From Needs to Prototypes

Scott Klemmer
A2 Examples
User Needs
After the observations, I noted user needs that could enhance a person’s experience in gaming by improving and augmenting the physical space around him and her. I sorted the user needs based on trends that I saw throughout my observations.

Phone Noise Workarounds:
1. User needs a way to pause or mute phone notifications when a game is being played on a different device to avoid constantly looking down at his or her phone
2. User needs a convenient way to reply and view phone notifications without being distracted from the game (in-game notifications)
3. User needs a convenient way to take phone calls while playing games without being distracted too much (muting the game chat and taking the call automatically)

Gaming Environment Augmentation/Detection/Changes:
4. User needs to know if the current environment is suitable to reach the full experience of the specific game
5. User needs to know if the sounds around him or her would be distracting for the game
6. User needs to know if the sounds from the game itself would distract from the communication between his or her teammates
7. User needs a way to automatically mute the microphone or lower it’s volume if excessive background noise is present
8. User needs to know if headphones or speakers are recommended to enhance the experience of the game that he or she is playing
9. User needs a way to contact remote in-game teammates quickly in case he cannot use his microphone due to technical or environmental distractions
10. User way to know if a microphone is suitable in the environment and notify all his or her teammates if he or she is not available via microphone

Minimizing External/Uncontrollable Distractions:
11. User needs a way to be notified in-game (or easily) if someone else has an urgent request or need so there is no need for the unplanned interaction
12. User needs a convenient way to remotely notify others that he or she is in the middle of playing a game to stay focused
13. User needs a way to be alerted that other people are in the vicinity and distractions are expected
14. User needs a schedule of the approximate when he or she would be engaged in a game, so his or her acquaintances can avoid distracting him or her
15. User needs to know if surrounding environment has any potential distractions for gaming (audio and visual)
My interviews are based on people who go through anxiety attacks or are often very anxious. Since the full on attack is hard to observe I asked my participants to keep a diary of any attacks they had while I was not present. I was hoping this would help describe the exact
Scoping
Raise your hand if you have made a Web page
Raise your hand if the source of other pages helped.
I am a Ph.D. candidate in Computer Science at UC Berkeley, specializing in human-computer interaction. My current research interests include end-user programming and informal tools to support the design of user interfaces for applications that run on desktop PCs and mobile devices.

My advisor is Professor James Landay. I am a member of the Group for User Interface Research.

I graduated from the California Institute of Technology, popularly known as Caltech, in 1997.
I am an Associate Professor in Computer Science & Engineering at the University of Washington, specializing in human-computer interaction. My current research interests include Automated Usability Evaluation, Demonstrational Interfaces, Ubiquitous Computing, User Interface Design Tools, and Web Design.

I was previously the Laboratory Director of Intel Research Seattle, a university affiliated research lab that is exploring the new usage models, applications, and technology for ubiquitous computing.

I am a founding member of the University of Washington Design:Use:Build (DUB) Center, a cross-campus interdisciplinary group of HCI and Design researchers.

I received my B.S. in EECS from UC Berkeley in 1990 and my M.S. and Ph.D. in CS from Carnegie Mellon University in 1993 and 1996, respectively. My Ph.D. dissertation was the first to demonstrate the use of sketching in user interface design tools. I was also the chief scientist and co-founder of NetRaker, which was acquired by KeyNote Systems in 2004.
RESEARCH

I am interested in techniques to improve the design of computer systems with respect to their usefulness and usability. To that end, I have investigated the effectiveness and usability of several HCI techniques (e.g., think-aloud usability studies, Cognitive Walkthrough, GOMS) and produced new techniques for bringing usability concerns to the design process (e.g., CPM-GOMS and software architecture evaluation for usability). Much of my work focuses on cognitive modeling, where I work within a unified theory of cognition to develop models of human performance that produce quantitative predictions of performance with less effort than prototyping and user testing. I also work on bridging the gap between HCI and software engineering, specifically including usability concerns in software architecture design.

