and storied history, beginning with Grace Hopper's invention in the early 1950s of the first compiler. What's inspirational for me is that she conceptualized how improved tools could provide a much wider audience with access to computation.

In the intervening years, good programming environments for the desktop and web enabled legions of developers to create the content that helped put a PC on every desk, and the goal of my group's research is to enable an analogous success for ubiquitous computing. Specifically, our interest lies in the move from tools for technology experts toward tools for domain experts, designers.
Licklider and Project MAC lead to ... Sketchpad! Initiated both graphics & HCI in one fell swoop.
Was also Alan Kay’s advisor.
Mouse, Hypertext

Influenced by Bush, @SRI (then part of Stanford)
- Hypertext
- Mouse - did informal testing, tried multiple versions
- Fall Joint Computer Conference
Alan Kay gets his PhD at Utah, working with Ivan Sutherland. Spends two years at SAIL, then leaves for newly created PARC, headed by Bob Taylor.
“The best way to have a good idea is to have lots of ideas.”

-Linus Pauling

Linus Pauling may be the premier chemist of the twentieth century. He was awarded the Nobel Prize for his work on describing the nature of chemical bonds.

What his work philosophy shares with that of professional designers is the practice of trying out multiple alternative ideas, approaches, solution strategies. (rewrite)
There are three specific ways in which construction of multiple alternatives is important in design:

First, designers may build dozens of prototypes to get a more complete understanding of a design space. For example, Paul Bradley at IDEO built about eighty foam models for the original Microsoft mouse to quickly explore different directions.
Bill Buxton and many other reflective designers see the core of design as consisting of two activities: generating multiple possible solutions to a problem (divergence), followed by a selection of desirable solutions from that set (or convergence).
Inspiration

Great design on the web that I'm archiving here for inspiration and recognition. Idea first pioneered by Lisa McMillan.

Read more about this Web Design Inspiration set on Flicker.

450 photos | 753,631 views | Add a comment?
items are from between 19 Sep 2005 & 05 Dec 2006.
“Good artists borrow, great artists steal”
- Pablo Picasso

Les Demoiselles d'Avignon

19th century Fang sculpture
Self-assessment

You’ll get better with time
Our goal is for this experience to be authentic
(It’s more work for us)
The TAs are your safety net. They’ll steer you right if you go wrong.
You can use the rubric to guide your work.
Human-Centered Design
Scott Klemmer
Autumn 2009
Fall 2009