Social Computing Systems

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Why are we covering this?

Building without design is aimless wandering

The design process can help guide good design

We want to build useful things
Designing Real Systems
System Design
The process of design

- what is wanted
  - interviews
  - ethnography

- scenarios
task analysis

- analysis

- guidelines
principles

- precise
specification

- design

- implement
and deploy

- architectures
documentation
help

- evaluation
heuristics

- prototype

- dialogue
notations
Motivation and Initial Design

- Study the context of the problem, and how a solution would fit
- Discover + articulate a problem
- List stakeholders / needs / constraints
- Consider what tech is available and feasible
- Decide what to do first
Prototyping

- Start with a low-fidelity model
- Iterate
- Test with ‘example’ users
  - e.g., within-team tests, hypothetical user profiles, etc.
- Iterate
- Test with real users
- Iterate
- More iterating
- Keep iterating...
Types of Prototypes

- Sketches
- Paper prototypes
- Physical mock-ups
- ‘Workbench’ build
- One-off production
- Small-batch production
- Release-ready
What Should a Prototype Be?

- Quick
- Cheap
- Explanatory
- Better than nothing
Prototyping Example: Google Glass

Thousands of dollars + months of effort

Millions of dollars + years of effort
How Not to Prototype

How to draw an Owl.

“A fun and creative guide for beginners”

Fig 1. Draw two circles
Fig 2. Draw the rest of the Owl
How Not to Prototype
User Testing

- Qualitative (understand experiences)
  - Observation (e.g., ‘Think Aloud’ study)
  - Survey and interview
  - Preference evaluation

- Quantitative (understand performance)
  - Task-based metrics (e.g., completion time)
  - Data-centric (e.g., data mining of user interaction traces)
User Testing

https://twitter.com/designuxui/status/576432203560685568
Results
Benefitting From User Testing

- What went wrong?
- What went right?
- Is there a ‘gulf of understanding’?
- How could these issues be addressed?
  - Functionality
  - Instructions / priming
  - Experience… (e.g., for ‘expert’ features)
- Are the users the right stakeholder to address?
Example Design Process Walkthrough

- We work in a hospital, and see that a large % of the mistakes made are made because one MD doesn’t know what the MD from the last shift did.

- Where do we start?
Example Process: Contextual Inquiry (CI)

- User-centered design method
- Observe the processes at the hospital. Watch an MD work.
- Understand the ‘pain points’, their causes, and the current state of the art
- Interview participants to understand the ‘why’ behind the ‘what’
- Understand broader context: stakeholders, organizational structure, etc.
Example CI Findings

- Doctors check patient charts at the start of their shifts to see history.
- Doctors are overloaded, and often forget to take notes on the charts.
- Nurses don’t always double-check charts until the end of their shift.
- Nurses’ and doctors’ shifts are staggered to prevent high turnover.
- Doctors know they sometimes miss recording information in general.
- However, they can’t recall when exactly after the fact.
Example Process: Example Profiles

- Create example profiles for relevant stakeholders.
Example Process: Brainstorming Solutions

- What could address the problems we see?
Example Process: Refining Solutions

- What technology could we leverage to help achieve our ideas?
- What is too far off in the future?
Example Process: Prototyping

- What could we build quickly to try out our top ideas?
Example Process: Refinement

- Using a wood-block prototype, we ask doctors to pretend it’s a real tool
- We find that MDs remember to use the device when they’re far from the chart
- What should we do next?
Example Process: User Study

- We’ve built a ‘real’ version of our device. Now we deploy it in the hospital.
- How do we measure success?
- How else can we find ways to improve?
Questions?
Readings

Extra-credit reading for 498 students

- [Beyond Being There](#) by Hollan and Stornetta

Required reading for 598 students [Response paper due by next Tuesday]

- [The Intellectual Challenge of CSCW: Socio-Technical Gap](#) by Mark Ackerman
- [Beyond Being There](#) by Hollan and Stornetta
- [Beyond Bowling Together: Sociotechnical Capital](#) by Paul Resnick

Paper should include:

- a paragraph about each of the readings that explains the problem space and the argument presented in the paper
- one page synthesis of all the readings that connects them in a coherent way (there’s no right answer here -- you can tell *your* story!)