Two active research projects have their own websites.
Usability and Software Architecture (U&SA)
The CogTool Project: a Tool for Cognitive Modeling

TEACHING

I teach courses in HCI design and evaluation methods. I was the Director of the Master of Human-Computer Interaction Program for almost a dozen years, stepping down in January 2009.

FULL CURRICULUM VITA (.pdf)
Examples provide context, implementation, and composition.
“There are no rules of composition in photography, there are only good photographs”
-Ansel Adams
Examples *can* increase

This creature can walk on land and swim in water very well.

A very funny creature, it is so soft that it makes no noise when it walks.

This is a blue-green creature that is very wrinkled but gentle.

Smith et al. 1993
Will nothing new ever be created?
...without reducing novelty

This creature can walk on land and swim in water very well.

A very funny creature, it is so soft that it makes no noise when it walks.

This is a blue-green creature that is very wrinkled but gentle.

Marsh et al. 1996
Just for Small Innovations?

“By ... metaphors and analogies we try to link the new to the old, the novel to the familiar. Under sufficiently slow and in the case of a sharp discontinuity, however, the method breaks down ... our past experience is no longer relevant, the analogies become too shallow, and the metaphors become

—E.W. Dijkstra, *On the Cruelty of Really Teaching Computer Science*
Les Demoiselles d'Avignon

John Richardson, *A Life of Picasso: The Cubist Rebel, 1907-1916*
“Good artists borrow, great artists steal”

Les Demoiselles d'Avignon

19th century Fang sculpture

John Richardson, A Life of Picasso: The Cubist Rebel, 1907-1916
(How) can we measure creative results?
Design Process at Large

Steven Dow et al.


Participants picked their concept

“I went with the whole parachute idea and what I had from the... This is the best approach for such a design...

“I am not a very good outside-the-box thinker, so I kinda just had... No... for some reason... this seems to be the only idea. There needs to be a platform and then as good of cushion as possible... I don’t see any other
Functional Fixation

Duncker, 1945
DESIGN AT LARGE

Can process offer a fixation antidote?

Prototyp

Feedback

Prototyp

Feedback

Prototyp

SERIAL
Task: Design a Web Ad (N=33)
Parallel design -> more clicks

Clicks per million impressions

<table>
<thead>
<tr>
<th></th>
<th>Parallel</th>
<th>Serial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>445</td>
<td>398</td>
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F(1,30)=4.227, p<.05
...and more time on the site

Average time on client site per visitor

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<th>Time (in seconds)</th>
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<td>31.3</td>
</tr>
<tr>
<td>Serial</td>
<td>12.9</td>
</tr>
</tbody>
</table>

F(1,493) = 3.17
...and higher expert ratings

Likert-scale rating (0-50)

Parallel condition: 24.4
Serial condition: 21.7

F(1,5) = 7.948, p < 0.05
...and more diverse designs

7=highly similar
0=not at all similar

F=182, p<0.001
Comparison aids learning

**Training session**

**Separate cases**
- **CASE#1**: “Describe the solution.”
- **CASE#2**: “Describe the solution.”

**Comparison cases**
- **CASE#1**: “Describe the **parallels** of these solutions”
- **CASE#2**: 

**Learning outcome**

Solutions to a landlord-tenant lease

Gentner, Loewenstein, & Thomson, 2003
Share Multiple -> More Clicks

Clicks per million appearances

Share Multiple: 1072.1
Share Best: 734.9
Share One: 774.6

$\chi^2 = 4.72$,
Benefits of sharing multiple

- More individual exploration
- More feature sharing
- More conversational turns
- Better consensus
Storyboarding activity

• Star people
• From setting to satisfaction
• What is a need/problem/setting?
• Find the fundamental need, not surface needs
• Avoid overtravelled paths
  • Help me find a study buddy
  • I’m hungry, where’s cheap to eat? (have you tried Yelp?)
Storyboarding Tips

• Fold your sheet of paper in 4 so you can use the entire box as your frame
• Make it BIG
• Make it rough, no need for too much detail or artistry
• NO erasing!
Prototyping activity
Final Project Example

• Crowdsourced gift purchasing
  http://gifthub.herokuapp.com/home
Announcements

• Quiz 2 next Tuesday
• One person submits team assignments